PATRICIA C. FRANKS

RECORDS & INFORMATION MANAGEMENT

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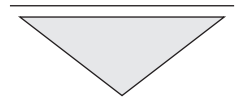
Contents

List of Illustrations

Figures

Tables



Introduction

With all of the hype about social media, cloud computing, digital preservation, electronic records, big data, and the concept of information governance to tame the resulting chaos, why would anyone publish another book with a title as unpretentious as *Records and Information Management*? It's because a term other than *records and information management* would limit the scope of this book and its message in a way that would make it less relevant to readers. The discipline of records management, including a responsibility to manage all information, is fundamental to every information governance program.

Recordkeeping can be traced back to prehistoric times when early cave dwellers documented their lives by painting murals on walls. Since then, advances in technology used to facilitate the creation and management of records have introduced challenges that require records management solutions. Until recently, those solutions were developed in response to a problem (e.g., inability to locate needed files) with what might be considered a prescriptive approach that most often addressed inactive records.

However, with the dawn of the twenty-first century, records management has been transformed from an authoritative, reactive profession that developed and dictated solutions to users to protect the organization (Records Management 1.0) to a consultative, proactive profession that analyzes the needs of users before designing solutions that work for both the organization and its employees (Records Management 2.0). Today, records management can be used to control records and information in both analog and digital forms residing within the enterprise or on third-party servers during every phase of the lifecycle.

Due to the growth of electronic records and information and the need for an integrated approach to recordkeeping, the terms *records manager*, *records and information manager*, and *records professional* are used interchangeably in this book to describe those who have recordkeeping responsibilities, including archivists, records managers, and information managers, regardless of their job title (e.g., digital archivist, knowledge management advisor, information governance specialist).

One of the most striking changes that has impacted today's records professional is the breadth of knowledge required to be successful. Not only must records professionals understand and be able to manage records and information from creation through disposition and preservation, but they must also master the fundamentals of different but related fields, including compliance, risk management, change management, and project management. This book therefore differs from traditional records management works by placing equal emphasis on business operations out of which records arise and ways in which the records professional can contribute to the core mission of the enterprise beyond the lifecycle management of records.

About This Book

In order to bring a real-world perspective to this book, 12 individuals were invited to contribute their expertise to the conversation in the form of either perspectives (reflections) or paradigms (case studies). The guest authors include archivists, records managers, and information professionals who come from the United States, the United Kingdom, and the Netherlands. They talk about their experiences dealing with artifacts, records, and information that include both paper and digital objects, and they give us "something to think about."

Chapter 1 provides the reader with a glimpse of the path recordkeeping and recordkeepers have taken from prehistoric times to the present. Steve Bailey, in his perspective on realigning the records management covenant, expresses his conviction that to meet the challenges of the future, records managers must deviate from the past practice of developing records management programs "for the organization" and instead *put the user first*.

Chapter 2 introduces the reader to the concept of information governance and the key role records management plays in an information governance strategy. The chapter explains laws, regulations, and standards that impact records and information management programs for both government and private organizations in the United States and abroad. Eugene Yang provides a rationale for standards within the context of the nuclear regulatory environment with his paradigm on the US nuclear power industry.

Chapter 3 introduces the reader to records creation, capture, classification, and file plan development for records and information that result from business activities conducted using some of the many systems, components, networks, and applications employed by users at home and at work. Tanya Marshall, Deputy State Archivist and Senior Records Analyst for the Vermont State Archives, contributes to the conversation about classification and information systems in her paradigm on the Vermont Functional Classification System (VCLAS).

Chapter 4 presents records retention strategies useful to those organizations stressing the value of disposition as part of the overall information governance approach. In her contribution to this chapter, Nancy Kunde, a Certified Archivist and Certified Records Manager, describes one organization's approach to records appraisal, retention, and disposition as part of implementing an Enterprise Resource Planning (ERP) system and shares lessons learned.

Chapter 5 describes ways in which records and information managers can contribute their expertise during the active phase of the information lifecycle to decisions being made about workflow processes, access controls, storage systems, metadata, and the search and retrieval processes. In her contribution to Chapter 5, Deborah Rifenbark describes the steps taken to automate a manual "new business intake" workflow process within a law firm.

Chapter 6 describes systems of record and systems of engagement as well as the vital role records professionals play in identifying records in both types of systems and in providing guidance to those responsible for capturing and managing them. Mary Beth Herkert, Oregon State Archivist, shares experiences and lessons learned in expanding cloud services to local governments in a paradigm on records management in the cloud.

Chapter 7 explores the ways in which the social media introduced in Chapter 1 impact the recordkeeping profession. It introduces the diffusion of innovation and trend spotting as methods that can be used to prepare for the inevitable changes that will take place due to emerging technologies and changing societal expectations. Christian van der Ven, Coordinator of Digital Services at the Brabant Historical Information Center, the Netherlands, describes a social media initiative to improve customer service in his paradigm on discovering the South Land. This is an example of what might be happening in your organization right now; your responsibility will be to understand if records are being created and, if so, how they can be managed.

Chapter 8 discusses business resumption, which depends upon vital records, disaster preparedness and recovery, and business continuity plans. In 2005, Hurricane Katrina wreaked devastation across Texas, Louisiana, and Mississippi, causing an estimated $100 billion in damages and flooding 80 percent of the city of New Orleans. HP (Hewlett-Packard) provides a business case describing how the Archdiocese of New Orleans rebuilt its archives after Hurricane Katrina, thanks to the expertise of Emilie Gagnet Leumas, Director of Archives and Records, Archdiocese of New Orleans.

Chapter 9 presents several methods of monitoring and auditing records and information management programs. Risk assessment—which includes risk identification, risk analysis, and risk evaluation—is explored. Fred V. Diers offers one method to mitigate risk in his paradigm on creating defensible records retention programs.

Chapter 10 covers the topics of inactive records management, archives, and long-term preservation. In keeping with the theme of the chapter—control—guest contributors Barb Ricci and Jeffrey Cox describe how they implemented a records management program for physical records as a first step in a comprehensive plan for the city of Los Alamos, New Mexico, that will eventually include electronic records.

Chapter 11 presents the reader with a variety of options for records and information management education and training, including degree programs, professional development opportunities, and in-house training programs. In his paradigm on digital education for a digital world, Ross Harvey of Simmons College provides an overview of the school's virtual Digital Curriculum Lab.

Chapter 12 explains how the information shared in Chapters 2 through 11 can be used to develop a legally defensible records management program and an effective information governance strategy. Diane Carlisle of ARMA International provides a detailed explanation of the Generally Accepted Recordkeeping Principles and an overview of the Maturity Model that can be used to evaluate and improve an existing records and information management program.

This book is suitable for records professionals at any stage of their career. Those wishing to learn all they can about records and information management would benefit from reading all of the chapters. However, the book is also intended for experienced professionals who would benefit from a reference book that brings together a variety of topics—including archives, records and information management, information governance, digital preservation, and more. When necessary, important ideas or definitions are included in more than one chapter, so that the chapters can be read independently.

Increasingly, organizations are forming information governance committees comprised of stakeholders from records management, information technology, legal, compliance, and

business units, among others. Their task is to develop strategic information governance policies and programs. The glossary included at the end of this book will provide a basic vocabulary that should prove useful to members of these new information governance teams.

CHAPTER

1

The Origins and Development of Records and Information Management

Introduction

From the days of the early cave dwellers who painted symbols onto stone walls through today when social media–savvy citizens post their own digital messages on Facebook walls, three factors remain constant: human beings are compelled to record their experiences, using the tools and technologies available to them, with the intent to share that information with others. Before we can develop a strategic approach to records and information management for today and tomorrow, we should look to the past at the custom of recordkeeping and the conventions that developed around it. As Shakespeare wrote in *The Tempest* and the US government has carved on the National Archives Building in Washington, DC, "What's past is prologue."[1]

Records and Recordkeeping in Society

Long before the invention of the alphabet and the written word, stories and sagas were passed down by those who mastered the skill of rote memorization. In addition to cultivating the skills of memorization, memory aids were found useful and were used, especially as evidence of an activity. A brief glimpse at recordkeeping practices from 15,000 BCE to the present day demonstrates that no matter how much civilization develops, our desire to remember and document remains the same.

Recordkeeping and Ancient Civilizations

Between 15,000 and 13,000 BCE, human beings documented the animals involved in their hunt for food through mural paintings on the walls of caves found in the "sole region of Paleolithic mural paintings" in Europe.[2] Abbe Breuil, an explorer and scientist who studied the paintings on the walls of the caverns of Lascaux, describes the caves not as dwellings for humans but as "places (that) could have served only as specially chosen repositories for the secrets of a civilization."[3]

Tangible and portable memory aids were needed to document transactions. In Mesopotamia as far back as 8000 BCE, plain clay tokens were utilized for recordkeeping, probably to count agricultural items such as grain or cereal. By 4000 BCE, tokens decorated with markings thought to be used to record manufactured goods appeared in settlements in southern Mesopotamia. Similar tokens were used to record animals, with wedge-like shapes engraved into the clay to represent quantity followed by a sign that indicated the

type of animal.[4] This method of recordkeeping is considered the precursor to the cuneiform writing system created by the Sumerians. The evolution of recordkeeping from tokens to the written word is illustrated in Figure 1.1.

By 3200 BCE, hieroglyphics were developed in Egypt by a people who saw literacy as the most valued skill. Recordkeeping was used both for commercial and religious purposes. Records of land holdings, crop yields, and taxes were made. Religious texts were written and copied by scribes in temples and were inscribed on funerary equipment and papyrus.

As writing skills became more widespread, the volume of information that needed to be organized and stored grew. The archives of Ebla (modern Tell Mardikh, Syria) ultimately contained an estimated 20,000 clay tablets written in Sumerian script that dated from approximately 2250 BCE.[5] The archives are believed to have been a repository for records about economic matters, such as accounts of the state revenues, but they also contained royal letters, law cases, and diplomatic and trade contracts—all organized on shelves according to subject. The information contained in these tablets provided a glimpse into the everyday life of the citizens of Ebla.

Papyrus scrolls were used as a recording medium throughout the known world until circa 170 BCE when Egypt cut off its supply of papyrus to Pergamum, an ancient Greek city located in Anatolia (now modern Turkish town of Bergama). In response, the people of Pergamum produced parchment made out of a thin sheet of sheepskin or goatskin. This innovative recording medium allowed for increased information to be recorded and spread throughout Europe and Asia.[6]

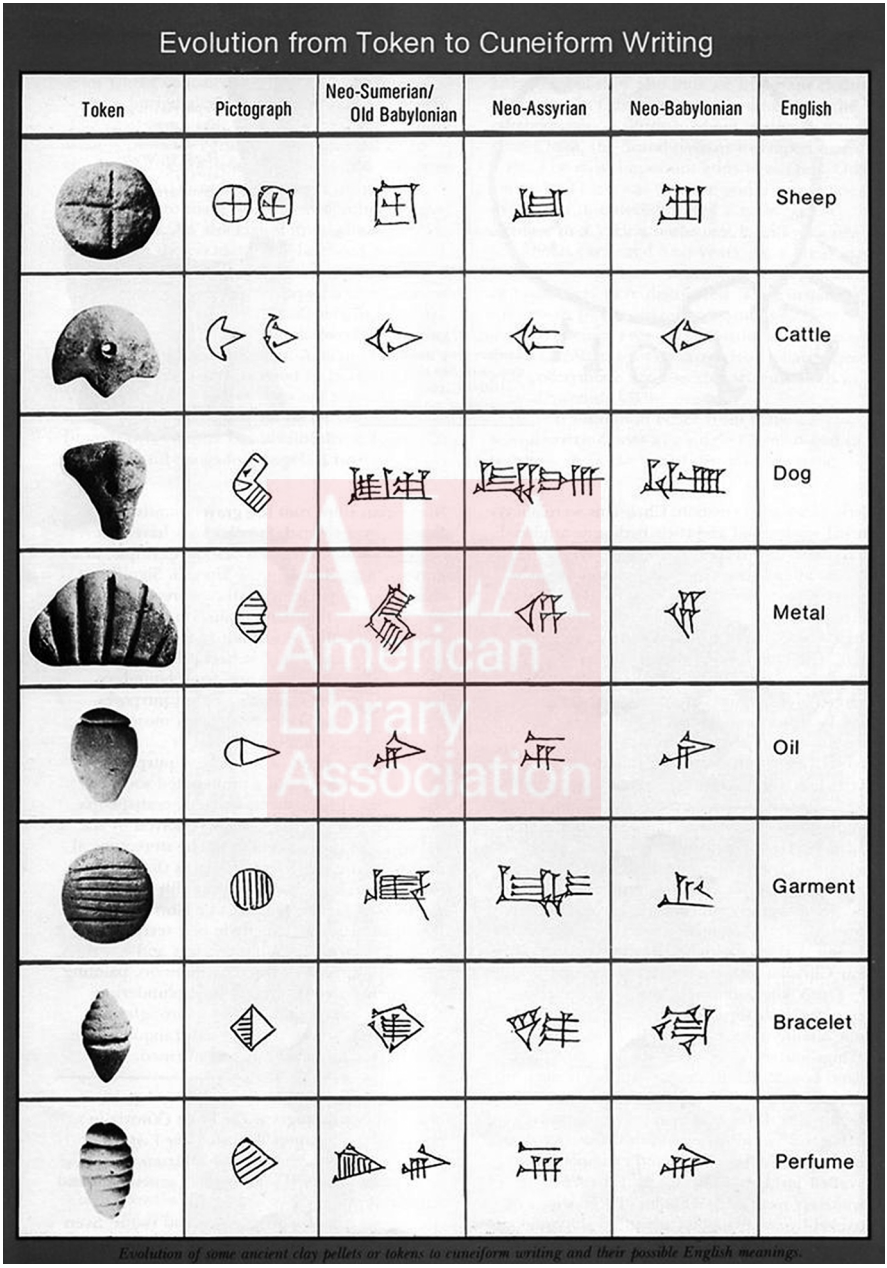
Recordkeeping: First Millennium through the Early Twentieth Century

The second century CE brought with it the development of a papermaking process in China by Ts'ai Lun, known to the Chinese as the patron saint of papermaking.[7] The paper was thin, strong, and flexible. It wasn't until the third century that the secret art of papermaking made its way to Vietnam and Tibet. Over the next several centuries, it spread to the rest of the civilized world. By the ninth century, papyrus had been replaced by parchment in Europe. Paper was not used as a practical medium in Europe until Johann Gutenberg perfected moveable type and printed the Gutenberg Bible in 1456. This sparked a revolution in mass communication and ushered in the age of modern paper and the printing industry.

Just as we're experiencing today, advancements in technologies and tools required new, often bureaucratic, solutions to managing records, such as the following:

- The fourteenth century saw the first office of the clerk of the rolls, register, and council, later known as the Lord Clerk Register, appear in Scotland. This office assumed responsibility for keeping the national archives.[8]
- The town clerk of the city of London was made responsible for the safekeeping of the city corporation's records in 1462.[9]
- In 1540, the Emperor Charles V transferred his most important records to a tower in the castle of Simancas (in Spain),[10] and Jacob von Rammingen, considered the father of archival science, wrote the manuscript of the earliest known archival manual. Rammingen's archival manual was printed in Germany along with a more detailed book on the same subject in 1571.[11]

Figure 1.1. Engraved clay tokens, evolution to cuneiform writing, and English equivalents.



Source: Denise Schmandt-Besserat, "Reckoning Before Writing," Escola Finaly, accessed January 15, 2013, http://en.finaly.org/index.php/Reckoning_before_writing. © Denise Schmandt-Besserat, licensed under the Creative Commons Attribution-ShareAlike 3.0 Unported License.

- In 1681, Jean Mabillon, a Benedictine monk, published *De Re Diplomatica* (*Study of Documents*). This six-volume treatise produced the name of a new science—diplomatics—that attempts to establish the provenance of a written text through systematic analysis of the material on which the text is written, the scripts and penmanship used to write the text, and the language usage within the text.[12]
- On January 7, 1714, Queen Anne of England granted the first known patent for a machine or method for the impressing or transcribing of letters "so neat and exact as not to be distinguished from print."[13] The machine was useful in settlements and public records because the impression would be more lasting than writing and could not be erased or counterfeited without discovery.
- In 1772, the General Register House in Edinburgh was designed by Robert Adam to serve as a repository for the public records of Scotland.[14]
- In 1790, the US Congress enacted the US copyright law to protect books, maps, and charts.[15]

The nineteenth century saw the establishment of a number of national archives, including those in the Netherlands, Portugal, Argentina, Italy, Spain, Canada, France, India, Ireland, and the Philippines. In the United States, a number of state archives and historical societies were established, including those in New York, Rhode Island, Pennsylvania, Indiana, Maryland, Iowa, Nebraska, and Colorado.

The nineteenth century also produced a new technology that automated the task of writing and editing—the first modern manual typewriter invented by Christopher Latham Sholes and two colleagues in 1867. E. Remington and Sons marketed the typewriter commercially in 1874. This technology allowed records and correspondence to be produced more quickly and easily. Businesses purchased typewriters and hired women as typists at salaries higher than for schoolteachers or nurses.

The population grew so rapidly in the United States during the nineteenth century that the 1880 census took seven and one-half years to complete. In a search for a method to streamline the process, the US Census Bureau offered a prize for an inventor to help with the 1890 census. It was won by Herman Hollerith, who used Joseph Marie Jacquard's punched cards for the computation. The 1890 census was completed in only three years and saved the government $5 million. Hollerith built a company that eventually became known as International Business Machines (IBM).

In 1893, a new invention to organize and store the increasing volume of paperwork was unveiled at the Columbian Exposition in Chicago, Illinois—the filing cabinet. In 1897, the Library of Congress established its Manuscript Division with a staff of four and a collection of 25,000 items.

The first decades of the twentieth century ushered in additional state and national archives, along with the first of many laws and regulations designed to protect official records. In 1903, the State Library of Western Australia was authorized to accept official records, and the Archives of Ontario, Canada, was founded. On December 15, 1909, H.R. 15428 was introduced to create a Commission on National Historic Publications in the United States. In 1911, the British Royal Archives was established in Windsor Castle in England. In 1922, Sir Hilary Jenkinson's book, *A Manual of Archive Administration*, was published. Also in 1922, the former American Telephone and Telegraph Company

established its Historical Collection in New York City. In 1925, South Australia passed an act to regulate the disposal of government records.

Recordkeeping in the United States in the Twentieth Century

The federal government was the primary driver for records management in the United States. Major technological innovations were made, and unforeseen challenges emerged to which government and industry were required to respond.

Ground was broken for the US National Archives building in 1931, and the cornerstone was laid in February 1933. Congress established the National Archives in 1934 to centralize federal recordkeeping, with the Archivist of the United States as its chief administrator. President Franklin D. Roosevelt signed legislation creating the National Archives on June 19, 1934, and Robert D. W. Connor was appointed first Archivist of the United States on October 10, 1934.

Corporate Archives to Adapt to Capture and Preserve the History of the Organization

In 1922, the former American Telephone and Telegraph Company established its Historical Collection in New York City. Renamed the AT&T Historical Library in 1933, and later called the AT&T Corporate Archives in 1982, this collection was consolidated in 1987 with the Bell System Museum and the archives of Bell Labs and Western Electric, in Warren, New Jersey. Following the 2005 acquisition of AT&T Corporation by Texas-based SBC Communications, the AT&T Archives merged operationally with the SBC Archives to form the AT&T Archives and History Center with two locations. The San Antonio facility holds the historical records of SBC (renamed AT&T Inc.) and the other major companies it has acquired since 1997: Pacific Telesis Group, SNET, Ameritech, Cingular, AT&T Wireless, and BellSouth.

Source: Courtesy of the AT&T Archives and History Center.

In 1935, Emmett J. Leahy joined the staff of the National Archives, where his first assignment was to form a committee of special examiners to examine the records presented to the Archivist that were without "permanent value or historical interest"and to decide whether the records should be destroyed or otherwise disposed of.[16]

By 1937, the initial survey of federal government records was nearing completion and the committee realized the enormity of the records problem they were facing due to a lack of conformity in procedures, unprecedented growth in volume of documents created and requiring management and storage, and the number of duplicate records retained across federal government agencies.

The National Archives initiated a records management program to segregate records of temporary value from those that had archival value. A key component of the program was the records lifecycle model developed by Leahy that controlled the creation, use, and disposition of records either by destruction or transfer to the National Archives.

The Society of American Archivists (SAA) was founded in 1936 with A. R. Newsome, a North Carolina historian, as its first president. Theodore C. Pease was appointed the first editor of the SAA journal, *The American Archivist*, in 1939.

During the summer of 1940, tired of being misquoted, President Franklin D. Roosevelt had a recording machine installed under the Oval Office to record press conferences, which he sometimes turned on before the press conference and turned off after capturing additional conversations. The device was also connected to his telephone. Digital copies of these original recordings reside alongside images, movies, and other radio addresses in the FDR Presidential Library and Museum in Hyde Park, New York.

New agencies and departments were added to the US government during World War II, and, not surprisingly, the volume of documents grew as well. The scheduling of records for disposition was given legal status by the Records Disposal Act of 1943, which defined records and authorized the National Archives Council to develop procedures to dispose of records no longer needed as well as to reproduce permanent records on microfilm so that the originals could be disposed of. The Act was amended in 1945 to include the government-wide General Schedule (GS), which authorized the systematic disposal of government records.

In 1950, the Federal Records Act codified a series of laws—including prior legislation from the late 1930s and 1940s—in 44 *United States Code* (USC) sections 21, 23, 25, 27, 29, 31, and 33. The Federal Records Act set forth records management policies and practices of agencies within the federal government and established the National Archives and Records Administration (NARA) with the mandate and the responsibility to preserve records of permanent historical value to the United States.[17] In 1955, the first *Guide to Records Retention Requirements* was published.[18]

In addition to contributions to the National Archives, Emmett J. Leahy was central to the emergence of the Commercial Records Center (CRC) industry. In 1948, he became the first executive director of the National Records Management Council and formed the Business Archives Center, thought to be the first CRC in the United States. During the 1950s and 1960s, CRCs continued to emerge in large metropolitan areas, including New York and Philadelphia, primarily to store inactive records for large corporations and organizations.

By the 1960s, the original US National Archives building on Constitution Avenue in Washington, DC, was out of room, forcing expansion to a new site. Most of the federal documents are now housed in a 2-million-cubic-foot building in College Park, Maryland, dedicated in 1994, that has room for 400 researchers.

Like President Franklin D. Roosevelt, Presidents Truman and Eisenhower recorded conversations, but President John F. Kennedy installed the White House's first secret recording network to protect himself against officials who told him one thing in private and said something different in public. The pen and pencil set on his desk turned the network of microphones on and off.

President Richard M. Nixon also employed a secret recording system that was discovered in 1973 as a result of the Watergate scandal. During the 1972 presidential campaign, five men connected to the Committee for the Re-Election of the President (CRP) broke into the Democratic National Committee headquarters at the Watergate complex in Washington, DC. During the investigation, it was revealed that President Nixon had a tape-recording system in his office that recorded many conversations that implicated the president in a cover-up of the break-in. The president's secretary, Mrs. Rose Mary Woods, tried to take the blame for an 18-minute gap in the tapes that provided evidence that the president was involved in the Watergate break-in (see Figure 1.2). The Watergate break-in and subsequent attempts to cover it up resulted in President Nixon's resignation from office in 1974.[19]

After archivists at presidential libraries confirmed that other presidents had secret tapes as well, the US Congress passed the Presidential Records Act in 1978, which established public ownership of records generated by subsequent presidents and their staffs.

Figure 1.2. Known as the *Rose Mary Stretch,* President Nixon's secretary demonstrated how she accidentally hit the pedal beneath her desk that activated the machine that erased 18 minutes of a taped conversation while talking on the telephone.

Source: Wikipedia, accessed January 15, 2013, http://en.wikipedia.org/wiki/Rose_Mary_Woods. Courtesy of the Gerald R. Ford Library and Museum.

Information Technology, Records, and the Information Age

In the United States, records management policies and procedures were implemented and modified over time as a result of an increasing volume of information generated by a growing population using emerging technology. This technology, which would eventually converge, initially followed two discrete paths: (1) computers for data processing and (2) electronic typewriters and word processing equipment for text processing.

Computers for Data Processing

Between 1943 and 1945, two University of Pennsylvania professors, John W. Mauchly and J. Presper Eckert, received funding from the war department to build the first all-electronic digital computer, ENIAC (Electronic Numerical Integrator and Computer). ENIAC was expected to replace all of the women who were employed calculating firing tables for the army's artillery guns. ENIAC filled a 20-by-40-foot room, weighed 30 tons, and used more than 18,000 vacuum tubes, which generated so much waste heat that it had to be housed in a specially designed room with a heavy-duty air-conditioning system. The first task assigned by the war department was to determine the feasibility of building a hydrogen bomb.

Later the US National Bureau of Standards contracted to build the Universal Automatic Computer (UNIVAC) (see Figure 1.3). One of the significant technical features of UNIVAC was the use of magnetic tape for mass storage. Due to the high cost, control remained in the hands of the few employees within the agencies using the technology. Reports were printed out to provide information and filed for the record.

Although the term *digital* was first used in 1938 to describe a computer that operates on data in the form of digits, the federal government did not address machine-readable materials through legislation until 1950 when the US Federal Records Act was expanded to establish the framework for records management in federal agencies.

In 1956, IBM launched the RAMAC 305, the first computer with a hard disk drive (HDD). It weighed over a ton, but could only store about 4.4 MB (megabytes) of data. In 1962, the IBM 1311, the first storage unit with removable disks in disk packs was released. Users could easily switch files for different applications.

In 1975, IBM announced the 5100 Portable Computer for the use of engineers, analysts, statisticians, and other problem solvers. It weighed 50 pounds, was available in twelve models with between 16 K (kilobytes) and 64 K of main storage, and offered magnetic tape cartridges that provided more than 100 routines applicable to math problems, statistical techniques, and financial analyses. This model was withdrawn from the market in March 1982 as more efficient models took its place.

Figure 1.3. UNIVAC, 1951, showing operator control board, central processor, and magnetic tape drive units.

Source: Hagley Digital Archives, accessed February 7, 2013, http://digital.hagley.org/cdm/singleitem/collection/p268001coll4/id/1190/rec/159. Courtesy of Hagley Museum and Library.

The 5.25" floppy disk became the standard removable storage medium in 1978 and remained in use until the early 1990s. Three different options were available that provided from 160 KB to 1.2 MB of storage. In 1984, IBM again changed the way information was stored by introducing 3.5" floppy disks that also provided three options ranging from 720 KB to 2.88 MB of storage. The 3.5" disks were widely used in the 1990s but seldom used by the year 2000.

Electronic Typewriters and Word Processors for Text Processing

The first model of the Electromatic typewriter was completed in March 1930, and a new division of IBM, Electromatic Typewriters, was formed in 1933. This product greatly increased typing speeds and the ease with which documents could be created, resulting in the growth of paper records.

In 1961, IBM introduced the Selectric typewriter, which could print faster than the previous typewriters because the moveable carriage had been replaced with a revolving type element (ball). The removable element also allowed the operator to select among different type fonts (see Figure 1.4).

Bits, Bytes, and Other Units of Information

A *bit* is the smallest unit of information stored on a computer in the form of either a 1 or a 0 (meaning on or off). A *byte* is made up of 8 bits and has the ability to represent 256 characters, either numbers or letters.

Unit	Equivalent
1 kilobyte (KB)	1,024 bytes
1 megabyte (MB)	1,024 kilobytes
1 gigabyte (GB)	1,024 megabytes
1 terabyte (TB)	1,024 gigabytes
1 petabyte (PB)	1,024 terabytes
1 exabyte (EB)	1,024 petabytes
1 zettabyte (ZB)	1,024 exabytes
1 yottabyte (YB)	1,024 zettabytes

Computers use binary math (base 2), but the common units used to measure digital information are often simplified by using a digital numbering system. For example, you may often see the units represented as 1 = KB = 1,000 bytes.

Figure 1.4. Removable type element on the Selectric typewriter allowed operators to select from a number of different fonts.

Source: Flickr, accessed January 15, 2013, http://www.flickr.com/photos/teezeh/6089374659/sizes/z/in/photostream/. Courtesy of Thomas Cloer.

This was followed in 1964 by IBM's MT/ST (Magnetic Tape/Selectric Typewriter), which combined the features of the Selectric with a magnetic tape drive that could hold one to two pages of text. The text on the magnetic tape could be corrected and reprinted to produce as many copies as desired, and then the tape could be reused for other projects. This was the beginning of word processing technology that eventually would offer additional features at lower costs as more manufacturers entered the market.

IBM introduced the first 8" floppy disk in 1971 as an alternative to storage on a hard drive or magnetic tape. The floppy was reusable, portable, and inexpensive, but each disk could store only 80 KB of data initially. In 1973, Vydec was the first manufacturer to produce a word processing system using floppy disks for storage that could hold 80 to 100 pages of text. These floppy disks were also used to store programs, separating programs from the equipment and encouraging the development of word processing and other programs independent of the hardware. Before the introduction of the floppy disk, word processing hardware was only capable of one task: processing text. The separation of the program from the hardware marked the beginning of the convergence of word and data processing functions that could be performed by the increasingly popular personal computer introduced by IBM in 1981.

Word processors served as stand-alone office machines through the 1970s and 1980s, in most instances to replace the electric typewriter. As features including display screens and the ability to print to a dot matrix printer were added to personal computers, most business machine companies stopped manufacturing the dedicated word processor.[20]

The information age, which began with the advent of personal computers in the late 1970s, brought about a transition from a paper-based records environment to a hybrid environment that includes digital records. In spite of claims that we would soon see the paperless office, the ease with which documents could be created, edited, stored, retrieved, and printed resulted in a growth in the volume of paper records.

Electronic Records Bring Additional Challenges

In 1976, Ethernet (computer network architecture) was developed to provide distributed packet switching for local area networks (LANs). The LANs provided a means for organizations to encourage employees to file documents, spreadsheets, and other work-related files to their private folders or to department folders, where the records could be subject to records management policies. During much of this time, though, printing copies of documents and storing them in file cabinets was standard practice.

As the volume of records grew throughout the 1980s, organizations searching for more efficient means to store and manage information turned to electronic document management systems (EDMS). In addition to increasing accountability for the organization, EDMS helped to enforce records management policies and procedures. A major problem with the use of EDMS was the inability to access information when away from the office, which was increasingly the circumstance encountered by a more mobile workforce. Staff members had to copy information to their laptops for use when out of the office and then upload files to the EDMS when they returned.

Larger organizations seeing a need for connectivity between LANs at remote geographic locations developed wide area networks (WANs), often using leased lines, which were quite expensive. By the early 1990s, the Internet and the World Wide Web made connectivity

possible, and businesses began to expand their own networks using virtual connections instead of leased lines. The demand for solutions to allow access from outside of the organization walls also resulted in virtual private networks (VPNs) provided by Cisco, Check Point, and Microsoft. In reality, VPNs posed their own unique challenges to users. VPNs were as difficult to use with an EDMS and collaboration was challenging. So, enterprising workers used e-mail with file attachments to avoid the use of VPNs when necessary.

In 1990, Tim Berners-Lee created the World Wide Web in order to facilitate sharing and updating information among researchers.[21] By 1994, Jeff Bezos wrote a business plan for Amazon.com, and a new business model was born. Governments, businesses, and individuals came to realize the potential of the web. Records were posted to, or created through, transactions taking place on websites. Web technology was also used to create intranets to facilitate access to information within the organization and extranets to allow business partners and customers to access information from outside the organization.

Communication Technologies

To this point we've discussed technologies used to record events and transactions, either for use in daily operations or to share information with future generations. But in 1965 a method was developed for the primary purpose of facilitating communication among colleagues. Communications technologies would eventually be used to produce records that also had to be identified and managed.

E-mail

E-mail is a mature technology now, but when introduced at MIT in 1965, the system called MAILBOX began with the concept of leaving an electronic note in someone's directory so they could see it when they logged in.[22] Soon after, Ray Tomlinson, an ARPANET (Advanced Research Projects Agency Network) subcontractor to the US Department of Defense, wrote a program to alert users they had a message in their directory if they were using dumb terminals to access the same mainframe computer.

When computers were networked, a better system was needed to exchange messages. Tomlinson is also credited with inventing Internet-based e-mail in 1971. His contributions included a file transfer protocol to adapt the local SNDMSG mail program to send electronic messages to any computer on the ARPANET network and the use of the @ symbol to tell which user was at which computer.[23] Those early addresses would be written as *sender-name@computer-name to recipient-name@computer-name*. By 1974, there were hundreds of military users of e-mail; by the end of the 1970s, 75 percent of all ARPANET traffic was e-mail.[24]

The first known use of the term *e-mail* was in 1982.[25] On August 30, 1982, 18-year-old V. A. Shiva copyrighted the computer program he created called EMAIL. He also designed the graphical user interface (GUI) with the fields (metadata) we still use today:[26]

- To
- From
- Cc
- Bcc
- Subject
- Reply, Reply All, Forward
- E-mail body and attachment

In 1978, 5,000 e-mail messages were sent, e-mail topped 150 trillion messages in 2011, and more than 500 trillion messages are expected to be sent in 2020.[27]

Records and information managers understand that although storage costs may not be a major factor due to declining costs of storage media, time wasted searching through and reading irrelevant communications, or even more time-consuming, retrieving and redacting information to present e-mail for e-discovery, can be substantial. Today organizations have the option of outsourcing their e-mail systems to take advantage of potential benefits, including these:

- *Ease of management:* IT staff may not be required to manage on-premise e-mail systems, and some hosted services offer customer support 24 hours a day, 7 days a week.
- *Cost-effectiveness:* E-mail that lives in the cloud often costs less than in-house, server-based e-mail platforms.
- *Productivity enhancement:* Hosted communication solutions are available that offer more than e-mail, for example, scheduling and information-sharing tools.
- *Flexibility:* Employees can access outsourced e-mail from any location using an Internet connection. Mobility solutions are available to keep data synchronized between a smartphone and the hosted e-mail account while an employee is traveling.
- *Data protection:* Outsourced e-mail resides outside of the organization's data center and server, so e-mail messages will not be destroyed by a disaster that strikes the organization such as a flood or fire. Hosted services offer their own data protection (e.g., daily backups) and security features (e.g., protection to reduce spam and detect intrusions).

E-mail systems are communication systems and not management systems. However, a number of e-mail management systems that provide records management and retention functionality exist that can be employed to improve the e-mail management process.

Instant Messaging (IM)

In the early 1990s, chat room software was designed to set up chat rooms on web servers. People were able to type in messages that could be seen by everyone in the room. Early chat rooms allowed the equivalent of instant messages for everyone within that room. Early instant messaging became a chat for two. Today, IM provided by services such as Skype allow more than one contact to be created, resulting in a group instant message.

In 1996, an Israeli company, Mirabilis, introduced a free IM utility called ICQ, a homophone for *I seek you*. It used a client residing on the user's computer to communicate with an ICQ server whenever the user was online and the client was running. AOL acquired Mirabilis in 1998 and named the IM utility AIM (AOL Instant Messenger). Although this may sound like ancient history, you might be surprised to learn that when AOL sold AIM in 2010 to Digital Sky Technologies, a Russian investment company, it had over 100 million registered accounts and had been updated to allow for integration with Facebook and other websites.[28] Web-ICQ is available for installation on any computer, and ICQ Mobile is available for any mobile device.

One benefit of ICQ from the user standpoint is that one account can be signed into from multiple devices simultaneously, for example, laptop, smartphone, and tablet. Message notifications are received wherever you happen to be at the time. The promotions for ICQ are geared toward individuals who want to connect to friends and have fun playing games. The encouragement through those same ads, however, to *take the chat from your boss on*

your desktop PC promotes the personal use of chat at work and indicates a potential area of risk for the organization and the individuals involved. Although users may enjoy the flexibility and ease with which they can engage in conversations, records and information managers may wonder about the implications of using this service on multiple devices and how ownership by a foreign entity impacts their ability to comply with their home country's laws and regulations.

Today there are a number of instant messaging services available—Windows Live Messenger, Google Talk, and Yahoo! Messenger, to name a few. Most now offer services such as file sharing, and some have integrated IM with e-mail in order to notify users of new e-mail messages. Google Talk allows users to archive IM conversations and drag files and folders into the chat window. There are applications, such as eBuddy, that provide access to multiple IM services—including MSN, Yahoo, AIM, Google Talk, Facebook, ICQ, and Myspace—in one online location. One fact that may cause sleepless nights for records and information managers is that this service works even if the user is behind a firewall.

Employees used to the convenience of using IM in their daily lives will find a way to incorporate IM into their work lives. Organizations that understand both the benefits and risks related to IM have an alternative to prohibiting use: they can offer an enterprise solution. For example, IBM employs Sametime, an IM product, to replace voice mail in order to avoid phone tag. The ability to see when contacts are online allows users to communicate effortlessly in real time. Additional advantages of using IM instead of the telephone for business communication is that less time is spent when chatting online than on the telephone and it costs less money. Additional features such as video chat and group chat help employees conduct business more efficiently.

Although some of the previous events occurred after the year 2000, they seem very conservative in nature compared to the technologies that will be described in the next section. This is where the disruptive change brought about by new technology and changing societal views and expectations can be most strongly felt today.

Web 2.0, Social Media, and Society

Until the end of the twentieth century, electronic systems were used mainly to conduct and record business transactions. But early into the twenty-first century, these *systems of record* were augmented with what are now called *systems of engagement*. By 2004, Facebook was founded, followed by YouTube one year later; users found it easy to create and publish content on these websites. The authoritarian, closed, passive, static, one-way communications medium offered by early webmasters became democratic, collaborative, active, dynamic, and interactive. The organization no longer had complete control of the message or the record.

In the past, organizations introduced technology to employees in a top-down fashion, but the introduction of social media into the workplace was often bottom-up. A report from eMarketer projected that two-thirds of all US Internet users—representing 164.9 million people—will be regular social network users by 2014.[29] As a battle between e-mail and social networks for users' time and attention gained momentum, consumers increasingly turned to mobile devices for social activities. Employees, comfortable using social media in their personal lives, found ways to introduce Web 2.0 tools into the workplace, and the

acronym BYOD (bring your own device) was coined to describe business acceptance of the use of personal devices to conduct business.

Records managers must be familiar with Web 2.0 tools and technologies, be aware of current implementation strategies within the organization, and be able to identify and manage the records created as a result of such implementation.

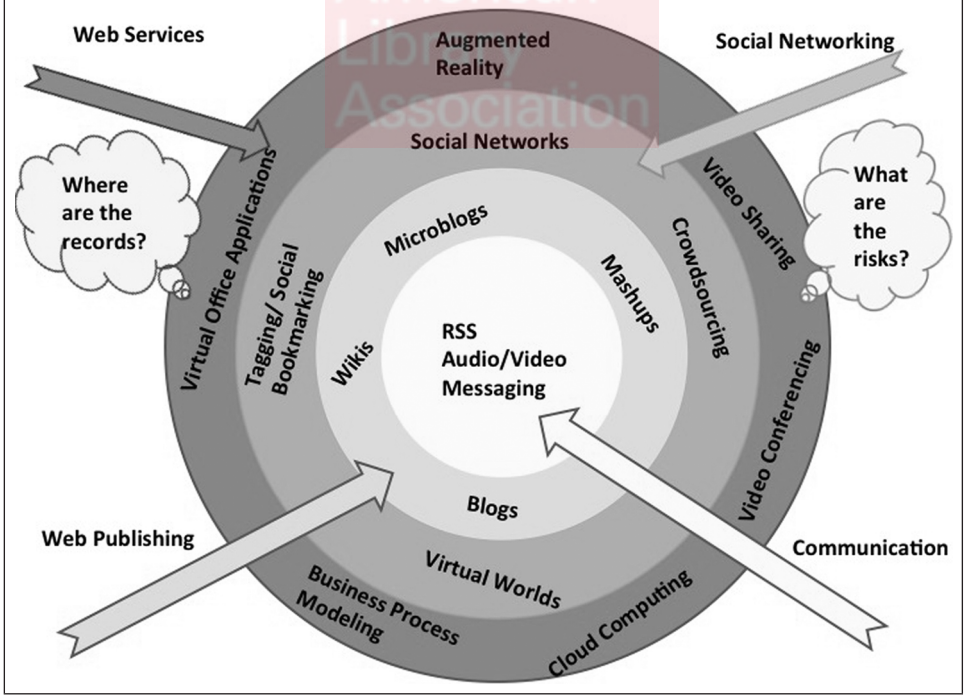
Web 2.0 Tools

Web 2.0 tools can be used for social engagement in the form of communication, social networking, and web publishing, as well as to provide and acquire web services (see Figure 1.5).

Social media tools will continue to evolve; already the lines between blogs, microblogs, and social networks are disappearing. According to Technorati's 2010 report on the state of the blogosphere, "As the blogosphere converges with social media, sharing of blog posts is increasingly done through social networks."[30] The convergence of functions will continue as successful social networks add features to attract additional subscribers.

The remainder of this chapter describes examples of tools and categories that represent each of the four spheres of activity included in our Web 2.0 model and also introduces Web 3.0. Some of the examples could potentially be included in more than one category, and the landscape is constantly evolving so that new software and services will likely replace some of the examples provided here by the time you read this book, presenting opportunities and challenges for all of us.

Figure 1.5. Web 2.0 model illustrating activities and categories.



Tools That Facilitate Communication

Recent communication tools have blurred the lines between journalist and reader, publisher and user, and communicator and broadcaster. It's now simple and inexpensive to develop content and share it with the world.

RSS (Really Simple Syndication)

RSS is a format for delivering regularly changing web content directly to the subscriber.[31] Many news-related sites, personal blogs, and other online publishers use RSS feeds to syndicate their content. Content developed as podcasts (audiocasts) and vlogs (video blogs) is not only posted to an individual's or organization's site in the hope that someone will visit but is also broadcast directly to users. Due to a decline in use, Google decided to retire its popular, free reader as of July 1, 2013. A promising alternative to Google Reader is Feedly, another free tool with mobile apps for the iPhone, iPad, and Android that synchronize read status with Feedly on the web. A professional version of Feedly is planned for the end of 2013.

Audio and Video Messaging Tools

Podcasting is a way to receive audio and video files over the Internet to your mobile device or desktop. You can listen to these files on your computer or load them onto your MP3 player. Video files are broadcast in the same manner as audio files and are sometimes referred to as *vodcasts*.

Two messaging tools found in this category, Eyejot and Google Talk, allow for an integration of technologies. Eyejot allows you to create a video e-mail message from your computer or smartphone; messages can also be sent directly to Twitter, a microblog. A business version of Eyejot allows longer messages, file attachments, and even document storage. Google Talk allows communication via instant messaging, PC-to-PC voice chats, voice mail, and file transfers. With this type of technology, a message created once can be distributed to multiple platforms, making instant duplicate copies.

Tools That Facilitate Web Publishing

Blogs and microblogs allow individuals to publish content. They can be used to establish communities of interest by promoting interaction between and among publishers and readers. Additional tools in this sphere of activity are wikis and mashups.

Blogs

Blogs (web logs) began as a form of personal online journal frequently updated and intended for public consumption. They are defined by their format: a series of entries posted to a single webpage in reverse-chronological order that do or do not include reader comments. Organizations that allow comments can monitor the posts and delete those that are deemed unacceptable. Such control, though, could damage the trust established within the blog community. More than one person is often authorized to post on behalf of an organization. Under development are new blog readers that will offer interactive experiences for blog followers, such as the ability to interact directly with blog contributors via messages on mobile devices.[32]

Blogs are easy and inexpensive to create by downloading software, such as WordPress, or by starting a blog on a blog hosting site, such as Blogger. Blogs of interest can be located

using blog search engines, such as Technorati and Google Blog Search. As of the beginning of 2012, 8 percent (up from 1 percent in 2011) of the 4,114 bloggers responding to Technorati's 2011 State of the Blogosphere survey blogged on behalf of corporations.[33, 34]

Microblogs

Microblogs allow individuals to communicate by exchanging short messages. Twitter, which allows 140-character messages called tweets, has played an important role in reporting natural disasters and political uprisings around the globe. As of July 2012, Twitter had over 517 million global registered users, sending 400 million tweets per day. In early 2013, the most followed Twitter users were entertainers Justin Bieber, with over 33.38 million followers, and Lady Gaga, with more than 33.36 million followers.[35, 36]

One of the first examples of return on investment came from @Dell Outlet. Dell made over $2 million in sales of its refurbished products and another $1 million in sales of new products purchased by those who moved from the outlet site to the main site between 2007 and 2009.[37] The key to Dell's success, according to Lionel Menchaca, chief blogger, was offering Twitter-exclusive deals to create buzz and grow the follower base to over 600,000. By 2011, Dell had opened a Social Media Command Center and instituted a new job family within the organization entitled "Social Media and Community."[38]

Products and services that put the user first naturally attract followers. In January 2012, Tumblr, a four-year-old microblogging platform, surpassed WordPress.com in the number of blogs hosted. Tumblr, a cross between a website and Facebook-like profiles, reported hosting 91.6 million blogs on January 28, 2013. Features allow users to post text, photos, links, music, and video from their phone or desktop using e-mail or a browser.

Wikis

A wiki can be described as a combination of a website and a Word document. The biggest advantage is that groups can work collaboratively using only a browser. The best-known wiki is *Wikipedia*, an encyclopedia written by volunteers from around the world. It exhibits the qualities of "openness, sharing, and acting globally" identified by Tapscott and Williams as the principles of *wikinomics*.[39] Enterprise wikis are available as hosted options or for use on enterprise servers and are used for everything from product development to knowledge management.

One of the most successful wikis is *Intellipedia*, an online system for collaborative data sharing used by the US intelligence community established in late 2005. Don Burke, *Intellipedia* doyen, and Sean P. Dennehy, *Intellipedia* and Enterprise 2.0 evangelist, were awarded 2009 Homeland Security Medals for their contributions to the nation by promoting information sharing across the intelligence community. In January 2011, Chris Rasmussen proposed using the same wiki software to create The Living Intelligence System for the intelligence community to change how information is created and content is vetted.

Mashups

Mashups are webpages or applications that combine data from two or more online sources. Data can be brought in from public Application Programming Interfaces (API), other web services, and data feeds (such as RSS). The results are different from the original intent

when the raw data was produced. Three distinct types of mashups are consumer mashups, business (enterprise) mashups, and data mashups.

A *consumer mashup* combines different data types from multiple sources in a browser and organizes the information through the browser interface. HousingMaps is an example of a consumer mashup created by adding rental listings from Craigslist to mapping data to create a visual representation of apartments for rent.

Business (or enterprise) mashups combine the organization's own resources, applications, and data with other external web services and publish the results to enterprise portals, application development tools, or as a service in a service-oriented architecture. Business mashups can help a company deliver better customer service. For example, a mashup of the organization's order management system with logistics information from UPS or FedEx would give call center representatives immediate access to order status and package tracking in one view.

Data mashups combine similar types of media and information from disparate data sources, or different tables within a single data source, into a single representation. One example of a data mashup is the Havaria Information Services' Alert Map, which combines data from over 200 sources related to severe weather conditions, biohazard threats, and seismic information.[40]

For records managers, the questions posed by mashups are these: (1) Have new records been created as a result of these mashups? (2) If so, where are they stored and how do we manage them?

Tools That Facilitate Interaction through Social Networking

Social Networks

Social networking occurs through websites that allow users to share content, interact, and develop communities of interest. Two popular social networking sites are Facebook and LinkedIn. Facebook's networking features include instant messaging, groups, forums, e-mail, games, music, and videos. As of October 2012, there were 1 billion monthly active Facebook users, and as of September 30, 2012, 604 million of them accessed the social networking site through their mobile devices.[41] LinkedIn is a professional networking site with more than 187 million users in over 200 countries and territories as of September 30, 2012. Executives from all 2012 Fortune 500 companies were listed as members, and 85 of the Fortune 100 companies used its corporate hiring solutions.[42]

In July 2011, Google+ launched its own social network that acquired more than 90 million users globally in just six months and 500 million members by the end of December 2012.[43, 44] Google+, considered one of the fastest-growing social networks of all time in terms of unique active users, surpassed YouTube and Twitter to be ranked the second most popular social networking site after Facebook by 2013.[45]

A very different type of social networking site began in 2010 as a service that allowed individual users to send e-mail with an image attached for "pinning" to an online board to be shared with others. Of concern to records and information managers is the fact that by the end of 2012, thousands of organizations were using Pinterest to share content, engage consumers, increase customer reach, and drive traffic to their websites and other social networking sites. Examples include Whole Foods' use of Pinterest to share recipes and the Smithsonian's use to share their collections.[46]

Virtual Worlds (Multiuser Virtual Environments)

Sometimes called virtual worlds, multiuser virtual environments share certain characteristics: 3-D graphics, web-based access, simultaneous interaction among users, and representation of a persistent virtual world. Users, called *residents*, interact with one another through avatars. Two popular products are Second Life and ActiveWorlds.

Early evidence of cost-savings potential was provided by IBM Academy of Technology in the fall of 2008 when two major events were held using Second Life. The first event was a Virtual World Conference for over 200 members, and the second was a general meeting for the Academy. IBM and Linden Lab, creator of Second Life, reported that the first event alone saved the firm $320,000 when compared to the potential cost of conducting the conference in the physical world.[47]

ActiveWorlds provides an option for businesses that want full control over their own worlds behind a firewall to license and download the software to their own servers.

Tagging and Social Bookmarking

The explosion of information posted to the web has prompted the creation of author-created and user-created metadata used for social tagging, social bookmarking, tagging of photos, and tag clouds/word clouds. Tagging provides both opportunities and challenges for records managers.

Tagging, or *folksonomy*, a user-generated taxonomy, is substantially different from traditional taxonomies, which are classification systems arranged in a hierarchical structure. A folksonomy is comprised of terms in a flat namespace (no hierarchy and no parent-child or sibling relationships). Folksonomies are sets of terms that a group of users tag content with—not a predetermined set of classification terms or labels.[48]

Flickr, the photosharing site, encourages users to tag their photos with freely chosen index terms. These tags, however, may or may not make sense to others. Someone searching a simple term such as *apple*, for example, may have the fruit in mind but may find the image returned to them is of the Apple Newton MessagePad or apple cakes. *Geotagging* is another form of social tagging that adds a geographic location to images uploaded to Flickr based on a Google map. This can be helpful when searching for objects based upon a geographic location. *Word clouds* (also known as *tag clouds*) can be used to pull terms out of any text. A graphic of terms is then created with each term presented in a size relative to the number of times it was found in the article (see Figure 1.6). This is a fast, easy way to visualize the most important indexing terms for written works.

The notion of relying solely on tags for search and retrieval may be unthinkable for records managers and archivists, but organizations can benefit from the integration of social cataloguing into records management programs. Taking the lead in this area, Microsoft began to support free tagging (folksonomy) as well as a centrally managed controlled vocabulary (taxonomy) with SharePoint 2010.

Crowdsourcing

Crowdsourcing involves using the general public to do research or other work, which may or may not be paid.[49] The Smithsonian Institution saves staff time by using the crowd to identify photographs placed on Flickr. The members of the crowd not only identify

Figure 1.6. Word cloud created based on contents of Chapter 2 of our text—a preview of coming attractions.

images but also provide additional descriptive information that is integrated with the Smithsonian's catalog entries.

Tools That Facilitate Web Services

Web services rely on the technical requirements needed to allow different software applications to interoperate. Simple services can interact with each other to achieve complex operations. Among the technologies in this category are augmented reality, videoconferencing, virtual office applications, cloud computing, and business process modeling.

Augmented Reality

Between the real world and the virtual world lies augmented reality, technology that blurs the lines by enhancing what we see, hear, feel, and even smell. Video games and cell phones are driving the development of augmented reality, but e-commerce applications are also available. Augmented reality adds graphics, sounds, haptic feedback (tactile feedback that takes advantage of a user's sense of touch), and smell to the natural world (see Figure 1.7, p. 20).

Videoconferencing Services

Videoconferencing brings people together from different geographic areas in real time. This technology is used for online meetings, training sessions, and product demonstrations with remote customers and colleagues. GoToMeeting and WebEx are popular web-conferencing platforms. Key features include the ability to share presentations and speak using a computer microphone or by using phone conferencing. Additional features vary but can include the ability to conduct web tours, share the desktop among multiple participants, use a chat feature, and record the session for later use—potentially creating new records that must be managed. A more recent entry to this field is Google+ Hangouts, which can be started from within Google+. This free service offers many of the features of subscription-based alternatives.

Virtual Office Applications

Virtual office applications—including e-mail, calendars, and documents—allow access to the information employees need to conduct their jobs from their homes or while traveling.

Figure 1.7. Using the junaio mobile reality browser by metaio on a camera-equipped mobile device and getting instant, context-sensitive information about an object, image, or place changes how we understand and experience the digital world.

Source: metaio, "The Big Picture of Augmented Reality," Press Release, May 17, 2011, http://www.metaio.com/press/press-release/2011/ar-on-tablets/. Courtesy of metaio, Inc.

The concept is not new, and products have long been available to allow employees to share applications and information hosted on an enterprise server from within the business or by web access. What is different in Web 2.0 is that the virtual office applications are hosted on third-party servers to create virtual office environments.

Perhaps the most popular virtual office provider at this time is Google. Google provides services including Gmail, Google Calendar, Google Docs, and Google Drive to more than a million businesses as well as government agencies. Companies that have experienced downtime due to server problems or run out of space for e-mail storage will be tempted by offers of unlimited e-mail storage for every employee and a guarantee to be available at least 99.9 percent of the time.

Zoho is a suite of online applications free to individuals. Organizations can utilize these applications but must pay a fee for enhanced features. In addition to the convenience of web access and opportunities for collaboration, organizations can reduce their IT costs by storing information on Zoho's servers. Security features are provided on multiple levels including the physical, software, and people/process levels. Zoho claims the information is more secure on its servers than if left on desktop computers or employee laptops.[50]

Cloud Computing

Cloud computing is a general term for delivering hosted services—for example, software, storage, backup, web hosting, and filtering spam and malware—over the Internet. Cloud computing services include social networking sites, photography websites, video sites, and

tax preparation sites. Tim O'Reilly, who is credited with coining the term *Web 2.0*, views cloud computing as using the Internet as a platform for all computing. Cloud computing involves "the sharing or storage by users of their own information on remote servers owned or operated by others and accessed through the Internet or other connections."[51]

Cloud Computing Options

Private: Services and infrastructure maintained on a private network

Public: Services and infrastructure provided off-site over the Internet

Hybrid: Includes a variety of public and private options with multiple providers

Records managers need to know what records are stored and what type of agreements are in place to understand how records can be managed according to an organization's records management policy and records retention schedule. Additional information on cloud computing is provided in Chapter 6.

Business Process Modeling

A *business process* is a collection of activities designed to produce a well-defined goal. Business analysts and managers perform business process modeling (BPM) in order to improve efficiency and quality within the business process. Classic tools for analyzing the business process include flow charts, data flow diagrams, Gantt charts, and program evaluation and review technique (PERT) diagrams. New tools are more sophisticated and based upon a widely used standard called business process modeling notation (BPMN). These new tools can be used to document, simulate, and improve business processes.

IBM's WebSphere Business Modeler, for example, allows the client to "whiteboard" business process workflows and to design the steps to complete tasks. Collaboration and sharing can take place using a Web browser and the WebSphere Business Modeler Publishing Server.

Web 3.0 and the Semantic Web

Although Web 2.0 enables authors and users to tag objects in ways meaningful to them, many of the tools create their own silos of information controlled only by those applications. Web 3.0 places the focus on technology that will allow the user to search for information across silos using a common language related to real-world objects.

The *semantic web* is a web of data that "provides a common framework that allows data to be shared and reused across application, enterprise, and community boundaries."[52] It is an extension of the World Wide Web, sometimes described as *linked data*, that enables content sharing beyond the boundaries of applications and websites.

In 2009, Tim Berners-Lee described planning a trip in a semantic web reality.[53] In his scenario, the semantic web is given all the data relating to the traveler (such as dates and budget) and all the data relating to the traveler's destination (accommodations, transportation, activities) that are available on the web. At that point, planning the perfect trip is merely a matter of generating a computer-optimized comparison between the vacation destination's data and the traveler's own data. Although the services envisioned by Berners-Lee are not yet a reality, semantic tools are being developed to allow relationships between concepts to be analyzed and acted upon. A number of firms now provide semantic web-based applications. TripIt, founded in 2006, is one such service that manages travel planning.

Many examples of the successful integration of Web 2.0 tools in organizations can be found, and Web 3.0 examples are emerging. Records management best practices are just beginning to appear. Today, not only are records managers concerned with identifying and managing records across the enterprise, they must also know how to identify and manage records residing *in the clouds.*

Summary

From prehistoric times to the present day, human beings have recorded their experiences using the tools and technologies available to them with the intent to share that information with others. These records have served two purposes: primary (administrative, legal, regulatory) and secondary (historic and research). The methods used to create and store the content of these records have changed over time based on a number of factors, including tools available to record the content and the medium on which the content could be recorded and stored. In the past, the recording tools and storage media included clay coins, parchment, papyrus, and the Gutenberg printing press. Today, they include handheld devices and social media. Responsibility for records evolved from our early ancestors who memorized stories to pass along or painted drawings inside caves to today's teams made up of representatives from records management, information technology, business units, the legal department, human resources, and more.

During the late nineteenth and early part of the twentieth centuries public and private organizations took steps to formalize the management of records, mainly in paper form. The end of the twentieth century and first decade of the twenty-first century saw the rise of digital records, including records created using social media and mobile devices.

Efficiency and ease of use has always been the goal of the introduction of new technology, in spite of unintended outcomes (e.g., the growth in the volume of paper to be managed). Since the dawn of the twenty-first century, users have become more vocal in making their wants and needs known. This has resulted in the development of tools such as social networking sites and microblogs that make it easier to create records but more difficult to manage them.

For those using the new technologies to conduct business, records creation is secondary and a result of their efforts to pursue their core mission. Records and information managers who understand the way work is conducted in their organization have a better chance of identifying and providing intellectual and/or physical control over the records created.

In 2008, Steve Bailey tackled the topic of records management and Web 2.0 in his book *Managing the Crowd: Rethinking Records Management for the Web 2.0 World*. In it, he challenges records and information managers to find time amid the daily operational pressures to debate the larger issues presented by the new technological paradigm and the threat it poses to established theory and practice. In his contribution to this book, "Realigning the Records Management Covenant," Bailey provides his perspective for managing records in a way that helps you better achieve your organization's goals.

PERSPECTIVE

Realigning the Records Management Covenant

Steve Bailey, Records and Information Manager, Senior Advisor, JISC InfoNet

Organizational Origins

Advances in technology have consistently led to fundamental changes in the way in which records are created and used. Indeed, it could be argued that records management as a discipline has largely emerged and been shaped as a response to the often unintended consequences of these developments. What is clear is that historically records management has largely been forced to respond to such changes and has seldom, if ever, been in a position to dictate them. So if to date the nature of records management has been shaped by technological circumstances beyond its control, how might this affect its role and nature in the near future?

In the nineteenth and twentieth centuries, records and the technology used to create them primarily existed to serve one master: the organization. Much of what characterizes established records management theory and practice today still strongly reflects this focus. We strive for a consistent shared filing structure across the entire organization, for the introduction of commonly applied metadata schemas and other standards, and for the implementation of enterprise-wide records management systems. Look at any records management textbook published in the past decade and virtually every benefit identified is stated as a benefit to the entire organization, be it enhanced corporate accountability, improved legal compliance, or reduced overheads. Existing international standards for records management make for similar reading, with virtually every recommendation defined in terms of what the organization requires and what is in the organization's best interests.

"It's the User, Stupid!"

Contrast this with the meteoric rise in the power of the individual in society and culture since the turn of the present century. Ours is increasingly a digital landscape that has *you* at its center. Whether it's consumer devices that allow you to download, store, and describe your entire music collection, social networks that enable you to manage the entirety of your social relationships from one place, or cloud-based services that give you the ability to pick and choose the applications you access from your desktop, one thing is clear: the locus of power in the digital world is steadily shifting away from the organization and toward the user both individually and collectively as a part of *the crowd*.

To be successful in the twenty-first century, records management needs to fundamentally realign itself, to stop viewing users as little more than pawns to be moved at will for the benefit of the greater cause, and instead see them as the primary beneficiary of what we offer. Yes, the enterprise still matters, yes, compliance still counts, but we must acknowledge a fundamental yet often-overlooked fact: "we are impotent unless we can convince other people to behave in a manner that supports our objectives."[54] If we continue to focus on the needs of the organization, we will inevitably fail both it and its users; if we focus on our users, we stand a chance of benefiting both them and by extension the organization as a whole.

This requires an understanding of the working patterns, priorities, and requirements of users far beyond that which we currently strive for: beyond focus groups, beyond limited trials in a "model office" environment, and beyond user representation on project steering boards. Instead we must strive for as detailed, comprehensive, and rounded an analysis of our users as possible. Connecting records management with the growing field of human-computer interaction (HCI) represents one promising way of potentially achieving this. HCI—a combination of computer science, cognitive psychology, sociology, information science, and design—provides a professional literature focused on studying, designing, evaluating, and implementing effective information systems that embrace the user and organization alike. It combines qualitative and quantitative approaches to researching human behavior in the context of technology and uses the results to design effective systems. For the records manager, this would mean resisting current temptations to start with the solution (be it a new system or even a nontechnical element such as a corporate file plan) and instead focusing first on developing an accurate understanding of user behaviors, preferences, and needs.

Providing a Benefits-Led Experience

Imagine this: records management solutions that people proactively *want* to use because doing so makes *their* life easier! In 2008, I expressed this objective as one of the ten defining principles of what I called Records Management 2.0: an attempt to redefine what records management needs to achieve to continue to be relevant in the Web 2.0 age. Principle 7 states: "Records Management 2.0 must be a benefits-led experience for users that offers them a positive incentive to participate."[55]

Is it farfetched to believe that users might ever view records management tools in this light—that we could make them so beneficial, so indispensable to managing life in the information age that they might even choose to use them not only to manage their records at work but in other spheres of their life? Perhaps not. After all, consider the paradox that at the same time records managers are struggling to get users to add even the merest and simplest of metadata from a predefined list, numerous Web 2.0 services are thriving thanks to their users' seemingly insatiable desire to voluntarily categorize and tag the information of interest to them.

A Win-Win Scenario

Our goal is to redraw the records management covenant: to seek a concord with the user that is as strong—if not stronger—than the one we currently enjoy (or endure) with the enterprise. But to be worthwhile, such a contract has to be mutually beneficial. Pleasing the user may be satisfying, but what is in it for us?

First, as already alluded to, we have little choice if we genuinely wish to deliver records management solutions that work for our organizations. Despite our job titles, it is rare that we directly manage records ourselves. Instead we manage the processes, policies, systems, and—most crucial of all—the people in the form of the users we rely on to do it on our behalf. Assuming, therefore, that we want our projects to succeed and we want to reap the resulting rewards, there is clearly an element of self-interest in keeping the user satisfied. But what if in addition, the combination of user engagement and technology also offered the potential for us to revolutionize the accuracy and efficiency with which we manage records?

Making Use of Activity Data

If captured and analyzed appropriately, the data that tracks how individuals use records management systems could dramatically improve our understanding not only of user needs, but of the management requirements of our records and ultimately the very nature of our organizations themselves. Such *activity data*—for example, tracking which book a customer searched for next or ultimately bought after viewing a particular item—is an integral part of the customer experience of Amazon and other leading e-commerce sites. What if we were to make use of similar techniques for the purpose of managing records?

Let's consider how the logic underpinning this functionality could be applied within *our* professional world, for what we have here is a potential mechanism for establishing precisely how your organization functions, how people work, and how information flows. Imagine if instead of "customers who bought this item also bought," the message were "users who viewed/edited this information also viewed/edited these sources of information." What then starts to emerge is a picture of information in its true organizational context. Hitherto unknown patterns of behavior come to light based not on how we *think* people *might* work, but on how they *actually* work. This is not the clear-cut world of process-review workshops and simple unified modeling language (UML) diagrams that bear little resemblance to reality. This is the real world where processes intermingle, users waste time going down cul-de-sacs, and operations are repeated. It is a far more complex world, for sure, but also a far richer one in terms of the information it provides the records manager, because now we can see *exactly* where a particular document fits into a particular process (or processes), exactly who uses it, and to what information it relates. Combine this with statistical data measuring precisely how many users have viewed/opened/edited/distributed a particular document and we are on the cusp of achieving a greater knowledge and depth of understanding of how our organizations truly operate and the value of the individual records being produced than ever before.

This is the true prize offered if we have the courage and vision to realign the records management covenant in favor of the user. It becomes a question not simply of the need to play catch-up with technology, but of unparalleled opportunity—to mine the data resulting from this renewed user engagement for our own professional ends and in doing so define a new epoch in the evolution of records management.

Notes

1. William Shakespeare, *The Tempest*, in *The Complete Pelican Shakespeare*, ed. Alfred Harbage (New York: Penguin Group, 1969), 2.1.247. References are to act, scene, and line.
2. P. M. Grand, *Prehistoric Art: Paleolithic Painting and Sculpture* (Greenwich: New York Graphic Society, 1967), 34.
3. Ibid., 24.
4. AncientScripts.com, "Cuneiform," accessed November 19, 2012, http://www.ancientscripts.com/cuneiform.html.
5. C. H. Gordon, *Forgotten Scripts: Their Ongoing Discovery and Decipherment* (New York: Basic Books, 1982), 155.
6. *Encyclopaedia Britannica*, s.v. "Parchment," accessed November 26, 2012, http://www.britannica.com/EBchecked/topic/443382/parchment.

7. HQ PaperMaker,"All about Paper," accessed November 19, 2012, http://www.hqpapermaker.com/paper-history/.
8. Athol L. Murray, "The Lord Clerk Register," *The Scottish Historical Review* 53, no. 156 (October 1974), 124–156: http://www.jstor.org/stable/25529087. Full access requires registration.
9. Reginald R. Sharpe, ed., "Introduction," in *Calendar of Letter-Books Preserved Among the Archives of the Corporation of the City of London* (London: John Edward Francis, BreaiM's Buildings, E.C., 1912), e-book: http://www.archive.org/details/cu31924103071134.
10. Ministry of Education, Culture, and Sport, "History of the General Archive of Simancas," General Archive of Simancas, accessed on January 28, 2013, http://en.www.mcu.es/archivos/MC/AGS/Presentacion/Historia.html.
11. The National Archives, "Library New Editions January/February, 2011," accessed January 28, 2013, https://www.nationalarchives.gov.uk/documents/new-books-january-february-2011.pdf.
12. Richard Pearce-Moses, s.v. "diplomatics," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed January 28, 2013, http://www2.archivists.org/glossary/terms/d/diplomatics.
13. Great Britain Patent Office, *Patents for Inventions: Abridgments of Specifications Relating to Printing, Including Therein the Production of Copies on All Kinds of Materials* (London: George E. Eyre and William Spottiswoode, 1859), 84, http://books.google.ca/books?id=zJAhbHXjyqQC&pg=PA84&lpg=PA84&dq=No.+395+_+January+7+1714+Machine+for+Transcribing+Letters&source=bl&ots=P0PpbjxMtd&sig=OFCLwcKwQQi3A-0UbEjtj-r5-l8&hl=en&sa=X&ei=tio_T7aqOePaiQKW7pTEAQ&ved=0CF0Q6AEwBw#v=onepage&q=No.%20395%20_%20January%207%201714%20Machine%20for%20Transcribing%20Letters&f=false.
14. A. A. Tait, "The Register House: The Adams Building," *The Scottish Historical Review* 53, no. 156 (October 1974), 117: http://www.jstor.org/stable/25529086. Full access requires registration.
15. US Copyright Office, "Copyright Act of 1790," accessed January 28, 2013, http://www.copyright.gov/history/1790act.pdf.
16. Emmett Leahy Award, "Emmett J. Leahy (1910–1964)," accessed November 20, 2012, http://www.emmettleahyaward.org/Emmett_J.html.
17. Richard Pearce-Moses, s.v. "federal records act," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed November 20, 2012, http://www2.archivists.org/glossary/terms/f/federal-records-act.
18. Richard J. Cox, Closing an Era: *Historical Perspectives on Modern Archives and Records Management* (Westport, CT: Greenwood Press, 2000), 3.
19. Thomas Craughwell, "#3: The Watergate Scandal (Top 10 Mistakes by US Presidents)," *Encyclopedia Britannica Blog*, January 1, 2009, http://www.britannica.com/blogs/2009/01/3-the-watergate-scandal-top-10-mistakes-by-us-presidents/.
20. Wikia, "History of Archives, Recordkeeping, and Records," accessed November 20, 2012, http://scratchpad.wikia.com/wiki/History_of_Archives,_Recordkeeping,_and_Records#Early_Recordkeeping.
21. Tim Berners-Lee is a British engineer and computer scientist and MIT professor credited with inventing the World Wide Web in 1990. In 2004, he was the first recipient of Finland's Millennium Technology Prize for creating the World Wide Web.
22. Ian Peter, "The History of Email," *NetHistory*, accessed January 27, 2013, http://www.nethistory.info/History%20of%20the%20Internet/email.html.
23. Mary Bellis, "History of Email and Ray Tomlinson," About.com Guide, accessed January 27, 2013, http://inventors.about.com/od/estartinventions/a/email.htm.
24. Ian Peter, "The History of Email," *NetHistory*, accessed January 27, 2013, http://www.nethistory.info/History%20of%20the%20Internet/email.html.

25. V. A. Shiva, "USPS and EMAIL: Email and Its Opportunities for USPS," accessed November 20, 2012, http://vashiva.com/vashiva-usps-and-email/.
26. Scott Kirsner, "MIT Prof Who Invented Early E-mail System Donating Records to Smithsonian Musuem," *Innovation Economy*, February 16, 2012, http://www.boston.com/business/technology/innoeco/2012/02/mit_prof_who_invented_early_e-.html.
27. V. A. Shiva, "USPS and EMAIL: Email and Its Opportunities for USPS," accessed November 20, 2012, http://vashiva.com/vashiva-usps-and-email/.
28. "ICQ: Summary," *TheMediaBriefing*, accessed January 27, 2013, http://www.themediabriefing.com/products/icq.
29. "eMarketer: Two-Thirds of U.S. Internet Users Will Use Social Media by 2014," *RICG*, accessed January 29, 2013, http://www.ricg.com/marketing_articles/digital_marketing/emarketer_two_thirds_of_us_internet_users_will_use_social_media_by_2014/.
30. Jon Sobel, "State of the Blogosphere 2010 Introduction," Technorati Social Media, November 3, 2010, http://technorati.com/blogging/article/state-of-the-blogosphere-2010-introduction/#ixzz1PM3DBQKw.
31. WhatIsRSS.com, "What Is RSS? RSS Explained," accessed November 23, 2012, http://www.whatisrss.com/.
32. Geoff Simon, "NuffnangX Lauches Mobile Friendly Blog Reader," Technorati Social Media, December 11, 2012, http://technorati.com/social-media/article/nuffnangx-launches-mobile-friendly-blog-reader/.
33. StateOfTheBlogosphere, "State of the Blogosphere 2011: Introduction and Methodology," Technorati Social Media, November 4, 2011, http://technorati.com/social-media/article/state-of-the-blogosphere-2011-introduction/.
34. Jon Sobel, "State of the Blogosphere 2010 Introduction—Page 2," Technorati Social Media, November 3, 2010, http://technorati.com/social-media/article/state-of-the-blogosphere-2010-introduction/page-2/.
35. Dan Farber, "Twitter Hits 400 Million Tweets per Day, Mostly Mobile," CNET News, June 6, 2012, http://news.cnet.com/8301-1023_3-57448388-93/twitter-hits-400-million-tweets-per-day-mostly-mobile/.
36. Lance Whitney, "Bieber Squeaks Past Gaga with Most Twitter Followers," CNET News, January 23, 2013, http://news.cnet.com/8301-1023_3-57565358-93/bieber-squeaks-past-gaga-with-most-twitter-followers/.
37. DELL-Stephanie N. "@DellOutlet Surpasses $2 Million on Twitter," *Direct2Dell: The Official Dell Corporate Blog*, June 11, 2009, http://en.community.dell.com/dell-blogs/direct2dell/b/direct2dell/archive/2009/06/11/delloutlet-surpasses-2-million-on-twitter.aspx.
38. Lindsay Bell, "Dell's Social Media University," *Marketing Cloud Blog*, May 26, 2011, http://www.radian6.com/blog/2011/05/social-media-university/.
39. Don Tapscott, "Macrowikinomics: New Solutions for a Connected Planet," accessed January 27, 2013, http://dontapscott.com/books/macrowikinomics/.
40. RSOE—Emergency and Disaster Information Service Alert Map, accessed November 23, 2012, http://hisz.rsoe.hu/alertmap/index2.php.
41. Facebook, "Newsroom," accessed November 25, 2012, http://newsroom.fb.com/content/default.aspx?NewsAreaId=22.
42. LinkedIn, "About—LinkedIn and the Enterprise," accessed November 25, 2012, http://press.linkedin.com/about.
43. Google. "Google Announces Fourth Quarter and Fiscal Year 2011 Results," *Google Investor Relations*, January 19, 2012, http://investor.google.com/earnings/2011/Q4_google_earnings.html.
44. Harrison Weber, "Google+ by the Numbers: 500m+ Users, 235m of Them Active and 135m Using the Stream," The Next Web, December 6, 2012, http://thenextweb.com/google/2012/12/06/google-by-the-numbers-500m-users-235m-of-them-active-and-135m-using-the-stream/.

45. Kamau Mbote, "Google+, World's Second Most Popular Social Networking Site," Humanipo News, January 28, 2013, http://www.humanipo.com/news/3559/Google-worlds-second-most-popular-social-networking-site.
46. Cat Lee, "New Tools for Business in the Pinterest Community," *Pinterest Blog*, November 14, 2012, http://blog.pinterest.com/post/35710687813/new-tools-for-businesses-in-the-pinterest-community.
47. Linden Lab, *How Meeting in Second Life Transformed IBM's Technology Elite into Virtual World Believers*, Linden Research Inc., accessed November 25, 2012, http://secondlifegrid.net.s3.amazonaws.com/docs/Second_Life_Case_IBM_EN.pdf.
48. Isabella Peters, F*olksonomies: Indexing and Retrieval in Web 2.0* (Berlin: Walter de Gruyter GmbH, 2009), 223.
49. *YourDictionary*, s.v. "crowdsourcing," accessed November 25, 2012, http://computer.yourdictionary.com/crowdsourcing.
50. Zoho, "Zoho Security Practices, Policies and Infrastructure," accessed November 25, 2012, http://www.zoho.com/security.html.
51. Robert Gellman, *Privacy in the Clouds: Risks to Privacy and Confidentiality from Cloud Computing*, World Privacy Forum, February 23, 2009, 4, http://www.worldprivacyforum.org/pdf/WPF_Cloud_Privacy_Report.pdf.
52. W3C, "W3C Semantic Web Frequently Asked Questions," last modified November 12, 2009, http://www.w3.org/RDF/FAQ.
53. Tim O'Reilly, O'Reilly Media, *Web 2.0 Summit 09: Tim Berners-Lee and Tim O'Reilly, "A Conversation with Tim Berners-Lee"* [video interview], YouTube, October 24, 2009, http://www.youtube.com/watch?v=KY5skobffk0.
54. Robert L. Sanders, "The Records Manager Steps Out of the Comfort Zone: The Problem with Selling Records Management," *Records Management Quarterly* 32, no. 2 (April 1998): http://www.accessmylibrary.com/article-1G1-20776059/records-manager-steps-out.html.
55. Steve Bailey, *Managing the Crowd: Rethinking Records Management for the Web 2.0 World* (London: Facet Publishing, 2008), 31.

CHAPTER

2

Building an Information Governance Program on a Solid RIM Foundation

Introduction

The unprecedented growth of digital information, the diversity of file formats, and the accompanying challenges in determining what to trust, keep, secure, discard, and preserve have resulted in a renewed interest in and appreciation for the value of records and information management (RIM) to the organization.

During the first decade of the twenty-first century, organizations aspiring to manage records and information assets across the enterprise embraced the concept of information governance. In this chapter, you'll be introduced to information governance and the role records and information management plays within that structure.

Information governance requires more than one point of view. Representatives from legal, human resources, information technology, and business units must participate in developing the information governance strategy. But because of their broad understanding of the flow of information across the enterprise, records professionals are in a unique position to contribute their knowledge and skills to this initiative.

The major element of information governance is *accountability*—accountability with the laws, regulations, and standards governing records and information. Therefore, in this chapter, you will also be introduced to the major laws, regulations, and standards to which records and information management programs (and information governance initiatives) must comply.

Information Governance

A renewed interest in records and information management has resulted in a call by many to use fundamental records management principles as the foundation for sound information governance.

Information is a vital organizational asset, and information governance is an integrated, strategic approach to managing, processing, controlling, archiving, and retrieving information as evidence of all transactions of the organization. Writing in the *eDiscovery Journal* blog, Barry Murphy explained that information governance provides a framework for the "conservative side of information management."[1]

Every organization must consider its legal and regulatory environment along with its tolerance for risk when determining its governance framework. Questions to be asked include these:

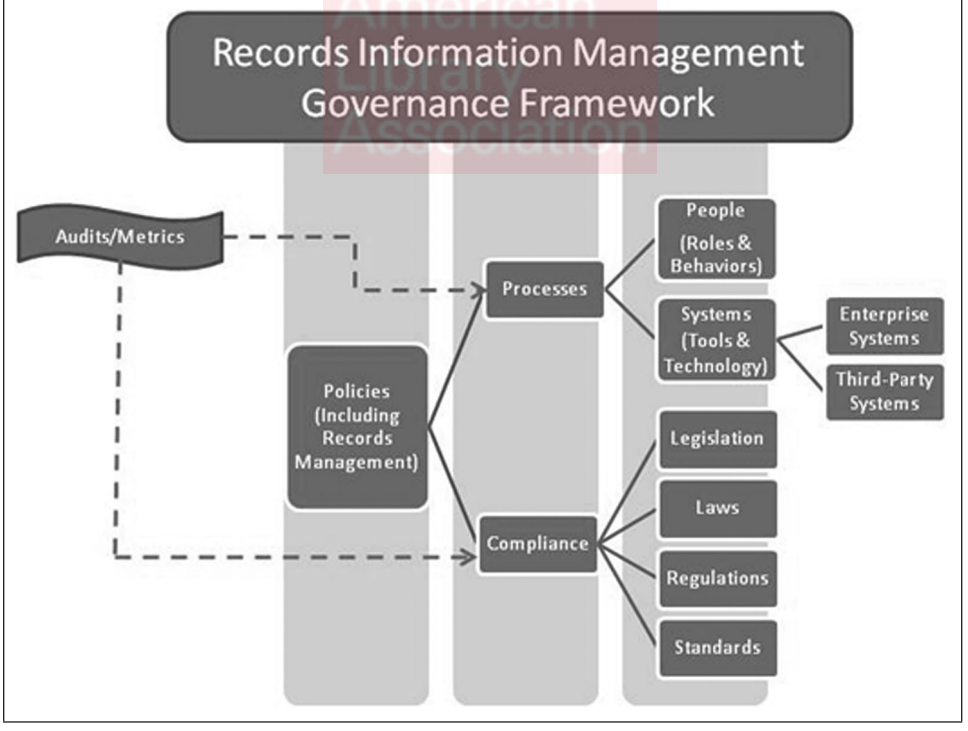
According to Gartner,* **governance** is viewed as "the specification of decision rights and an accountability framework to ensure appropriate behavior in the valuation, creation, storage, use, archiving and deletion of information. It includes the processes, roles and policies, standards, and metrics that ensure the effective and efficient use of information in enabling an organization to achieve its goals."

*Gartner, s.v. "information governance," *IT Glossary*, accessed December 22, 2012, http://www.gartner.com/it-glossary/information-governance/.

- What records and information are needed to support business processes?
- What steps must be taken to be in compliance with governing laws and regulations?
- What records and information should be destroyed and when?

Records management is essential to information governance and can play a key role in answering these questions. An information governance model can be used to provide context to discussions of an integration of information management, risk management, and records management considerations. This framework would address all types of information, whether meeting the criteria established for a record or not. There are three basic elements to a records information management governance framework as shown in Figure 2.1: policies, processes, and compliance. Accountability measures in the form of audits and metrics must be used to monitor the components of these elements. Records management must be integrated throughout the process.

Figure 2.1. Records information management governance framework.



Records and Information Defined

Although an information governance program manages both records and information, it is important to understand the difference between the two. A *record* is "recorded information, regardless of medium or characteristics, made or received by an organization in pursuance of legal obligations or in the transaction of business" according to ARMA International.[2] The definition of *record* provided by the International Standard Organization is slightly different: "information created, received, and maintained as evidence and information by an organization or person, in pursuance of legal obligations or in the transaction of business."[3]

Information is a "collection of data, ideas, thoughts, or memories."[4] Information is also defined as "facts provided or learned about something or someone" and that which is "conveyed or represented by a particular arrangement or sequence of things; for example, computing data as processed, stored, or transmitted by a computer."[5]

Despite the distinction made between records and information, an information governance framework ideally should take "a single platform approach for managing all information, enterprise-wide, in accordance with corporate/organizational policy and business goals."[6]

Policies

An information governance framework relies foremost upon a comprehensive records and information management policy that draws on best practices and can be adapted for almost any circumstances. It must address roles and responsibilities, communications and training, and metrics and monitoring. The records and information management policy must refer to the requirements for managing records resulting from all business activities. And, the records and information management policy must acknowledge the additional considerations to be addressed when managing records created by or residing in social media and the clouds.

Policy teams must include representation from the appropriate functional areas, such as records management, information technology, business units, compliance, human resources, and marketing and/or public relations. The advent of Web 2.0 and collaborative, web-based technologies has resulted in the formation of social media teams in many organizations. When that is the case, input from this team should be included as well. Most organizations have a number of policies governing communications, security, privacy, compliance, and social media that must be harmonized.

Compliance

Organizations must adhere to applicable legislation, laws, regulations, and standards. Organizations accept the fact that a records retention schedule is *media-neutral* and that retention requirements must be met. At the same time, all new initiatives, such as social media initiatives, must be reviewed to determine if new records—and, therefore, records series—will result. Automated processes should be utilized as much as possible for such tasks as moderating content to be posted, capturing and categorizing content from third-party public sites, and applying records retention and disposition requirements. Controls include establishing acceptable use agreements, providing legal guidance, and adhering to organizational branding and style guide requirements when using third-party public sites and cloud computing.

Processes

Processes are implemented to ensure compliance at an acceptable level of risk for the organization. Operational guidelines govern the selection of appropriate media to accomplish the core mission of the organization and human factors, such as speaking on behalf of the organization only when authorized to do so. Operational guidelines set out best practice for all parties involved when managing information. These include guidelines for the use of personal and enterprise information technology, participation on social media sites, and ethical behaviors.

Confusion over the role of records management within information governance comes from a focus exclusively on technology that can automate some records management functions, such as records categorization, retention, and legal holds. There is much more to records management programs than automating technology to handle records management tasks.

Records Management as a Professional Management Discipline

The term *records management* describes a professional management discipline that originally managed physical documents (e.g., letters, contracts, minutes of meetings). This is in contrast to the term *information management* that came into use in the 1970s to describe a computer environment in which structured information (data in columns and rows) was stored electronically. More than 90 percent of information in business today is created electronically, and 95 percent of data is unstructured (objects not contained within a database, such as word processing documents and images).[7, 8]

Because records exist in both electronic and paper form, the records management profession has embraced the term *records and information management* to describe the services they provide. Regardless of the form of the record or information, the primary obligation remains the same—accountability. Organizations expect their records and information management programs to enable the management of information in a timely, accurate, complete, and cost-effective manner. The information managed must be accessible and usable.

International Standard *ISO 15489-1:2001* defines *records management* as the "field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use, and disposition of records, including processes for capturing and maintaining evidence of and information about business activities and transactions in the form of records."[9]

Records and Information Management Objectives

The activities of a records and information management program are undertaken with specific objectives in mind. An effective records and information management program will:

- develop and/or identify standards and procedures for the effective, efficient, and secure management of records and information throughout the organization;
- provide effective control, appropriate security, and management over the creation, maintenance, use, and disposition of all records within the organization;

- ensure that the records accurately reflect the business practices, policies, and transactions of the organization;
- simplify the activities, systems, and processes of records creation, maintenance, and use;
- preserve and dispose of records in accordance with business needs, statutes, and regulations;
- protect vital records;
- provide business continuity in the event of a disaster;
- protect records of historical importance;
- provide evidence of business, personal, and cultural activity; and
- maintain corporate, personal, and collective memory.

Records and Information Management Risks

More recently, organizations have been looking to records and information programs to mitigate risks to the organization. This approach looks at the other side of the coin to describe what will happen if the organization does not have a comprehensive record management program in place. Major concerns are:

- damage to the organization's reputation;
- high costs for information management and storage;
- lost files and risk of spoliation;
- legal discovery penalties or sanctions; and
- audit and compliance violations.

An effective records and information management program comprised of records management policy and procedures, well-trained personnel, and advanced information systems will reduce risks to the organization. The program must ensure that records and information are managed properly throughout their lifecycle—from creation through destruction or preservation.

Records and Information Lifecycle

An essential characteristic of information is its value, which may decline as time passes and eventually become zero. The value of information contained in records must be considered at each stage of the records and information lifecycle. But models change over time, influenced by current practices and the technology available.

Document-Centric Records and Information Lifecycle

Throughout the twentieth century, records were controlled in the form of documents. *Document* is defined as (1) any written or printed work; a writing; (2) information or data fixed in some media; (3) information or data fixed in some media, but which is not part of a record; a nonrecord; (4) a written or printed work of a legal or official nature that may be used as evidence or proof; a record.[10]

A *document* is traditionally considered to be text fixed on paper, but today drawings, word processing files, webpages, and database reports are also considered documents. Like records, documents have content, context, and structure, but the nature of these attributes

may change in an electronic environment (e.g., a hypertext document on the web may be formed by combining different sections housed on different servers in different countries through the use of links).

Robek, Brown, and Stephens described five stages in the lifecycle of a record stored in the form of a "document":

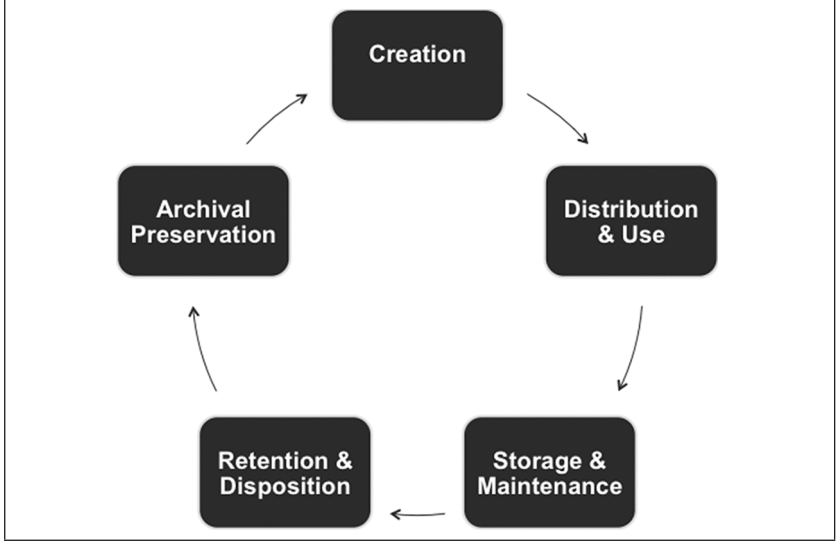
- Creation
- Distribution and use
- Storage and maintenance
- Retention and disposition
- Archival preservation[11]

The lifecycle model shown in Figure 2.2 portrays a closed system that begins with the birth of a document (creation) and ends with its death (destruction) or movement to an archive for permanent preservation. This model is useful when describing the management of paper-based records. In order to save storage space, retention schedules are developed to document the method of disposition and to establish destruction dates. Records that are no longer in active use but that have not yet met their retention requirements may be transferred to a records center for storage and eventual destruction. Records that have permanent value are most often transferred to an archive for preservation and use.

Document Management Systems

By 2011, the concept of a document-centric records and information management lifecycle had evolved to reflect the electronic environment that allows for storage in a document library and to emphasize the continuing value of the information contained. New electronic documents enter the system and those that no longer have value to daily operations exit the

Figure 2.2. Document-centric records and information lifecycle model.



cycle. Records management functionality—such as retention, disposition, and legal holds—is integrated into most document management systems.

Although companies are overwhelmed with information in many electronic formats, paper-based documents still exist and need to be managed. But in this case, storage space is saved and records use improved by digitizing physical files—scanning hard copy—and bringing those digital files into the document library to reside alongside born-digital document-based information in the document management system model shown in Figure 2.3. In this particular system, records management software is used as a tool to automate storage and retention by providing indexing, searching, and disposal capabilities that allow users to archive and retrieve records within the electronic library.

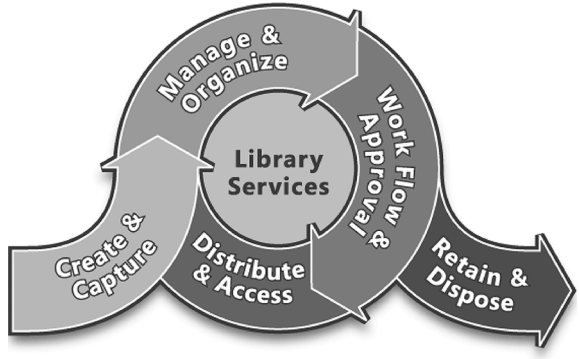
But what about information that exists apart from that created through or brought into document-based information systems? A document management system is just one type of electronic system employed within an organization. E-mail systems, knowledge management systems, and web content management systems also contain content that must be managed. In order to bring order to chaos when faced with the number of systems in use across an enterprise, the concept of enterprise content management was born.

Enterprise Content Management

The term *enterprise content management* (ECM) was first defined by AIIM (Association for Information and Image Management) in 2000. The definition has been modified several times over the years. In 2005, ECM was described as "the *technologies* [italics added] used to capture, manage, store, preserve, and deliver content and documents related to organizational processes."[12] By 2010, the definition used was expanded to this:

> The *strategies, methods and tools* used to capture, manage, store, preserve, and deliver content and documents related to organizational processes. ECM covers the management of information within the entire scope of an enterprise whether that information is in the form of a paper document, an electronic file, a database print stream, or even an e-mail.[13]

Figure 2.3. Document management system model.



Source: FileHold, "Records Management Software," accessed January 15, 2013, http://www.filehold.com/features/standard/records-management. Courtesy of FileHold.

The *strategies* referred to in the ECM definition include the management of workflow, creation, repositories, versioning, publishing, and archives.

ECM systems manage the complete lifecycle of unstructured content in a variety of forms, including paper documents, electronic forms, and electronic unstructured data such as e-mail, instant messages, text documents, and spreadsheets. Because the latest definition of ECM encompasses areas that traditionally have been addressed by records management, it reinforces the value of a comprehensive records and information management program.

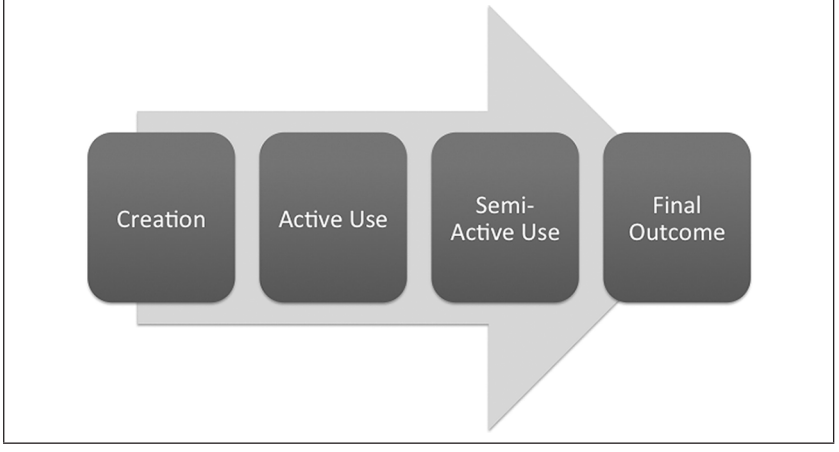
Information Lifecycle Management

Not all information is created equal. Some information will be classified as records, but other useful information may never be designated as a formal record (e.g., work in progress). Therefore, organizations are justifiably concerned about managing all information and not just official *records*. Some of the information will be structured and other information unstructured. *Structured data* is organized in a way that makes it identifiable. A database such as Access or SQL is structured in the form of columns and rows, which makes searching for the data type within the content possible. All other electronic information that has the potential to be records is stored as unstructured data. *Unstructured data* is anything not in a database. Images, word documents, and even tweets are examples of unstructured data.[14] Unstructured data is more difficult to classify, maintain, archive, and dispose of than structured data.

Information, whether structured or unstructured, can be thought of as "the communication or reception of knowledge or intelligence" that must be managed.[15] Information lifecycle management (ILM) is a comprehensive approach to managing the flow of an information system's data and associated metadata from creation and initial storage to the time when it becomes obsolete and is deleted.[16]

There are many variations on the information lifecycle model, from simple to complex. As with the document-based records management lifecycle shown in Figure 2.2 and the document management system model shown in Figure 2.3, the information management lifecycle can take a *cradle to grave perspective*. Figure 2.4 illustrates a model based on four

Figure 2.4. Information lifecycle model.



main phases: creation, active use, semi-active use, and final outcome. This simplified diagram with its clearly defined phases can be used to understand the controls that must be applied to information during each stage of its lifecycle, regardless of the technology.

- *Creation:* Although planning is not included as a separate phase, planning should be considered an essential part of the creation phase. Planning before creation can help to ensure that the right information is created, that it is reliable, that the right people are creating it, that it is created in the most appropriate format, and that the necessary metadata is captured.
- *Active use:* During this phase, information and records are in constant or frequent use, primarily in the conduct of the business. To appropriately manage information during this stage, the purpose(s) for which the information can be used must be defined, the information must be findable and accessible, the individuals who need access to the information must be granted such access, and the integrity of the information must be secured.
- *Semi-active use:* Records and information managed in the semi-active phase are the most vulnerable because they have declined in value and controls tend to be less stringent. During this phase, information may be referred to on occasion for reference purposes, held to satisfy retention requirements, or retrieved for evidential purposes.
- *Final outcome:* During this phase, information that is no longer useful to the organization and that has met its retention requirement is destroyed. Information that has enduring value for historical reference or research or that must be retained due to regulatory obligations is preserved. Disposal of information that has met its retention requirements and no longer has value must be controlled. Even more challenging, preservation of and access to information of enduring value must be ensured.

The models introduced so far have one thing in common. They represent a lifecycle of records or information that parallels the human lifecycle with a clearly definable beginning and end. There are those who believe, however, that this lifecycle approach is inadequate, especially when managing electronic records.

Records Continuum

While most records and information managers in the United States embrace the records and information lifecycle model, many experts outside of the United States advocate the *records continuum* as an alternative. The records continuum concept was formulated by Australian archival theorist Frank Upward based upon four principles:

1. A concept of "record" inclusive of records of continuing value (archives) stresses their use for transactional, evidentiary, and memory purposes, and unifies approaches to archives/recordkeeping, whether records are kept for a split second or a millennium.
2. There is a focus on records as logical rather than physical entities, regardless of whether they are in paper or electronic form.
3. Institutionalization of the recordkeeping profession's role requires a particular emphasis on the need to integrate recordkeeping into business and societal processes and purposes.

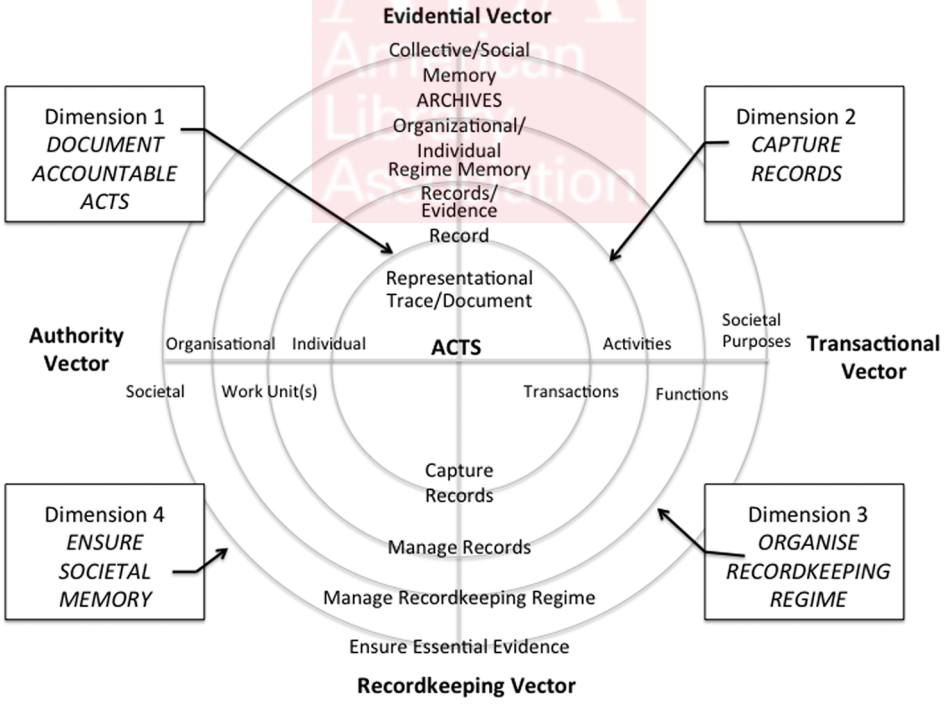
4. Archival science is the foundation for organizing knowledge about recordkeeping. Such knowledge is revisable but can be structured and explored in terms of the operation of principles for action in the past, the present, and the future.[17]

The records continuum model emphasizes overlapping characteristics of recordkeeping—evidence, transaction, and the identity of the creator. It deemphasizes the time-bound stages of the lifecycle model and combines the recordkeeping and archiving processes into integrated time-space dimensions as illustrated in Figure 2.5.

In the United States, archives and records management are often viewed as two separate responsibilities managed by two different types of professionals, the archivist and the records manager. The Australian model's integrated approach, however, underscores the importance of managing records and archives seamlessly to fulfill both managerial and cultural responsibilities. Recordkeepers, whether they consider themselves archivists or records managers, must understand the uses and values of records from creation to and including long-term preservation. The goals of records and archives in the Australian model are these:

1. To ensure important current business and/or personal needs
2. To ensure effective management and/or compliance with regulations
3. To ensure corporate continuity and societal "good citizenship"

Figure 2.5. Records continuum model.



Source: Understanding Society Through Its Records, "Australian Contributions to Recordkeeping," accessed January 15, 2013, http://john.curtin.edu.au/society/australia/. Courtesy of Frank Upward, Monash University, Australia.

4. To ensure cultural construction and transfer
5. To ensure cultural affirmation and/or celebration[18]

In this digital world, there is an increasing convergence of records and information management functions as exhibited by our discussions of records management, document management, enterprise content management, and information management. The records continuum model illustrates a similar convergence of the functions of the archivist with those of the records and information manager by placing equal emphasis on the preservation of information to ensure societal memory.

Records Management Program Elements, Functions, and Activities

Although records management programs can and do vary depending on the size and culture of organization, the industrial sector to which it belongs, and the applicable laws and regulations, common functions must be performed.

Records Management Program Elements

The elements of a comprehensive records management program listed here will be addressed in detail in future chapters:

- Policy and procedure development
- Records inventory, appraisal, retention, and disposition
- Active files management (paper and electronic)
- Inactive files management and control (records center and digital archiving)
- Preservation (digital and physical)
- Vital records protection and disaster and business continuity planning
- Training and outreach programs

Records Management Activities

In order to ensure that those functions listed previously are performed, the records and information manager is responsible for specific activities. The National Archives and Records Administration (NARA) defines the following activities for federal records managers that are also applicable to records managers in the private sector:

- *Identifying records:* This involves distinguishing records from nonrecords for retention purposes; determining how, how many (in terms of volume), and by whom the records are being created and received; and identifying the relationship of the record to the organization's business operations or functions.
- *Developing a file plan:* This is an organizational structure that identifies classes of records (records series) that the organization produces. Records in the same category often have the same retention periods.
- *Developing records schedules:* The schedules will document how long records must be retained and their final disposition based upon time, event, or a combination of both.
- *Providing records management guidance:* This involves developing policies and procedures for implementing records management activities. Training programs must also

> be instituted for all employees with records management responsibilities, including upper-level management and executives. All records, regardless of format, location, or control must be addressed.[19]

When determining the specific activities mentioned here, such as developing a records schedule, the records professional must refer to governing laws, regulations, and standards. Prevailing trends in case law must also be monitored and taken into consideration when evaluating risk. The next section of this chapter is devoted to standards, laws, regulations, and the legal environment.

Standards, Laws, Regulations, and the Legal Environment

Regulatory compliance is required to safeguard physical and electronic records, shield the organization from unnecessary risk, and help control costs. Standards, technical reports, and guidelines create a professional environment of best-practice procedures that enable organizations to create compliant records/information systems, policies, and procedures.

Standards

> Standards provide us with codification of practice, explicit rules from implicit methodologies, development of a body of common knowledge, consistency in practice and quality, interoperability and interconnectivity, and efficiency. Many of the standards overlap and one standard cannot be used for everything; instead, several standards may work together to achieve standard practice.[20]

The appropriate mix of standards will be unique to each organization. Several of the standards often referred to by records/information managers are listed in this chapter.[21]

De Facto Standards

Some programs and practices are used so often and widely that they are considered *de facto standards*. One example is the US Department of Defense standard *DoD 5015.2-STD Electronic Records Management Software Applications Design Criteria Standard* (*DoD 5015.02-STD*). This standard was originally developed to provide implementation and procedural guidance on the management of records in the US Department of Defense. Products are tested by the Joint Interoperability Test Command (JITC), and product registers are available to provide information about certified records management application (RMA) products.[22]

NARA subsequently endorsed this standard for use by all government agencies. Eventually so many private firms turned to this standard when developing or evaluating enterprise records management (ERM) system products that ARMA International published a technical report, *Using DoD 5015.02-STD outside the Federal Government Sector*, to help those outside of the federal government better understand how to apply the de facto standard for their own needs.

Outside of the United States, guidance is provided in the form of another, similar de facto standard, *Model Requirements for the Management of Electronic Records* (*MoReq*).[23] *MoReq* is intended for use throughout the European Union by public and private sector organizations. Like *DoD 5015.02-STD*, *MoReq* is used to design or evaluate records management applications and has become a guiding principle used by electronic records management system suppliers and developers.

De Jure Standards

De jure standards are those adopted by an official standards-setting body, such as the International Organization for Standardization (ISO) and the American National Standards Institute (ANSI). Standards development is a complex task. Some standards are accompanied by a technical report to provide guidance for implementation.

ISO, the largest developer and publisher of international standards, is a network of national standards institutes of 160 countries. In the United States, ANSI is the official representative to ISO. ISO has adopted a number of records management standards that belong on every records manager's resource list.

The standards available to records managers are not just those that are considered records management standards. Records managers will identify other standards based on the needs of the organization and the task at hand. For example, three additional ISO standards that may prove useful are *ISO 31000:2009: Risk Management—Principles and Guidelines*; *ISO 10005:2005: Quality Management Systems—Guidelines for Quality Plans*; and *ISO/IEC 27001: 2005: Information Technology—Security Techniques—Information Security Management Systems—Requirements.*

Sampling of ISO Records/Information Management Standards and Technical Reports

ISO 15489-1:2001: Information and Documentation—Records Management—Part 1: General. This part of *ISO 15489* provides guidance on managing records of originating organizations, public or private, for internal and external clients. All of the elements outlined in Part 1 are recommended to ensure that adequate records are created, captured, and managed.

ISO/TR 15489-2:2001: Information and Documentation—Records Management—Part 2: Guidelines. This part of *ISO 15489* is an implementation guide to *ISO 15489-1* for use by records management professionals and those charged with managing records in their organizations. It gives an overview of the processes and factors to consider in organizations wishing to comply with *ISO 15489-1*.

ISO 23081-1:2006: Information and Documentation—Records Management Processes—Metadata for Records—Part 1: Principles. This part of *ISO 23081* covers the principles that underpin and govern records management metadata. These principles apply through time to records and their metadata; all processes that affect them; any system in which they reside; and any organization that is responsible for their management.

ISO 23081-2:2009: Information and Documentation—Managing Metadata for Records—Part 2: Conceptual and Implementation Issues. This part of *ISO 23081* establishes a framework for defining metadata elements consistent with the principles and implementation considerations outlined in *ISO 23081-1:2006*.

ISO/TR 23081-3:2011: Information and Documentation—Managing Metadata for Records— Part 3: Self-Assessment Method. *ISO/TR 23081-3:2011* provides guidance on conducting a self-assessment on records metadata in relation to the creation, capture, and control of records.

Professional associations are active in developing standards, guidelines, best practices, and technical reports to assist their members.[24] These associations receive requests for guidance from their members, but they must work with a national standards development body if they wish to develop a standard.

In 2005, AIIM (Association of Information and Image Management) was instrumental in moving the PDF file format forward from a popular de facto standard to an ANSI and ISO approved standard. *ISO 19005-1:2005—Document Management—Electronic Document File Format for Long-Term Preservation—Part 1: Use of PDF 1.4 (PDF/A-1)*, the first PDF/A standard based on PDF version 1.4, was approved in 2005. Part 2 of *ISO 19005* was approved as a final draft in 2011 and is based on version 1.7 of PDF. Part 3, published in 2012, also specifies the use of PDF 1.7 for preserving the static visual representation of

page-based electronic documents over time, but it also allows any type of other content to be included as an embedded file or attachment.

In 2011, ANSI endorsed a standard developed by a consensus group formed by ARMA International. The standard *Implications of Web-Based, Collaborative Technologies in Records Management* (*ANSI/ARMA 18-2011*) provides requirements and best practice recommendations related to policies, procedures, and processes for an organization's use of internally facing or externally directed (public or private) social media technologies such as wikis, blogs, mashups, and classification (tagging) sites.

Laws and Regulations

In 2008, 22 to 33 percent of the total volume of information had to be evaluated and managed for its compliance, preservation, and security profile. But only 20 to 40 percent of that total volume of *high-value* information could be considered *business records*. High-value information was expected to account for 35 to 45 percent of the digital universe by the end of 2012.[25] Retention management must be performed to manage all high-value information regardless of records status. It is not surprising that the regulatory environment is becoming more complex in light of growth in the volume of high-value information, increased global business, the current, shifting geopolitical environment, and the unstable economic landscape combined with the increasingly intrusive capabilities of technology.

In the United States, those responsible for ensuring records and information management compliance must be knowledgeable of four different types of actions: executive orders, legislation (statutes), administrative actions (regulations), and judicial decisions (case law).

Executive Orders

Executive orders are issued by the incumbent president, who can revoke orders of previous presidents, changing the way in which presidential records are to be managed. The Presidential Records Act of 1978 (PRA) changed the legal ownership of the official records of the president from private to public and established a new statutory structure under which presidents must manage their records. In January 1989, President Reagan issued Executive Order 12677 to establish procedures for NARA and former and incumbent presidents to implement the PRA. Shortly after the attacks of 9/11, President George W. Bush issued Executive Order 13233 revoking President Reagan's Executive Order 12677 and restricting access to the records of former presidents. This new executive order applied to the records of the vice president as well. President Barack Obama's first act as president in 2009 was Executive Order 13489 revoking President Bush's Executive Order 13233 and limiting the authority of the president and former presidents to block the release of presidential records.

Legislation and Regulations

Laws are created by statues that originate from legislative bills. Laws can be enacted on the federal, state, and local levels of government. On the federal level, the US Congress votes to adopt legislation, the president signs the legislation making it a law, and various agencies are charged with publishing regulations to provide guidance to implement the law. *Regulation* is defined as "a rule or order issued by an executive authority or regulatory agency of a government and having the force of law."[26] Regulations are applicable only within the jurisdiction or purpose for which such regulations are made.

Noncompliance with laws or regulations can result in fines, sanctions, litigation, and personal liability for corporate officers. Managing records in a prudent and defensible manner is essential to minimizing risk and establishing proof of compliance. But the question is, compliance with which laws and regulations? Responsibility for answering that question varies across organizations. A 2009 study by Iron Mountain revealed an increased appreciation for the role of records management in reducing risk. The survey of 2,679 organizations of all sizes in the private, publicly traded, government, and nonprofit sectors revealed that 25 percent of the organizations' records management departments reported to legal/compliance and audit/risk management compared to 18 percent in 2007.[27]

The individual responsible for identifying applicable laws and regulations will need to consider those laws and regulations specific to his or her organization's situation. Regulations provide more detail than the laws from which they arise and will, in some cases, specify the length of time certain records must be available for audit. This information is essential to determining the retention period for records that result from a similar activity or that document a specific type of transaction.

In the United States, the Office of the Federal Register provides access to the official text of federal laws, presidential documents, administrative regulations and notices, and descriptions of federal organizations, programs, and activities. Of particular significance to records managers is the *Code of Federal Regulations* (CFR) that codifies the general and permanent rules published in the *Federal Register* by the departments and agencies of the federal government.

Records management issues are addressed in Title 44 of the *United States Code* (USC) The basis for records management in the federal government is the Federal Records Act of 1950 (44 USC § 2901) that states: "This law establishes the basis for records management programs in Federal Agencies."[28] Some of the chapters of Title 44 that relate to records management are these:

- NARA (Chapter 21)
- Presidential records (Chapter 22)
- Records management by the Archivist of the United States and by the Administrator of General Services (Chapter 29)
- Records management by federal agencies (Chapter 31)
- Disposal of records (Chapter 33)

NARA regulations can be found in Title 36 of the *United States Code* and in the *Code of Federal Regulations*, 36 CFR 1220, subchapter B—Records Management. Subchapter B specifies policies for federal agencies' records management programs relating to proper records creation and maintenance, adequate documentation, and records disposition. Among the regulations are those related to managing vital records, implementing disposition, transferring records to records storage facilities, and electronic records management.

Congress can also regulate the actions of private firms. The Sarbanes-Oxley Act of 2002 (SOX) is legislation enacted by the US Congress and signed by President Bush in response to the high-profile Enron and WorldCom financial scandals.[29] Administered by the Securities and Exchange Commission (SEC), it is designed to protect shareholders and the general public from accounting errors and fraudulent practices. It applies to all public companies in the United States, international companies that have registered equity or debt securities

Key US Federal Statutes Related to Records Management

National Archives Act of 1934. Signed by President Franklin D. Roosevelt, this act established the National Archives to centralize federal recordkeeping, with the Archivist of the United States as its chief administrator.

Federal Records Act of 1950. This act, as amended, establishes the framework for records management programs in federal agencies. As the primary agency for records management oversight, the NARA is responsible for assisting federal agencies in maintaining adequate and proper documentation of policies and transactions of the federal government. This is done by appraising records (determining record value and final disposition of temporary or permanent records), regulating and approving the disposition of federal records, operating federal records centers, and preserving permanent records.

Freedom of Information Act (FOIA) of 1966. This act, as amended, ensures public access to US government records. FOIA carries a presumption of disclosure. The burden is on the government to demonstrate why information may not be released. Upon written request, US government agencies are required to disclose their records, unless they can be lawfully withheld from disclosure under one of nine specific exemptions in the FOIA. This law was most recently amended by the OPEN FOIA Act of 2009.

Privacy Act of 1974. This act establishes safeguards for the protection of records that the federal government collects and maintains on US citizens and permanent residents. The act mandates that the government must disclose what information is being collected and how it will be used. It also bars agencies from maintaining information not directly related to their mission. The act allows individuals to seek access to records retrieved by their name and personal identifier and to seek amendment of any inaccurate information.

Presidential Records Act (PRA) of 1978. This act establishes ownership, possession, and control of presidential records as the domain of the United States. It includes provisions that state how such records are to be administered. It gives the president ultimate responsibility for the implementation of records management controls. The PRA of 1978 allows the president, in consultation with the Archivist of the United States, to dispose of those records that no longer have administrative, historical, informational, or evidentiary value. The archivist must state that he/she will not take action to prevent such disposition. Responsibility for the custody, control, preservation of, and access to presidential records of past presidents lies with the archivist.

Paperwork Reduction Act of 1995. This act requires that agencies obtain the approval of Office of Management and Budget (OMB) before requesting most types of information from the public. It requires the head of each agency to designate a chief information officer to carry out the responsibilities outlined.

E-Government Act of 2002. This act promotes the use of the Internet and electronic government services to make the federal government more transparent and accountable. In addition, it provides enhanced access to government information and services in a manner consistent with laws regarding protection of personal privacy, national security, records retention, access for persons with disabilities, and other relevant laws.

with the SEC, and the accounting firms that provide auditing services to them. SOX contains three rules that affect the management of business records. The first rule deals with destruction, alteration, or falsification of records. The second defines the retention period for records storage at not less than five years. The third refers to the types of business records that need to be stored—all business records and communications, including electronic communications. Consequences for noncompliance include fines, imprisonment, or both.[30]

The financial industry is also regulated by the Financial Industry Regulatory Authority (FINRA). FINRA requires brokerage firms and their registered representatives to retain records of all communications related to the broker-dealer's business, including those that are made through public blogs and social media sites, such as Facebook, LinkedIn, and Twitter. In Regulatory Notice 10-06 released in January 2010, FINRA provided guidance regarding the issues that arise from such use. Specifically, FINRA requires that any firm that "intends to communicate, or permit its associated persons to communicate, through social media sites must first ensure that it can retain records of those communications as

required by Rules 17a-3 and 17a-4 under the Securities Exchange Act of 1934 and NASD Rule 3110."[31] The firm must accept responsibility for ensuring that communications made through social media technologies meet retention and retrieval requirements necessary to comply with the books and records rules.

Another heavily regulated industry is the healthcare industry. The Health Insurance Portability and Accountability Act of 1996 (HIPAA) is a federal statute to help consumers maintain their insurance coverage by standardizing the electronic exchange of information (transactions) between trading partners.[32] HIPAA regulations also established privacy and security standards to protect individually identifiable health information. Records and information management professionals in healthcare-related organizations must understand and be prepared to comply with HIPAA rules and regulations.

One law that has far-reaching implications for organizations engaged in interstate and foreign commerce is the Electronic Signatures in Global and National Commerce Act (E-SIGN).[33] E-SIGN was enacted by Congress and signed into law by President Clinton using his electronic ID on June 30, 2000. The purpose of this law was to facilitate the use of electronic records and signatures by ensuring the validity and legal effect of contracts entered into electronically. Section 101(c)(1)(C)(ii) of the act requires businesses to obtain the consumers' electronic consent or confirmation to receive information electronically that a law requires to be in writing.[34] More than ten years after this law was enacted, many industries have reported a positive impact on their ability to conduct business. The real estate industry, for example, cites the ability to close transactions more quickly and at lower cost using e-signature technology.

Caution is advised when identifying applicable laws and regulations. In order to be compliant with these regulations, additional research is required. As illustrated by the number

Key US Federal Provisions Governing Implementation of Records Management Statute

Code of Federal Regulations relating to records management (36 CFR 1220–1239). Subchapter B—Records Management (Parts 1220–1239) contains regulations affecting federal agencies and their records management programs.

Definition of records (44 USC Chapter 33, § 3301). Definition of records as used in statutes and regulations, including the Federal Records Act and the Freedom of Information Act. This definition is used by federal agencies to identify records and governs agencies' records management responsibilities.

Records Management by the Archivist of the United States and by the Administrator of General Services (44 USC Chapter 29). Divides general responsibility for records management between the Archivist and the Administrator. The Archivist assumes responsibility to provide guidance and assistance to federal agencies with respect to ensuring adequate and proper documentation of the policies and transactions of the federal government and ensuring proper records disposition. The Administrator assumes responsibility to provide guidance and assistance to federal agencies to ensure economic and effective records management by such agencies. Enumerates additional responsibilities each party will assume when carrying out their primary obligations to provide guidance and assistance to federal agencies.

Records Management by Federal Agencies (44 USC Chapter 31). Charges the head of each federal agency with making and preserving records containing adequate and proper documentation of the organization, functions, policies, decisions, and essential transactions of the agency. Requires each federal agency head to establish and maintain an active, continuing program of management of the records of the agency in cooperation with both the Administrator of General Services and the Archivist of the United States. Requires the head of each federal agency to provide for the transfer of records to a records center maintained and operated by the Archivist or, when approved by the Archivist, to a center maintained and operated by the head of the federal agency.

of executive orders repealing previous presidential executive orders, present and future actions can modify or negate previous decisions. For example, in 1995, the Utah legislature passed the Uniform Electronic Transactions Act, putting electronic signatures and records on equal footing with paper and ink. In 2010, the Utah Supreme Court held that petitions could be electronically signed. In March 2011, however, the Utah legislature passed Senate Bill 165 to eliminate the use of online signatures for the electoral process in Utah.

Rule 26 and Other Amendments of the *Federal Rules of Civil Procedure*

Organizations must not only be prepared to demonstrate compliance with laws and regulations, but they also must be prepared to defend themselves in court. The *Federal Rules of Civil Procedure* (FRCP) govern the conduct of civil actions brought into federal district courts.[35] Many states have used the FRCP as a model for their own rules of civil procedure. Rules 26 and 37 govern the production of evidence in most federal court cases and make the efficient management of electronic records more important than ever. Implications for records management programs cannot be ignored.

FRCP Implications for Records Management Programs

Rule 26(a) defines *electronically stored information* (ESI) as a specific category of information to be disclosed. Businesses (whether plaintiff or defendant) have a responsibility to produce e-records. The party requesting discovery from an opposing party may request that ESI be produced in specific formats. The responding party can object, and if the parties cannot agree, the court has the option of ordering the format of the ESI production. The implication for records management is that organizations must know what formats their electronic records are stored in, what metadata is associated with them, and what formats they can be converted to.

Rule 26(f) requires parties to meet to discuss e-discovery issues within 120 days of filing of the litigation and at least 21 days before the scheduling conference. Because the goal of these meetings is to reach an agreement on logistical issues, the parties must have an up-to-date data map of electronic assets available to address questions about repositories, file types, locations, access time frames, relevance of metadata, and more. Rule 26(f) also demands that parties take steps to preserve relevant data in order to meet production requirements. Litigation holds must be instituted to prevent records from being disposed of according to the organization's retention requirements. Failure to institute a litigation hold may result in a charge of spoliation of evidence.

Rule 26(b)(5) addresses the accidental production of privileged information, such as trade secrets or financial information. The presenting party can notify the recipient and request that the recipient return, sequester, or destroy the information. If the recipient disputes the claim, the court can be asked to rule on the request. It is better to implement information management and e-discovery systems that will prevent such unintended disclosures.

Rule 26(b)(2) acknowledges that some ESI may be unduly burdensome to produce due to issues such as hardware or software obsolescence or damaged media. In such cases, the rule states that a party need not produce e-records it regards as "not reasonably accessible because of the undue burden of cost." The requesting party can introduce a motion to compel production, and the burden is on the responding party to prove that the information is not reasonably accessible. The court can order production in spite of the assertion that production would be an unreasonable burden.

Rule 37(f) recognizes the fact that companies cannot preserve all of the data they generate. This rule states, "absent exceptional circumstances, a court may not impose sanctions as the result of the routine, good-faith operation of an electronic information system." Organizations must document and follow their policies and procedures, including their records retention policies, if they wish to demonstrate that they have disposed of potentially discoverable data in the normal course of *good faith* business operations.

Note: The *Federal Rules of Civil Procedure* can be viewed at http://www.law.cornell.edu/rules/frcp.

The Legal Environment

Court rulings on cases similar to those in which an organization may find itself is part of the risk assessment process used to determine which records and information demand additional protection and for how long the records and information should be retained. Keeping track of e-discovery decisions is not an easy task. Information about cases and trends can be gathered from publications such as those provided by Gibson Dunn, a firm with over 1,000 lawyers in 17 offices in the United States, Europe, the Middle East, Asia, and South America. Their *2012 Year-End Electronic Discovery and Information Law Update* included the following highlights:

> A shift in sanctions rulings also appeared to take place this year, as courts have gained more experience in dealing with alleged e-discovery failures and are more frequently favoring pragmatic solutions over punitive sanctions.
>
> Although most cases [addressing legal holds] continued to consider when a defendant's duty to preserve arises, a few recent decisions have addressed when a plaintiff's duty to preserve arises. In these decisions, courts have held that a plaintiff's duty to preserve—like that of a defendant—arises when litigation is "reasonably foreseeable." Exactly when litigation is reasonably foreseeable, however, can be less than clear in practice.
>
> In addition, the discoverability of social networking information—and relatedly, the obligation to preserve that information—continues to be an area where courts need to, and are, developing new and innovative ways to craft rules that properly account for the fluid nature of social networking sites. Specifically, in 2012, courts found themselves increasingly faced with difficult questions about the extent to which parties are obligated to preserve social media for and during litigation—and whether the modification of social media sites constitutes sanctionable spoliation.[36]

If you are employed by an international firm, you must become familiar with legal requirements and codes of practice in the countries in which business is conducted. The Data Protection Act 1998 (DPA 1998) is an act of the United Kingdom (UK) Parliament defining the ways in which information about living people may be legally used and handled.[37] This Act contains six major parts that outline the basic rights of data subjects, methods in which data can be handled by those who possess it, special exemptions, and modes of enforcement. DPA 1998 was enacted to bring the UK law up-to-date with the European Parliament Directive 95/45/EC which required member states of the European Union to protect people's fundamental rights and freedoms, including the right to privacy with respect to the processing of personal data.[38]

The goal of the European Commission, the European Union's governing body, is harmonizing laws of its member states to promote standardization and facilitate compliance. However, not all countries belong to the European Union and not all that do are in compliance with the directives of the European Commission. Additional laws and regulations outside of the United States are included in the appendix.

It is easy to see how complex this is becoming, which explains why large organizations employ chief compliance officers (CCOs) to ensure that the organization is complying with regulatory requirements and that the company and its employees are complying with internal policies and procedures. Records and information managers must be aware of these complex issues in order to develop records retention schedules on their own or in collaboration with the corporate compliance officer.

Summary

The volume and variety of digital data created today presents enormous challenges to the organization. According to one recent estimate, approximately 70 percent of the digital universe is created by individuals, and yet enterprises are responsible for the security, privacy, reliability, and compliance of 85 percent of it (e.g., in 2012, the US White House asked Google to remove an anti-Muslim video from YouTube).[39, 40] Constantly evolving laws, regulations, and case law, along with the fact that much of the data is being created outside of the organization's firewalls, add to the complexity of the situation. An accountability framework that includes policies, processes, roles, standards, and metrics is necessary for the organization to effectively govern their records and information.

An information governance program built upon a solid records and information management foundation can produce benefits and mitigate risks to the organization. Benefits include the protection of vital records and those of historical importance; the preservation of corporate, personal, and collective memory; and effective control, appropriate security, and management over the creation, maintenance, use, and disposition of all records within the organization. Risks that can be minimized include those that arise from lost files and potential charges of spoliation; high costs for information management and storage; and audits and compliance violations.

A number of lifecycle models have been developed to describe the various stages in the lifecycle of records and information, including the document management lifecycle model, the information lifecycle model, the records management lifecycle model, and the records continuum. The goal of each of these is to ensure that the right information is available to the right person at the right time in compliance with all governing laws and regulations.

Records management programs vary across organizations and industries, but they all possess certain core elements (e.g., retention and disposition, active files management, preservation) and activities (e.g., records identification, file plan development).

Laws, regulations, and standards impact records and information management programs for both government and private organizations. Industry-specific laws and regulations must be taken into account, for example, the impact of HIPAA regulations on the healthcare industry. Organizations involved in international business must understand the laws and regulations of the countries in which they operate.

The nuclear power industry is heavily regulated in the United States. Life-of-Plant retention requirements can result in a duty to preserve some records for 100 years or more. In his contribution to this chapter, Eugene Yang, principal consultant of KISMET Consulting, explains how the US Power Industry mitigates risk in the use of electronic formats to maintain quality assurance records retention requirements.

PARADIGM

The US Nuclear Power Industry Mitigates Risk in the Use of Electronic Formats to Meet Quality Assurance Record Retention Requirements

Eugene Yang, Principal Consultant, KISMET Consulting, Inc.

Introduction

The conduct and operation of the US nuclear power industry is based on Title 10 of the *Code of Federal Regulations*, which is the set of regulations that define the jurisdiction of the US Nuclear Regulatory Commission (USNRC). Within those regulations, Appendix B of Part 50 (10 CFR 50 Appendix B) sets down the requirements for a Quality Assurance Program, of which Criterion 17 speaks to the requirement for the management of quality assurance records.

Most nuclear facilities' retention policies were built on the notion that "lifetime quality assurance records" are required to be maintained for the life of the particular item while it is installed in the plant. These are also known as "permanent" records. Originally, this meant retaining records for approximately 40 years (the design life of a plant). However, with license renewal and plant life extension activities, another 20 years of operating life is being added onto these facilities, thus extending the "life-of-plant" retention period. In addition, for certain record types, other requirements further extend the retention period and may exceed 100 years—or more!

As with any other industrial sector in the United States, the nuclear power industry has also adopted information technologies in all aspects of power production, from engineering modeling analyses to plant digital control to managing administrative functions. In the area of records management, the use of information technology has grown from initially creating database indexes (that pointed to either paper records or microfilm-based images) to the now more common practice of using enterprise content management platforms that provide a web-based experience in indexing, metadata search, full-text search, and record content (images or rendered documents) retrieval.

The use of information technology, however, while introducing efficiencies in records processing, storage, and retrieval, presents risks to long-term retention, one of which is that the electronic file itself cannot be read directly but must be "viewed" with software. One cannot hold a PDF file, for example, up to the light and view its contents. Even more important, will the software used to create it be available in the future? Will it be able to read a file that was based on several generations-old technologies? Or, worse yet, will the company that created the software application be out of business prior to the retention period expiration?

Thus, the nuclear power industry faced a key records management issue: dealing with electronic documents that are created in proprietary formats and present a risk to long-term preservation (or being "sustainable"). The question then is, how can the risk of not being able to view an electronic record years from now be mitigated so that it can be retrieved, viewed, and used during its retention period?

Guidance on Sustainability

The nuclear industry has sought guidance and standards from various industry-based and international organizations. An important source of guidance was from the National

Archives and Records Administration (NARA), which has determined the following criteria for digital file sustainability (preservation):

- Publicly and openly documented
  - Existence of complete documentation (standards-based)
- Nonproprietary
  - *Transparency:* degree to which the digital representation is open to direct analysis
  - *External dependencies:* degree to which the format is dependent upon specific hardware, operating system, or software for rendering or use and the complexity of dealing with those dependencies in future technical environments
  - *Impact of patents:* degree to which the ability of archival institutions to sustain content in a format will be inhibited by patents
  - *Technical protection mechanisms:* implementation of mechanisms that prevent the preservation of content by a trusted authority
- In widespread use
  - Degree to which the format is already in use
- Self-documenting
  - Digital objects that contain basic descriptive, technical, and other administrative metadata
- Can be opened, read, and accessed with readily available tools

Format Discussion

"Native files formats" are those electronic formats that are created through the use of an authoring or creation tool, such as word processing or computer-aided drafting and design software. These formats do not conform to the NARA criteria due to two key points: (1) the proprietary nature of these software tools, and (2) the ease with which changes can be made to documents declared records and retained in native file formats.

The primary purpose of sustainable formats is to provide "a mechanism for representing electronic documents in a manner that preserves their visual appearance over time, independent of the tools and systems used for creating, storing, or rendering the files."[41] Through research, use, and experience, three (3) formats have emerged in the nuclear power industry to meet the sustainability challenge:

- Tagged Image File Format (TIFF) (standard: TIFF 6.0)
- Portable Document Format/Archive (PDF/A) (standard: *ISO 19005-1, ISO 19005-2*)
- Extensible Markup Language (XML) (standard: W3C XML 1.0, XML 1.1)

TIFF is a file format for storing images (raster, bit-mapped), including photographs and line art. This format accommodates black-and-white, grayscale, and color scales. In document management systems, it is usually combined with CCITT Group IV 2D compression (bitonal). The format rights are owned by Adobe Corporation (this may compromise the nonproprietary criterion, but due to its long service in all industries and ubiquity across a myriad of software application platforms, it has become a de facto standard).

For most power plants, the "file format of choice" for electronic permanent plant records is Adobe System's Portable Document Format (PDF). The primary concern is the consistent generation of electronic QA records that dictate the ability of users in the distant future to open and read these records. In 2005, the International Organization for Standardization

(ISO) formally approved and issued *ISO 19005-1:2005: Document Management—Electronic Document File Format for Long-Term Preservation—Part 1: Use of PDF 1.4 (PDF/A-1)*, which establishes PDF/A ("PDF-Archive") as an output format that is self-descriptive. This means that a "reader" based on the specifications described in the ISO standard can be developed that will be able to open these files. Thus, should a company that created the software for creating a PDF/A-based record become defunct, a software developer in the future, when using the ISO standard, can replicate a viewing tool. (As of June 2011, ISO has issued *ISO 19005-2:2011—Part 2: Use of ISO 32000-1 (PDF/A-2.*)

XML started as a simplified subset of the standard generalized markup language (SGML) and is considered "extensible" because it allows users to define their own elements. It is used in two broad categories: data-centric and document-centric. Data-centric XML is used in data transport, where it is successfully used in web-based information processing. Document-centric XML is used for its SGML-like capabilities and is typically defined through the document type description schema. Hence, one could create a fully XML-tagged document that would be capable of being read, without necessarily having to use a rendering tool to view the contents. Style sheets can then be devised to provide user-friendly renditions of the XML-based document. Table 2.1 (p. 52) provides a comparison of these formats and how they conform to the NARA criteria.

Because an electronic record saved in any of these formats can be altered either through accidental or malicious intent, the nuclear power industry further mitigates the risk through a "defense in depth" strategy. Aspects of this strategy include the following:

- Controlling access to the enterprise content management system (network security)
- Controlling access to the record itself (rights/permissions security)
- Storage of the format to either "write once read many" (WORM) optical disk or "fixed-content storage" on magnetic drives ("burning" the file mitigates against content alteration)
- Administrative and technical processes to ensure no record is overwritten or changed (e.g., record modification request process, checksum analysis)
- Penalties on employees for violating policy (e.g., employment termination)

Importance of a Comprehensive Program

It is important to note that this discussion centers on the notion of a long-term *format type*. These sustainable formats alone do *not* guarantee long-term sustainability, as it is only *one* component of an entire archival strategy. To further mitigate the risk of not having the record retained adequately for a nuclear power plant's quality assurance program regulatory compliance, a comprehensive electronic records program needs to be established that not only addresses the long-term format issue but also includes all aspects of an electronic records management program, such as the following:

- Programmatic (policy, procedures, and audits)
- Information (indexing standards, data integrity audits, content management)
- Technology (software quality assurance, secure operating environment backup/recovery)
- Organizational support (roles and responsibilities of the users and the records management personnel, identified organizations that are record owners, self-assessments)

Table 2.1. Comparison of file formats and their conformity with NARA criteria.

Format type	Acronym	Description	Standard	Publicly and openly documented	Nonproprietary	Widespread use	Self-documenting	Can be accessed with readily available tools
/Archive	PDF/A	Defines a form of PDF for the long-term archiving of electronic documents (based on the PDF 1.4 specification). Places requirements on a conforming reader that must follow certain rules for reading the file.	ASO 19005-1:2005	Yes	Yes	No, but increasing	Yes	Yes
Tagged Image File Format	TIFF	A file format for storing images, including photographs and line art. Accommodates black-and-white, gray-scale, and color. In document management systems, usually combined with CCITT Group IV 2D compression (bitonal). Rights owned by Adobe Systems. Contextual metadata must be external.		Yes	No	Yes	Yes	Yes
eXtensible Markup Language	XML	Started as a simplified subset of SGML, it is extensible because it allows users to define their own elements. It is used in two broad categories: data-centric and document-centric. Data-centric is where XML is used in data transport. Document-centric SML is used for its SGML-like capabilities and is typically defined through the Document Type Description schema.	World Wide Web Consortium (W3C) XML 1,0, XML 1.1	Yes	Yes	Yes	Yes	Yes

Source: Excerpted from the Nuclear Information and Records Management Association Technical Guideline 15 (NIRMA TG-15-2011), *Management of Electronic Records*, Appendix B, "Format Sustainability." Courtesy of the Nuclear Information and Records Management Association (NIRMA).

Notes

1. Barry Murphy, "What Is Information Governance?" *eDiscovery Journal* (blog), March 22, 2010, http://ediscoveryjournal.com/2010/03/what-is-information-governance/.
2. ARMA International, *Glossary of Records and Information Management Terms*, 4th ed. (ARMA TR 22-12012) (Overland Park, KS: ARMA International, 2012), 97.
3. International Organization for Standardization (ISO), *ISO 15489-1:2001: Information and Documentation—Records Management—Part 1: General* (Geneva: ISO, 2001), 3.
4. Richard Pearce-Moses, s.v. "information," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed December 22, 2012, http://www2.archivists.org/glossary/terms/i/information.
5. *Oxford Dictionaries Online*, s.v. "information," accessed December 5, 2012, http://oxforddictionaries.com/?region=us.
6. D. Gould and A. Turner, "Information Governance Reboot," HP Webinar, slide 12, attended January 31, 2013.
7. ARMA International, "What Is Electronic Records Management?," accessed January 27, 2013, http://www.arma.org/rim/101/index.cfm.
8. Eileen Yu, "Oracle Looks to Clear Air on Big Data," ZDNet, October 4, 2012, http://www.zdnet.com/oracle-looks-to-clear-air-on-big-data-7000005211/.
9. International Organization for Standardization (ISO), *ISO 15489-1:2001: Information and Documentation—Records Management—Part 1: General* (Geneva: ISO, 2001), 9, http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=31908.
10. Pearce-Moses, s.v. "document," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed December 22, 2012, http://www2.archivists.org/glossary/terms/d/document.
11. Mary F. Robek, Gerald F. Brown, and David O. Stephens, *Information and Records Management* (New York: Glencoe/McGraw-Hill, 1996), 7–8.
12. *Wikipedia*, s.v. "enterprise content management," last modified December 3, 2012, http://en.wikipedia.org/wiki/Enterprise_content_management.
13. Ibid.
14. John F. Ganz et al., *The Expanding Digital Universe: A Forecast of Worldwide Information Growth through 2010*, International Data Corporation (IDC), March 2007, 13, http://www.emc.com/collateral/analyst-reports/expanding-digital-idc-white-paper.pdf.
15. *Merriam-Webster Online*, s.v. "information," accessed December 6, 2012, http://www.merriam-webster.com/dictionary/information.
16. SearchStorage, s.v. "information life cycle management," last modified May 2004, http://searchstorage.techtarget.com/definition/information-life-cycle-management.
17. Modeling Cross-Domain Task Force, "Appendix 16: Overview of the Records Continuum Concept" [electronic version], in *International Research on Permanent Authentic Records in Electronic Systems (InterPARES) 2: Experiential, Interactive and Dynamic Records*, Luciana Duranti and Randy Preston, eds. (Padova, Italy: Associazione Nazionale Archivistica Italiana, 2008), http://www.interpares.org/display_file.cfm?doc=ip2_book_appendix_16.pdf.
18. John Curtain Prime Ministerial Library, "Australian Contributions to Recordkeeping—The Records Continuum," accessed December 6, 2012, http://john.curtin.edu.au/society/australia/.
19. National Archives and Records Administration (NARA), "Typical Records Management [RM] Functions and Typical RM Program Activities," accessed December 6, 2012, http://www.archives.gov/records-mgmt/policy/prod6a.html.
20. Patricia Manning, "Competency Statement E (e-Portfolio Prepared in Partial Fulfillment of MARA Degree)," unpublished essay, 2011.

21. For additional information, consult *A Guide to Commonly Used National and International Records Management Standards and Best Practices* developed by Virginia A. Jones, CRM, FAI. The guide is available at no cost from the ARMA International Education Foundation website at http://www.armaedfoundation.org/pdfs/V_Jones_RIM_Standards2010.pdf.
22. Joint Interoperability Test Command (JITC), "Records Management Application," accessed December 6, 2012, http://jitc.fhu.disa.mil/cgi/rma/.
23. Inforesight Limited, "MoReq2," accessed February 8, 2013, http://www.moreq2.eu/moreq2. This site provides documents for download as well as the most up-to-date information on *MoReq*.
24. If you are a member of a professional association and feel you can contribute to the development of a standard, technical report, or guideline, consider becoming involved with your professional organization's standards development initiatives.
25. Vivian Tero, "Global Records Compliance: What You Need to Know," *PCWorld*, June 2010, 1–32, http://research.pcworld.com/content15096.
26. *Merriam-Webster Online*, s.v. "regulation," accessed December 6, 2012, http://www.merriam-webster.com/dictionary/regulation.
27. Iron Mountain, *Best Practices for Records Management (Iron Mountain Compliance Benchmark Report)*, 2010, http://ironmountain.com/forms/crm2010/2010_benchmark_report.pdf.
28. Cornell University Law School, "Federal Records Act of 1950," 44 USC § 2901 et seq., Legal Information Institute, accessed December 6, 2012, http://www.law.cornell.edu/uscode/html/uscode44/usc_sup_01_44_10_29.html.
29. Cornell University Law School, "Public Company Accounting Reform and Corporate Responsibility," 15 USC § 98, Legal Information Institute, accessed December 6, 2012, http://www.law.cornell.edu/uscode/html/uscode15/usc_sup_01_15_10_98.html.
30. SearchCIO, "Sarbanes-Oxley Act (SOX)," last modified November 2006, http://searchcio.techtarget.com/definition/Sarbanes-Oxley-Act.
31. Financial Industry Regulatory Authority (FINRA), *Regulatory Notice 10-06—Social Media Web Sites: Guidance on Blogs and Social Networking Sites*, January 2010, http://www.finra.org/Industry/Regulation/Notices/2010/P120779. See also SEC Rel. No. 34-37182 (May 9, 1996), 61 Fed. Reg. 24644 (May 15, 1996); SEC Rel. No. 34-38245 (Feb. 5, 1997), 62 Fed. Reg. 6469 (Feb. 12, 1997), *Notice to Members* 03-33 (July 2003).
32. US Government Printing Office, "Health Insurance Portability and Accountability Act of 1996," H.R. 104-191, 104th Cong. (1996), http://www.gpo.gov/fdsys/pkg/PLAW-104publ191/content-detail.html.
33. Cornell University Law School, "Electronic Signatures in Global and National Commerce," 15 USC § 96, Legal Information Institute, accessed December 6, 2012, http://www.law.cornell.edu/uscode/15/usc_sup_01_15_10_96.html.
34. Federal Trade Commission and Department of Commerce, *Electronic Signatures in Global and National Commerce Act: The Consumer Consent Provision in Section 101(c)(1)(C)(ii) (2001)*, Federal Trade Commission, June 2001, http://www.ftc.gov/os/2001/06/esign7.htm.
35. The *Federal Rules of Civil Procedure* can be viewed at http://www.law.cornell.edu/rules/frcp.
36. Gibson Dunn, *2012 Year-End Electronic Discovery and Information Law Update*, January 14, 2013, http://www.gibsondunn.com/publications/Pages/2012-YearEnd-Electronic-Discovery-Update.aspx.
37. SearchStorage.co.UK, "U.K. Data Protection Act 1998 (DPA 1998)," last modified January 2008, http://searchstorage.techtarget.co.uk/definition/Data-Protection-Act-1998.
38. European Union, *Directive 95/46/EC of the European Parliament and of the Council on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of Such Data*, October 24, 1995, http://www.unhcr.org/refworld/docid/3ddcc1c74.html.
39. EMC, "New Study Forecasts Explosive Growth of the Digital Universe; Spotlights Worldwide Phenomenon of 'Digital Shadow,'" Marketwire, March 11, 2008, http://www.marketwire.com/

press-release/New-Study-Forecasts-Explosive-Growth-Digital-Universe-Spotlights-Worldwide-Phenomenon-NYSE-EMC-831713.htm.
40. Declan McCullagh, "White House Pressures Google over Anti-Islam Video," CNET News, September 14, 2012, http://news.cnet.com/8301-13578_3-57513264-38/white-house-pressures-google-over-anti-islam-video/.
41. International Organization for Standardization (ISO) *ISO 19005-1:2005: Document Management—Electronic Document File Format for Long-Term Preservation—Part 1: Use of PDF 1.4 (PDF/A-1*) (Geneva: ISO, 2005), http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=38920.

CHAPTER

3

Records and Information Creation/Capture, Classification, and File Plan Development

Introduction

The amount of information created worldwide in digital format surpassed 1.8 zettabytes (1.8 billion terabytes) during 2011. By 2020, the world will generate 50 times that amount. This digital data is generated by "numerous devices in numerous forms: remote sensors, online retail transactions, text documents, e-mail messages, web posts, camera and video images, computers running large-scale simulations, and scientific instruments such as particle accelerators and telescopes."[1]

Much of the digital data is created automatically and is ephemeral (transitory) in nature. In the world of information management, *transient data* is created within an application session. It passes quickly into and out of existence producing results beyond itself. At the end of the session, it is discarded or reset back to its default and not stored in a database.[2] Transitory digital data should not be confused with transitory records. *Transitory records* are those only needed for a short time. They can be used or acted upon and then destroyed. They do not contain information that will be needed in the future. In this chapter, we'll deal specifically with records and information that result from business activities conducted using some of the many systems, components, networks, and applications employed by users at home and at work (see Figure 3.1, p. 58).

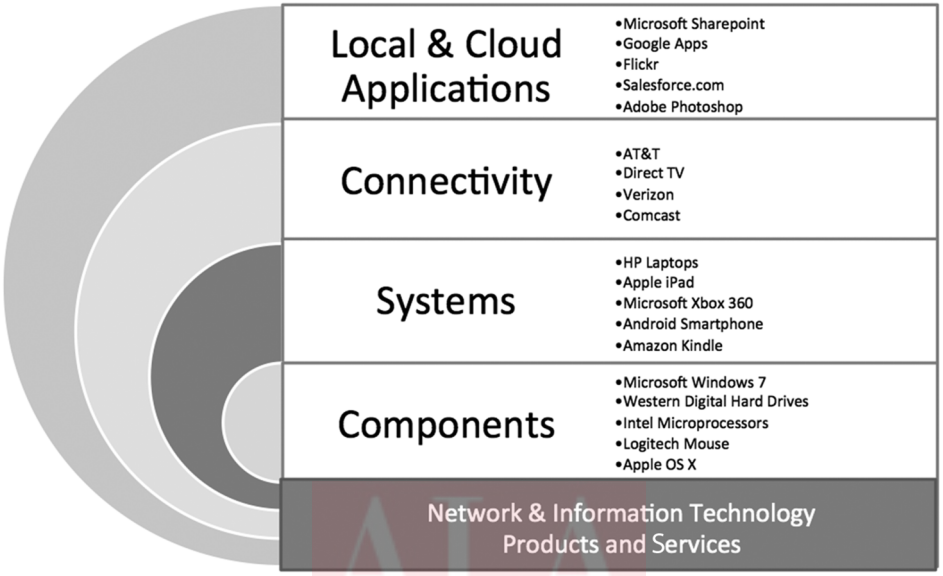
When discussing records and information creation and capture, it is necessary to consider storage issues, which influence our attitude toward creation. The core technology for data storage, especially magnetic disks, has progressed rapidly, "enabling government, research, and corporate organizations to create massive data warehouses that can store much of the data as fast as it is created."[3]

Although great strides have been made in the area of data storage technology, additional research and development is needed to address, among other issues, the lack of standards for software (e.g., proprietary word processing formats); systems requirements needed to support data privacy, access limitations, and retention requirements; and development of sustainable economic models to support data access and preservation over the long term.

Records and Information Creation and Capture

Records are a *subset of information* created and captured as evidence of business decisions, actions, or transactions. All records, including business e-mail and other electronic records, created or received, should be managed by an approved records management system.

Figure 3.1. Examples of NIT products and services available for work and home use.



Source: Adapted from President's Council of Advisors on Science and Technology, *Report to the President and Congress—Designing a Digital Future: Federally Funded Research and Development in Networking and Information Technology*, December 2010, http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-nitrd-report-2010.pdf.

Regardless of the methods used to create and capture records (manual or automated process), users sometimes have difficulty identifying a *record*. The fact that there is no universal definition of a record contributes to the confusion.

The International Organization for Standardization (ISO) defines *records* as "information created, received, and maintained as *evidence* and *information* by an organization or person, in pursuance of legal obligations or in the transaction of business [emphasis added]."[4]

The International Council on Archives' Committee on Current Records in an Electronic Environment defines a *record* as "recorded *information* produced or received in the initiation, conduct or completion of an institutional or individual activity and that comprises content, context and structure sufficient to provide *evidence* of the activity [emphasis added]."[5] In the United States, the Federal Records Act (FRA) defines records to include "all books, papers, maps, photographs, machine-readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States Government under Federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as *evidence* of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government or because of the *informational value* of the data in them [emphasis added]."[6]

The National Archives of Australia updated its definition of a record in 2004 to "that which is created and kept as *evidence* of agency or individual functions, activities and transactions . . . to be considered evidence, a record must possess content, structure and context and be part of a recordkeeping system."[7]

Although the definitions differ, key terms present themselves to help us identify information as records for retention purposes. Each definition recognizes that a record is *evidence* of a business transaction or activity. Three of the four specify the *informational value* of the content.

Creating Records

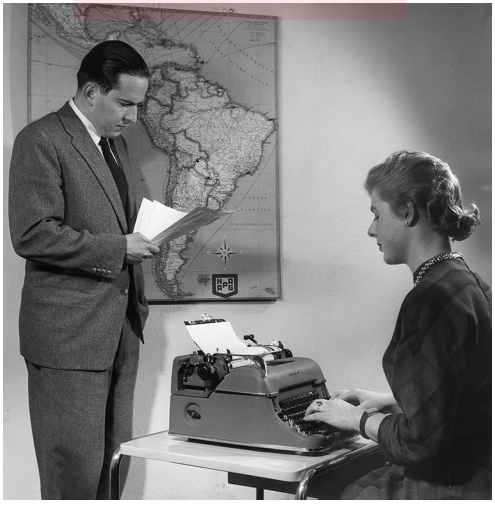
Information is a valuable business asset that can help an organization achieve its goals by supporting business activity; examples include data sets and technical manuals. Information, though, is not evidence of an activity and is not a record unless it possesses these additional characteristics:

- *Authenticity:* An authentic record can be proven to be what it purports to be, created or sent by the person purported to have created or sent it, and created or sent at the time purported.
- *Reliability:* A reliable record can be trusted as a full and accurate representation of the transactions, activities, or facts to which it attests.
- *Integrity:* A complete and unaltered record is said to possess integrity.
- *Usability:* A usable record can be located, retrieved, presented, and interpreted.

Records provide evidence of work activity and help the organization conduct its business in an efficient and accountable manner.

At one time, organizations had limited tools with which to create records, and only a few people within the organization had the authority to create records. In the mid-1950s, for example, an executive would dictate a letter to a private secretary who would type information onto paper for his signature as shown in Figure 3.2.

Figure 3.2. A secretary takes dictation on a typewriter, 1954.



Source: bpk, Berlin/German History in Documents and Images (GHDI), accessed December 12, 2012, http://germanhistorydocs.ghi-dc.org/. Courtesy of Art Resource, NY.

Once signed, the original correspondence would be mailed to the intended recipient and a copy would be filed in a file drawer. Office copiers were not necessary because the secretary used carbon paper to make one or more duplicates on a thin, lightweight, strong paper called *onionskin* at the same time that the original was typed. Access to the organization's official copy was limited. Therefore, privacy and security measures were less complicated than they are today.

Advances in information technology changed the methods used to create and capture records by making the job of the secretary easier through the introduction of electronic typewriters and word processers and, eventually, by virtually eliminating the position of secretary in most organizations.

Today, thanks to the introduction of computer technology, networking, and the World Wide Web, records creation and capture is the work of all staff. Therefore, recordkeeping must be considered integral to the activities that promote the core mission of the business unit or organization and not as an add-on. The extent of the tasks that must be performed by staff is, of course, impacted by the degree of automation that can be applied.

Because there is value in information that does not fit the definition of a record, many wonder why we make the distinction. The National Archives of Australia explains why records matter:

> Records are an essential tool of good business and for efficient administration. They provide:
>
> - information for planning and decision-making
> - evidence of government accountability
>
> and are often subject to specific legal requirements.
>
> For government agencies, records document what is done and why. They provide evidence of communications, decisions and actions.[8]

Knowing what records to create involves:

- using work process analysis to identify the records needed to document business or work processes;
- understanding the legal and regulatory requirements that impact the organization, including internal policies, procedures, and directives; and
- assessing the risks of failing to create records.

Records creation and capture can be integrated into business rules for workflow and transaction systems. Records can also be created as a deliberate action after the event, such as documenting the minutes of a meeting from recordings made during the meeting.

Capturing Records

In records management terms, *capturing a record* means ensuring that the record—for example, a receipt, contract, or directive—becomes fixed so that it cannot be altered or deleted. This is different from the use of the term *capture* to denote the process of collecting information and delivering it into business applications and databases for further action. Dynamic records—such as those created as the result of a comment on a blog, a post to a social networking site, or an entry on a wiki site—pose unique challenges because the information may be both captured for further action and may be deemed a record that must be preserved in an unalterable state.

Records are captured by a records system to:

- establish a relationship between the record, the creator, and the business context that originated it;
- place the record and its relationship within a records system; and
- link it to other records.

These goals can be accomplished through the use of explicit metadata embedded in, attached to, or associated with the specific record, regardless of its format.[9]

Records Capture Methods

Records capture can occur manually after creation if using a paper-based filing system, such as by printing and filing an e-mail message. Records can be captured automatically, and at the time of creation, if using an electronic system. For example, automatic transfer to an e-mail archive server (repository) can be carried out based on keywords or metadata such as sender, recipient, date, and terms found in the subject line or text of the message. Records on third-party systems used for outreach, such as a blog, may be captured upon creation if the content is static in nature or after creation if the content is dynamic. Table 3.1 lists some of the ways that an organization can capture content.

Social media tools present unique challenges to the organization. Under pressure by consumers and enterprises alike, sites such as Facebook are beginning to provide tools to allow the user to download information. Competition also spurs social networking providers to innovate. In an attempt to distinguish itself from other social networking sites, Google+ offers a number of ways to export data, including a feature called Google Takeout. Google Takeout, also available as a stand-alone service, allows the user to export contacts, Google Buzz messages, Picasa Web photos, and profile data with one click.

By the time you read this text, the technology landscape will have changed. Scan the horizon not only for new technologies but also for vendors who provide software solutions that make it easier to capture records created through those technologies. Software

Table 3.1. Records can be captured either manually or automatically by the employee, the organization, or a third-party provider.

Paper-based filing system	Electronic system	Third-party system
Printing an electronic document (e.g., an e-mail) to place in a file folder housed in a file cabinet	Registering an electronic document in an electronic records management system (manual)	Contracting with a cloud-based service provider (e.g., Arkovi) to harvest (or accept transfer of) and store electronic content for the organization
Making a photocopy of an original document sent by your organization and placing it in a file folder	Entering data into an electronic system, which then saves the data automatically	Using a web crawler (e.g., Internet Archives' Heritrix) to collect digital objects over the Internet
Receiving a physical copy of a signed contract and placing it in a fireproof vault	Scanning and digitizing an old photo to store in an electronic records management system	Using tools provided by third-party sites to download your data (e.g., download all data stored within Google products with the use of Google Takeout)

Figure 3.3. Handheld device used to access and update patient records when away from the practice.

Source: Inchware, "Pocket Synergy for BlackBerry," accessed December 12, 2012, http://www.inchware.co.uk/products/synergy/blackberry.html. Courtesy of Inchware.

applications for mobile devices are available, and data created using those devices must be captured as well. Inchware markets and supports a suite of medical applications designed for use by healthcare professionals using small handheld computers such as PDAs and cell phones. Pocket Synergy for the BlackBerry allows primary care professionals access to full patient clinical records when providing care outside of the practice (see Figure 3.3). The data can be synchronized using a USB connection upon return to the office, and wireless synchronization allows data to be updated to the full Pocket Synergy system while away from the office.

Because information creation and capture is the work of all staff to some extent, the organization must provide its employees with these tools:

- Policies, procedures, and guidelines
- Effective information technology systems
- Records management compliance program
- Staff training

Controlled Language and Records Classifiation

Once records are created and captured, they must be managed in a way that allows the right record to be located at the right time and in a usable form. Nonrecords can also have evidentiary or informational value for the organization, so decisions must be made related to the management of all information of value. Traditionally, controlled language was developed to identify terms used for titling or indexing records. Those terms were incorporated into a thesaurus used to classify records (group them together under a specific label) or to select indexing terms for the record. These terms were broad subject areas and not closely related to business functions. More recently, classification has gone beyond developing an alphabetical listing of terms that could be used for indexing and grouping to developing a classification scheme based on an analysis of the functions and activities of an organization.[10]

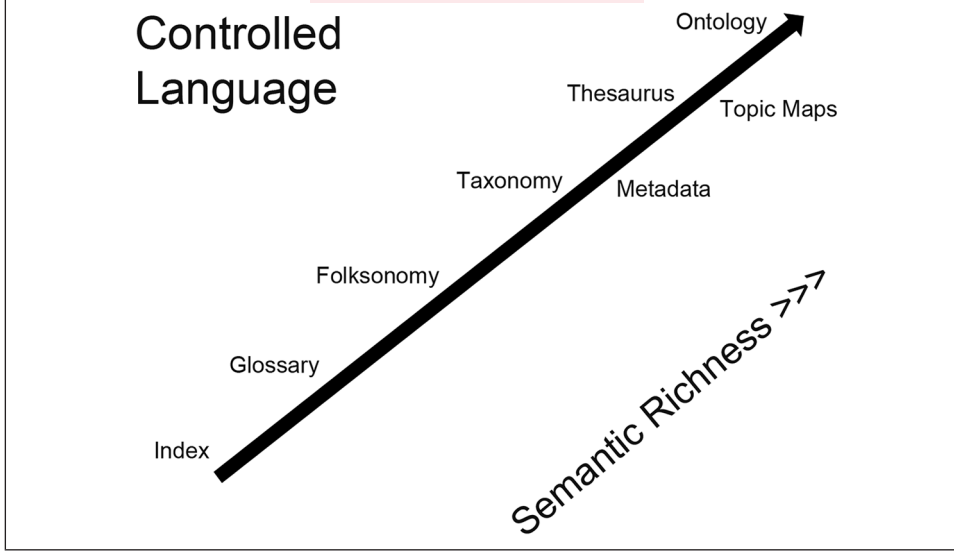
Controlled Language

Controlled language, also called *controlled vocabulary*, is a way to organize information in "an agreed-upon use of language in a predetermined or predictable way for description of organizational information resources, regardless of the format of the resource (media neutral)."[11] A number of controlled language (vocabulary) tools are available, including an

index, a glossary, a folksonomy, a taxonomy, a thesaurus, or an ontology. When placed on a semantic richness continuum, they appear as shown in Figure 3.4.

- An *index* is an ordered list of controlled language terms that points to the location of information related to each term.[12]
- A *glossary*, also known as a *vocabulary*, is an alphabetical list of terms in a particular domain of knowledge with the definitions for those terms.[13]
- A *folksonomy*, a contraction of the words *folk* (person) and *taxonomy*, is an [unstructured] system of classification that makes use of terms that occur naturally in the language of users of the system.[14]
- A *taxonomy* is a subject-based classification scheme used to arrange terms in a controlled vocabulary into a hierarchical structure showing parent-child relationships. In a simple taxonomy, each item being classified fits into just one place in the taxonomy, with a single parent and any number of children.[15]
- A *thesaurus* is a classification structure that establishes relationships between terms, generally using a hierarchical display format with standardized relationship indicators.[16] The following are examples of properties describing subjects:
  - BT (broader term) refers to a term above a given term in a hierarchy that is wider in scope or less specific in meaning (e.g., BT = *reading materials*).
  - NT (narrower term) refers to a term below a given term in a hierarchy that is narrower in scope or more specific in meaning (e.g., NT = *volume*).
  - USE (preferred term) refers to another, synonymous term that should be used instead of the given term (e.g., USE = *book*).
  - RT (related term) refers to a related term to the given term that is neither a synonym nor a broader term (e.g., RT = *leisure reading*).

Figure 3.4. Semantic richness of controlled language facilitates search and retrieval.



- An *ontology* is a working model of entities and interactions in some particular domain of knowledge or practice, such as transportation. In 1993, Stanford University artificial intelligence specialist Tom Gruber described ontology as "the specification of conceptualizations used to help programs and humans share knowledge."[17] This is accomplished through the use of a set of concepts—classes (or sets), attributes (or properties), and relationships (or relations among class members)—specified in some way in order to create an agreed-upon vocabulary for exchanging information.

Two terms in Figure 3.4 (p. 63) represent related but dissimilar concepts:

- *Metadata* is information about an asset beyond the file name. It is an attribute or element that helps define an "object" (i.e., document, database, image, or presentation). It can be used as a finding aid, but it is not a system of classification. Tools like thesauri provide statements about "subjects" used in classification. Subject-based classification uses subjects in metadata.
- *Topic maps* combine classification and metadata. They are organized around topics (subjects). But, since a *subject* can be anything, we can use *objects* described by metadata as a special kind of subject. This allows us to create a subject for those objects, such as *document*. We can express the metadata describing the new subject (document-object) using names (e.g., authors), occurrences (e.g., events/activities), and associations (e.g., employee).

Let's turn our attention now to the ways in which classification systems are used in the business environment.

Classification and Filing Systems

Classification is defined as the systematic arrangement in groups or categories according to established criteria; specifically: taxonomy.[18] Classification systems can be used to impose some kind of order on the chaos that results from the growth of information by grouping *like* objects together. Remember the clay tokens discussed in Chapter 1 used in Mesopotamia in 4000 BCE? Some of the engraved symbols represented not only the quantity but also the *type* of animal. The symbols representing different types of animals comprised a form of classification scheme.

There are many different classification schemes, but we'll cover just a few in this chapter. In the first half of the twentieth century, manual filing systems tamed the chaos that arose from the growth of records attributed to the typewriter. Paper files were most often organized according to one of these filing methods: alphabetic, numeric, geographic, subject, and chronological. Many organizations must still deal with their legacy paper documents, and others continue to print and file today. For example, NARA's *2010 Records Management Self-Assessment Report* revealed that some US federal agencies were still printing and filing e-mail records.[19] The "print and file" approach, while not preferable, exists and must be addressed.

In the 1960s, the emergence of mainframe computers brought about the desire to computerize filing systems. At the same time, text indexing systems and sophisticated search algorithms came into use to classify and locate data. Don't allow the focus on digital information to lead you to dismiss simple classification schemes completely. The alphabetic

scheme used to organize and classify paper records can be used to control digital records as well.

Alphabetic, Subject, and Numeric Filing

Although digital records may be created by employees using devices such as computers, smartphones, and iPads, at least some of those businesses have paper files. A recent visit to the dentist's office underscored this fact. A patient scheduling system allowed for computerized scheduling of appointments, but copies of dental charts, insurance forms, and even X-rays were placed into a paper file folder on open shelving.

Alphabetic Filing System

A system in which files and documents are arranged in alphabetic order from A to Z is known as an *alphabetic filing system*.[20] It's an easy and effective organizational system that has one primary goal—fast retrieval of important documents. Records stored as hard copies are often filed alphabetically (see Figure 3.5). Computer files can also be organized alphabetically into folders labeled with the letters of the alphabet.

Figure 3.5. Alphabetic filing guides reduce filing and location time by subdividing a file drawer.

Source: Courtesy of the Smead Manufacturing Company, http://www.smead.com/.

Setting up an alphabetic filing system using system folders is one option for organizing client files. We often see this system in small law offices, where a simple folder structure based on client names stored alphabetically is created on a shared drive. The client folders may be subdivided into folders based on the subject of the contents, such as correspondence, deposition, and evidence. Access to the shared folders is provided on an as-needed basis for attorneys, paralegals, and other support staff. Without the benefit of document management, enterprise content management, and/or records management software, this may be the best option.

Subject Filing System

A *subject file system* is one in which each document relates to a specific subject matter and is arranged in alphabetical order by subject.[21] In a document-based system, subject filing requires someone to analyze each document to determine the subject. Cross-referencing is required if more than one subject is contained within the same document.

Many small, local governments use a subject filing system arranged alphabetically. The categories are arranged according to the types of activities taking place, and each category usually contains several subcategories. The state of Alaska released a sample filing system for small communities based on the subject filing system. The categories and subcategories recommended are shown in Table 3.2 (p. 66).

Table 3.2. Sample subject filing classification scheme for small governments.

Category	Subcategories	Description
Financial	Accounts Receivable Accounts Payable Budgets Audits Financial Reports Payroll Records Current Grant Files	Financial records document fiscal transactions needed for financial management, budgeting, and audit purposes.
Legal	Land Records Contracts Agreement Employee Files	Legal records document contractual obligations of the organization, land titles, and attorney advice.
Managerial	Agency Correspondence Current Project Files	Managerial records include policies and procedures, management reports, and records that provide direction on how operations are handled.
Operational	Buildings Equipment	Operational records provide information on the day-to-day operations of the organization.
Historical	Council Meeting Minutes Photos	Historical records include incorporation documents, minutes, and records that document what has gone on in the past.

Source: Alaska Department of Commerce, Community, and Economic Development, *Sample Filing System for Small Communities*, accessed December 13, 2012, http://www.dced.state.ak.us/dca/logon/admin/pub/SampleFilingSystem.pdf.

Numeric Filing System

A *numeric filing system* is any classification system designed to arrange records based on numbers that are assigned or taken directly from a record, such as a purchase order. Decimal numeric filing arrangements are the most commonly used numeric filing method, and the best-known system of this type is the Dewey Decimal System developed for libraries in the late 1800s. It has ten classes divided into ten subclasses, which are further divided into ten subdivisions. A code known as a *numeric call number* is assigned to each book or other resource based on where the content falls within the taxonomy.

Example of a Numeric Filing System

The Dewey Decimal System has ten main classes:

000 Computer Science, Information and General Works
100 Philosophy and Psychology
200 Religion
300 Social Sciences
400 Language
500 Science
600 Technology and Applied Science
700 Arts and Recreation
800 Literature
900 History and Geography

Source: OCLC, "Dewey Decimal Classification Summaries," accessed January 18, 2013, http://www.oclc.org/dewey/resources/summaries/#ten.

At the turn of the twentieth century, the Library of Congress developed its own classification system to categorize books and other items. This system has twenty-one subject categories, and resources are identified by a combination of letters and numbers (see sidebar on p. 67).

Some librarians unhappy with the weaknesses of both systems have begun to use a simplified subject-based taxonomy similar to the classification system found in bookstores.[22]

Chronological and Geographic Filing Systems

A *chronological filing system* is set up by date and used to organize business records such as invoices, purchase orders, and bills of lading. If using a file folder, the newest records go in the front. If using a computer, a field to hold the date of the transaction is included in order to allow the software to find the date in question and retrieve the appropriate document. If more than one document has the same date, a search is conducted on a secondary field as well. This system is most useful for small files and records with a short life span so that older files can be purged to make room for more recent records.

A *geographic filing system* classifies records according to geographic location. The Standard Geographical Classification (SGC) is Statistics Canada's official classification system for geographic areas in Canada.[23] It provides unique numeric codes for three types of geographic areas: provinces and territories, census divisions (counties, regional municipalities), and census subdivisions (municipalities). The three geographic areas are related hierarchically, so a seven-digit code can be used to show the relationships.

Library of Congress Classification Outline

The Library of Congress Classification Scheme includes twenty-one categories:

A	General Works
B	Philosophy, Psychology, Religion Auxiliary Sciences of History
D	World History and History of Europe, Asia, Africa, Australia, New Zealand, etc.
E	History of the Americas
F	History of the Americas
G	Geography, Anthropology, Recreation
H	Social Sciences
J	Political Science
K	Law
L	Education
M	Music and Books on Music
N	Fine Arts
P	Language and Literature
Q	Science
R	Medicine
S	Agriculture
T	Technology
U	Military Science
V	Naval Science
Z	Bibliography, Library Science, Information Resources (General)

Source: Library of Congress, "Library of Congress Classification Outline," accessed December 13, 2012, http://www.loc.gov/catdir/cpso/lcco/.

Another classification scheme in use by Statistics Canada is the Classification of the Economic Territory of Canada 2011, which was approved as a departmental standard on February 21, 2011.[24] The classification scheme was designed to ensure a consistent and coherent picture of the Canadian economy. The classification includes a list of the economic provinces and territories of Canada and a class designating the Canadian territorial enclaves abroad.

Classification of the Economic Territory of Canada

This classification scheme refers to economic territories rather than geographic areas:

10	Newfoundland and Labrador	35	Ontario	60	Yukon
11	Prince Edward Island	46	Manitoba	61	Northwest Territories
12	Nova Scotia	47	Saskatchewan	62	Nunavut
13	New Brunswick	48	Alberta	81	Canadian territorial enclaves abroad
24	Quebec	59	British Columbia		

Source: Statistics Canada, "Classification of the Economic Territory of Canada 2011," last modified June 8, 2011, http://www.statcan.gc.ca/subjects-sujets/standard-norme/sgc-cgt/et-te/et-te-eng.htm.

Business Classification Schemes

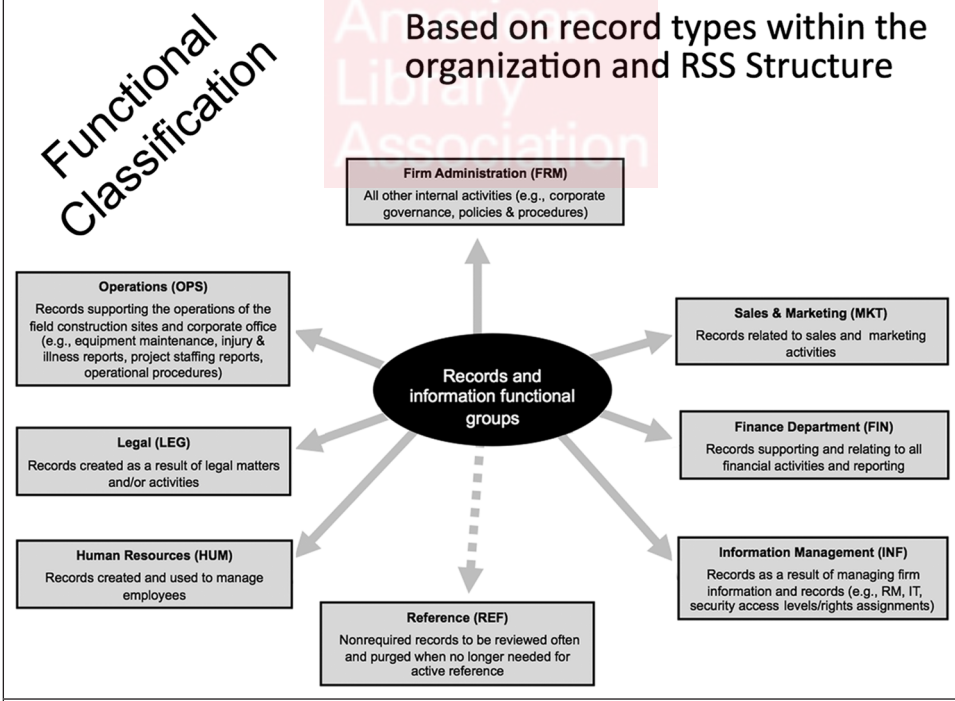
ISO 15489-1:2001 defines *classification* as the "systematic identification and arrangement of business activities and/or records into categories according to logically structured conventions, methods, and procedural rules represented in a classification system."[25] *Business classification* is the process that helps an organization describe, organize, and control information. Business classification systems are built upon an analysis of the organization's business activities. The business classification scheme is used to link records to their business context and is necessary to capture full and accurate records.

Functional Classification Scheme

Since the release of *ISO 15489-1:2001*, classification based on organizational functions and activities has been the preferred method to control information and records. Classification by function is based on the context of a record's creation and use rather than content alone. Classification by function means classification according to *why* the record exists and not what it is about (subject). Functions consist of activities, which consist of transactions.

The main functional high-level categories used in the example in Figure 3.6 along with the unique three-letter identifier for each are:

Figure 3.6. Major headings of functional classification scheme derived from records and information functional groups.



Source: Unpublished report. Courtesy of MARA graduate C. J. Rodriguez.

- Firm Administration (FRM)
- Sales and Marketing (MKT)
- Finance Department (FIN)
- Information Management (INF)
- Reference (REF)
- Human Resources (HUM)
- Legal (LEG)
- Operations (OPS)

A functions-based classification system offers several benefits because it:

- provides an understanding of the relationship between the business and its records;
- identifies records that should be created for their evidential value;
- identifies high-priority records that should be captured because of their business value;
- facilitates retention decisions; and
- allows retention requirements to be determined at the point of creation.[26]

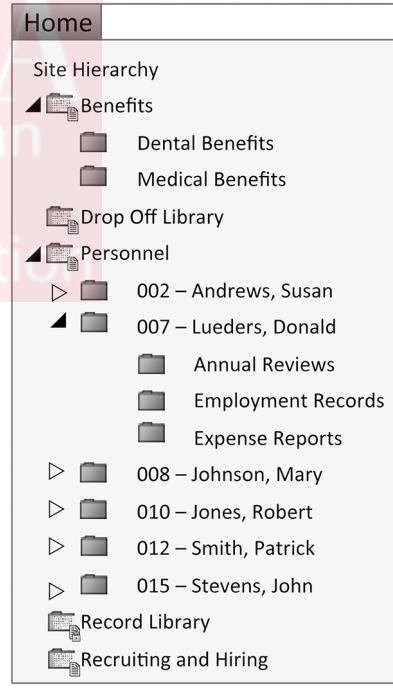
Records Classification Scheme

Records classification is the process followed to categorize or group records into retrieval units. A records classification scheme is also referred to as a *file plan*. The records classification scheme (file plan) is a tool used to classify records and other business information based on the business activities that generate records. It is derived directly from the organization's business classification scheme.

The records classification scheme is often represented as a directory or folder structure, especially in electronic records management systems, as shown in Figure 3.7, and it can provide two, three, or sometimes four levels. The hierarchical structure orders or ranks *function* > *activity* > *topic* > *subtopic*. When implemented within a business information system, it controls the vocabulary used, ensures consistency of information description, and facilitates the capture, titling, retrieval, maintenance, and disposal of records and other information.

As with any hierarchical scheme, navigational paths (such as links) exist between related terms, but those paths are limited to the relationships within the structure and the terms used for classification. A second classification tool, a *functional thesaurus*, can be built from the same business classification scheme, but the terms would be listed in alphabetical order.

Figure 3.7. Hierarchical representation of a file plan for a human resources function.



Source: Don Lueders, "Introducing the SharePoint 2010 Records Center," *SharePointRecordsManagement.com* (blog), May 2, 2010, http://sharpoint recordsmanagement.com/2010/05/02/introducing-the-sharepoint-2010-records-center/. Courtesy of SharePointRecordsManagement.com.

Indexing, Content Analysis, and File Plan Development

The primary method used to create an index for records and information management has evolved from humans analyzing and indexing individual documents to computers scanning large volumes of documents against controlled terms and indexing them automatically. An analysis of the content of records can provide the controlled terms used in indexing. Simply put, *content analysis* is a term that can be applied to all examinations of message content. The primary focus of content analysis, however, has expanded from conceptual analysis of the content of a record to an analysis of the relationships between concepts. File plan development also relies on content analysis to describe and categorize the content in the enterprise that is or may become a record.

Indexing

Classification systems work because they follow predefined rules to ensure consistency. ARMA International's alphabetic filing rules establish an index order of units for personal names that are indexed by surname and then first name followed by initial or middle name as shown in Table 3.3.

Table 3.3. Example of indexing order within an alphabetic filing system.

Personal (file) name	First unit	Second unit	Third unit
Jane A. Doe	Doe	Jane	A.
Jane Alexandra Doe	Doe	Jane	Alexandra

Numeric filing uses numbers directly from a record, such as a purchase order number, or relies on the use of assigned numbers. In a straight-numeric filing system, purchase order numbers would be the primary unit of indexing, and the purchase orders would be arranged consecutively in ascending order.

In the functional classification system illustrated in Figure 3.6 (p. 68), the Sales and Marketing function was represented by the letters MKT and the Legal function as LEG. The organization could as easily have determined that each function should be represented numerically instead, for example, Sales and Marketing as 10 and Legal as 20. If so, the numbers 10 and 20 would be the primary numbers; subdivisions would then be identified by appending a second number, and so on. This is known as a duplex-numeric system because two or more sets of codes are used.

The chronological filing system is a type of numeric arrangement, but dates are used as indexing units. The most common order is year, month, day as in 2013-05-03 to denote May 3, 2013. The document with the most current date is placed at the front of a physical file folder.[27]

An Introduction to Content Analysis

Content analysis is defined as a research tool used to determine the presence of certain words or concepts within texts and sets of texts.[28] It is also defined as a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use.[29] When dealing with electronically stored information, content analysis

describes and categorizes content in the enterprise that may become records, provides source locations, and describes how the content will move to the records management application.[30]

As early as the 1930s, content analysis was used in military intelligence to analyze communist propaganda and military speeches for themes by searching for the number of occurrences of particular words and phrases.[31] Today content analysis is used in a number of fields including marketing and media studies, sociology and political science, and literature and rhetoric. It can include visual documents as well as text, and the focus is on phrases and categories rather than simple words. Two categories of content analysis are *conceptual analysis* and *relational analysis*.

The examination of text for the existence of certain words is an example of conceptual analysis. *Text content analysis tools*, for example, can provide statistics about the text (written content)—such as word count, number of sentences, and reading ease—to help you improve your writing. This type of tool is built into most word processing programs but also exists as stand-alone software or services.

Some content analysis tools not only report the existence of certain words and phrases but also perform tasks such as extracting metadata and hyperlinks, classifying documents, and detecting language and encoding. This type of tool is particularly suited to information retrieval and extraction projects and is an important part of text-mining tools.

Relational content analysis has been termed *semantic analysis*.[32] It goes beyond determining the presence of concepts to looking for meaningful (semantic) relationships between those concepts. In Chapter 1, you were introduced to the promise of the semantic web that allows data to be shared and reused across application, enterprise, and community boundaries. The semantic web employs semantic ontologies (controlled vocabularies) to accomplish this task.

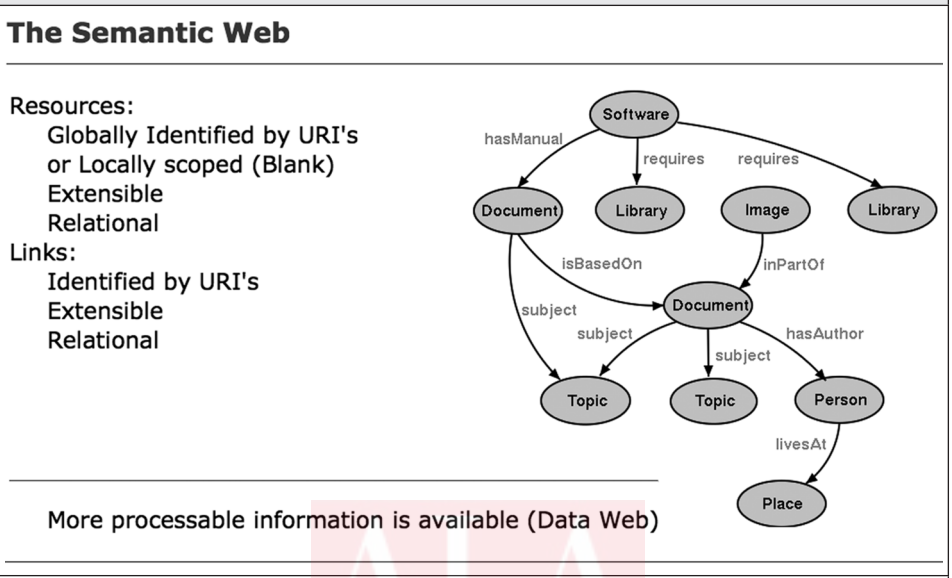
When we enter data into a database, the application controls the data. In order to retrieve the data, we look for the file in question and then open it in the appropriate application. By contrast, the semantic web allows a person—or a machine—to start out in one database and then move through other databases about the same topic seamlessly and effortlessly (see Figure 3.8, p. 72).

Paypal's Praveen Alavilli described the semantic world on the web as "[o]ne giant labeled, directed multi-graph of people, things, and relationships."[33] The term *labeled* refers to the use of vocabularies and data formats that enable semantics on the web. Two examples of semantic ontologies (controlled vocabularies) are *FOAF* (Friend of a Friend), which is used to represent basic person information such as contact details and basic relationships, and *SIOC* (Semantically-Interlinked Online Communities), which is used to describe the main concepts and properties for online communities. The description of concepts across applications has serious implications for the type of metadata associated with files and the way in which records and information managers—and all users—will engage in search and retrieval tasks in the future.

Content Analysis and File Plan Development

The terms *content analysis* and *file plan* are most often used to refer to elements of an electronic records management system. The file plan lists the records in the organization and describes how they are organized and maintained. There is more to file plan development

Figure 3.8. The semantic web.



Source: Eric Miller, "Weaving Meaning: An Overview of the Semantic Web," World Wide Web Consortium, November 20, 2004, http://www.w3.org/2004/Talks/1120-semweb-em/slide17-0.html. Copyright © 2004 World Wide Web Consortium (Massachusetts Institute of Technology, European Research Consortium for Informatics and Mathematics, Keio University). All Rights Reserved. http://www.w3.org/Consortium/Legal/2002/copyright-documents-20021231.

than one might think when looking at an image that represents a records classification hierarchy (file plan) as shown in Figure 3.7 (p. 69). The file plan also describes, for each type of record in the enterprise, where the records should be retained, the policies that apply to them, how they need to be retained, how they should be disposed of, and who is responsible for managing them. Procedures for amendments and additions must be documented, and responsibility for the control of the file plan (e.g., evaluating and updating) must be assigned. It is wise to identify all regulatory, operational, and societal recordkeeping requirements before completing the records classification scheme.

Records Management Metadata

Metadata, as described in the basic records management standard *ISO 15489-1:2001*, is "data describing context, content, and structure of records and their management through time."[34] Records management has always managed metadata. When dealing with paper records, metadata such as *author*, *subject*, and *title* of records were implicit in the record and were used to index records for filing. In the digital world, metadata needs to be explicitly documented in order to describe the content, context, and structure of records and their management through time and within and across domains (e.g., activities, workgroups).

Metadata is used to define a record at the point of capture so that it is fixed into the business context and management control is established over it. Metadata at this point

includes information about the context of records creation, the business context, and the agents involved, as well as metadata about the content, appearance, structure, and technical attributes of the records themselves.[35] Metadata will continue to be applied throughout the records lifecycle. It ensures the authenticity, reliability, usability, and integrity of the record and can be used as evidence of transactions and activities (see sidebar, Court Opinions Related to Metadata Are in Flux).

Information captured as records must be linked with metadata that characterizes the records' specific business context when the records commit an organization to action, render an organization or individual accountable, or document an action, a decision, or a decision-making process.[36] Court opinions continue to evolve regarding the evidential value of metadata and should be monitored. The attention paid to this topic indicates that the organization will be at risk if it does not capture and manage metadata along with the record.

Court Opinions Related to Metadata Are in Flux . . . but It Is Wise to Be Prepared

In 2009, in *The Lake v. City of Phoenix*, the Arizona Supreme Court ruled that metadata associated with public records are indeed a part of the public record itself.[a]

In February 2011, a federal district court in New York expressed an opinion in *National Laborer Organizing Network v. Immigration and Customs Enforcement Agency* that "metadata maintained by the agency as part of an electronic record is presumptively producible under FOIA, unless the agency demonstrates that such metadata is not 'readily producible.'"[b] However, in June 2011, the court reversed itself stating that the earlier decision would not have precedential value in any other lawsuit.[c]

"In *Commercial Law Corp., P.C. v. FDIC*, No. 10-13275, 2012 U.S. Dist. LEXIS 51437 (E.D. Mich. Apr. 12, 2012), Michigan District Judge Sean F. Cox ruled that a party can be compelled to produce a mirror image of its computer drives using a neutral third-party expert where metadata is relevant and the circumstances dictate it, even though the requesting party initially failed to request that metadata and specify the format of documents in its first discovery request."[d]

[a] K&L Gates, "Supreme Court of Arizona Holds Metadata Is Subject to Public Records Requests," Electronic Discovery Law, October 30, 2009, http://www.ediscoverylaw.com/2009/10/articles/case-summaries/supreme-court-of-arizona-holds-metadata-is-subject-to-public-records-requests/.

[b] Daniel Lim and John Blumenschein, "Metadata and Load Files Required for Government FOIA Responses," Guidance Software: Newsroom, February 11, 2011, http://www.guidancesoftware.com/Media/NewsRoom/NewsRoomBlog.aspx?B=BlogContentDetails&BlogS=NewsRoomMenu&newsroommenu_id=3503&image_id=1000000303&md_id=1000000296&id=1000002799&blogid=2523.

[c] Christine Beckett, "District Court Withdraws Metadata Opinion After Settlement," *Reporters Committee for Freedom of the Press*, June 23, 2011, http://www.rcfp.org/browse-media-law-resources/news/district-court-withdraws-metadata-opinion-after-settlement.

[d] Doug Austin, "eDiscovery Case Law: Plaintiff Compelled to Produce Mirror Image of Drives Despite Defendant's Initial Failure to Request Metadata, eDiscovery aily Blog, June 15, 2012, http://www.ediscoverydaily.com/2012/06/ediscovery-case-law-plaintiff-compelled-to-produce-mirror-image-of-drives-despite-defendants-initial.html.

Records Management Metadata Standards

The importance of creating, capturing, and managing metadata at every stage of a record's lifecycle is evident. But, what metadata? Records management standards and technical reports were introduced in a sidebar in Chapter 2 (see p. 41). Let's see how those standards apply to managing metadata for records.

These are three specific international standards related to managing metadata for records within the framework of *ISO 15489*:

- *ISO 23081—Part 1: Principles*
- *ISO 23081—Part 2: Conceptual and Implementation Issues*
- *ISO 23081—Part 3: Self-Assessment Method*

ISO 23081—Part 1: Principles

ISO 23081—Part 1 is the international standard that sets the framework for creating, managing, and using records management metadata and explains the principles that govern them. It addresses the relevance of records management metadata in business processes and the different roles and types of metadata that support business and records management processes. As is the nature of standards, this document tells the reader *what to do* but not *how to do it*. This standard makes clear that records management metadata consist of the following:

1. Metadata that document the business context in which records are created or captured, as well as the content, structure and appearance of those records;
2. Metadata that document records management and business processes in which records are subsequently used including any changes to the content, structure and appearance.[37]

ISO 23081—Part 2: Conceptual and Implementation Issues

ISO 23081—Part 2 is a technical specification that supports the standard (*Part 1*). It does not prescribe a specific set of metadata elements, but it does identify generic types of metadata that fulfill the requirements for managing records. No metadata schema is presented; organizations are expected to select specific metadata to meet their business requirements for managing their own records.

The phrase *metadata for managing records* as "structured or semi-structured information, that enables the creation, registration, classification, access, preservation and disposition of records through time and within and across domains" is defined in this document.[38] Metadata for managing records describes the attributes of records to enable their management and use or reuse. But the metadata also document the relationships between records and the agents that make and use them and the events or circumstances in which the records are made and used (relationships such as those illustrated in Figure 3.8, p. 72).

A metadata model for managing records groups metadata elements into six categories, as shown in Figure 3.9. Metadata elements are recommended for each of these six categories. For example, the following elements are recommended description metadata:

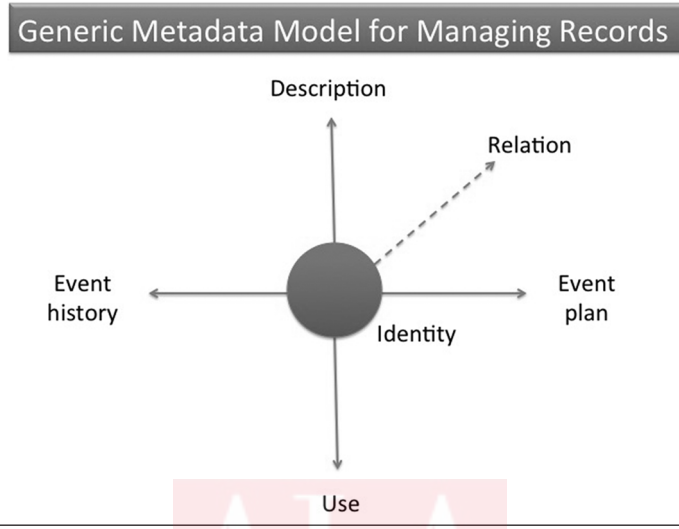
- Title
- Classification
- Abstract
- Place
- Jurisdiction
- External Identifiers

A logical plan showing the relationships between all metadata elements identified, called a *metadata schema*, must be created. The metadata schema incorporates a set of rules to enable the management of metadata; for example, rules related to semantics (e.g., agreement about the meaning of elements, such as author, title) and syntax (rules to convey semantics and structure of the expression of the values).

ISO 23081—Part 3: Self-Assessment Method

ISO 23081—Part 3 provides guidance on conducting a self-assessment on records metadata created in relation to the creation, capture, and control of records. It was designed to identify

Figure 3.9. Metadata Model as described in *ISO 23081-2:2009*.



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an organization's current state of records metadata readiness and the risks associated with the current state and to give direction on how to improve the organization's readiness. The self-assessment method considers two levels: the metadata framework level and the systems level.

The set of metadata framework criteria rates how well an organization has established a framework to meet key recordkeeping metadata criteria. It addresses nine main criteria independent of specific systems, such as metadata strategy, policies and rules, and metadata structures, including schemas and encoding schemes. The set of twenty criteria for systems and system-related projects includes criteria such as the implementation of metadata elements into systems and the management of the metadata process.

Developing a Records Management Metadata Schema

Developing a metadata schema for records management can be time-consuming. Although organizations are expected to define their own metadata elements and schema, a good place to start is by reviewing existing records management metadata standards and guidance. The *Government of Canada Records Management Metadata Standard* (*GC RMMS*) defines a records management metadata element set that outlines the metadata that should be captured in records management systems used by federal government institutions. The document declares and defines the semantics of a core set of metadata elements necessary to ensure the authenticity, reliability, integrity, and usability of records as set forth in *ISO 15489*

and *ISO 23081*. A companion document, the *Government of Canada Records Management Application Profile* (*GC RMAP*), provides business rules for the use of each element and the relationships among elements.

Employees are the intended audience for the documents, in particular, information management professionals (especially records managers), knowledge management professionals, metadata specialists who work in the records management domain, electronic document and records management system (EDRMS) designers and developers, and information technology staff responsible for supporting EDRMS.

The characteristics of the *GC RMMS* can be used as a guide for your own work:

- Metadata model: Determine the names of all of the elements to be used to manage records and list them alphabetically. The *GC RMMS* has identified fifty elements, such as title, creator, and description.
- Adopt existing metadata elements when possible. The *GC RMMS* has adopted seven Dublin Core descriptive metadata elements: *creator, description, identifier, language, subject, title,* and *type*.
- Determine the convention to be used to format the names of the declared elements. The *GC RMMS* uses the following convention: lowerCamelCase. The character strings' remaining element names must remain unchanged; this is essential when translating human readable *GC RMMS* document into a machine-readable format (e.g., XML) and for ensuring interoperability.
- Describe the attributes of each metadata element. For the seven Dublin Core descriptive metadata elements, the attributes are name, URI, and definition. For example, the metadata element *Subject* would be described in this way:

Attribute	Value
Name	Subject
URI	http://purl.org/dc/elements/1.1/subject
Definition	The topic of the content of the resource

- Describe the attributes of each metadata element created for the organization. For example, the metadata element *Disposition Action* would be described in this way:

Attribute	Value
Name	dispositionAction
Definition	The action that will be taken on the records or file on expiry of its retention period
Value Domain	Enumerated strings of text representing disposition actions
Datatype Name	String

Metadata is essential to ensuring that records and information will survive and continue to be accessible into the future. Records professionals should be prepared to work

with information management and vendors to define metadata requirements, develop metadata policies and strategies, and monitor metadata creation.

Summary

The amount of digital data created worldwide annually surpassed 1.8 zettabytes by the end of 2011, and the digital data generated by 2020 is expected to be fifty times that amount.[39] This digital data can be divided into three categories:

- Transient data created within an application session and discarded or reset to its default by the end of the session.
- Transitory records needed for a short time that is used or acted upon and then destroyed.
- Records that result from business activities that must be retained as vital records to ensure business continuity or for administrative, regulatory, fiscal, and historical purposes.

Records creation can occur in numerous ways using a variety of devices, including laptops, iPads, and smartphones. Records capture ensures that the record is fixed (unalterable) as evidence of an activity or event. Metadata is captured with the record and continues to accrue throughout its lifecycle. The method of capture depends on the method of creation (e.g., e-mail received, blog posted on social network, or data entered into database as the result of a business transaction) and initial location of the information (e.g., enterprise system or third party).

Once records are identified and captured, they must be managed. Controlled language and classification systems are used to impose order. Classification schemes range from simple alphabetic and subject filing systems to business classification schemes and records classification schemes (file plans). Before completing the records classification scheme, all recordkeeping requirements, such as applicable regulations, must be identified.

Beyond content analysis, file plan development includes records description, policies, retention and disposition requirements, and responsibility for controlling the file plan. Legal and regulatory compliance and records retention and disposition will be addressed in the next chapter.

The key to managing electronic records is the use of metadata. *Metadata* is "data describing context, content, and structure of records and their management through time."[40]

Records management has always managed metadata. When dealing with paper records, metadata were implicit in the record, but in the digital world, metadata needs to be explicitly documented in order to describe the content, context, and structure of records and their management through time and within and across domains.

Before moving on to Chapter 4, read the paradigm contributed by Tanya Marshall, Deputy State Archivist and Senior Records Analyst for the Vermont State Archives. Marshall describes how the Vermont State Archives applied many of the concepts covered in this chapter to develop VCLAS, a classification system to identify core government functions and appraise related records and information.

PARADIGM

The Vermont Functional Classification System (VCLAS)

Tanya Marshall, Deputy State Archivist/Senior Records Analyst, Vermont State Archives

Introduction

The Vermont Functional Classification System (VCLAS) was developed by the Vermont State Archives and Records Administration (VSARA) as a balanced approach for identifying core government functions and appraising related records and information. VCLAS breaks down the complexities of government into its basic parts: legislation, public agencies, areas of accountability, activities, and transactions. Descriptive information about each part and its relationships and dependencies to other parts is collected, analyzed, and reported using standardized terminology. In addition to appraisal, VCLAS also serves as an objective documentation strategy of government functions, legislation, and agencies over time.

The Vermont State Archives

The need for VCLAS emerged in 2003, after Vermont finally created a state archives and mandated the identification and preservation of state archival records. Although the archives had previously existed by name, its holdings were limited to legislative acts, administrative rules, municipal charters, oaths of office, gubernatorial correspondence, and similar legal records, required to be filed with the Vermont Office of Secretary of State, the parent office of the state archives. Basic archival principles and practices were applied as needed, but since the records were required by law to be filed and preserved, the staff had limited knowledge or experience in appraising records. Further, while knowledgeable in the functions and activities of the office of the governor and the legislative branch, the staff had little or no experience with or understanding of the functions, activities, or records of the judicial and executive branches or local government.

This lack of knowledge and experience was immediately a problem. Under the new law, the archives became a legal custodian of a wide range of records dating from the mid-1700s through 2003. Appraised as archival by the existing state records management program, the archives needed to reassess those appraisal decisions and plan accordingly for future accessions. This meant evaluating hundreds of appraisal forms and decisions dating back several decades to understand the context in which records were created, used, and appraised. At the same time, the archives had a short period of time to provide intellectual and physical control of the newly accessioned records and make them available to researchers.

Why VCLAS?

Initially VCLAS was a simple relational database that applied traditional cataloging rules and allowed the archives to see and manage, for the first time, its collective holdings—the legal records filed with the secretary of state's office and the newly accessioned records. But the standard catalog entries, coupled with existing finding aids, proved futile for meeting the archives' new mandate of identifying records of archival value. The new database facilitated the output of data into standards such as MARC, Dublin Core, and EAD, but there were significant gaps in existing documentation about the records. It was difficult to see patterns,

connections, and interrelationships among the records, government agencies, and subjects or understand how and why appraisal decisions had been made.

VCLAS was, therefore, expanded to include authoritative information about agencies, legislation, functions, activities, and transactions using a faceted classification scheme. Facets are simply parts or angles from which something is examined and defined and each facet in VCLAS contains static information about an entity, such as an agency, that is standardized or normalized to facilitate searching, browsing, and linking. There are also priorities and preferences for terms, definitions, and applications. Agency names, functional areas (also called "domains" or areas of accountability) and legal citations use terms, definitions, and applications established by state and federal laws and regulations. Activities and transactions (i.e., record types) that cross many agencies and functions are defined using legal and similar dictionaries.

With the addition of facets, VCLAS evolved as a tool for capturing research on agencies, legislation, functions, activities, and transactions and making this information readily accessible for later exploration and use. When research reveals a relationship between two facets, such as an agency and a function, the facets can be linked to define an *instance*. Instances may contain additional information specific to the relationship that, like facets, are standardized to facilitate searching and browsing. Instances are how VCLAS accommodates the ever-changing nature of state government and encapsulates relationships that exist or existed. For example, if an agency is connected to a function, an instance is created in VCLAS (agency X *is responsible for* Function Y). If the function is mandated by a law, another instance is created (Function Y *is authorized by* Statute Z). This process is very much like the old song called "Dry Bones or Skeleton Bones," with the toe bone connected to the foot bone, and the foot bone connected to the ankle bone, and so on. At some point, the sum of the parts will emerge and that is what VCLAS does for Vermont state government.

The Vermont State Archives and Records Administration

Using the static and stable information collected in each VCLAS facet and associated relationships, VSARA began to look for patterns to facilitate the process of appraising records and establishing retention requirements. VSARA found not only patterns but also a way to increase the integrity of its research, appraisal decisions, and record schedules. Starting with a small number of agencies seeking to update their recordkeeping requirements and existing data already in VCLAS, VSARA began to see that specific activities generated the same types of records regardless of legislation, agency, domain, or time period. Further, record types, when associated with certain legislation, seemed to yield the same appraisal results and retention requirements. This meant that VCLAS was more than just a tool for capturing and representing research, it could be used for records analysis, appraisal, and scheduling.

Presently, archival and records management resources and reports, such as finding aids, archival catalogs, record inventories, and record schedules, are all generated directly from VCLAS. VCLAS has also been expanded to include facets for people, occupations, and jurisdictions and its semi-flexible structure means that the state of Vermont could apply VCLAS in areas in which little structure exists but is needed. One area where VCLAS is being adopted is enterprise or statewide systems. The state of Vermont has invested in several enterprise systems in the past decade, but there has not been an

enterprise information management or metadata strategy for them. As a result, the benefits of having such systems, which were some of the primary reasons for investment, have not been achieved.

One opportunity for VCLAS when using terms in its facets is that those terms can be used as naming standards. The *public agency facet*, for example, with its standardized list of agency names, can be used whenever such a list is needed. Implementing other facets is not necessary and using just this one facet can significantly improve how information is stored and retrieved. VCLAS's public agency facet has since been integrated into a statewide public records request reporting system. A subset of VCLAS's *legislative facet*, specifically legislation exempting records from public access, has also been applied in this system. The state's Enterprise SharePoint environment is another area in which VCLAS is being applied.

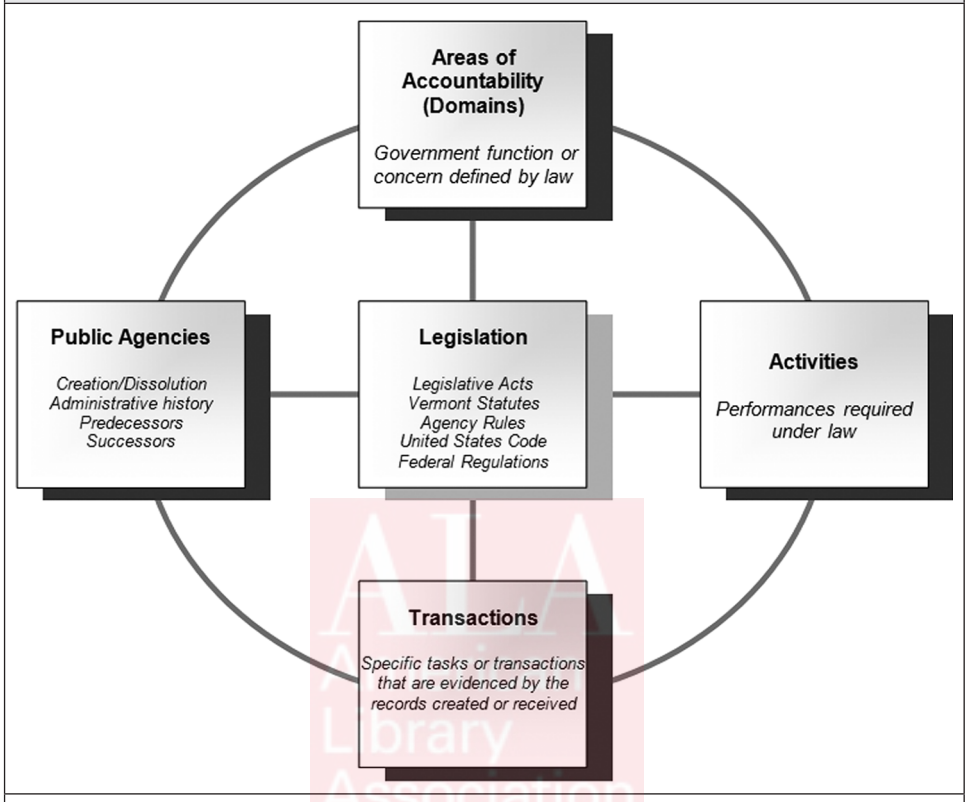
Prior to its deployment across the state, SharePoint was publicized for its ability to store one document but share it across the enterprise through rights management and enterprise search. Most agencies, however, are using SharePoint to replicate their shared drives. Like most shared drives, there is not a lot of thought put into setting up document libraries or SharePoint sites. Therefore, from an archival and records management standpoint, SharePoint has not provided further structure or leveraged recordkeeping abilities. Yet, SharePoint sites using VCLAS have structure and the ability to apply recordkeeping requirements. For example, folders have been replaced by columns that contain VCLAS terms that also appear on the agency's record schedule (views can be used to imitate the folder structure that users are accustomed to seeing).

Also, users are prompted to select VCLAS terms from a list when filing records or if the record is being created from a content-type template in SharePoint, the terms are already embedded, and the document is automatically filed. Testing VCLAS in other areas of SharePoint have temporarily been halted because plans are underway to upgrade to SharePoint 2010, which features managed metadata. The Managed Metadata Service in SharePoint 2010 is the first opportunity for the state to centrally manage and implement an enterprise metadata strategy for its records. With its stable terms and direct correlation to record schedules and information management, VCLAS is slated to fulfill the role as the state's enterprise metadata standard in SharePoint 2010.

VCLAS Today

VCLAS has proven itself to be a simple tool for breaking down, capturing, and linking complex information about government agencies and their functions and records. In keeping with VSARA's emphasis on the records continuum, VCLAS is consistent with the *Resource Description Framework* (*RDF*), *ISO 15489*, *Describing Archives: A Content Standard* (*DACS*), *Model Requirements for the Management of Electronic Records* (*MoReq*), and other archival and records management standards. The research conducted by VSARA's archivists and records analysts, including recordkeeping decisions, is subsequently documented and available for reuse and export in multiple ways. Although VCLAS contains information that supports the physical and intellectual control of content in the Vermont State Archives, it has become a metadata strategy for Vermont government records and information in general (see Figure 3.10). The same structure can be applied to any written and recorded information the state of Vermont produces or acquires in the course of agency business and implemented in any enterprise-wide system.

Figure 3.10. The VCLAS model.



Source: Courtesy of Vermont State Archives.

Notes

1. President's Council of Advisors on Science and Technology, *Report to the President and Congress—Designing a Digital Future: Federally Funded Research and Development in Networking and Information Technology*, December 2010, 51, http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-nitrd-report-2010.pdf.
2. PCMag.com, s.v."transient data," *PCMag.com Encyclopedia*, accessed December 5, 2011, http://www.pcmag.com/encyclopedia_term/0,2542,t=transient+data&i=53093,00.asp.
3. President's Council of Advisors on Science and Technology, *Report to the President and Congress*, 51.
4. International Organization for Standardization (ISO), *ISO 15489-1:2001: Information and Documentation—Records Management—Part 1: General* (Geneva: ISO, 2010), 3.
5. International Council on Archives, Committee on Current Records in an Electronic Environment, *ICA Study 16: Electronic Records: A Workbook for Archivists*, International Council on Archives, 2005, 11, http://www.ica.org/10801/studies-and-case-studies/ica-study-n16-electronic-records-a-workbook-for-archivists.html.

6. Cornell University Law School, "Federal Records Act of 1950," 44 USC § 3301, Legal Information Institute, accessed December 12, 2012, http://www.law.cornell.edu/uscode/html/uscode44/usc_sup_01_44_10_29.html.
7. Information Enterprises Australia Pty Ltd (IEA), *The Australian Record Retention Manual 2010 Edition*, 11th ed. (Fremantle, Australia: Information Enterprises Australia, 2010), 16, http://iea.highway1.com.au/getfile/482.
8. National Archives of Australia, "Why Records Matter," Commonwealth of Australia, accessed December 12, 2012, http://www.naa.gov.au/records-management/.
9. International Organization for Standardization (ISO), *ISO 15489-1:2001*, 12.
10. Catherine Robinson, "Records Control and Disposal Using Functional Analysis," New South Wales Government: State Records, accessed December 12, 2012, http://www.records.nsw.gov.au/recordkeeping/keyword-products/records-control-and-disposal-using-functional.
11. ARMA International, *Controlled Language in Records and Information Management* (Lenexa, KS: ARMA International, 2008), 5.
12. Ibid., 7.
13. *Wikipedia*, s.v. "glossary," last modified December 2, 2012, http://en.wikipedia.org/wiki/Glossary.
14. Dictionary.com, s.v. "folksonomy," accessed December 12, 2012, http://dictionary.reference.com/browse/folksonomy.
15. *Merriam-Webster Online*, s.v. "taxonomy," accessed December 12, 2012, http://www.merriam-webster online.com/dictionary/classification.
16. ARMA International, *Controlled Language in Records and Information Management* (Lenexa, KS: ARMA International, 2008), 9.
17. Thomas R. Gruber, "Toward Principles for the Design of Ontologies Used for Knowledge Sharing" (Technical Report KSL 93-04, Knowledge Systems Laboratory, Stanford University), paper presented at the International Workshop on Formal Oncology, Padova, Italy, March 1993, http://www-ksl.stanford.edu/KSL_Abstracts/KSL-93-04.html. Gruber has since updated this definition: "In the context of computer and information sciences, an ontology defines a set of representational primitives with which to model a domain of knowledge or discourse. The representational primitives are typically classes (or sets), attributes (or properties), and relationships (or relations among class members)" (http://tomgruber.org/writing/ontology-definition-2007.htm). However, the original definition is better suited for our purposes.
18. *Merriam-Webster Online*, s.v. "classification," accessed December 13, 2012, http://www.merriam-webster .com/dictionary/classification.
19. National Archives and Records Administration (NARA), *2010 Records Management Self-Assessment Report*, February 22, 2011, http://www.archives.gov/records-mgmt/pdf/rm-self-assessmemt.pdf.
20. ARMA International, *Glossary of Records and Information Management Terms*, 4th ed. (Overland Park, KS: ARMA International, 2012), 5.
21. Ibid., 115.
22. Education Insider, "Dewey Decimal System vs. Library of Congress: What's the Difference?" Education-Portal.com, December 9, 2010, http://education-portal.com/articles/Dewey_Decimal_System_vs_Library_of_Congress_Whats_the_Difference.html.
23. Statistics Canada, "Standard Geographical Classification (SGC) 2011—Volume I, The Classification," last modified May 16, 2011, http://www.statcan.gc.ca/subjects-sujets/standard-norme/sgc-cgt/2011/index-indexe-eng.htm.
24. Statistics Canada, "Classification of the Economic Territory of Canada 2011," last modified June 8, 2011, http://www.statcan.gc.ca/subjects-sujets/standard-norme/sgc-cgt/et-te/et-te-eng.htm.
25. International Organization for Standardization (ISO), *ISO 15489-1:2001*, 2.
26. Jay Kennedy and Cherryl Schauder, *Records Management: A Guide to Corporate Recordkeeping*, 2nd ed. (Melbourne: Longmans, 1998), 115.

27. Additional examples of indexing methods can be found in ARMA International, *Establishing Alphabetic, Numeric, and Subject Filing Systems* (Lenexa, KS: ARMA International, 2005). Users referring to this guide are presented with specific rules that must be followed to ensure that records can be retrieved quickly and easily when necessary.
28. The term *texts* is used broadly to include books, essays, interviews, discussions, newspaper articles, speeches, conversations, advertising, theater, informal conversations, or any occurrence of communicative language.
29. See Google Books for excerpts from books discussing content analysis: http://books.google.com/books?hl=en&lr=&id=q657o3M3C8cC&oi=fnd&pg=PA3&dq=%22content+analysis%22+%2B+records&ots=bK8kBYGdwW&sig=WttW3p0Gquh1APRUXRdQa5oFJfQ#v=onepage&q=%22content%20analysis%22%20%2B%20records&f=false.
30. Microsoft, "What Is Records Management?" last modified February 26, 2009, http://technet.microsoft.com/en-us/library/cc261982(office.12).aspx.
31. C. W. Roberts, "Content Analysis," in *International Encyclopedia of the Social and Behavioral Sciences*, accessed December 13, 2012, http://dx.doi.org/10.1016/B0-08-043076-7/00707-5.
32. Michael E. Palmquist, Kathleen M. Carley, and Thomas A. Dale, "Applications of Computer-Aided Text Analysis: Analyzing Literary and Nonliterary Texts," in *Text Analysis for the Social Sciences: Methods for Drawing Statistical Inferences from Texts and Transcripts*, ed. Carl W. Roberts (Mahwah, NJ: Lawrence Erlbaum Associates, 1997).
33. Sean Golliher, "SemTech 2011 Coverage: Paypal Discusses Social Commerce and the Semantic Web," Semanticweb.com, June 13, 2011, http://semanticweb.com/semtech-2011-coverage-paypal-discusses-social-commerce-and-the-semantic-web_b20536.
34. International Organization for Standardization (ISO), *ISO 15489-1:2001*, 3.
35. International Organization for Standardization (ISO), *ISO 23081-1:2006: Information and Documentation—Records Management Processes—Metadata for Records—Part 1: Principles* (Geneva: ISO, 2006), 3.
36. International Organization for Standardization (ISO), *ISO 15489-1:2001*, 11.
37. International Organization for Standardization (ISO), *ISO 23081-1:2006*, 3.
38. International Organization for Standardization (ISO), *ISO 23081-2:2009: Information and Documentation—Managing Metadata for Records—Part 2: Conceptual and Implementation Issues* (Geneva: ISO, 2009), 2.
39. President's Council of Advisors on Science and Technology, *Report to the President and Congress*, 51.
40. International Organization for Standardization (ISO), *ISO 15489-1:2001*, 3.

CHAPTER

4

Records Retention Strategies: Inventory, Appraisal, Retention, and Disposition

Introduction

The debate over keeping information forever versus following a records retention and disposition policy is ongoing. Some experts believe that all information has potential value and should be preserved permanently. They point to the decreasing cost of storage and the increasing capacity of storage media. Other experts adhere to the lifecycle model of records management and advocate for destruction of records that no longer have value. They point to the cost of locating and redacting information requested in the course of litigation and the inadequacy of today's automatic indexing systems for information and associated metadata to enable efficient search and retrieval.

> Even if you *can* keep information forever, *should* you?

Organizations are faced with compelling reasons to retain records for use in conducting business and to comply with existing laws and regulations. They must conduct a cost-and-risk assessment to decide if they will retain all information permanently or dispose of it. The purpose of this chapter is not to resolve the debate over the *keep everything forever storage retention strategy* versus the traditional *records retention and disposition strategy*. This chapter will provide records retention strategies useful to those organizations that include disposition as part of their overall information governance approach.

Records Inventory

New businesses are often so consumed with their core mission that records management is an afterthought. By the time those in charge finally understand the necessity of developing a strategic approach to records and information management, records exist in a variety of formats and are stored in a multitude of equipment types and locations, often putting the organization at risk. That makes the task of ensuring that records and information are managed efficiently and effectively much more difficult. A records inventory is the first logical step in establishing a records retention and disposition program where none exists.

Businesses with established records and information management programs must continue to audit compliance and make adjustments to their policies and practices based on internal factors (e.g., reorganization, acquisitions, and mergers) and external events (e.g., changes in laws and regulations). A periodic records inventory is necessary to ensure

records inventory: A detailed listing that includes the types, locations, dates, volumes, equipment, classification systems, and usage data of an organization's records. Note: The inventory is usually prepared to facilitate evaluation, appraisal, and organization of the records for ease of access as well as for backup and disaster recovery planning and procedures.

Source: ARMA International, *Glossary of Records and Information Management Terms*, 4th ed. (Overland Park, KS: ARMA International, 2012), 98.

that the organization understands what types of records exist, in what format, and where they are stored.

ARMA International defines *records inventory* as "a detailed listing that includes the types, locations, dates, volumes, equipment, classification systems, and usage data of an organization's records."[1] This definition can be applied to both physical and electronic records inventories.

Although we are swiftly and surely moving toward a digital world, a records and information management professional must acknowledge and be equipped to manage paper records until they are either digitized and the paper version can be disposed of or until their retention requirements have been met.

Even in offices where paper records need not be retained if the records are available in alternate formats (e.g., microfilm), many offices will maintain a hybrid system for years (see Figure 4.1). Some inactive records have long-term retention requirements and back-scanning can be cost prohibitive. In addition, if paper records of historical value exist, they must be identified and managed in a way that ensures their survival.

Inventory of Physical Records

Records can be stored on different types of physical media, such as paper, CDs, videocassettes, microfilm, magnetic tape, and X-ray film. Architectural models made out of balsa wood may even be considered records that must be managed. The records inventory will

Figure 4.1. Massachusetts Secretary of State is required to retain some paper records 85 years "after" microfilming for permanent retention.

Source: Massachusetts Records Conservation Board, Massachusetts Archives, and Supervisor of Records, *Massachusetts Statewide Records Retention Schedule 01-11,* 2011, 158, http://www.sec.state.ma.us/arc/arcpdf/0111.pdf.

Physical Record Example

A commission resurveying the North Carolina/South Carolina boundary in 1928 found a long leaf pine that had been blazed to mark the boundary in 1735. They felled the tree, replaced it with a stone marker, and gave one half of the blazed section of the tree to each state. The South Carolina State Archives holds many maps and plats serving as legal records of boundaries of various kinds, but this tree section is unique and one of the most unusual records in the holdings of the State Archive

Source: Image courtesy of the South Carolina Department of Archives and History.

be used to develop a retention schedule, provide input into the vital records protection program, and identify potential improvements to the records and information management program for both active and inactive records.

A necessary component of any successful project is support from top management—preferably in the form of a directive from the organization's president or chief operating officer to all employees who will be involved in the records inventory project. Additional champions within the organization should be identified, including managers from finance, legal, information management, and human resources. The project can be accomplished by internal records and information management staff, departmental staff, or an outside consulting firm. There are advantages and disadvantages of each approach. The budget allocated for the project and the time frame within which it must be accomplished will be determining factors.

The internal records and information management staff will have a very good understanding of the records held by the organization and the individuals they need to work with to conduct the inventory. But they may not have the time needed to conduct a physical inventory. The work unit staff would know what records are created and where they are located, but they may be reluctant to point out any weaknesses in their system. An outside consultant would be objective and have the experience necessary to conduct the records inventory, but there may be internal resistance and the cost for an outside consultant would be higher than if internal staff were used.

Preinventory Steps

Once support from top management has been obtained, champions have been identified, and the project manager has been appointed, the following preinventory steps should be taken:

- Clarify the records inventory objectives and strategies.
- Design the inventory form and accompanying directions. Blank forms are available from ARMA International, and many examples are available online, such as the Minnesota State Archives Records Inventory worksheet illustrated in Figure 4.2 (p. 89).
- Staff and train the project team. Provide them with an organizational chart describing the main functions of each office along with the necessary supplies to inventory physical holdings, including blank inventory forms; adhesive labels to identify records and containers and to show they have been inventoried; and equipment including flashlight, gloves, and dust masks for storage areas.

- Communicate to staff and management about the project. Allay the fears of those representing each work unit to be inventoried and explain that this is an *inventory* and not an *audit*.
- Conduct a preliminary survey to identify the location of records, estimate their total volume, flag hazards, and note any problems with space and storage.
- Establish a work schedule that includes dates, locations, and contacts for each unit to be inventoried but provides flexibility. Other activities (e.g., budget deadlines) may take priority within the units and need to be accommodated.

Conducting the Inventory Steps

The following are the recommended steps to take when conducting an inventory:[2]

- Draw a map of the physical layout of each area, numbering each piece of storage equipment and noting the location of each records series. Record all records such as correspondence, photographs, reports, and maps that are evidence of the organization's activities. Disregard all nonrecords such as magazines, catalogues, blank forms, books, and pamphlets.
- Inventory the records as a series, a group of identical or related records that can be evaluated as a unit because they are normally filed, used, and disposed of as a unit. Record the information on an inventory form. Complete a separate form for each location where the records in the same series are filed or stored. The information from all forms related to one series will be consolidated onto a master inventory and used to develop a records retention and disposition schedule.
- Store the inventory data in a database developed in-house (e.g., using Microsoft Access) or in records management software purchased specifically for the task. A system to manage physical assets as well as electronic records provides additional advantages. For example, one solution allows users to manage both the physical document and an electronic copy if both must be retained. A double-click on the electronic copy will bring up the location of the physical record. Once the retention requirements have been met, the system alerts the appropriate party to destroy both copies.

Completing the Records Inventory Form

An inventory form similar to the one illustrated in Figure 4.2 must be completed for each records series. The method described here takes an *archival approach* by starting at the end of the workflow, accepting the fact that records exist that must be managed. Complete the inventory form by performing the following steps:

- Visit or contact each functional area within the organization.
- Locate, identify, and inventory their records.
- Complete one form for each records series title. All records in a series must have the same retention period. If a record exists that does not fit within established series, create a new record series. Note whether original or a duplicate and the medium on which the records are stored.
- If the information is not available from the representative of the functional area, check the applicable data privacy classification laws and business practices for data in the record series.

- The retention requirements are based on legal, fiscal, and administrative requirements. If the retention periods are not known, or need to be verified, identify state and federal laws that prescribe a retention period for the records and check the state and federal audit requirements as well. Note that for this particular form, retention requirements will be stated in terms of length of time in the office, storage area, and records center. The retention period can be expressed in terms of time, for example, retain three years, or in terms of an event or action, for example, retain six months after audit.

Figure 4.2. Minnesota Records Inventory worksheet, page 1.

MINNESOTA RECORDS INVENTORY*

See Instructions on Reverse.

1. Agency	2. Division/Section	3. Location of Records

4. Records Series Title

5. Records Series Description. Include contents (e.g. contracts, reports, applications, correspondence), purpose, and form numbers.

6. ☐ **Original File** ☐ **Duplicate File** — **7. If duplicate, list location of original file.**

8. STORAGE MEDIA (Check all that apply)

☐ Paper
☐ Microfilm (not COM)
☐ Computer Output Microfilm (COM)
☐ Electronic (Tapes, Disks)
☐ Other, including:
☐ Photographs
☐ Computer Cards
☐ X-Rays
☐ Slides
☐ _____

9. DATA PRIVACY CLASSIFICATIONS

	Statute Number or Date of Temporary Classification
☐ Public	
☐ Private	
☐ Confidential	
☐ Nonpublic	
☐ Protected Nonpublic	

10. RETENTION REQUIREMENTS	YEARS	CITATION
A. Federal Law		
B. State Law		
C. Statute of Limitations		
D. Audit Period		
E. Administrative Needs		

11. RECOMMENDED RETENTION PERIODS

A. Agency Office
B. Agency Storage
C. State Records Center (State Agencies Only)
D. Total Retention (A + B + C)

12. A vital record is essential to the continuation or resumption of your operations after a disaster.

Are any documents in this records series considered vital? ☐ Yes ☐ No

If yes, which documents are vital and why?

13. VOLUME **(See Chart)** →

Office	Storage
Cubic Feet	Cubic Feet
Inclusive Dates	Inclusive Dates

VOLUME CHART TO DETERMINE CUBIC FEET

Letter Size Drawer = 1.5
Legal Size Drawer = 2.0
Shelving 4' Letter = 2.3
Shelving 4' Legal = 3.0
Records Center Box = 1.0 (12" X 15" X 10")
3X5 Card 12" Row = 0.1
4X6 Card 12" Row = 0.2
5X8 Card 12" Row = 0.3
Printouts 12" Stack = 1.25
Transfer Case = 2.5 (24" X 16" X 11")

14. Inventory Completed By (Print Name)	Title	Date	Phone

Source: Minnesota Historical Society and Minnesota State Archives, *Preserving and Disposing of Government Records*, May 2008, http://www.mnhs.org/preserve/records/docs_pdfs/PandD_may2008.pdf.

Inventory of Electronic Records

The fact that an organization creates electronic files doesn't mean they retain the files in that format for recordkeeping purposes. The 2009 *US Geological Survey: General Records Disposition Schedule*, for example, provides the following advice when it comes to properly managing e-mail records:

> E-mail provides a powerful capability to communicate with ease and efficiency. With this capability comes a responsibility to properly manage any [f]ederal records employees create or receive on e-mail. The Federal Records Act applies to e-mail just as it does to records that are created by any other means. Therefore, until such time as the USGS is able to implement an electronic recordkeeping system, employees are required to "print and file" their e-mail created or received via the USGS e-mail system.[3]

A 2012 memorandum to the heads of US government executive departments and agencies and independent agencies set a target date of 2016 by which time all agencies will manage both permanent and temporary e-mail records in an accessible electronic format.[4] However, e-mail sent and received before 2016 may still be stored in paper format. This information would be revealed during the initial records inventory interview. An electronic records inventory can be conducted either at the same time as the paper records inventory or independently.

Location of Electronic Records

An electronic records inventory will form the basis for management decisions and assist organizations in fulfilling their current and future obligations when faced with e-discovery and/or Freedom of Information (FOI) requests. The electronic records inventory is more challenging than a physical records inventory and requires assistance from information technology (IT) as well as input from users of the information and communication systems. The information gathered will feed into the development of the file plan discussed in Chapter 3 and will be a key element when developing requirements for the organization's electronic records management system discussed in Chapter 6.

In addition to electronic records housed within an electronic records management system, active records are maintained in the organization's business systems and stored in third-party systems and on mobile devices. The result is that organizations are faced with electronic records in a variety of formats stored in multiple locations that can be categorized as follows:

- *Centralized information systems:* Centralized information communications technology systems are installed and operated by the information technology department and include e-mail servers, content/document/records repositories, enterprise-wide application servers (e.g., enterprise-wide geospatial information systems), and legacy systems (obsolete information technology). Organizations operating from multiple physical sites benefit from centralized systems that provide instant access to updated, consistent information.
- *Decentralized information systems:* Decentralized computing occurs when work units have a high degree of local autonomy in developing their information technology resources and specific needs not relevant to other work units in the organization (e.g., a 911 computer dispatch system used by the local fire department).

- *Personal work stations and storage devices:* Decentralized computer systems pose fewer problems than other decentralized locations within which records may reside, such as PC hard drives, laptops, digital cameras, smartphones, and tablets.
- *Third-party systems:* The Internet and Web 2.0 have changed the way organizations conduct business. Organizations interact with their current and potential customers on social networking sites hosted by third-party providers, often creating records that must be managed. They also take advantage of the benefits offered by cloud service providers, which can result in records stored on computers located outside of the country in which the organization does business.

The electronic records inventory should concentrate on logical collections of records grouped by business function or subject and not physical location. Many of the steps involved in preparing for and conducting an electronic records inventory mirror those involved in a physical records inventory. However, rather than a map of the physical layout of an office area or records storage center, a data map can be used as a diagram of agency-owned information and communication tools and technologies.

IT should maintain a data map for centralized systems and decentralized systems for which they have responsibility. The data map should also include information hosted at social media sites and by third-party providers. Individuals familiar with information and communication technology within each work unit will need to be interviewed to identify any information systems or storage locations not already included on the data map.

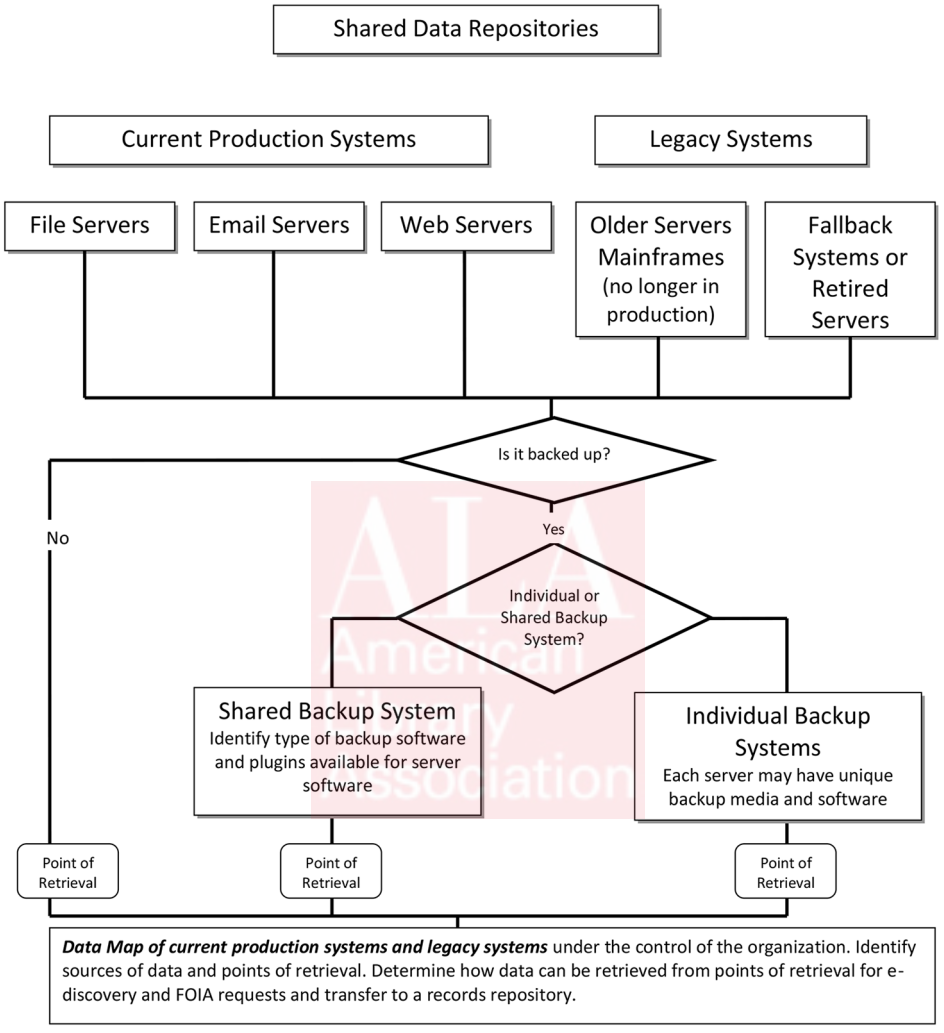
ESI Data Mapping

Data mapping is not a new concept, since it is usual practice to keep an inventory of all agency-owned tools and technologies. Inventorying provides intellectual control over electronic systems (network applications, backups, and legacy media). This inventory often contains information as to the number and size of files residing in e-mail accounts or shared folders, but it rarely explains the types of information produced by the systems. Electronically stored information (ESI) data maps must be accompanied by additional information that can be used to develop effective records management, records retention, and litigation hold policies and procedures.

The diagrams in Figures 4.3 and 4.4 (pp. 92, 93) show the logical relationship between the systems and repositories and backup systems. But more detail is necessary. The process of creating the data map involves compiling a complete list of all systems used, including collaboration tools such as SharePoint. A list of business processes should also be compiled and then compared with the system list to ensure that all electronically stored information is accounted for. A list of roles, groups, and users involved in the business processes should also be developed. Offsite or third-party storage systems used for cost-efficiency or disaster recovery purposes should be included.[5]

Social media enterprise solutions may be implemented internally and should be included on the data map. If the organization uses social media tools provided by commercial entities or takes advantage of cloud services, the data map must be modified to include the information hosted by these third-party providers as well. The data map (or maps) supplemented by charts, lists, and tables, with supplementary illustrations and analyses that describe the information and the infrastructure and systems that host the information, provides a "total information systems overview" known as a *data atlas*.[6]

Figure 4.3. Example of a data map for current production systems and legacy systems.

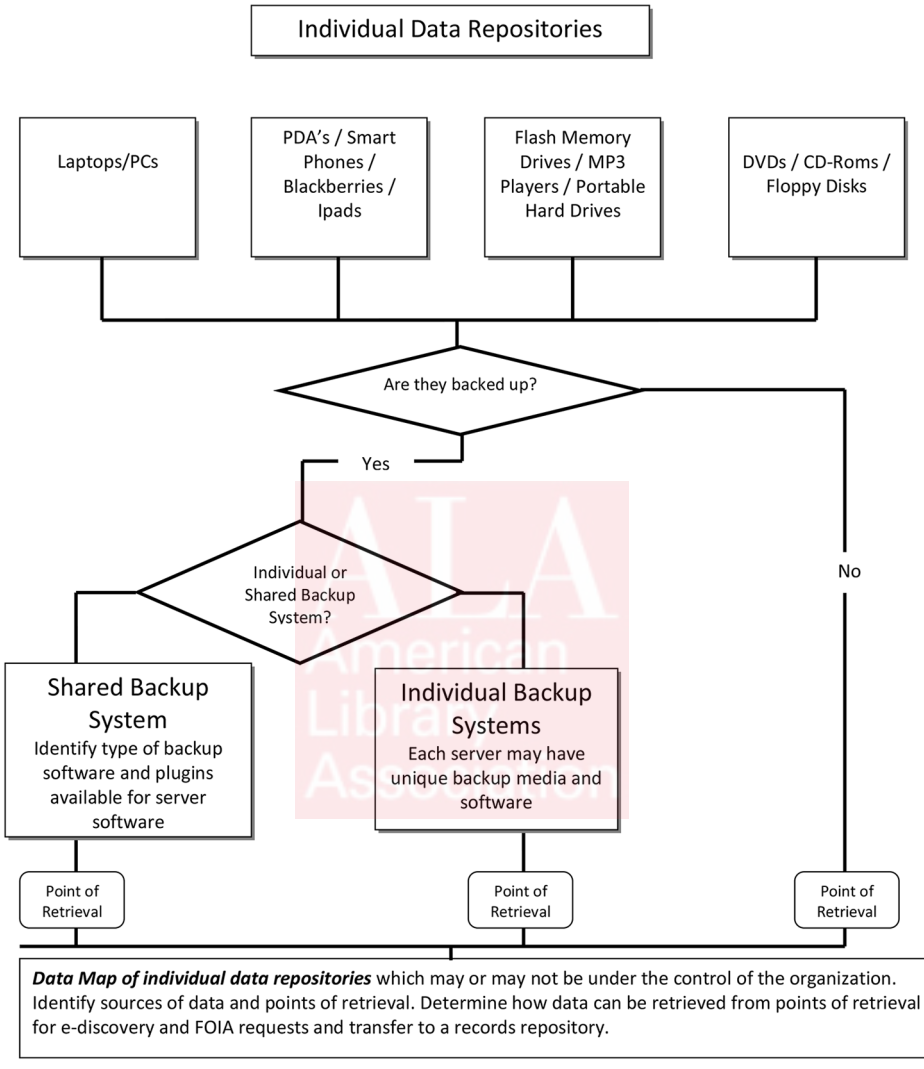


Source: "Litigation E-Discovery Readiness: Creating a Data Map," November 12, 2007, Client Alert, Thompson and Knight LLP, http://www.tklaw.com/publications.cfm.

Completing the Electronic Records Inventory

The scope of the electronic records inventory project must be considered during the planning phase. Enterprise-wide inventories may be accomplished as part of one project in a small- or medium-sized organization, but limiting the scope of the project is a better way to approach an electronic inventory project in a large organization. Project managers understand the wisdom of tackling the low-hanging fruit (projects and people most likely to ensure success), so that success can be declared and built upon.

Figure 4.4. Example of a data map of individual data repositories.



Source: "Litigation E-Discovery Readiness: Creating a Data Map," November 12, 2007, Client Alert, Thompson and Knight LLP, http://www.tklaw.com/publications.cfm.

Although the data map is invaluable, users of the information systems must also be surveyed. The electronic records inventory can be approached in one of three ways:

- Require that representatives of each work unit complete an electronic records inventory for their area. The questionnaire should be submitted to the project manager, who would contact the persons completing the inventory form if there were questions.

- Assign the task of completing the records inventory form to the records manager or other member of the records inventory team. The form should be completed during interviews with work unit liaisons and those using the information systems within each area.
- Implement a hybrid approach. Ask the work unit representatives to complete and submit the form. Use the form as a basis for the interviews to follow. Additions and corrections should be made based on the information gathered during the interview.

An example of an electronic records inventory form is provided in Figure 4.5. Records liaisons are advised to use the form to add, change, or delete a records series on the related records retention schedule.

Some organizations may seek more detailed information than that gathered through the use of the form in Figure 4.5. The State Archives Department of the Minnesota Historical Society employs a three-page form to request additional information about records management practices and information and communications hardware, software, and media.[7] Examples of questions and statements from that form follow.

Information Solicited Related to Records Management:

- Is the records series considered vital for business continuity purposes?
- Is the records series considered historical (e.g., eligible for transfer to State Archives)?
- Are there statutory retention requirements? If yes, list.
- Are there audit retention requirements? If yes, list.
- Are there administrative retention requirements? If yes, list.

Information Solicited Related to Information Technology:

- System title (include commonly used name and/or acronym if applicable).
- List and describe equipment used to create and access the record series.
- Indicate the media type(s) on which the record series is maintained (e.g., hard drive, optical disk, magnetic tape).
- What is each media type's recording capacity and density?
- If removable media is used, where are the media stored?
- Is there a migration plan to keep media refreshed? If so, what is the frequency of migration?
- What is the frequency of backups?
- Where are the backups stored?
- What is the retention period for backups?
- Is there current supporting documentation for hardware, software, and media? If yes, where stored?
- List software used to create and access the record series (including version information).
- Indicate record format(s) (e.g., Word, PDF, TXT, TIFF, HTML, ASCII, XML).
- Are the records compressed and/or encrypted?
- Is there metadata associated with the records/record series? If yes, in what format and where stored?

Figure 4.5. A standard electronic records inventory form.

INSTRUCTIONS – Type or Print a separate form for each new or revised electronic record series. Forward with Records Retention Schedule (DGS 550-1) COMAR 14.18.04	DEPARTMENT OF GENERAL SERVICES RECORDS MANAGEMENT DIVISION 7275 Waterloo Road, P.O. Box 275 Jessup, Maryland 20794 (410) 799-1930	ELECTRONIC RECORDS INVENTORY PAGE_____ OF _____
1. Department/Agency	2. Division	3. Unit
DEFINITION: Record Series - A group of related records stored electronically and used as a unit for reference as well as retention and disposition purposes		
4. Electronic Record Series Title		5. Earliest Year/Latest Year _____ to _____
6. INPUT - Identify source of information to be entered	7. OUTPUT - Identify the use/s of information generated by system	
8. ELECTRONIC RECORD SERIES DESCRIPTION - Briefly describe the information/documents/forms contained in a series. Include purpose and function of the system.		
9. Policy on Access and Use – Explain or attach copy if established in writing.		
10. Updating Cycles or Conditions and Rules for Revising Information in the System		
11. Specify the Location and Media of the Main Electronic Data File. Explain the progression established to ensure the record's retention and usability throughout the record's authorized life cycle.		
12. Recommended Retention		
13. Typed or Printed Name of Preparer	14. Telephone Number	15. Date
16. Title of Preparer		
DGS 550-6		

Source: Maryland State Archives, January 19, 2013, http://msa.maryland.gov/msa/intromsa/html/record_mgmt/forms/dgs_550-6_electronic_records_inv.pdf.

Commom File Formats

PDF: Portable Document Format
TXT: Text File
TIFF: Tagged Image File Format
HTML: Hypertext Markup Language
ASCII: American Standard Code for Information Interchange
XML: Extensible Markup Language

These types of questions elicit information that can be used to create or update a records retention schedule and that can be factored into migration and preservation decisions for records with long-term retention requirements. Once the electronic records inventory project has been completed, the records manager or other person conducting the electronic records inventory must ensure the accuracy of the interpretation of the information provided. If a questionnaire was completed and submitted by a work unit, the responses should be reviewed with the unit records liaison or other person completing the form. If the survey/interview method was used, the person conducting the interview should prepare a summary of the results of the inventory and submit it to the interviewee for editing, if necessary, and approval.

The electronic records inventory reveals the volume and characteristics of the organization's electronic records at a specific point in time. The inventory can be conducted by a records manager or other individual (e.g., consultant) through interviews, surveys, observation, or a hybrid approach. Work unit liaisons can provide information specific to their operations and systems, but information and communications systems at the enterprise level should be inventoried by working with the IT department. The information gathered through the electronic records inventory promotes an understanding of information created and retained, including electronic records series title, series description, and recommended retention. It will be used in building a records retention schedule.

Records Appraisal

Records appraisal builds upon the work accomplished during the records inventory. Records retention schedules are dependent on the value of the records created and managed within the organization. Once that value is determined, practices to create, capture, manage, and preserve the records can be more clearly and accurately defined.

appraisal (records appraisal): The evaluation of a document's worth or value for retention or archival purposes, based upon its current or predicted future use(s) for administrative, legal, fiscal, research, or historical purposes.

Source: ARMA International, *Glossary of Records and Information Management Terms*, 4th ed. (Overland Park, KS: ARMA International, 2012), 6.

Records Retention Values

Appraisal is performed at the records series level. An analysis of the value of the records series identified during the records inventory can help determine a realistic records retention period for each series. Each records series must possess one or more of four values:

- Administrative (operational)
- Fiscal
- Legal (and regulatory)
- Historical (research/archival)

When possible, the archival value of the record should be identified during the appraisal process to ensure proper maintenance until such time as the record is transferred to an archive.

Administrative (Operational) Value

Records that possess administrative value aid in the conduct of day-to-day business, define policy and procedures, or ensure administrative consistency and continuity. Records with administrative (operational) value include directives/policies/procedures; organizational charts; general correspondence; minutes of official meetings; and personnel records.

Fiscal Value

Records that possess fiscal value may be necessary to conduct current or future business or provide evidence of financial transactions and the movement and expenditure of funds. Records with fiscal value include financial audit reports; accounting journals and ledgers; tax receipts; annual budget documents; and payroll records.

Legal (and Regulatory) Value

Records that possess legal value are those that document and protect the rights and interests of an individual or organization, provide for prosecution or defense of litigation, demonstrate compliance with laws and regulations, and/or meet other legal needs. Records with legal value include contracts, titles, claims, deeds, and birth certificates.

Historical (Documentation or Research/Archival) Value

Records that possess historical value are useful or significant for documenting and understanding the past. These records may have had primary value for the organization at one time but may no longer possess administrative, legal, or fiscal value. They do, however, contain authentic evidence of an organization's policies, decisions, operations, or other activities that should be retained. They often document the development of a government and its policies, provide evidence of the lives and activities of people, describe social and economic conditions, and record the development of community and business. Records with historical value may include correspondence (authored by or received by a significant person, such as the founder of the organization or the president of the country); US military records; birth, marriage, and death records; meteorological (weather and climate) data; and legal opinions.

Primary and Secondary Value of Records

The *primary value* of records—administrative, fiscal, legal, and operational—is derived from the original use for which they were created. Traditionally administrative, fiscal, and operational records are considered transient by archivists, and records must possess other values to be considered archival.

Records have *secondary value* when they are useful or significant based on purposes other than that for which they were originally created. Secondary value includes information or evidential value as well as research value. US Census records, for example, provide evidence of the size and composition of the US population only until the next census is published. But the content of the census records provides information of value to researchers long after its evidential value has expired.

Legal value can be either primary or secondary, depending upon the purpose and function of a record. A contract, for example, is a legally enforceable agreement between two or more persons that documents specific actions on the part of each party (primary purpose).

However, the contract may continue to have legal value after final settlement if the contract period is less than the relevant statute of limitations (secondary legal value).

Vital records may be identified as part of a paper or electronic records inventory or may be the subject of a separate vital records inventory. Vital records and their relationship to disaster preparedness and recovery and business continuity will be covered in Chapter 8.

Records Series

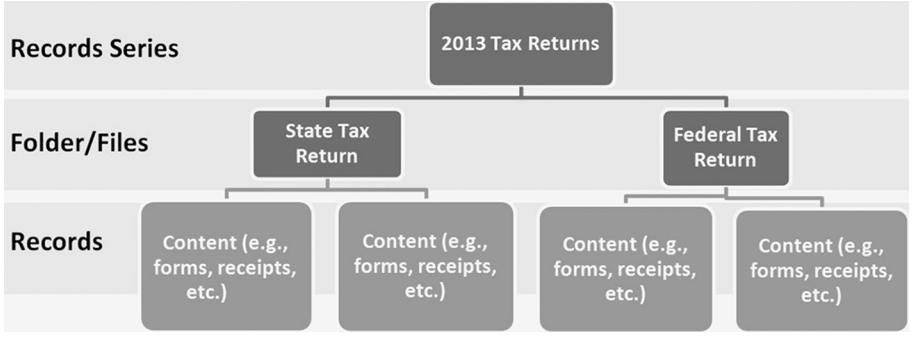
The common unit for organizing and controlling files in the United States is called a *records series*. Records are kept together, either through physical or intellectual control, because they relate to a particular subject or function, result from the same activity, document a specific type of transaction, take a particular physical form, or have some other relationship arising out of their creation, receipt, maintenance, or use.[8]

> **records series:** A group of related records filed/used together as a unit and evaluated as a unit for retention purposes, e.g., a personnel file consisting of an application, reference letters, benefit forms, etc.
>
> *Source:* ARMA International, *Glossary of Records and Information Management Terms*, 4th ed. (Overland Park, KS: ARMA International, 2012), 99.

Think of the different types of documents you used to prepare your last year's federal tax return. Whether you mailed your hard-copy return or filed electronically, the supporting documentation must be retained to provide evidence for the figures you used on your tax return in case of an audit. If you e-filed your tax return on eFile.com, you were urged to print (either as hard copy or a PDF file) your tax return and keep a copy for your records along with the supporting documentation.

A copy of the forms you submitted and the supporting documentation comprise a records series that could be named *2013 Tax Returns*. You might decide to separate the various documents used to prepare your tax returns into two folders, one for *State Tax Returns* and another for *Federal Tax Returns*. The resulting hierarchy is shown in Figure 4.6. Once you determine how to organize these records, the next question is, "How long should you keep them?" If you file a claim for a refund, for example, the Internal Revenue Service (IRS) has three years from April 15 of the year due, or from the date you actually filed if later, to audit your tax returns. Unless you believe the IRS will initiate proceedings against you for tax fraud, you can probably dispose of your records after the three-year period expires.

Figure 4.6. Anatomy of a records series.



Notice the conditional term *probably*. Retention periods can be affected by other factors, such as claiming loss for worthless securities or failing to report all of your income. The tax code and retention requirements are even more complex for businesses, including self-employed individuals and small businesses, partnerships, and international corporations. A records manager must follow a similar but more complex thought process to determine what constitutes a records series. Each record series must be controlled by a records schedule that provides mandatory instructions for the retention and disposal of records. In order to determine the retention period for each records series, research needs to be conducted into prevailing legal and regulatory requirements.

Legal and Regulatory Compliance

Organizations must comply with the recordkeeping requirements established by the jurisdictions that exercise control over them. Section 10 of Figure 4.2, the Minnesota Records Inventory worksheet, is shown in Figure 4.7. This section provides space to record the number of years the records must be retained and to list the governing citations. The person completing this section of the form must identify the retention requirements that apply to the records series in question and cite the source of that information.

Federal and State Laws

In the United States, some regulations apply to organizations in general, such as accounting and tax laws; others apply to organizations within specific industries, such as healthcare. Some are imposed by the federal government, while others are imposed by the state or local governments. Retention requirements often vary across jurisdictions. Florida, for example, requires public hospitals, healthcare facilities, and medical providers to maintain master patient indexes (including patient name, number, birth date, date of admission, and date of discharge, where applicable) for ten years.[9] Texas requires master patient indexes to be retained permanently.[10]

Statutes of Limitations

Statutes of limitations are federal or state laws that restrict the time in which legal proceedings can be brought against a defendant in either a civil or criminal matter. In Alabama, a product

Figure 4.7. Section 10 of the Minnesota Records Inventory worksheet used to list retention requirements.

10. Retention Requirements	Years	Citation
A. Federal Law		
B. State Law		
C. Statute of Limitations		
D. Audit Period		
E. Administrative Needs		

Source: Minnesota Historical Society and Minnesota State Archives, *Preserving and Disposing of Government Records,* May 2008, http://www.mnhs.org/preserve/records/docs_pdfs/PandD_may2008.pdf.

liability action must be brought "within one year from the time when the injury is or should have been discovered."[11] In California, action must be taken "within two years from the time when the injury is or should have been discovered."[12] In Massachusetts, however, action must be brought "within three years of the date on which the injury occurred."[13]

Audit Period

There are different types of audits. "Generally, the IRS can include returns filed within the last three years in an audit. Additional years can be added if a substantial error is identified. Generally, if a substantial error is identified, the IRS will not go back more than the last six years."[14] The Securities and Exchange Commission requires accounting firms to retain for seven years certain records relevant to their audits and reviews of issuers' financial statements.[15] Records to be retained include the accounting firm's work papers and certain other documents that contain conclusions, opinions, analyses, or financial data related to the audit or review.[16] According to the Massachusetts Society of Certified Public Accountants, a corporation's internal audit records should be retained six years; but a public audit report must be retained permanently.[17]

Administrative Needs

The retention requirements for records with administrative or operational value would not be discovered during legal research but would be revealed based on the records inventory and input from records creators and users. The information gathered through a records inventory, records appraisal, and legal research is used to develop the records retention and disposition schedule.

Developing a Records Retention and Disposition Schedule

The primary purpose of a records retention and disposition schedule is to ensure that records are retained only as long as necessary and then disposed of when they no longer have value.

records retention schedule (RRS): A comprehensive list of records series titles, indicating for each series the length of time it is to be maintained. [This] may include retention in active office areas, inactive storage areas, and when and if such series may be destroyed or formally transferred to another entity, such as an archives for historical purposes.

Source: ARMA International, *Glossary of Records and Information Management Terms*, 4th ed. (Overland Park, KS: ARMA International, 2012), 99.

The benefits of developing a records retention and disposition schedule to facilitate disposal of physical records are well documented and include a reduction in time to locate and retrieve desired information as well as a reduction in costs associated with the equipment, space, staff, and/or services needed to manage those records.

When the discussion turns to electronic records, though, the benefits are less clear. First, electronic records are not as visible as physical records. They take up less space on storage devices that are increasing in capacity and decreasing in price. There is a cost to identifying and disposing of electronic records residing both under the direct control of the enterprise and under the control of third-party providers that can exceed storage costs.

There are advantages to disposing of electronic records, however, including mitigating the risk of retaining records that could be used against the organization (the proverbial

smoking gun), reducing the cost of locating the requested records in response to e-discovery and/or freedom of information requests, and reducing the cost of inspecting records to redact personally identifiable information (PII), such as social security numbers, credit card numbers, address information, and driver's license numbers.

Retention Schedule Considerations

The following list of questions should be answered before the actual work begins on the development of the records retention and disposition schedule:

- Is there an existing records retention and destruction schedule or are you creating it from scratch?
- What is the scope of the retention schedule—enterprise-wide or focused on one function or work group?
- Will you use a functional retention schedule or one related to the organization's structure?
- Was a records inventory completed recently? If so, much of the information you need can be taken from the records inventory form. If not, that should be completed before proceeding further.
- Will a *general* records schedule be prepared for records that exist in departments, agencies, and work groups across the enterprise?
- Have legal/regulatory considerations been researched? If so, you can use that information for the schedule. If not, determine who will conduct the research and monitor any changes in legislation. This research feeds into the records schedule and must be completed first.
- Will electronic records be included in this retention/disposition schedule or will separate records retention and disposition schedules be prepared for physical and electronic records?
- What resources are available to develop and maintain the retention schedule(s), such as records retention scheduling software and a records laws research database?

Records Retention and Disposition Schedule

The records retention and disposition schedule is created after the records inventory, records appraisal process, and legal/regulatory research have been completed. The format used to record information will differ, but common elements will be included in every schedule. This information may be gathered manually, but it should be managed through the use of a database or records retention software program.

The most common elements include the records series, record title and description, records office, retention requirement (often specifying location for active and inactive files), and disposition method. If a functional classification is used, the function (e.g., fiscal), and the record category (e.g., fiscal: budget and budget control) will be included. Additional information may include storage medium, effective date, and revision number and date.

Figure 4.8 (p. 102) displays the portion of the New Jersey Records Retention and Disposition Schedule that provides retention and disposition data for the records series called *Consultant File*. Note the columns for indicating how long each file should be retained within the agency and in the records center.

Figure 4.8. Portion of New Jersey's State General Records Schedule.

Records Retention and Disposition Schedule	Agency # G100000	Schedule # 005	Page # 32 of 38

Records Series #	Record Title & Description	Retain In		Disposition
		Agency	Records Center	
1423-0000	Consultant File File reflecting the findings of a professional consultant hired by a state agency. File may contain but is not limited to: work-papers; financial documents; needs analysis, studies documents; surveys; questionnaires; statistics; correspondence; and preliminary, interim, and final reports.			
1423-0001	Consultant File – Final Report	25 yrs		Archival review
1423-0002	Consultant File – Contract	3 yrs after termination of contract	4 yrs	Destroy
1423-0003	Consultant File – Financial Documents	3 yrs	4 yrs	Destroy
1423-0004	Consultant File – Work papers and Support File	3 yrs		Destroy

Source: State of New Jersey, Department of the Treasury, "State Agency General Records Retention Schedule" (GS100000-005), Records Retention Schedules: General Schedules and Series #, May 19, 2011, http://www.nj.gov/treasury/revenue/rms/retention.shtml.

The New Jersey Records Retention and Disposition Schedule is available online in PDF format. But increasingly, records schedules are developed and maintained electronically. The University of California allows the public to search its web-based Records Disposition Schedules Manual.[18]

Software and services can be acquired from vendors such as Eloquent Systems, Inc. Eloquent Records software was customized based on the Local Government Management Association of British Columbia (LGMA) records manual to produce the sample Records Classification and Retention Schedule shown in Figures 4.9, 4.10, and 4.11 (pp. 103, 104, 105).

Two functions are shown on the navigation bar in Figure 4.9: ADM (Administration) and OPR (Protective Services, Fire Protection, and Fire Investigations). Only the four sections with ⊞ have lower levels available in this sample database. A click on the ⊞ icon will open the lower level. Rather than drilling down from the "top level," a keyword search could be used, and, if desired, the search could be restricted to vital subjects—those with legal citations.

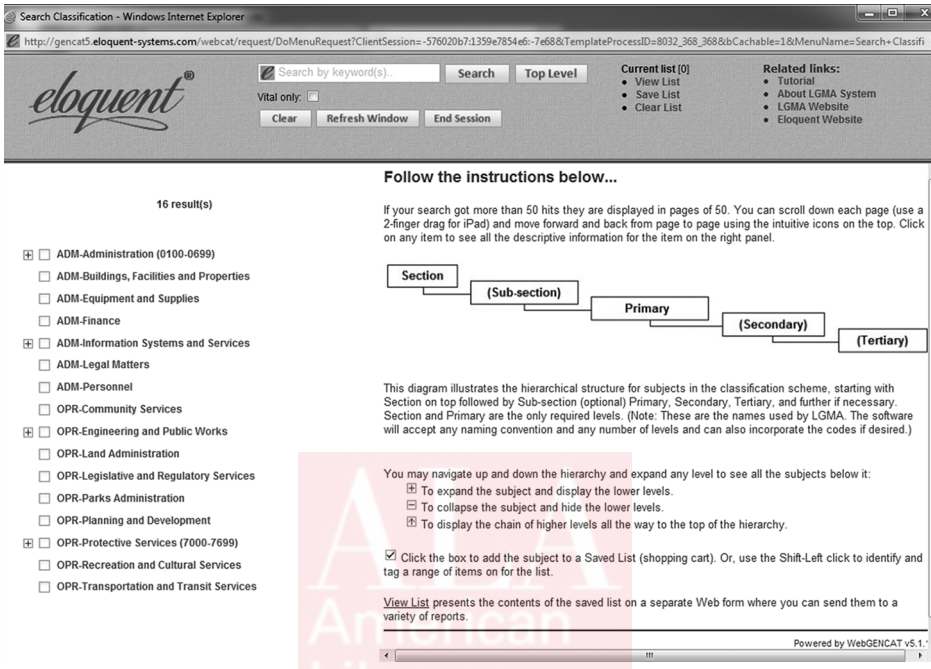
Figure 4.10 results from a click on ⊞ beside *ADM-Administration* and then a click on *Associations, Clubs, Societies* to get the detailed display shown on the right. The numbers beside the subjects are from the legacy data and serve no purpose for the software. Nine different records titles (names) are indicated as *lower levels* in Figure 4.10. A description, legal citation, and cross references are also provided.

Figure 4.11 results from drilling into the OPR category as follows: *OPR–Protective Services > Fire Protection > Fire Investigations > General*. This final screen shows the retention rules for this *records title*. The date on the folder is used in conjunction with the retention requirement to determine the disposition date. Note that the length of time to be retained on-site and off-site is specified along with the method of disposition. A retention schedule takes a great deal of time to create and maintain, and that is one of the reasons some records managers prefer the concept of *big buckets*.

Big Buckets and Records Retention Schedules

Big buckets is a method used to simplify records retention schedules by consolidating record types related to the same business function or process with similar retention requirements

Figure 4.9. This image illustrates the hierarchical structure for subjects in the LGMA classification scheme, along with the instructions for using the navigation bar.



Source: Courtesy of Eloquent Systems, Inc., http://www.eloquent-systems.com/.

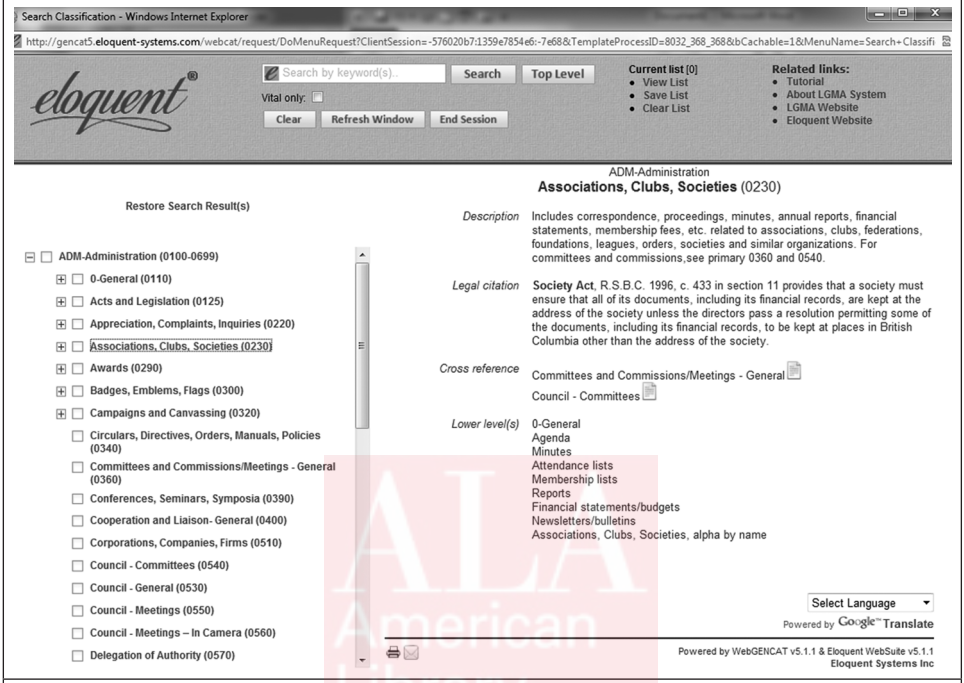
into bigger retention buckets (records series). The fewer buckets, the fewer retention choices, and the greater likelihood of compliance with the organization's retention schedule.

There are also disadvantages to the big buckets approach. One is the difficulty of managing exceptions, such as event-driven retention requirements. For example, two records titles may have a retention requirement of ten to twenty-five years, but the triggers can be different. The trigger for one can be the phrase *after the last update*, while the trigger for the other can be *after the last date of activity*. If the *last update* does not take place on the *last date of activity*, these are two different triggers.

> **"big bucket" or large aggregation schedule:** A type of flexible records schedule that applies disposition instructions against a large body of records grouped at a level of aggregation greater than the traditional file series or electronic system [and] that can be along a specific program area, functional line, or business process.
>
> *Source:* National Archives and Records Administration (NARA), "NARA Bulletin 2008-04: Guidance for Flexible Scheduling," Records Managers, April 30, 2008, http://www.archives.gov/records-mgmt/bulletins/2008/2008-04.html.

Developing a big bucket retention schedule includes the same initial steps we've already discussed, including conducting the records inventory (physical and electronic), organizing the information by business function and records series, appraising the value of the records, conducting legal research, and identifying the retention periods for all records—those that are governed by legal and regulatory requirements and those that are not.

Figure 4.10. Results from drilling down to the *Associations, Clubs, Societies* record series on the navigation bar at the left.



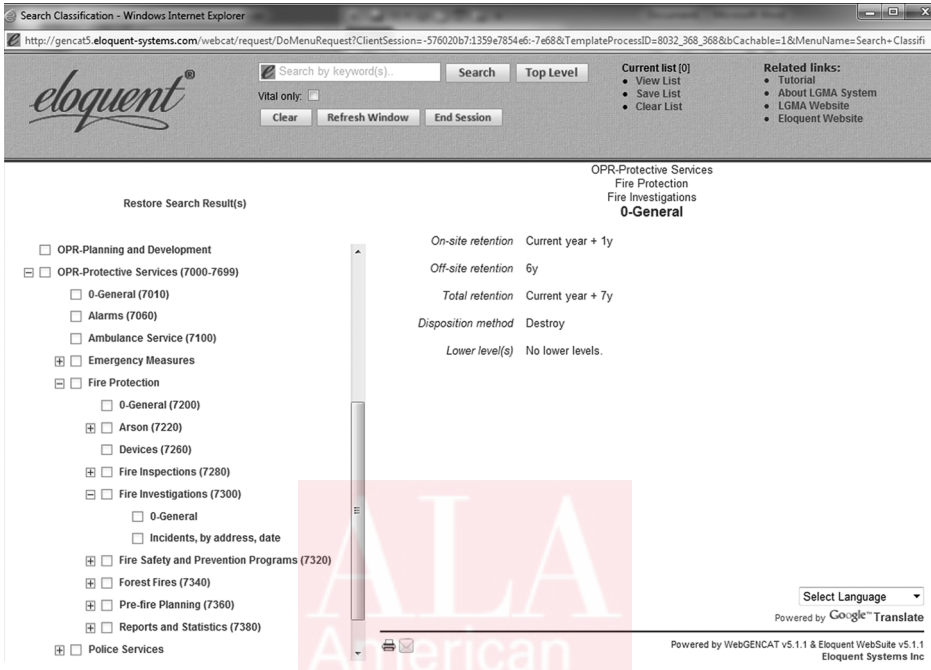
Source: Courtesy of Eloquent Systems, Inc., http://www.eloquent-systems.com/.

Once those tasks are accomplished, attention can be turned to creating the big buckets. In her 2008 article, "How to Win the Compliance Battle Using Big Buckets," Dr. Susan Cisco makes recommendations for developing new retention schedules and updating existing schedules, including the following:[19]

- Map the records to the correct legal groups. These will form the first round of buckets (records series).
- Consolidate those buckets into fewer buckets by assigning the longest retention period among a group of consolidated buckets to form new bigger buckets.
- Develop crosswalks to legacy content classified by a traditional records schedule and update retention requirements for physical and electronic records to reflect the new bigger retention buckets.
- Conduct a pilot implementation, analyze feedback, and make modifications before introducing the big bucket retention and disposition schedule enterprise-wide.

NARA provides guidance for federal agencies wanting to create a flexible "big bucket" or large aggregation schedule for their records in "NARA Bulletin 2010-03, Subject: Flexible Scheduling."[20] Supporting materials include an example of the type of crosswalk Cisco mentioned in her article (see Figure 4.12).

Figure 4.11. Retention and disposition requirement for General Fire Investigation records.



Source: Courtesy of Eloquent Systems, Inc., http://www.eloquent-systems.com/.

Figure 4.12. Example of a big bucket crosswalk.

AGENCY: Small Business Services Agency

Big Bucket Schedule

Item # and Title	Retention
#5 Quality control and performance planning records	Temporary. Destroy when 5 years old

Current Schedule

Item #	Title	Retention	NARA Authority
585a	Quality control program files	Temporary. Destroy when 5 years old	N1-000-95-1, item #6
N.A.	Benchmarking case files	Unscheduled	Not Applicable (N.A.)
580b	Performance planning and evaluation files	Temporary.Destroy when 6 years old	N1-000-97-5, item #1
585d	Independent quality check records	Temporary.Destroy when 3 years old	N1-000-95-1, item #9
340a	Procedures manual development files	Temporary.Destroy when 4 years old	N1-000-00-1, item #1
355c	Quality Assurance Monitoring System, master files	Temporary. Destroy records when 5 years old	N1-000-03-2, item #3

Source: National Archives and Records Administration (NARA), "Appendix B: Sample Crosswalks for a Big Bucket Item, Example 2," Records Managers—Frequently Asked Questions (FAQS) about Flexible Scheduling, May 3, 2010, http://www.archives.gov/records-mgmt/faqs/flexible-scheduling.html.

Aggregating records series into big buckets involves making risk management decisions. Notice that under the current schedule, illustrated in Figure 4.12, records retention periods range from "unscheduled" through "destroy when 6 years old." However, under the big bucket schedule, the retention period for each of these records series would be "destroy when 5 years old." There are risks in retaining records longer than necessary or not long enough. If the risk posed is acceptable to the organization, the big bucket schedule with a five-year retention requirement for this new, larger records series will make it easier for employees and autocategorization tools to make more accurate and consistent classification decisions.

Once the records retention and disposition schedule has been completed, operating procedures must be updated to reflect changes in existing operations. The operating procedures and records schedules should be included in a records retention and disposition manual to be shared with all stakeholders (e.g., legal counsel, chief operating officer, chief financial officer, and others) for their comments, approval, and signature. Once modifications are made, the parties satisfied, and the procedures and schedule approved, the manual can be published and training can be provided.

The records manager's job doesn't end with implementation and training. A program compliance review must be designed to audit the destruction or transfer of records scheduled for disposition. Notices of noncompliance must be sent when necessary. The records manager should also scan the internal environment for changes that may require an adjustment to the records retention and disposition schedule and monitor the external environment to see how legal and regulatory changes might impact the records retention and disposition schedule.

Summary

The primary purpose of a records retention and disposition schedule is to ensure that records are retained only as long as necessary and then disposed of when they no longer have value. The information gathered through the records inventory, records appraisal process, and legal research is used to complete the records retention and disposition schedule.

The records inventory provides a detailed listing of all records held by the organization, both physical and electronic. Tools such as floor plans of records storage areas and data maps of computer systems are helpful in conducting the records inventory.

To determine records retention requirements, records are appraised based on their current operational, regulatory, legal, fiscal, and historical value, and legal research is conducted to identify governing laws and regulations.

Related records are grouped into records series and evaluated as a unit for retention purposes. Retention requirements are assigned. This information is recorded on the records retention and disposition schedule, along with additional information such as the office of record, location of record, and method of disposition.

The concept of aggregating records series into big buckets is an alternative approach to the traditional records series that makes it easier for employees and autocategorization tools to make more accurate and consistent classification decisions.

The records retention and disposition schedule, along with accompanying operational procedures, must be made available to all employees who are assigned records management responsibilities. This information can be disseminated through the publication of a records

retention and disposition guidelines and through employee training programs. Tools needed to support retention and disposition should be integrated into communication and information systems during the planning phase to remove the burden for retention and disposition decisions from the user when possible. The destruction or transfer of records that have met their retention requirements should be audited to ensure that the organization is in compliance. Both the internal and external environment should be monitored for changes that might impact the records retention and disposition schedule.

In her contribution to this chapter, Nancy Kunde, a records management consultant who is both a certified archivist and certified records manager, shares lessons learned from the implementation of records retention scheduling within what was termed the HRS (Human Resource System) Project at the University of Wisconsin.

PARADIGM

Implementing Records Retention in an ERP System: Records Retention, Appraisal, and Disposition

Nancy Kunde, MA, CRM, CA, Records Management Consultant

Introduction

The shift from paper-based to digital-based recordkeeping has had a dramatic impact on all records management functions and caused records professionals to rethink, redefine, and reshape traditional RIM tools, concepts, and approaches to them. The focus of this mini–case study is to briefly describe one organization's approach to records appraisal, retention, and disposition as part of implementing an enterprise resource planning (ERP) system.

In 2008, the University of Wisconsin system began to implement an ERP system (PeopleSoft)—an $80 million project designed to manage all functions relating to human resource management at all twenty-six of its member institutions. It is known as the HRS (Human Resource System) project. The HRS System is a database-driven information system. It purports to streamline and standardize personnel and payroll processes across the UW system. Ultimately, the human resource processes are to be paperless and an all-digital recordkeeping environment created. Records management, specifically records retention, was incorporated into the HRS project mission statement; however, it did not become an active component until late in 2009.

Problem Statement

The goals of the HRS records management initiative were to identify the electronic record items within HRS; map them to existing retention requirements; integrate retention policy into the HRS project; and develop any necessary additions or changes to those requirements to incorporate new HRS record items. Sponsored by the UW system legal counsel office, the initiative had the overall objective to ensure that the UW system meets its state and federal obligations for records retention as well as its accountability and transparency responsibilities as a public institution. General records retention schedules (GRRS) governing personnel and payroll records existed for paper records. Could the existing general records retention schedules based almost solely on paper-based information systems be

successfully used to apply records retention to the myriad of reports and data created, managed, and distributed by the extensive ERP system? How would records retention policy governing digital records be implemented without suitable technical tools to support electronic records management? Shouldn't digital records be managed digitally?

Defining Records and Recordkeeping in the HRS Systems

Approach

The approach used to define records and recordkeeping in the HRS System is illustrated in Figure 4.13. Spreadsheets for each HRS module (e.g., payroll, absence management, time and labor) that outlined existing retention requirements were prepared. Project staffs in each module were asked to identify and list HRS reports, data sets, interfaces, and documents and then match them to record series in the existing records retention schedule. The records management analyst met with staff in each area to provide guidance and training, conducted records analysis, and populated a database with newly identified HRS record items. Following the conclusion of the initial steps, the records analyst prepared amendments to each GRRS and worked with existing records management personnel at the UW institutions to review the anticipated changes and gain their support. All retention schedule changes were coordinated with the UW Office of General Counsel.

From the outset of the records management initiative, it was clear that records management software (ERMS, ECM) would be needed to support the full implementation of records retention requirements; however, no additional financial resources would be made available to acquire such RIM tools. The records analyst together with HRS technical staff evaluated existing data warehouse and other data storage capabilities of PeopleSoft and existing institutional technical resources.

The project deliverables included the following:

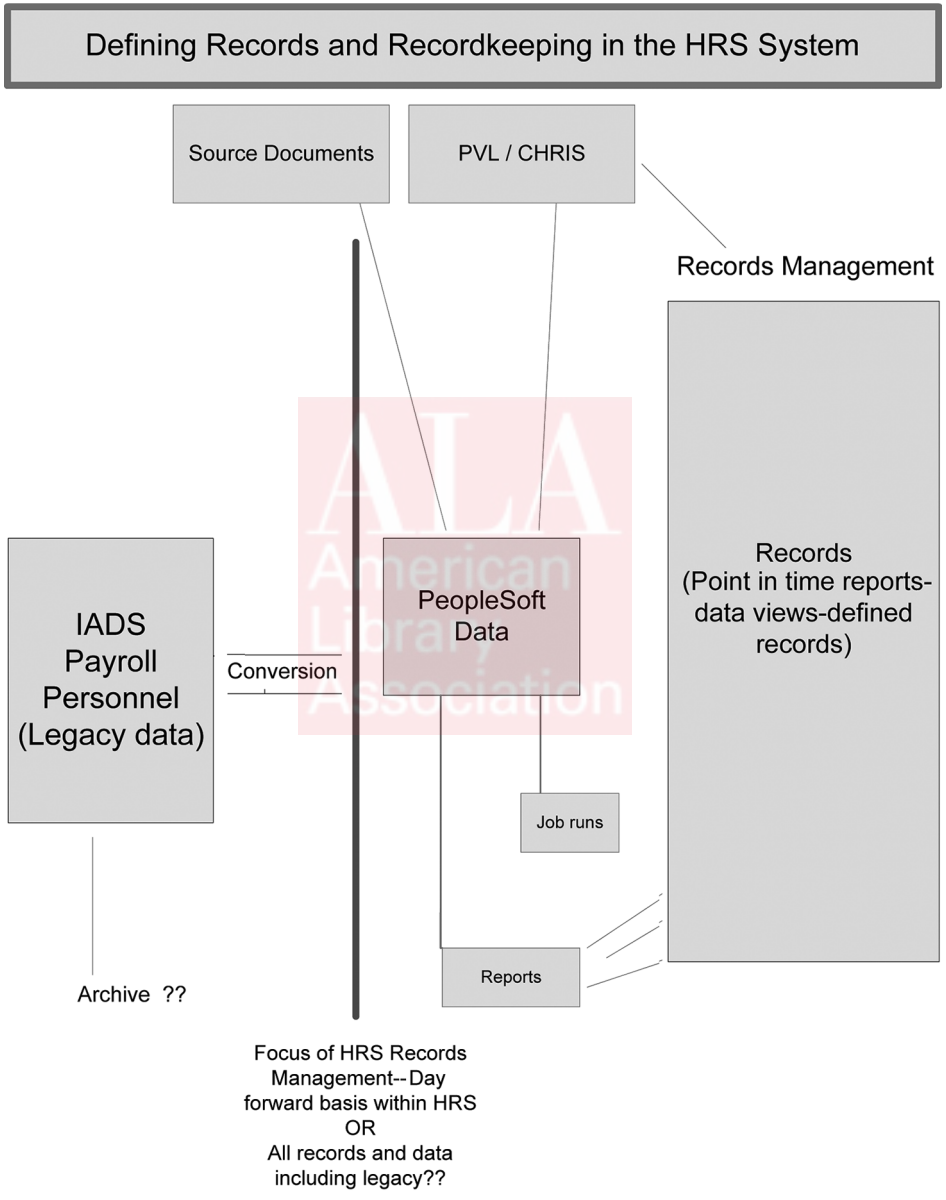
- Analysis of anticipated e-records from each business process team (e.g., payroll, absence management, time and labor)
- Evaluation of existing retention requirements
- Development of a process for updating retention information to ensure that it is kept up-to-date
- Procedures to move e-records from HRS to a retention tool (Cypress or other identified resource that will support record retention)
- Identification of a tool or tools that ultimately would be needed to support the retention and disposition of digital personnel and payroll records as identified by the previous records management project process

Results

The HRS records management initiative resulted in several products:

- General records retention schedules (GRRS) were revised to extend coverage to the myriad of HRS reports and data managed by the PeopleSoft client. GRRS was also prepared for the HRS System documentation.
- HRS forms, supplemental systems, and e-mail were addressed as part of the project and guidelines were prepared for these areas. A litigation hold procedure was crafted.

Figure 4.13. Planning diagram developed at outset of HRS project to define records retention issues in order to bridge the gap between all of these recordkeeping systems, forms and formats, and lay a day-forward foundation for managing HR records.



Source: Courtesy of Nancy Kunde.

- Content for an HRS records management webpage for the intranet site was prepared. Much of the intranet records management material will be transferred to the HRS service center website.
- A set of metadata for HRS records management was prepared.

Lessons Learned

Implementing records retention scheduling within an ERP system is an involved process that should not be undertaken lightly. The HRS project presented opportunities to address a number of records management questions and challenges, such as these:

- *What is a record?* This question has been the focus of much commentary in the RIM community. In ERP systems, such as HRS, that have the potential to produce hundreds, if not thousands, of reports and endless data sets, there must be some parameters established at the outset of the records retention initiative as to what will constitute a record and what will not.
- *A team approach* is a must for successful implementation of a records retention program. It requires the involvement and cooperation of those knowledgeable about the functional area responsible for the records as well as those with technical expertise about the systems supporting the records.
- *Digital records must be managed digitally*. Digital records retention requires resources for hardware and software to adequately implement records retention and ensure that the organization is in legal compliance. Legally speaking, a records retention policy that cannot be implemented is worse than no policy at all.
- *Records retention cannot be separated from digital preservation*. HRS retention policies contained records that needed to be retained for as little as two weeks to some that had permanent/archival value. Determinations about record storage media and format as well as conversion costs and data storage costs must be a part of records retention development from the outset.

Next Steps and Future Considerations

- *Conclude records management analysis report*. During the course of the HRS records management initiative, a major analysis document was begun that identified the complexity and myriad of technical issues necessary to fully implement the records retention requirements. For any organization implementing a records retention program within an ERP system, such a report can provide not only an analysis of the issues but a strategic road map for effective records management within an ERP environment.
- *Identify and designate an organizational home for an ongoing records management role*. Records management is an ongoing responsibility, not a project! Evaluation of new HRS (PeopleSoft) reports, monitoring conversion and transfer of data, and ensuring disposition of records at the end of their retention periods requires an ongoing identified records management role for HRS. Although a records management "project" can lay a foundation for a program, a successful records management program will require an organizational home that includes staff with professional records management expertise and experience.

- *Develop a mechanism for ongoing records appraisal of HRS records.* An enhanced records appraisal process can produce a much more meaningful retention schedule that has broader value to the organization than just records disposal. A process that fully captures metadata, understands the processes and procedures behind the need for records and data, and understands the records' use and users along with retention value, results in a records schedule that can serve a multitude of organizational purposes. For example, in the HRS project, the retention schedule has a role to play in shaping data stewardship policy and practices.
- *Plan for digital preservation*. Digitally born records require careful planning to ensure their access and retrievability. Hardware and software changes, major shifts in platforms, and implementation of new systems often render digital records unusable. Digital preservation is necessary to implement records retention and to preserve information of long-term or permanent value.
- *Develop infrastructure (governance) that will support good records management practices.* To be successful and perhaps more important to be an effective and efficient component of HRS, records management needs a governance structure. Such a structure should ensure that records issues are addressed as part of systems development and official records are identified, captured, and maintained in such a way as to ensure their accessibility and retrievability throughout their retention life.

Conclusion

Records retention scheduling is the heart of a records management program, and the production of records retention schedules is often the first task management expects from its records management staff. Fundamentally, the retention schedule remains a key policy document that reflects appraisal and analysis of the organization's information resources and sets forth a retention and disposition plan. Information systems such as ERP systems have introduced complexities to retention schedule development that require different approaches and strategies. The HRS records management initiative brought to light many of these issues. Though records schedules were ultimately produced, their implementation remains a major challenge because records retention was not fully considered in the overall planning for the HRS project. Records retention scheduling was identified as a legal requirement and included in the mission of the HRS project, but the reality of implementing digital records retention was not well understood by project staff. To adequately address records retention scheduling in massive information system projects such as the implementation of PeopleSoft, it needs to be integrated into the project from the outset. It also needs to be developed in coordination with other project elements such as hardware and software planning, information systems development and design, data stewardship, information architecture development, and digital preservation.

Notes

1. ARMA International, *Glossary of Records and Information Management Terms*, 4th ed. (Overland Park, KS: ARMA International, 2012).

2. Suzanne Etherington and Ann Marie Przybyla, *Inventory and Planning: The First Steps in Records Management* (Archives Technical Information Series #76), New York State Archives, 2003, http://www.archives.nysed.gov/a/records/mr_pub76_accessible.html.
3. USGS Geospatial Information Office, "US Geological Survey: General Records Disposition Schedule," in *US Geological Survey Manual*, May 2009, http://www.usgs.gov/usgs-manual/schedule/432-1-s1/infotouse1.html#infotouse1.
4. Executive Office of the President, Office of Management and Budget and National Archives and Records Administration, "M-12-18: Memorandum for the Heads of Executive Departments and Agencies and Independent Agencies," August 24, 2012, http://www.whitehouse.gov/sites/default/files/omb/memoranda/2012/m-12-18.pdf.
5. Ganesh Vednere, "The Quest for eDiscovery: Creating a Data Map," *Infonomics* 23, no. 6, 28–33.
6. Wayne Wong, "Managing Your Way to Compliance with a Data Atlas," *Information Management* (January/February 2012), 21–25.
7. Minnesota State Archives, "Electronic Records Inventory Worksheet," Minnesota Historical Society, June 10, 2004, http://www.mnhs.org/preserve/records/recser.html.
8. US Environmental Protection Agency, "What Is a Records Series?," Records, last modified July 5, 2007, http://www.epa.gov/records/what/quest5.htm.
9. Florida Department of State, *General Records Schedule GS4 for Pubic Hospitals, Health Care Facilities, and Medical Providers*, State Library and Archives of Florida, December 1997 (technical updates May 2007), 6, http://dlis.dos.state.fl.us/barm/genschedules/gs04.pdf.
10. Texas Department of State Health Services, "State of Texas Records Retention Schedule," May 23, 2012, http://www.dshs.state.tx.us/Records/MentalHealthHospitals.pdf.
11. FindLaw, "Time Limits for Filing Product Liability Cases: State-by-State," accessed December 14, 2012, http://injury.findlaw.com/defective-dangerous-products/defective-dangerous-products-law/state-time-limits-for-filing-product-liability-cases.html.
12. Ibid.
13. Ibid.
14. Internal Revenue Service (IRS), "How Far Back Can the IRS Go to Audit My Return?" IRS Audit FAQs, last modified December 7, 2011, http://www.irs.gov/Businesses/Small-Businesses-&-Self-Employed/IRS-Audit-FAQs.
15. Cornell University Law School, "17 CFR 210.2-06—Retention of Audit and Review Records," Legal Information Institute, January 30, 2003, http://www.law.cornell.edu/cfr/text/17/210/2-06.
16. Ibid.
17. Massachusetts Society of Certified Public Accountants, Inc., *The Record Retention Guide*, 2004, 3, http://www.cpa.net/resources/retengde.pdf.
18. University of California, "Records Disposition Schedules Manual," accessed February 25, 2012, http://www.ucop.edu/recordsretention/.
19. Susan Cisco, "How to Win the Compliance Battle Using 'Big Buckets,'" *Information Management*, July–August 2008, http://content.arma.org/IMM/JulyAug2008/How_to_win_the_compliance_battle.aspx.
20. National Archives and Records Administration (NARA), "NARA Bulletin 2010-03: Flexible Scheduling," Records Managers, May 3, 2010, http://www.archives.gov/records-mgmt/bulletins/2010/2010-03.html.

CHAPTER

5

Records and Information Access, Storage, and Retrieval

Introduction

The active phase of the records lifecycle is one in which records managers had little involvement traditionally. Paper records were stored in offices close to those who had reason to refer to them during the conduct of business. Office workers were responsible for designing and implementing filing systems, and records managers received custody of the records when then became inactive.

The introduction of digital information and electronic information systems took some of the responsibility out of the hands of office workers but placed it into the hands of the information technology department. Records managers still had little involvement with the active use of the information in the systems and devoted time to such activities as writing policies and procedures manuals, developing retention and disposition schedules, caring for inactive records, and overseeing the disposition of records either through destruction or transfer to an archives.

Recently, though, the explosion of digital information and the proliferation of electronic information and communication systems have transformed the way records management is perceived and practiced. Records have value both for their content and as evidence of communications, decisions, and actions. Records and information professionals are expected to understand the business processes, identify records-related risks, and partner with other stakeholders to ensure that the implementation and use of new systems and emerging technologies will comply with governing laws and regulations. The Australian government terms this new era of records management *digital records and information management*.[1]

Today almost all records are created digitally, but some paper-based practices still exist. The records manager can help the organization make a transition from the practice of retaining paper records to a digital records and information program by identifying existing work processes and determining where paper-based practices can be replaced by digital practices. This requires an understanding of information systems used to conduct daily operations.

In the previous chapter, you were introduced to an archival approach to identifying records by starting at the end of the workflow, identifying records in existence, and ensuring they are managed according to a records retention and disposition schedule. But there is a second approach, known as the *systems analysis approach*, which can be used to identify records for a records retention program. This approach requires the records manager to start at the point of creation (or planning when possible), following each step of the

workflow to identify the type of records created and indicating the records series to which the resulting records belong. Because records and information managers are increasingly part of an information governance team, an understanding of the business process is essential not only to identify and manage records but also to improve the workflow process. Records and information managers can contribute their expertise during this active phase of the information lifecycle to decisions being made about workflow processes, access controls, storage systems, metadata, and the search and retrieval processes.

Operational efficiency can be enhanced when automated processes are introduced or improved. In most cases, business practices will be changed to fit the new and improved process. The activity of reviewing existing business practices in order to make these changes is called *business process analysis*. Two approaches that can be used to better understand current business practices are *business process mapping* and the development of *workflow diagrams*.

Business Process Mapping and Workflow Processes

Business process mapping and workflow diagrams can help an organization identify records, streamline their operations, reduce redundant work tasks—and therefore duplicate records—and improve efficiency.

Business Process Mapping

A business process identifies how work is done within an organization, not what is done. Business process mapping involves assigning variables to given work tasks and plotting how work moves from one department to the next and from one employee to the next.[2]

Organizations create value for their stakeholders by developing more efficient and effective operations; this is called *business process improvement*. The process can be illustrated as a series of activities that contribute to a specific output. Those same activities contribute to the creation of records that must be captured and managed. Purchasing, for example, is a straightforward function found within any organization. The mission of purchasing departments may vary. The purchasing department of the City of Mission, Texas, describes its mission in this way:

> Purchasing will manage, facilitate and provide the highest quality, team-based, value-added procurement and ancillary support services that exceed the needs and expectations of our customers.[3]

The specific tasks involve issuing purchase orders and agreements through a competitive process with the goal of procuring quality goods and services at the lowest cost while maintaining compliance with all governing laws, regulations, and policies. Before the purchasing department can take control of the purchasing process, a requisition must be submitted by the requesting department and approved by those with authority to do so. Although a number of individuals may be involved in the requisition and purchase process, the primary user is concerned with one thing—ordering and receiving the necessary goods and services.

Once the goods or services have been received, two different documents may also be received, the bill of lading and a vendor invoice. The bill of lading is the official document prepared by the carrier duly accepting goods for shipment containing information that

includes the item, quantity, value, date, and more.[4] This bill of lading is a contract to carry goods to the intended destination. It is the basis by which the seller can claim consideration (bill for the products) and the buyer can take delivery of the goods. The vendor invoice is a bill generated by the vendor and submitted to the purchaser once delivery is made.

Workflow Diagrams for a Paper-Based Business Process

Workflow is a term used to describe the tasks, procedural steps, organizations or people involved, required input and output information, and tools needed for each step in a business process.[5] A workflow diagram is used to visually represent the components of the business process. The workflow will vary from one organization to another depending upon the size of the organization and the organizational structure. An example of a manual requisition/purchase ordering process for an organization that has a purchasing department is shown in Figure 5.1 (p. 116).

In this manual system, a *purchase requisition* is created within a department and printed. A copy is filed in the initiating department and the original is forwarded via interoffice mail through a set number of approvals depending upon the size and structure of the organization. Once the requisition receives final approval and the supplier is identified, a purchase order is completed and the order is placed. A copy of the purchase order is filed in the purchasing department, and a copy is sent back to the originating office for filing. Unless there are questions about the order, the purchase order remains in a file folder until the item(s) purchased arrive, accompanied by a bill of lading.

Although not illustrated in Figure 5.1, the bill of lading is returned to the purchasing department to provide evidence of delivery. A vendor invoice may accompany the delivery or be sent to the purchasing department separately. If it accompanies the bill of lading, it is also sent to purchasing marked with the corresponding purchase order number for verification purposes. Upon verifying for accuracy, the purchasing department sends the vendor invoice to the accounts payable department for payment (if it has not been prepaid). The original paper invoice is retained by accounts payable, often for the remainder of the current fiscal year plus six years. A copy of the purchase order is filed and retained by the initiating department and the purchasing department according to the records retention schedule, commonly three years within the purchasing department but only one year within the department that requested the order. The retention periods and departments involved may differ from one firm to another.

Within this manual process, the same data may be entered more than once and duplicate copies of documents are likely to exist within and across departments. An analysis of the workflow can result in savings of time and space.

Workflow Diagrams for a Digital Process

In today's world, most records—including purchase orders—are born digital. They are created using a variety of software and technologies, many with a web-based interface. And because of the ease of access to digital records, use takes on a whole new meaning. Let's return to the purchase order as an example of an automated requisition and purchasing system, the records created, and the operational and informational value that can be derived.

The requisition creation and approval process can be made more effective through the use of an automated requisition system that focuses on efficient workflow. User security

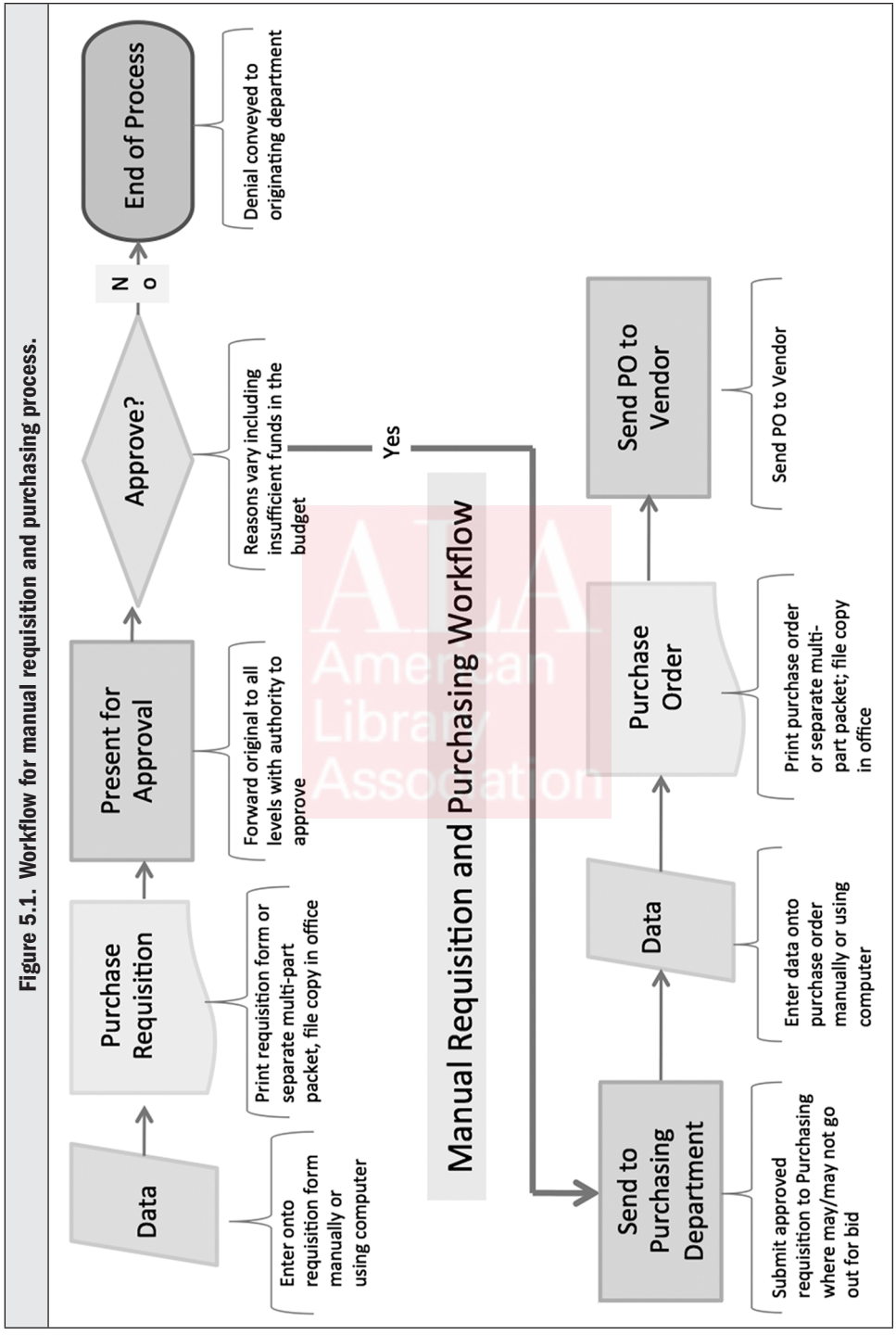


Figure 5.1. Workflow for manual requisition and purchasing process.

measures ensure that the end user preparing the purchase requisition can access only their own accounts. The end user may be required to enter quotes for the requested items. Those quotes may be electronically attached or scanned into the requisition maintenance screen for future reference.

The workflow process informs those with the authority to approve purchase requisitions that there are requisitions awaiting approval. In some organizations, there may be more than one level of approval before the purchase requisition is approved. The purchase requisition may be rejected at any level of approval for various reasons, including the fact that the amount requested is higher than the approved spending limit.

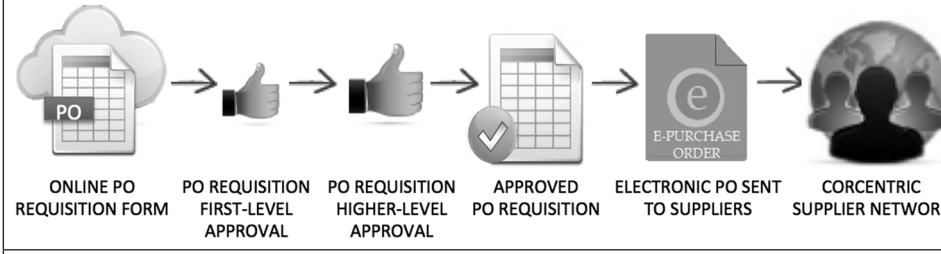
The outcome of the purchase requisition process is the purchase order. This may be accomplished through the use of an integrated module for purchase management or as part of a procurement management system that supports, automates, and standardizes all stages of the purchasing and procurement cycle from requisitioning to paying vendors. Once the purchase requisition reaches its highest level of approval, it can be converted into a purchase order (voucher) by a user with the proper security. The requesting department can be required to print a copy, but more often the purchase order will be saved to a file or e-mailed to the requesting party. Figure 5.2 illustrates an automated requisition/purchase order workflow process.

The examples shown in Figures 5.1 and 5.2 are just that, examples. The process can include a formal proposal process, purchases from unsolicited salespersons, phone calls to vendors, orders placed on the web, and trips to the local office supply store. The features of an automated requisition/purchasing process are many and can extend beyond the act of submitting a purchase order. The basics of the automated requisition process can include adding and maintaining suppliers, adding new requisitions, requisition approval workflow, requisition revisions and cancellations, converting requisitions to purchase orders, receiving process, invoice matching, and closing purchase orders and requisitions.

Some of the benefits derived from automating this process are:

- reduction or elimination of paperwork, including the cost of forms and paper, the hours spent by employees moving the paper, and the cost of filing and archiving;
- reduction in the time wasted in waiting for paper approvals that can result in delays to projects;

Figure 5.2. Automated requisition/purchase order workflow.



Source: Corcentric, "Electronic Purchase Order Software and Purchase to Pay Solutions," Accounts Payable (AP) Automation and Workflow Services, accessed December 14, 2012, http://www.corcentric.com/ap-automation/purchase-order-requisition.aspx. Courtesy of Corcentric, http://www.corcentric.com/.

- greater control of approved vendors by adding them to the system; and
- improved accountability by creating an audit trail of requests, approvals, and purchases.

Access controls are necessary to ensure that only authorized individuals have access to the system. That access will be conditional based upon roles and responsibilities.

Access Controls

Access control is the process by which users are identified and granted certain privileges to information, systems, or resources. Access controls can allow or deny access to a physical environment or an electronic environment. There are three types of access control methods: logical, physical, and administrative.[6]

Physical Access Controls

Attempt to board an airplane and you will understand physical access controls. You can't check your luggage unless it is screened. In addition to scanning, human screeners often open and inspect the luggage. You can't get into the boarding area unless you and your carry-on baggage are screened, most often automatically but at times by human screeners conducting what, in some cases, amounts to a "pat down." And, you can't board the airplane unless you prove you have purchased a ticket, been provided a seat, and are who you say you are. Authentication is established by providing a government-issued picture ID such as a valid driver's license or a current passport.

If you work in any large public or private organization, you understand that physical controls are used there as well. You may be issued a badge with your employee ID, name, and picture. The badge likely will serve as a smart card that can be read electronically. Once you are in the building, keypads may serve as another layer of security to control access to restricted rooms. Access to physical assets can be further controlled through the use of physical asset containers such as file cabinets, safes, or vaults that are protected and require codes, keys, or combinations to open.

Some corporate biometric access control systems based on a card, pin number, or fingerprint can handle thousands of users and be configured via a secure connection from any standard web browser. Access policies, user management, and reporting can be managed from an administrator's desk. Of all the biometric devices and scanners available today, iris cameras are considered the most accurate. They perform recognition detection based on an analysis of patterns visible within the iris of an eye.

Physical access controls can be breached, some more easily than others. IDs can be forged and buildings can be entered by waiting for someone else to open the door and walking in behind them as if you belonged. Security lies in layering the access controls in the hopes that a breach at one layer (e.g., workplace perimeter) will be discovered when the person moves on to the next layer (e.g., building), and the next (e.g., secure room).

Logical Access Controls

Protecting electronic information involves both physical and logical access controls. Logical access controls often entail the use of multiple security controls and authentication techniques. Logical access controls are found in databases, applications, servers, and even in

transit. Access to critical data should be determined by a person's role, and the need for access should be reviewed regularly.

The information technology (IT) manager must work with the business unit managers (data owners) to determine what access an employee should have to business information systems; for example, who needs access to the requisition and purchase order process in our previous example. Access could be extended to stakeholders outside of the organization, including vendors and clients. The records manager would work with IT to determine where records are created, how they are captured, and who needs access to the records.

When used within a firm that allows access from outside the country, IT access policies should be set by geographic region and then by user roles and responsibilities. This approach will help the firm comply with differing international standards for privacy. Just as with the ID badges for physical control, identification credentials must be issued (e.g., a digital signature) to authenticate the user. Three factors can be required for authentication:[7]

- Something you know (e.g., a password)
- Something you have (e.g., a certificate with associated private key or smart card)
- Something you are (e.g., a biometric such as fingerprint or iris)

Authentication assurance increases with the addition of a second and third authentication technique. In addition to establishing proof of identity, authorization to access the asset must be determined.

Today's technology allows employees to engage in *telework* (also called remote or virtual work), and organizations in the public and private sectors are taking advantage of the benefits. This means, however, a growing number of individuals need access to sensitive information from outside of the corporate firewall. Access can be provided through a virtual private network (VPN), which requires encryption and authentication of the remote client prior to access.

Access controls must also take into account mobile users of the system. In addition to the physical and logical access controls already discussed, networks can be made more secure, thus preventing unapproved access that could result in loss for the organization. These access controls would be applied by those responsible for information security. Two examples are:

- remote access server (RAS) or network access server (NAS) that serves as the access control point to allow or deny access to the local network, and
- firewalls that control traffic flow between a trusted network and an untrusted network.

Access Controls and Cloud Computing

Access control is a key concern when a firm moves critical applications and sensitive information to public and shared cloud environments. Cloud providers—such as Amazon, IBM, Google, Salesforce.com, and Sun—must provide access controls at least as robust as those employed by the client firm. Humans are still a factor, and employees of the firm providing cloud services must be screened and trained to the same standards as the client firm's own employees. Physical location of the cloud provider's data center must be evaluated for its physical security features, including authorized access and network requirements.

A service level agreement (SLA)—also known as a terms of service (TOS) agreement—is your contract with the cloud provider. Read it carefully, understand the contents, and negotiate the terms to reduce risks to your organization.

Factors to Consider When Selecting a Cloud Vendor

- *Physical location of your data and the level of security required for your customers*: Different countries have different requirements and access controls. Where are the cloud provider's repositories located? Do they use third-party providers? If so, where are their physical locations? Because the firm is responsible ultimately for compliance, it is necessary to include language in the SLA that requires the cloud vendor to store information where it is required by the firm.
- *Access to your data*: Is your data separated from the data of other users? Some vendors implement a multiple-tenancy model that stores information of multiple clients in a single instance of an application on the same server and/or in the same data store or repository.* Is it encrypted? What type of encryption?
- *Remedies for intrusion*: What happens if there is a security breach? Cloud computing attacks will grow as more companies move to the cloud. Potential attacks can include authentication attacks based on the factors discussed previously: what a person knows, has, or is.

* ARMA International, *Guideline for Outsourcing Records Storage to the Cloud* (Lenexa, KS: ARMA International, 2010), 13.

When evaluating the feasibility of contracting with a cloud service provider, keep in mind that access is dependent upon the Internet. How will the organization operate if Internet access is interrupted at either the vendor's or the organization's location? This is an issue that must be addressed in relation to the organization's disaster preparedness and business continuity plan for major interruptions. But minor interruptions due to network saturation, bandwidth capacities, and incompatibility with the organization's architecture will also adversely impact business operations.

Administrative Access Controls and Social Media

A third method to control access results from administrative action that includes developing policies and procedures, providing education and training, and monitoring and evaluating use. These controls must remain current to reflect the use of emerging technologies and evolving laws and regulations. In order to protect the organization from risk due to social media, access control processes should complement the social media and records management policies. Social media used to reach out to the public involves the use of technologies controlled by third-party providers; content may be stored in multiple locations, content may be created by multiple collaborators, and interactive content management may be a requirement. Many of the factors to be considered when selecting a cloud provider apply when evaluating the use of social media.

While most employees will engage in social media activities in their private lives, social media activities on behalf of the firm can be limited to authorized employees. Those employees should understand their roles and responsibilities. They should be provided user IDs and passwords to access the account(s) and to speak on behalf of the organization. The best protection for both the individual engaging in social media interactions and the organization requires the development of clear but comprehensive social media and records management policies followed by employee education and training.

Active Storage Systems

Records in the active phase of the records lifecycle are stored in a way that allows daily access and use. Physical records can remain in file cabinets in the office environment close to those who refer to them in the course of business. In education, for example, student folders with documentation of courses required for their program, courses already taken,

and courses planned might be located in the advisor's office, easily accessible for use during meetings with students. When use drops off, such as when a student graduates or transfers to another school, permanent records are often microfilmed and stored in physical control containers, such as vaults.

In an electronic environment, information used in the course of business is also stored in a manner that allows immediate access. For example, student information can reside in a student information system (SIS), also known as a student records system (SRS). The SIS is a software application used to organize student information and conduct operations. The systems vary in size, scope, and capability, and the functions of the system can support admitting, advising, and registering students, recording grades, and storing student records. In addition to allowing the advisor access to information about a student, the same information can be made available to multiple users—including the student—simultaneously. Access rules can be set up to allow access only to the information users need to perform their work.

Retention requirements must be considered when deciding upon the storage medium used. For example, the University of Pennsylvania's Records Retention Schedule, as adopted on July 17, 2011,[8] sets the requirements for student records shown in Table 5.1. As you can see on the schedule in Table 5.1, transcript requests should be disposed of after one year. They can be digitized and stored electronically or stored as paper in a file folder in a cabinet in the office until the end of that year. Grades should be retained permanently. If they are retained electronically, they could remain in the SIS for fast retrieval, but their use would diminish over time. Transfer to a more permanent medium for long-term storage, such as microfilm, may be a more viable option than managing the information in a database permanently.

According to the university guidelines, the office of origin has the option of maintaining most records in their office or of transferring them to the university records center. In some

Table 5.1. University of Pennsylvania's records retention schedule for student academic records.

Record type	Retention period
Admission records	10 years
Grade records	Permanent
Other academic records	5 years
Career planning and placement	4 years
Class schedules	Transfer to UARC after 2 years; permanent
College catalog	Transfer to UARC after 2 years; permanent
Degree audit records	5 years after date of last attendance
Disciplinary action records	5 years after graduation or date of last incident
Student academic files (departmental)	5 years
Transcript requests	1 year

Source: University of Pennsylvania, University Archives and Records Center, "University of Pennsylvania Records Retention Schedule: Academic/Student Records," University Records Center, last modified June 17, 2011, http://www.archives.upenn.edu/urc/recrdret/studtacad.html.

cases, however, permanent records, including class schedules and the college catalog, *must* be transferred to the university archives and records center. We'll discuss inactive records management and long-term preservation further in Chapter 10.

Student information systems can be integrated with other tools, such as learning management systems (LMS) used for online instruction. If so, grades computed in an LMS could be transferred electronically into the SIS at the end of the term. Grades stored in a grade book database in the LMS and transferred to the SIS utilize structured data, columns, and rows of data.

Alongside the information stored in databases, other systems—both paper and electronic—hold different types of data. Student requests for transcripts, for example, may arrive in the mail in the form of a letter. Regardless of whether the letter is filed in a physical file or scanned into a content management system, the data contained is unstructured and difficult to search. Schools also provide information for prospective and current students on their website in addition to or in place of the traditional print catalog. Data contained in webpages may be stored in a web content management system with associated metadata to enable search and retrieval based on content. That data is considered semi-structured.

Structured, Unstructured, and Semi-structured Data

The terms *structured data*, *unstructured data*, and *semi-structured data* have long been used by professionals in the information technology sector. Because a team approach is needed to manage information and records today, records and information managers should understand the vocabulary that may be used by other members of the information governance team. More important, though, is understanding the systems that manage these types of data. Simply put, structured data is synonymous with database data managed by database management systems and unstructured data with electronic objects managed by electronic document, electronic content, and electronic records management systems.

Figure 5.3. Index cards in card catalog.

Source: © Lars Aronsson, Creative Commons ShareAlike 1.0 License.

Structured Data

Have you ever used a card catalog? The data included in a card catalog—such as the author of the work, the title of the work, and the date of publication—is considered structured data (see Figure 5.3). The term *structured data* today refers more commonly to a database where specific information is stored based on a methodology of columns and rows. Databases can be classified based on the content type, for example, bibliographic, document-text, statistical, or multimedia objects.

They can also be classified according to their application, such as accounting, movies, manufacturing, or insurance. Metadata associated with each of the records within the electronic file are used to display those records within columns and rows as shown in Figure 5.4. Structured data is easily searched, mined, and manipulated.

Figure 5.4. Structured data is also known by the term *database data* because of the format and presentation of the data.

Structured Data		
ID	Name	Grade
1	Student Name No. 1	B
2	Student Name No. 2	A
3	Student Name No. 3	B+
4	Student Name No. 4	B
5	Student Name No. 5	A-
6	Student Name No. 6	B
7	Student Name No. 7	A
8	Student Name No. 8	C
9	Student Name No. 9	B
10	Student Name No. 10	A

Data Presentation

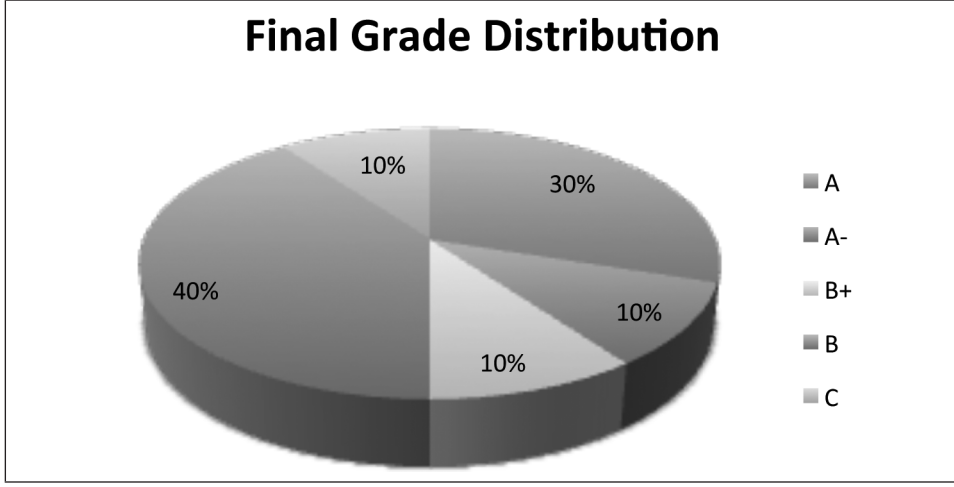
Reports, tables, and charts provide "snapshots" of data in the database at specific points in time. These formats make it easier for the busy individual to derive meaning from the data stored in a database. For example, the fact that a grade of B was earned by 40 percent of the students while a grade of C was earned by only 10 percent is easily and quickly understood by those viewing Figure 5.5.

Reports, tables, and charts produced from data in the database can be managed with software intended to manage unstructured objects, for example, electronic document management, electronic content management, and electronic records management system software.

Relational Database Management Systems (RDBMS)

The student grades example in Figure 5.4 displayed information from one database table that contained the student ID, student name, and student grade. But, popular database management systems are relational systems (RDBMS) that store data in collections of tables (also called entities). Each table consists of columns (properties of the table referred

Figure 5.5. End-of-term letter-grade distribution for students in one class.



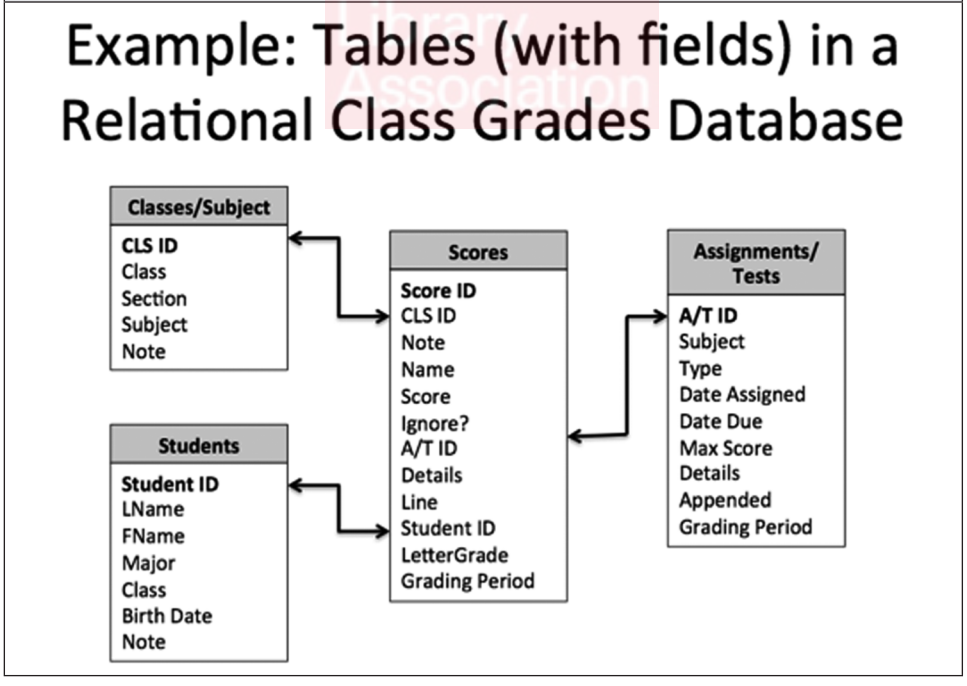
to as fields, such as student name and grade) and rows (also called records, such as an individual student's record) as shown in Figure 5.6.[9] Relations are defined between tables for cross-referencing using a primary key, for example, the ID assigned to each student in Figure 5.6. Data can be pulled from more than one table in a relational database to create a record (student scores on assignments and tests, for example).

Information technology personnel are usually responsible for managing the relational database, but they may not understand the records retention implications of creating records using data from tables in a relational database. Because the official record is comprised of the tables' fields, rows, and elements, plus the relationships between the tables, the record will be incomplete if one table containing information used to build the record is missing. RIM professionals must ensure that the records retention schedule is modified so that when it is applied to structured content, none of the tables are removed prematurely. This involves working with IT, and under certain circumstances the vendor, to explain what the different records series mean and how to apply the records retention schedule so that data is not disposed of without consideration of the relationships between that data and other data in the database.

Unstructured Data

Only 5 percent of data today is structured, reported Oracle's Asia-Pacific vice president of Exadata and strategic solutions, Christopher G. Chelliah, at the 2012 OpenWorld conference.

Figure 5.6. The primary key (ID in bold) in each table relates to the same ID in another table.



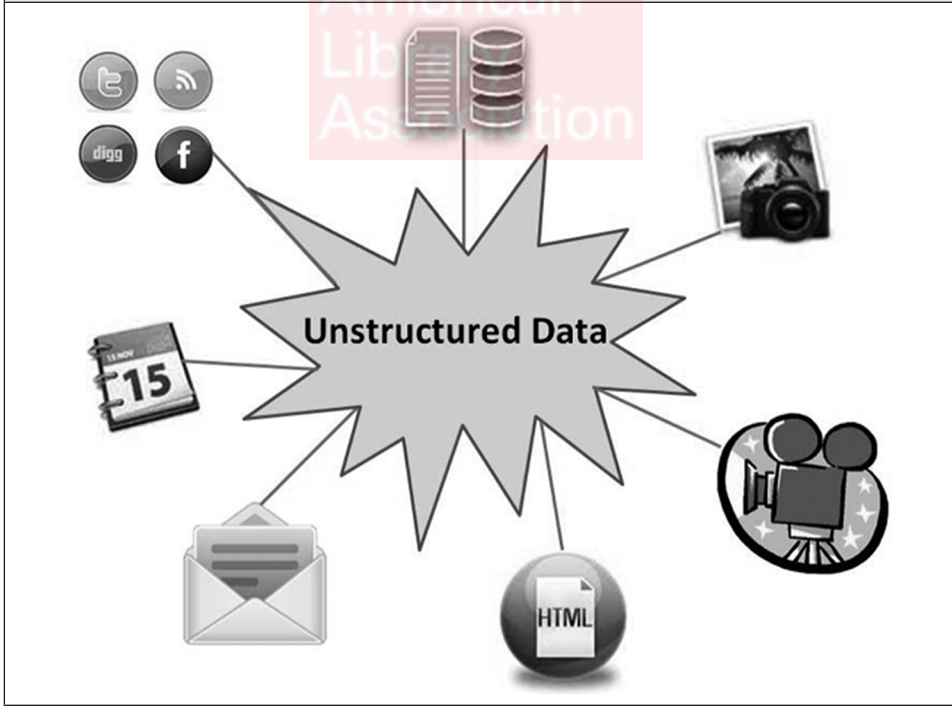
The other 95 percent lies in unstructured data primarily from the emergence of social media networks, customer information from telcos and utilities such as call history, messaging logs, and usage trends, and information services such as traffic data, weather information, and stock indices.[10]

Unstructured data has no well-defined model or schema for accessing information and typically includes digital images/objects, text, and other data types not part of a database (see Figure 5.7). E-mail messages, instant messages, Word documents, images, PowerPoint presentations, blogs, and MP3 files are all examples of unstructured data.

An easy way to determine if an item is unstructured is by asking if it is easily searchable (i.e., without adding metadata or using a crawler like an index server). If the answer is no, it is unstructured data. One of the biggest challenges facing organizations today is discovering a way to extract value from the vast amount of unstructured data produced. Organizations can capitalize on this vast amount of data by applying business intelligence applications and technologies for gathering, storing, analyzing, and providing access to unstructured data in order to help the enterprise make better business decisions.[11]

Wall Street traders, for example, have found they can use computer programs to monitor and decode words, opinions, and even keyboard-generated smiley faces posted on Twitter. Johan Bollen, a professor at Indiana University and co-author of the study linking Twitter mood measurement to stock market performance, claims an 87 percent accuracy rate in using Twitter mood measurements to predict Dow stock prices three to four days later.[12]

Figure 5.7. Unstructured data examples.



This type of knowledge about human emotions can be used as a basis for placing trades in order to profit from the information.

Structured data has been an IT-led activity, but unstructured data can best be understood by business units working with the data. Records managers can play a role in identifying the multiple ways in which unstructured data is generated and can assist the organization in developing a strategy to capture, manage, and derive value from it.

Semi-structured Data

Once unstructured data has been organized and/or has metadata attached that describes content, it is considered *semi-structured*. SharePoint lists, document libraries, and project and team sites are examples of semi-structured data. Although the web may appear to be a vast database, most of the information on the web consists of unstructured data. Hypertext Markup Language (HTML) is the publishing language of the web, and it is used to provide structure that tells the web browser how to present the page. But webpages marked up with HTML tags cannot be queried based on those tags. When the Extensible Markup Language (XML) is used to describe the content of the HTML document, those documents can be queried based on that content. XML is not a replacement for HTML; it doesn't do anything except wrap information in tags that can be used by software to send, receive, or display it.

In Figure 5.8, the HTML tags <h1> </h1> surrounding the word *bibliography* tell the web browser that the word should be displayed as a header (large, bold). The   tags tell the browser the content between the opening and closing tags should be treated as a paragraph, which means adding a blank space before and after. The <cite> </cite> tags instruct the browser to tag the words between the opening and closing tag as a title of a work and to display the title in italics. The <br> creates a line break on the webpage. These

Figure 5.8. Comparison of HTML and XML markup.

```
<h1> Bibliography</h1>
<p><cite>Title of Book </cite>
Author 1, Author 2, Author 3<br>
Publisher, Date of Publication</p>
```

HTML

1. *provides structure*; for example, text between and is one paragraph,
2. *define content*; for example, <cite> and </cite> is used to define a phrase between the tags as a reference source.
3. *specifies appearance*; for example, text between <cite> and </cite> will typically be displayed as italics.

```
<Bibliography>
    <book>  <title> Title of Book 1</title>
            <author>author 1</author>
            <author>author 2</author>
            <author>author3</author>
            <publisher> Publisher </publisher>
            <year> year </year>
    </book>
</bibliography>
```

XML *describes content*; for example, the text between the tags <author> </author> is described as the author of a work.

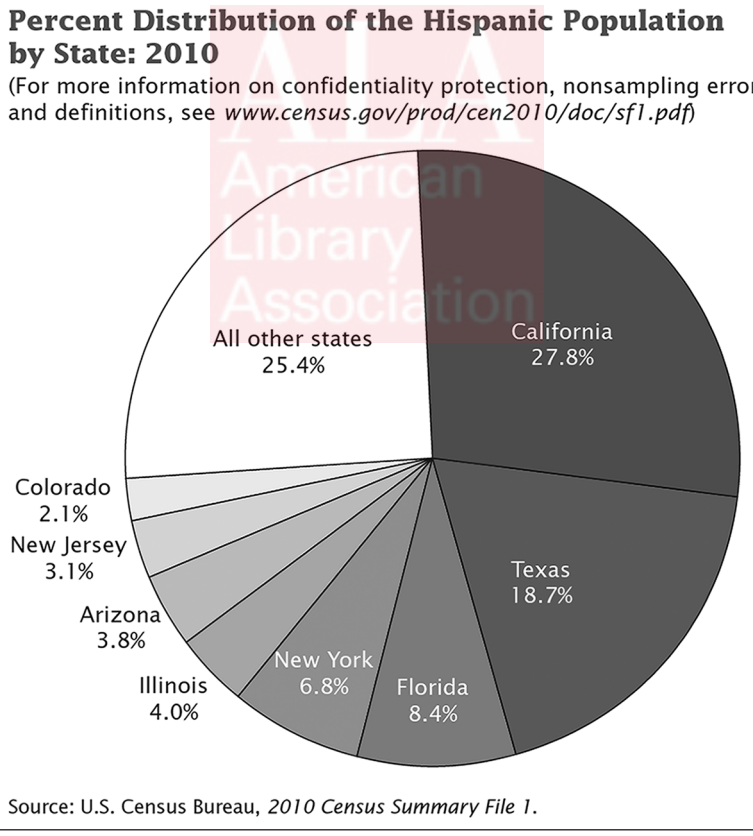
tags provide display instructions to the browser, but they don't facilitate search and retrieval of a work based on the title, any of the authors, the publisher, or the date of publication.

XML is a markup language for documents that contain structured information. However, since XML files don't conform to the formal structure of tables and data models associated with databases, information contained within an XML document is considered semi-structured. In addition to web documents, semi-structured data can be found in e-commerce transactions, mathematical equations, vector graphics, object metadata, and server application programming interfaces (APIs).

Big Data

Now let's turn our attention to the pie chart in Figure 5.9 illustrating the percent of distribution of the Hispanic population in the United States based on data from the US Census Bureau, 2010 Census. Data acquired as part of the 2010 Census, and other big data, is difficult to work with using traditional data management options.

Figure 5.9. Chart developed from US 2010 Census data.



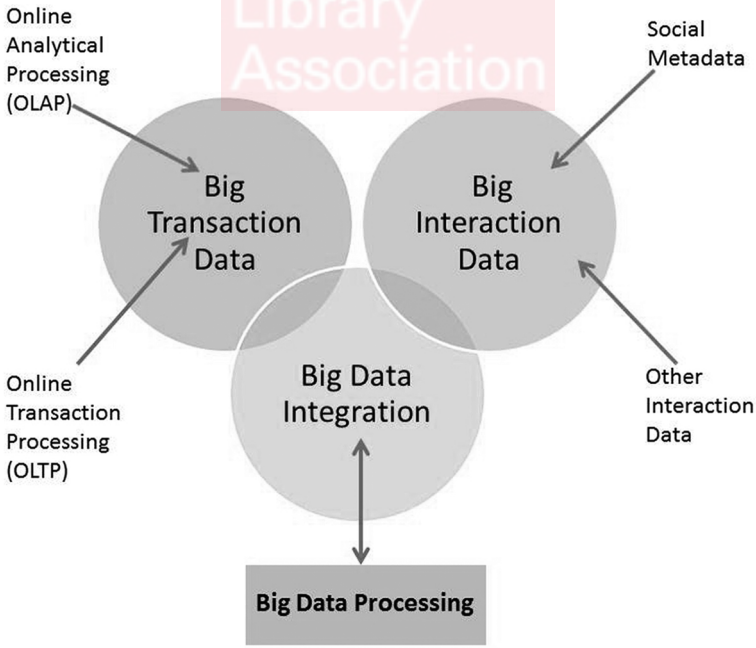
Source: US Census Bureau, *The Hispanic Population: 2010* (2010 Census Briefs), May 2011, http://www.census.gov/prod/cen2010/briefs/c2010br-04.pdf.

Big data can be defined as "data so large that it is difficult to process with traditional database and software techniques."[13] The term can be used to describe both structured and unstructured data "consisting of billions to trillions of records of millions of people—all from different sources (e.g., web, sales, customer contact center, social media, mobile data, and so on)."[14] The term is also used to describe the tools and techniques used to manage big data.

Organizations can incorporate big data techniques into their existing architecture. For example, radio frequency identification (RFID) tags can be used to track every product manufactured by an organization and stocked in customer stores around the globe, providing updates that can be used to understand what is being purchased and where. Market intelligence can be mined from billions of tweets that are posted to Twitter each month. Complex machinery producing terabytes of data per hour can be monitored and examined by engineers in near real time or can be mined later for engineering improvements.

Enterprises should seek opportunities to integrate the different types of big data stored in silos. Services are emerging that focus on this type of data integration. According to Informatica, a data integration company, "Big data is the confluence of three trends consisting of Big Transaction Data, Big Interaction Data, and Big Data Processing."[15] (See Figure 5.10.) Tracking products using RFID tags is an example of processing big transaction data. Marketing intelligence mined from tweets is an example of big interaction data. Integration of these types of data for processing and analysis is the value data integration companies provide.

Figure 5.10. Big data is the confluence of three trends.



Data Warehouse and Data Warehouse Systems

One way to gain valuable insights from the huge amounts of fast-flowing data facing large enterprises today is to transfer a copy into a data warehouse where it can be queried and analyzed without negatively impacting the transaction system. A data warehouse, as defined by Bill Inman, the "father of data warehousing," is a "subject-oriented, integrated, time-variant and non-volatile collection of data in support of management's decision-making process." Ralph Kimball, the "father of business intelligence," preferred a more simple definition with the focus on function: "A copy of transaction data specifically structured for query and analysis."[16] Both Inman and Kimball recognized the need to bring copies of valuable data together so that it can be queried and analyzed to support strategic decision making. The difference in their philosophy rests mainly on which comes first, the data warehouse or subsets called data marts.

A *data mart* is a specific, subject-oriented repository of data gathered from operational data and other sources and designed to serve the needs of a particular community of knowledge workers. The *data warehouse* is a central aggregation of data (which can be distributed physically) that starts from an analysis of what data already exists and how it can be collected and later used.[17] A synopsis of the two perspectives is provided in Table 5.2. Records managers immediately recognize that the contents of both the data warehouse and the data mart are duplicates of data already in existence. The question is, "Are the data stored in data warehouses and data marts records?" Some believe "they are and the records manager should have overall responsibility for the data."[18]

Table 5.2. Data warehousing and data marts—two perspectives.

	Bill Inmon	Ralph Kimball
Father of . . .	Data warehousing Credited with coining the term *data warehouse*	Business intelligence Credited with defining the concepts behind "data marts"
Definition of data warehouse	A subject-oriented, integrated, time-variant and nonvolatile collection of data in support of management's decision-making process.	A copy of transaction data specifically structured for query and analysis.
Focus	Design	Functionality
Paradigm	An enterprise has one data warehouse, and data marts source their information from the data warehouse.	Data warehouse is the conglomerate of all data marts within the enterprise. Information is always stored in the dimensional model.
View of data marts	Data warehouses can become enormous with hundreds of gigabytes of transactions. As a result, subsets, known as "data marts," are often created for just one department or product line.	Start with building several data marts that serve the analytical needs of departments, followed by "virtually" integrating these data marts for consistency through an information bus.

Note: Data warehouses in most enterprises resemble Kimball's idea because they start out as a departmental effort, originating as a data mart, and once additional data marts are added, a data warehouse is created.

Search and Retrieval Process

The search and retrieval process is dependent upon the storage system(s) in use. Storing data is one side of the coin; the other side is being able to retrieve it. Let's look at each data type—structured, unstructured, semi-structured—and some associated search and retrieval methods.

Basic Search Terms

keyword search: A type of search that looks for matching documents that contain one or more words specified by the user. This is a good substitute to find a document when you do not know the authorized subject heading or the complete name of the author of the document.

Boolean search: A type of search allowing users to combine keywords with operators such as AND, NOT, and OR to make keyword-based text searches more precise. Boolean operators can be used with most database and web search engines.

faceted search: Also called *guided navigation*, faceted search is a type of navigation model that leverages metadata fields and values to provide users with visible options for clarifying and refining queries. Faceted searches allow the user to filter data through multiple paths and different ordering. Database-driven e-commerce catalogs have facets of price range, color, brands, and more.

field search: A search for a term or number within a particular data field of a document or database. An online telephone directory allows users to search within fields.

full-text search: A search that compares every word in a document, as opposed to searching an abstract or a set of keywords associated with the document. Most web search engines perform this type of search.

reverse index search: A search using an index of keywords which stores records of matching documents that contain those keywords.[a]

structured search: Structured search is a method of using the structure of a document to help users find the right documents in a large collection of documents.[b] The three types of structured searches are: Boolean (Structured Query Language, or SQL) search, keyword (vector) search, and reverse indexes.

vector search model: The vector model considers a search query as a vector in keyword space and then scores the items located based on the distance from the query calculated by counting the number of times keywords appeared in each document, the size of the document, and the *density* of the keywords in the document.

[a] SuperGlossary.com, Business, Search Engine Optimization (SEO), page 15, accessed February 2, 2013, http://www.superglossary.com/Glossary/Business/Search%20Engine%20Optimization%20%28SEO%29/Page15/

[b] Dan McCreary, "Structured Search (Version 4)," Slideshare, last modified November 21, 2010, http://www.slideshare.net/dmccreary/structured-search.

Structured Data: Search and Retrieval Methods

From a user standpoint, it is not necessary to understand how to program a database, but it is important to understand how to use a database management system and its search and retrieval mechanisms to obtain the desired information.

Structured data is stored in a database that can be presented in tables comprised of columns and rows. Programming languages have been developed to manage structured data. SQL, which is an American National Standards Institute (ANSI) and International Organization for Standardization (ISO) standard, is the original data definition and query language for updating, deleting, and requesting information from databases. The program runs on a server interpreting actions taken by users who manipulate the data using tables, columns, rows, and fields. The client programs send Structured Query Language (SQL) statements to the server for processing. The replies are returned to the client program.

A database management system is necessary to access and process data contained in the SQL database. MySQL is a popular open source database management system used in web applications. SQL is also used in commercial applications.

Structured Search and Retrieval Example: Lexis/Nexis

LexisNexis is a subsidiary of Reed Elsevier, headquartered in Dayton, Ohio. The group started in 1970 as a database named LEXIS that was a continuation of the Ohio State Bar's efforts to offer full-text searching of all Ohio court cases. By the time it went public in 1973, it had added New York cases to the database. In 1980, the database contained all of the US federal and state cases, and the NEXIS service was added to give journalists a searchable database of news articles.

If you visit the LexisNexis Support Center, you will encounter an abundance of resources available to help the researcher. Basic search tips make recommendations on the use of capital letters, connectors, noise words (*stop words* such as *a* and *the* that are disregarded in a search), developing a search request, and an introduction to traditional Boolean searching. To find documents concerning employee drug tests, for example, you might use this search request:[19] *Drug w/5 test or screen! w/10 employ!* This search request is not natural language. The user must learn how to search on this system in order to locate the desired information. And this is only one type of system. Search tips for other databases reveal different strategies that must be employed by the user.

Search and Retrieval Options: Library of Congress

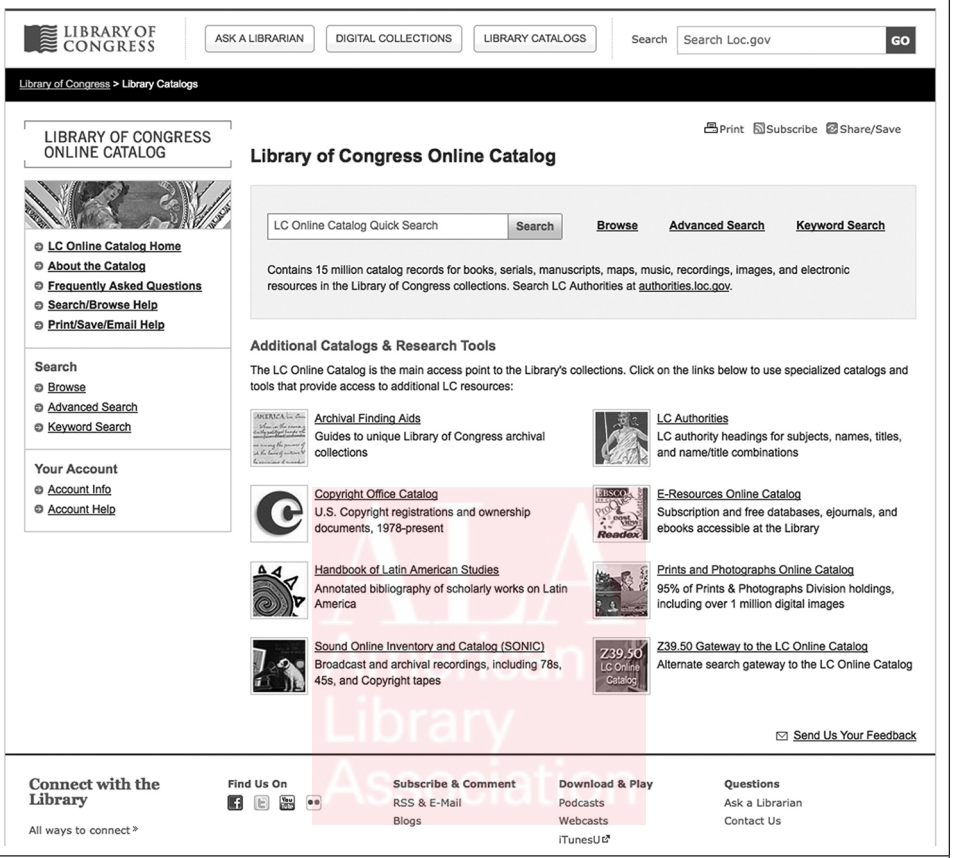
Note the search options available for the Library of Congress (LOC) Online Catalog shown in Figure 5.11 (p. 132). One method to search the LOC online catalog allows the user to insert a subject keyword. This allows a search for any word or phrase found in one of the subject heading controlled vocabularies used at the LOC. If the user doesn't know what words are in the controlled vocabulary, he or she can view the latest edition of the *Library of Congress Subject Headings* (*LCSH*), which includes approximately 337,000 total subject headings and references. The 33rd edition of this document is said to be "indispensable if you want to provide accurate reference information to readers."[20] It is available in six volumes containing 9,432 pages, hardbound, and updated annually.

Structured data can present the desired results if the user knows how to conduct a search. Business units should provide training to employees who are the end users of the systems. Records managers should understand the types of records generated by these systems, where they reside, and how they can be managed. The IT department in most cases will *own* the systems and have ultimate responsibility for the information managed, but effective information governance requires that all stakeholders are involved. If the systems are used to share information with the public, instructions to facilitate search and retrieval must be provided.

Unstructured Data: Search and Retrieval Methods

Industry studies have found that 60 to 80 percent of unstructured content is never used again 90 days after its creation.[21] This fact raises the question, why are we storing it? If this content has no value and could present risk if retained, resources should not be devoted to storing and protecting it. If it has value, that value should be identified and used.

Figure 5.11. Library of Congress Online Catalog.



Source: The Library of Congress, http://catalog.loc.gov/.

Vendor-Provided Solution: Google Search Appliance

Workers accustomed to performing Google searches in their private lives may wonder why a simple Google-like search couldn't be used to locate and retrieve information in the workplace. Actually, there are such solutions, including the Google Search Appliance (server hardware), that search both structured and unstructured data inside the organization, across all departments and teams regardless of geographic location and in multiple languages. This appliance crawls the content stored on web servers, file servers, content management systems, relational databases, wikis, and business applications and creates a master index of documents to be used in retrieval using Google's search technology. Enterprise enhancements not available in the public option include query suggestions, key matches, quality and ranking, automated synonyms, personalized search, spell-checker, and multiple languages support. One of the current models can handle up to 30 million documents. To handle larger volumes (in the billions), multiple search appliances can be linked together.

Open-Source Solution: Apache Solr

Open-source products are increasing in popularity and use. One open-source enterprise search platform is Apache Solr. Major features of this product include full-text search, hit highlighting, faceted search, database integration, rich document (e.g., Word, PDF) handling, and geospatial search.[22] This is a description of one product only, and alternatives should be considered. Solutions such as Apache Solr require more in-house IT expertise than a solution such as the Google Search Appliance, which can be implemented almost directly out of the box. However, in the long run, an open-source solution may be less expensive. These are factors that must be considered when determining the best search and retrieval solution for the enterprise. The role of the records manager is to keep abreast of search and retrieval options and to provide input from a records management and user perspective.

Semi-structured Data: Search and Retrieval Methods

Semi-structured data is often grouped with unstructured data when discussing search and retrieval methods. We're going to look at two examples of search and retrieval methods especially useful when working with semi-structured data.

Extensible Markup Language (XML)

As stated previously, XML is a markup language developed to describe the content of web documents. It uses standard descriptions for labeling digital information and automates the identification of material and exchange of data between computers. Data is stored within XML tag sets so that it can be searched, transmitted, or updated by any application that recognizes XML tags. XML can be used to label the information content of diverse data sources, including structured and semi-structured documents, relational databases, and object repositories.

An advantage of a search for XML documents is increased precision in search results. Consider a search for a document written by an author named *Black* using a full-text search for the name *Black*. The query might return documents with black as a color or black as a mood. Even the addition of the word *author* to create a Boolean search term of *Black AND author* may not reveal the required results if the word *author* is not included in the document and instead the contribution by the author is written as *contributed by*. However, if the author's name were marked up using XML as <*author*>*Black*</*author*>, the search would be more precise.

XML tags provide structure, but the tags themselves are not standardized. Unlike HTML with its predefined tags, any individual, organization, or industry can define their own XML tags. This is an advantage in that the organization or industry can use XML tags relevant to their situation. But the disadvantage is the resulting inconsistency across organizations and industries. This can be illustrated by the <*author*> </*author*> tag set used previously. What if the document was marked up using the tags <*contributor*> </*contributor*> instead of *author*? A search for author would not produce the desired results.

Two methods can be employed to express the XML system used:

- Document type definition (DTD) lists what tags can be used with the XML document along with their content and relationships to one another.
- XML schema—the newer, more powerful approach—provides the rules an XML document has to follow.

XML schemas (documents defining the *legal* building blocks of an XML document) do much more than describe the elements that can appear in a document, such as *author* or *contributor*. They also define, among other things, attributes that can appear in a document and the default and fixed values for elements and attributes. Schemas set expectations. For example, the format of a date can be confusing. In some countries *6-11-2014* is interpreted as June 11, 2014, but in others as November 6, 2014. The schema can ensure mutual understanding of the date by setting the date element with a data type like this:

<date type="date">2014-06-11</date>

The XML data type *date* requires the format of *YYYY-MM-DD* and ensures an understanding of the content because the XML date is always formatted as *YYYY-MM-DD*.

Vendors contribute to the problem when they use nonstandard XML tags in their products. But they can also be part of the solution. OASIS (Organization for the Advancement of Structured Information Standards) is a not-for-profit consortium that drives the development, convergence, and adoption of open standards. A technical committee of OASIS comprised of several large enterprise content management (ECM) system vendors—including Microsoft, IBM, Oracle, and SAP—developed the Content Management Interoperability Services (CMIS) specification to standardize a web services interface specification to enable interoperability of ECM systems. CMIS allows developers to create applications for CMIS-compliant content management systems to migrate content from one system to another. CMIS also allows users to share and access data across multiple content management systems.

More recently, OAIS launched an open-standards initiative to define a model for delivering aggregated content into a total web experience. Known as Web Experience Management Interoperability (WEMI), the technical committee will pull together a features set to enable organizations to optimize and manage online engagement with users, including through social networking and end-user devices.

This brief discussion is not meant to tell you all you need to know about XML or the open-standards initiative. Rather, it is included to provide a glimpse into the technology in use or in development that will impact information systems that create, store, and manage information assets.

Semantic Search

Semantics refers to the meaning of words. A *semantic search*, therefore, will search and discover the meaning of words and not just their occurrence. The concept of a *semantic network model* was coined in the early 1960s, but it was not until the advent of the World Wide Web that the concept of the semantic web (Web 3.0) was introduced as an extension to enable people to share content beyond the boundaries of applications and websites. Unlike the relationships built using hyperlinks within webpages, on the semantic web, the relationships are named and understood; for example, a relationship binding a person and his/her e-mail address.

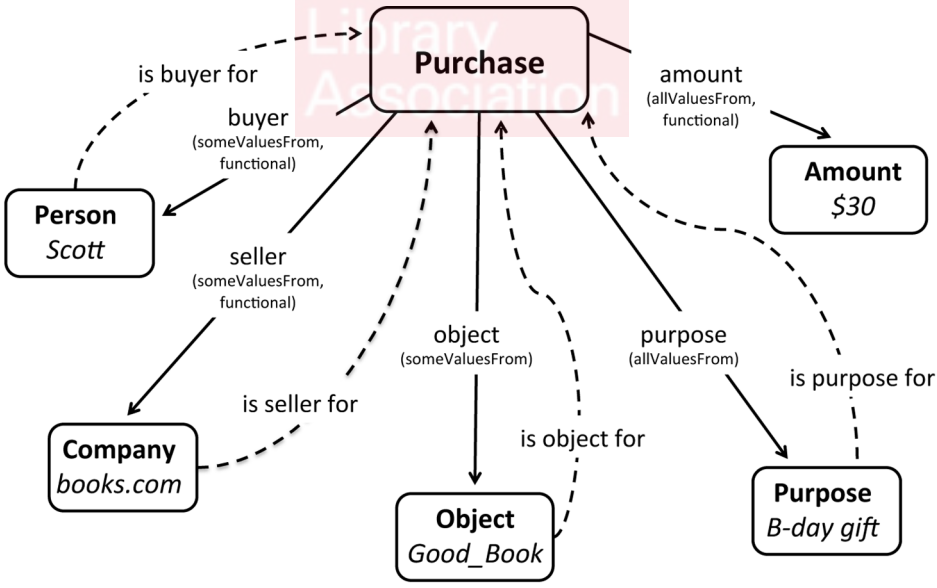
Semantic search engines return results based on their ability to understand the definition of the word or term being searched for and to understand the context in which the words are used. According to the World Wide Web Consortium (W3C), the vision for the semantic web is to extend the principles of the web from documents to data.[23] The inability to easily

share information residing in disparate repositories (silos) is a major deterrent to the efficient use of an organization's information assets. The integration of independent silos of data is one application that would benefit from semantic search.

Figure 5.12 illustrates the two-way relationship that exists between a purchase made and various facets of that purchase. This relationship can provide the basis for a *semantic faceted* search in which users explore a collection of items (purchases) by browsing their conceptual dimensions (facets) and their values (facet values).[24] Note the relationships expressed in Figure 5.12. They can be expressed as *the purchase of a "good book" was made for $30 by Scott from books.com as a birthday present*. The name of the recipient could be another facet providing additional information. A search on almost any one of these facets can provide valuable business intelligence. For example, who made this purchase? Scott. What do we know about Scott and how do we act on that knowledge? Two facts are apparent:

- He liked that *good book*. Maybe he will like similar books? Who else bought the *good book*? What other books did they purchase recently? Maybe Scott should be informed in case he'd like to buy those, too.
- He bought it as a birthday present for Zoe Franks. Perhaps he'd like to register the recipient of the gift in a birthday registry. Reminders of Zoe's birthday may result in repeat sales.

Figure 5.12. Semantic search explores relationships between an instance (purchase) and its facets.



For this illustration, the purchase has 1 buyer (Person), 1 seller (Company), and 1 object (Object).

You were introduced to ontologies in Chapter 3. The data in parentheses in the chart, for example, (allValuesFrom), are properties in the Web Ontology Language (OWL) vocabulary. OWL is a semantic markup language for publishing and sharing ontologies on the World Wide Web.[25] OWL was developed as a vocabulary extension of the *Resource Description Framework* (*RDF*). *RDF* is the standard model for data interchange on the web that allows structured and semi-structured data to be mixed, exposed, and shared across different applications.

Metadata and Metadata Standards

Archivists and records managers have long used metadata to create finding aids, file lists, inventories, and file plans. Records managers also capture metadata to manage records in records management systems. You became familiar with records management metadata in Chapter 3. This chapter will introduce you to metadata used for different types of digital objects, including images, publications, and music.

Metadata is structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use, or manage an information resource.[26] A metadata framework involves five components:

- *Schema:* a systematic, orderly combination of elements and terms
- *Vocabulary:* the value that would be entered into the schema
- *Conceptual model:* a model describing how all the information and concepts in a resource relate to one another
- *Content standard:* a standard that describes how vocabularies should be entered within the metadata schema categories
- *Encoding*: a method used to present the metadata (e.g., XML)

In 1995, work began on a set of metadata elements that would provide a basic group of text elements to describe and catalog digital resources. At the time, fifteen text fields were developed and called the *Dublin Core* after Dublin, Ohio, where the work originated. The Dublin Core metadata element set is now an international standard, *ISO 15836:2009: Information and Documentation—The Dublin Core Metadata Element Set*.[27] A Dublin Core metadata record can describe physical resources, digital materials, or composite media, such as webpages. The original fifteen elements are shown here:

- Title
- Creator
- Subject
- Description
- Publisher
- Contributor
- Date
- Type
- Format
- Identifier
- Source
- Language
- Relation
- Coverage
- Rights

The Dublin Core allows for extensibility; the elements can be added to and built upon to meet the needs of the organization. Metadata can be stored with the digital object or separately in a database. When metadata is associated with a digital object, the elements are encased in a tag and the source is identified by a *dc* for Dublin Core as in this example:

<dc:creator>Sam Franks</dc:creator>

In this example, Sam Franks is added as descriptive metadata to credit her as creator of the work. In addition to descriptive metadata, structural and administrative data can be applied to a digital object.

Descriptive Metadata

Descriptive metadata is information describing the intellectual content of the object. XML is an encoding language used to describe content. But the metadata encoded will vary depending on the object and the metadata schema used. It will even vary by equipment used to create it and software used to manipulate it.

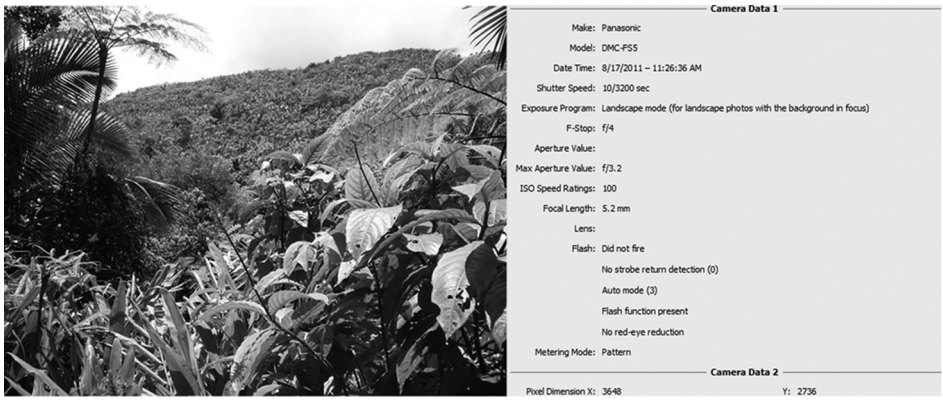
When a digital image is viewed in a popular graphic imaging program, for example, a form is available for the user to enter descriptive metadata in the following fields: document title, author, author title, description, description writer, keywords, copyright status, copyright notice, copyright info, and URL. However, descriptive metadata added by the camera automatically is also available (see Figure 5.13).

Metadata standards exist to facilitate interoperability. Although an organization might develop their own metadata schema for in-house use, problems occur when the collection is shared with outside institutions. Metadata standards have been developed for digital still images such as the one in Figure 5.13, but unfortunately, there is no definitive metadata standard that can be used without modification. Standards for digital still images include "Categories for the Description of Works of Art" (CDWA) and "MIX: NISO Metadata for Images in XML Schema" (MIX).[28, 29]

Structural Metadata

Structural metadata describes the physical and/or logical structure of complex digital objects, for example, how scanned pages should be assembled into a book. It can be used to describe the relationships between an object's component parts and is often used to facilitate navigation and presentation of complex items. The content organized by a structural metadata map may be a mix of digital content files, including structured or unstructured text, images, audio, video, and/or applications (e.g., PDF).

Figure 5.13. Metadata added to image file by camera.



Scanned Books and Publications

When considering a structural metadata scheme, it is necessary to consider the type of digital items being modeled and how they will be used. Scanned pages of a book would best be marked up in the Metadata Encoding and Transmission Standard (METS). One benefit of using METS for digital libraries is the number of page-turning applications that understand METS.

METS is a standard for encoding descriptive, administrative, and structural schema for digital objects. It was developed in 2001 for the Digital Library Federation (DLF), was approved as a NISO standard in 2004, and is maintained by the Library of Congress.[30]

The METS XML document format consists of seven major sections: header, descriptive metadata section, administrative metadata section, inventory of content files comprising the digital object, structural linking section, structural map, and behavioral metadata section.[31] However, the only mandatory section is overall structure of the object contained in a structure map between the following tags:

<mets:structMap TYPE="physical"> </mets:structMap>

Those responsible for libraries and archives in the public and private sectors should become familiar with METS XML to understand the type of metadata available for digital library objects they access or acquire and in order to make informed decisions on methods that can be used to scan and make available complex digital objects.

Electronic Books (E-books)

What about e-books? Publishers suffering from a downward spiral in sales of print materials now embrace the electronic publishing environment. In October 2011, the International Digital Publishing Forum (IDPF), the trade and standards association for the digital publishing industry, approved the EPUB 3 specification as a distribution and interchange format standard for digital publications and documents including textbooks; digital magazines; and educational, professional, and scientific publications. EPUB 3 is a set of four individual specifications that define a means of representing, packaging, and encoding structured and semantically enhanced web content for distribution in a single file format.

The file extension, .epub (EPUB), is an XML format for reflowable digital books and publications. It is composed of three open standards, the Open Publication Structure (OPS), Open Packaging Format (OPF), and Open Container Format (OCF). EPUB allows publishers to produce and send a single digital publication file through distribution and provides consumers with interoperability between software/hardware for unencrypted reflowable digital books and publications.

The Open Publishing Structure (OPS) combines subsets and applications of other specifications to facilitate the construction, organization, presentation, and interchange of electronic documents. Among the other specifications are XML, Digital Talking Book (DTB), Scalable Vector Graphics (SVG), and Cascading Style Sheets (CSS).

Not many records and information managers will find themselves responsible for creating EPUBs, but if necessary, enterprise content publishing solutions are emerging to allow technical communication authors and software development teams to convert and publish high volumes of content from Microsoft Word and Adobe FrameMaker to common formats

including PDF and e-books. In addition, records and information managers may need to provide input into editing the metadata that accompanies e-books they acquire, especially if working in a corporate archives or library.

EPUB metadata editors are appearing on the scene, and certain batch operations are allowed. The following metadata fields are available:

- Title
- Creator
- Series
- Series Index
- Publisher
- Date (original publication)
- Type
- Format Identifier
- Source
- Language

The Title, Creator, Description, Publisher, and Date fields are prepopulated.

EPUB files can be opened in most e-book readers, including the Barnes and Noble Nook and Sony Reader. At this time, Amazon's Kindle uses a proprietary format, AZW, but allows authors and publishers to convert their own files to the Kindle format for publishing. EPUB files can also be opened on a computer with various free programs, including Calibre, Adobe Digital Editions, and Mobipocket Reader Desktop.

Administrative Metadata

Administrative metadata states when and how information resources were created, the file type and other technical information, and access rights. Two types of administrative data that are sometimes listed as separate metadata types are *rights management metadata* and *preservation data*.

Rights Management

Increasingly those publishing on the web are turning to Creative Commons, a nonprofit organization that allows anyone who publishes on the web to license their work. They recommend Extensible Metadata Platform (XMP) for embedded metadata. XMP defines a rights management schema, and Creative Commons sets the following XMP properties: *xmpRights:Marked*, *xmpRights:WebStatement*, and *xmpRights:UsageTerms*. In addition, they defined a Creative Commons schema whose prefix is cc. It has the following properties: license, *morePermissions*, *attributionURL*, and *attributionName*. Creative Commons has an online metadata lab to let authors and publishers provide optional metadata about their work. Archivists and records and information managers should understand Creative Commons licensing (see http://creativecommons.org/).

Preservation: METS and PREMIS

Earlier you were introduced to METS and learned that it is a standard for encoding descriptive, administrative, and structural schema for digital objects—types of metadata relevant to preservation. Although the schema was developed originally for digital libraries, its use has been extended to digital repositories and preservation. Archival objects must retain the characteristics of fixity, viability, renderability, understandability, and/or authenticity. The Preservation Metadata: Implementation Strategies (PREMIS) working group released version 2.2 of the *PREMIS Data Dictionary for Preservation Metadata* in July 2012 to address these challenges.[32] A data model was developed to organize the semantic units in the dictionary into five entities important to digital preservation:

- Rights
- Agents
- Events
- Object
- Intellectual Entities

Implementation of the dictionary is supported by the XML schema "PREMIS Schema Version 2.2,"[33] also released in 2012.

Both METS and PREMIS are XML schema. PREMIS can reside within a METS document. METS can provide the structure and transferability, and PREMIS can provide the information about a digital object necessary for digital preservation actions. The Library of Congress has prepared guidance on how the PREMIS and METS tags should be integrated.[34]

Summary

The growth of digital information has transformed the way records management is perceived and practiced. Today's records and information professional, who once primarily managed inactive records and made arrangements for destruction or transfer to an archives, now use their expertise to improve active records and information management.

Today's records and information management professional must master more than one knowledge domain. He or she must understand the mission and goals of the organization and the work of business units. At the same time, he or she must understand information technology well enough to provide value to discussions related to information systems and must understand archives well enough to ensure that records are captured, managed, and preserved as long as they have value.

This expanding role requires that the new records professional understand business and information systems and be able to evaluate their effectiveness through the use of business process mapping and workflow diagrams. They must also understand structured, unstructured, and semi-structured data and be able to develop or recommend search and retrieval tools and strategies appropriate for each type of data.

Metadata plays an important part in information search and retrieval. The new records and information professional must understand metadata and become familiar with metadata schema and standards of use in his or her industry.

Records and information professionals can also participate in the development of physical, logical, and administrative access controls. They can address the importance of adhering to established procedures and play a prominent role in negotiating service level agreements with third-party providers, including social networks and vendors of cloud computing services.

In her contribution to Chapter 5, Deborah Rifenbark, CRM, describes the steps taken to automate a manual "new business intake" workflow process within a law firm. This paradigm piece illustrates how a records manager can implement business process analysis to improve efficiency, save time, and increase accuracy in client billing.

PARADIGM

New Business Intake—Law Firm Environment

Deborah Rifenbark, CRM, Chief Records Officer

Problem Statement

Due to manual processes crossing multiple departments, new business intake was taking too long. The manual processes, which routinely took from one day to one week to complete, prevented attorneys from billing in a timely manner for their work.

Study

Team members from each administrative department were selected to serve on a task force assigned to pull together all of the manual processes to determine if it would be possible to create an automated workflow. The administrative departments involved were accounting, technology, and records management, which included the areas of new business intake, conflicts, and records management. Through the use of interviews, team members for the respective departments gathered all of the manual steps required to bring in new business. This process took months because each step needed to be documented regarding where it began and ended. The steps were to include the following:

- What data was needed for their department
- Who they received the data from
- What manual processes were used
- What software was used
- Where the critical decision points were and whose authority was needed for those decisions
- If duplicative steps were being taken that could be combined
- What key information was required to minimize risk to the firm
- If there were any pain points where data was getting bottlenecked

The task force held meetings to discuss areas where data flowed between the departments, as we wanted to minimize the number of times the same data was entered into software or routed manually. Once all of the data was gathered, a workflow was created in Visio to document each required step.[35] Once the Visio workflow was created, a review of the manual process was completed to determine if any time could be gained by eliminating unnecessary steps. It was determined that we had the most efficient manual process in place. We provided a review to the executive level of what we had discovered along with our plan to automate the process to reduce the time required. The executive level determined that it would be beneficial to automate our manual process.

Software vendors were approached to determine if a product was available to create our automated workflow or if customized software was required. Once a software vendor was chosen, meetings were held to provide the vendor with the information required to begin customizing their software to meet our needs, as it was determined that no workflow existed that would meet our requirements. After almost one year of development and testing, we established a pilot group to push our plan into the real-world environment. Modifications

were made based on recommendations from the pilot group. Within six months, everyone was trained and we were live.

Results

Through automating this process, we reduced the administrative time required by several days, creating the opportunity for the attorneys to generate billing more efficiently for new clients and matters. By automating the process:

- Decision points cannot be bypassed and therefore remain documented.
- Electronic information relating to each client and matter from the new business intake software is now stored electronically in our document management system for future reference and disposition.
- All related billing information is accurate.
- Data entry errors are reduced as accurate data is required to be entered only once.
- Duplicative entry into multiple software products is no longer required, as the new business intake software pushes the data to all of our networked software.
- Manual reports and forms are no longer required and no longer maintained.

Notes

1. National Archives of Australia, "Digital Records," accessed January 27, 2013, http://www.naa.gov.au/records-management/agency/digital/index.aspx.
2. Drive Your Success, "Understanding Business Process Mapping and Workflow Diagrams," accessed January 19, 2013, http://www.driveyoursuccess.com/2011/08/understanding-business-process-mapping-workflow-diagrams.html.
3. City of Mission, Texas, "Mission Statement," Purchasing Department, accessed December 14, 2012, http://www.missiontexas.us/city-departments/purchasing-department.
4. Legal-Explanations.com, s.v. "bill of lading," accessed December 14, 2012, http://www.legal-explanations.com/definitions/bill-of-lading.htm.
5. SearchCIO, s.v. "workflow," last modified April 2005, http://searchcio.techtarget.com/definition/workflow.
6. Defense Information Systems Agency, *Access Control in Support of Information Systems: Security Technical Implementation Guide, Version 2, Release 2*, Department of Defense, December 26, 2008, 15, http://www.sentekglobal.com/solutions/downloads/access_control_stig_v2r2_final_26_dec_2008.pdf.
7. Ibid., 18.
8. University of Pennsylvania, University Archives and Records Center, "University of Pennsylvania Records Retention Schedule: Academic/Student Records," University Records Center, last modified June 17, 2011, http://www.archives.upenn.edu/urc/recrdret/studtacad.html. See metadata mentioned at: Kate Pugh, "Unleashing Unstructured Data's Value: Mobilizing Us, Not Just Our Machines," Dashboard Insight, February 17, 2011, http://www.dashboardinsight.com/articles/new-concepts-in-business-intelligence/unleashing-unstructured-data-value.aspx.
9. The term *record* when referring to rows in a database is different from the term *record* defined in *ISO 15489-1:2001*.
10. Eileen Yu, "Oracle Looks to Clear Air on Big Data," *ZDNet*, October 4, 2012, http://www.zdnet.com/oracle-looks-to-clear-air-on-big-data-7000005211/.

11. SearchDataManagement, s.v. "business intelligence (BI)," last modified November 2006, http://searchdatamanagement.techtarget.com/definition/business-intelligence.
12. Adam Shell, "Wall Street Traders Mine Tweets to Gain a Trading Edge," *USA Today*, May 4, 2011, http://www.usatoday.com/money/perfi/stocks/2011-05-03-wall-street-traders-mine-tweets_n.htm.
13. *Webopedia*, s.v. "big data," accessed December 14, 2012, http://www.webopedia.com/TERM/B/big_data.html.
14. Ibid.
15. *Informatica*, s.v. "big data," accessed December 14, 2012, http://www.informatica.com/Documents/big_data/big_data_infographic_informatica1.jpg.
16. 1KD, s.v. "data warehouse," last modified 2012, accessed December 14, 2012, http://www.1keydata.com/datawarehousing/data-warehouse-definition.html.
17. Nagesh V. Anupindi, "Inmon vs. Kimball—An Analysis," Nagesh.com, August 25, 2012, http://www.nagesh.com/publications/technology/173-inmon-vs-kimball-an-analysis.html.
18. Edward Atkinson, "Data Warehousing—A Boat Records Managers Should Not Miss," *Records Management Journal* 11, no. 1, 35–43.
19. LexisNexis, "Terms and Connectors—Introduction to Traditional Boolean Searching," Support Center, last modified 2011, http://support.lexisnexis.com/lexiscom/record.asp?ArticleID=GS_Boolean&ALid=Lexiscom_basics.
20. Library of Congress, *Library of Congress Subject Headings*, Cataloging Distribution Service, 2011, http://www.loc.gov/cds/products/product.php?productID=44.
21. Tony Asaro, "Content Chaos," *Storage* 9, no. 3 (May 2010), http://searchstorage.techtarget.com/magazine-sections/2010/05.
22. Apache Solr, The Apache Software Foundation, accessed December 16, 2012, http://lucene.apache.org/solr/.
23. World Wide Web Consortium (W3C), "W3C Semantic Web Frequently Asked Questions," Semantic Web, last modified November 12, 2009, http://www.w3.org/RDF/FAQ.
24. Ka-Ping Yee et al., "Faceted Metadata for Image Search and Browsing" (paper presented at annual conference of Computer-Human Interaction [CHI], Ft. Lauderdale, Florida, April 5, 2003), http://kevinli.net/flamenco-chi03.pdf.
25. World Wide Web Consortium (W3C), "Web Ontology Language (OWL)," W3C Semantic Web, September 6, 2007, http://www.w3.org/2004/OWL/.
26. National Information Standards Organization (NISO), *Understanding Metadata* (Bethesda, MD: NISO Press, 2004), 1, http://www.niso.org/publications/press/UnderstandingMetadata.pdf.
27. International Organization for Standardization (ISO), *ISO 15836:2009: Information and Documentation—The Dublin Core Metadata Element Set* (Geneva: ISO, 2009).
28. The Getty Research Institute, "Categories for the Description of Works of Art," J. Paul Getty Trust, last modified June 9, 2009, http://www.getty.edu/research/publications/electronic_publications/cdwa/index.html.
29. Library of Congress, "MIX: NISO Metadata for Images in XML Schema," Standards, last modified May 13, 2008, http://www.loc.gov/standards/mix/.
30. Library of Congress, "Metadata Encoding and Transmission Standard (METS)," Standards, last modified December 7, 2011, http://www.loc.gov/standards/mets/.
31. Jerome P. McDonough, "METS: Standardized Encoding for Digital Library Objects," Illinois Digital Environment for Access to Learning and Scholarship (IDEALS), 2006, https://www.ideals.illinois.edu/bitstream/handle/2142/177/METS.pdf?sequence=2.
32. PREMIS Editorial Committee, *PREMIS Data Dictionary for Preservation Metadata, Version 2.2,* Library of Congress, July 2012, http://www.loc.gov/standards/premis/index.html.
33. Library of Congress, "PREMIS Schema Version 2.2," Schemas, last modified September 28, 2012, http://www.loc.gov/standards/premis/schemas.html.

34. Library of Congress, *Guidelines for Using PREMIS with METS for Exchange*, revised September 17, 2008, http://www.loc.gov/standards/premis/guidelines-premismets.pdf.
35. Visio is a Microsoft diagramming tool for managing IT, process, quality, and compliance scenarios.

CHAPTER

6

Electronic Records and Electronic Records Management Systems

Introduction

In the previous chapter, we explored the active phase of the records and information lifecycle, focusing on systems and methods used to access, store, and retrieve data for operational needs and to be used in decision making. You learned that records managers, while identifying records created by or residing in information systems, can contribute to the organization by analyzing workflows and streamlining business processes. You were introduced to search and retrieval methods for structured, unstructured, and semi-structured data, as well as metadata standards that facilitate search and retrieval.

You also learned that information has value, whether considered a *record* or not. But not all information should be retained indefinitely for various reasons, including the cost of responding (locating, retrieving, reviewing, redacting, presenting) to e-discovery and freedom of information requests in today's litigious and open society. In this chapter, we'll turn our attention to the subset of information termed electronic records and the use of technology to manage them.

Electronic Records

The important distinction between electronic records and records stored on paper or microfilm is that information stored on paper or microfilm can be read by the human eye. An electronic record is invisible and indiscernible to a user until the system produces an image or sound.[1] The US National Archives and Records Administration (NARA) defines an electronic record as "any information that is recorded in a form that only a computer can process and that satisfies the definition of a record."[2] *ISO 16175-1:2010* defines an electronic record as a "record on electronic storage media, produced, communicated, maintained and/or accessed by means of electronic equipment."[3] Examples of electronic records include e-mail messages, word processing documents, electronic spreadsheets, digital images, databases, video and audio files, voice mail, webpages, and data stored in geographic information systems (GIS).

Electronic records reside in a variety of devices and locations depending on how they are created and by whom, as well as where they are within the records management lifecycle. For example, employees can create records away from the office and store them on USB flash drives, tablets, or smartphones. Employees working within the enterprise may store records on personal computer (PC) hard drives, network drives, and compact discs (CDs).

Information technology (IT) departments can move records to magnetic tapes for storage. Electronic records may reside in third-party systems controlled by vendors, for example, blog posts, tweets, and profiles posted to social networking sites or customer data stored in applications hosted by a software as a service (SaaS) provider.

One example of the increasingly widespread acceptance of a digital record is the stock certificate, which once was one of the most important pieces of paper in the life of an investor. Today, the paper stock certificate is becoming an historic relic. Some firms continue to produce paper certificates, perhaps as part of the company's branding efforts. The Walt Disney Company, for example, sends stock certificates adorned with Disney characters to investors for free with a $250 minimum investment. They are often purchased framed and presented as gifts. The certificate itself represents an investment and has added value as artwork. Today, however, stock ownership is tracked electronically.

Fewer Paper Stock Certificates

Just 1.6 million paper stock certificates were housed in the 10,000 square foot, three-story vault of the Depository Trust and Clearing Corporation (DTCC) at the end of 2011; that's down from 32 million in 1990. DTCC, a leading firm responsible for tracking stock ownership, cites several reasons for this change:

- An industry database, the Direct Registration System, lets companies, brokers, and regulators keep track of shareholders electronically.
- Companies are no longer required to provide paper certificates.
- Charges and fees to produce paper certificates have risen, motivating investors to go paperless.[a]

In October 2012, water from Hurricane Sandy flooded the underground vault in Manhattan damaging more than $1 billion in stock and bond certificates. Because DTCC maintains a certificate inventory file with ownership information stored in multiple data centers outside of the city, replacement certificates could be processed without requiring the presentation of the original certificates.[b]

[a] The Depository Trust and Clearing Corporation (DTCC), "Overview: Paper vs. Electronic Securities," No More Paper: The Problems with Paper, accessed December 16, 2012, http://www.dtcc.com/leadership/issues/nomorepaper/investors/#b2.

[b] Fox News, "Report: Secret Vault Holding $1 Billion in Bonds Flooded by Superstorm Sandy," November19, 2012, http://foxnewsinsider.com/2012/11/19/report-secret-vault-holding-1-billion-in-bonds-flooded-by-superstorm-sandy/.

In the past, records managers were responsible for retention and disposition of records that were no longer actively used by employees of the organization. But one major difference between then and now is the focus on the user, who may derive value from access to records that in the past were inaccessible (e.g., information in paper documents or on magnetic tapes stored in a records center). Another major difference is the diversity of systems employed today that create digital records. In some cases, it makes sense to control the records in the system of origin rather than move them to a records repository.

Electronic records must be identified regardless of their origin and location so that they can be controlled by the organization's records retention program. The timely disposition of records will help the organization minimize storage costs and mitigate risk related to legal and regulatory recordkeeping requirements that otherwise would be incurred by retaining records that no longer have value to the organization.

Enterprise Information Systems

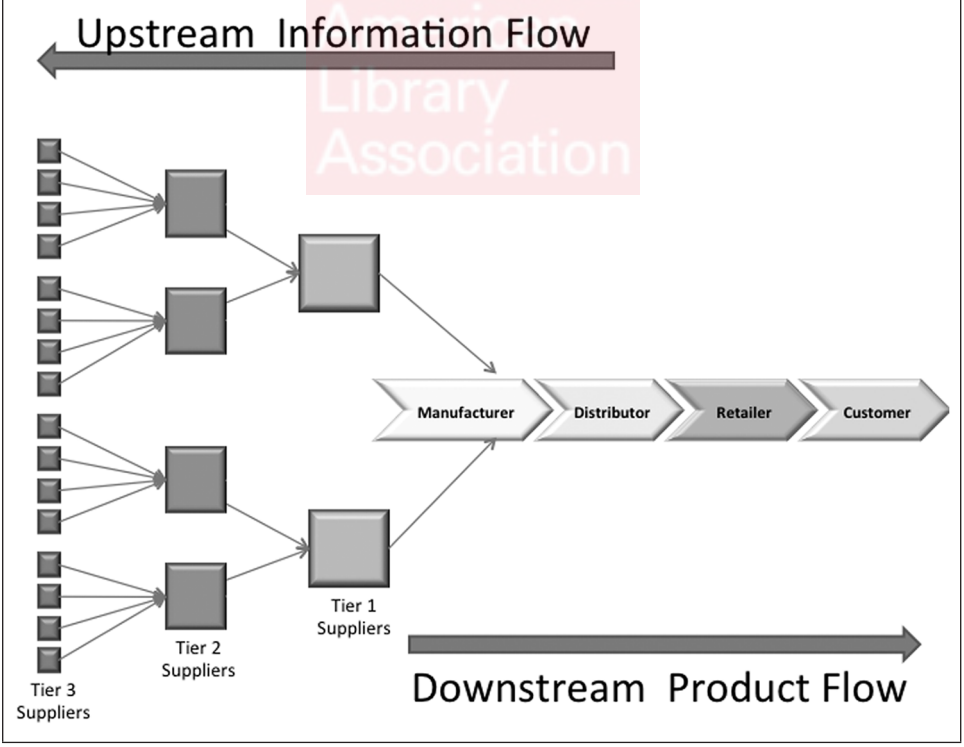
Electronic records can be produced by systems that serve the specific needs of one department or function (e.g., customer relationship management). Enterprise information

systems (EIS) were introduced to integrate the key business processes into a single software system that would enable information to flow seamlessly throughout the organization. Supply chain management is an area that benefited greatly from the integration of multiple systems into one in which every business unit along the supply chain has access to the same information (see Figure 6.1).

Wal-Mart's supply chain management practices present a classic example of how an investment in information technologies to facilitate information sharing can result in increased efficiency in operations and better customer service. In large part due to information technologies, Wal-Mart was the first nonindustrial service business in the United States to rise to the top of the corporate rankings.[4]

In 2005, the term *enterprise information system* came into use to represent this integration of information systems that include web-enabled features. United Parcel Service (UPS) can attribute its success to its logistics activities—which include air and ground delivery, as well as warehousing and supply chain management—and its superior customer service. Part of that service is to allow the customers to keep an eye on their package over the Internet using a tracking number. UPS is not the only national carrier to provide this service, and tracking can be accomplished without going directly to each carrier's site. The tracking number for various carriers including UPS, US Postal Service (USPS), FedEx, and

Figure 6.1. Supply chain management improves operations with information flowing both upstream to suppliers and downstream to customers.



On-Track can be entered into the Google search bar. Once you click *search*, Google will bring up a link that can be used to go directly to the package status page for the carrier that provided the tracking number.

These examples are provided to underscore the primary reason for electronic information systems. *They are not implemented to create records.* They are implemented to help the business improve operations, with an eye to increasing customer satisfaction. Records are created, though, and the organization creating the records has an obligation to manage them. If records are created and stored in an enterprise-wide information system, they will be easier to manage because the records will be controlled by one system. The introduction of enterprise-wide information systems has simplified the task of locating and capturing records. EIS, though, are not the solution to records management challenges. Electronic records management functions must be employed to control the records created by those systems. You were introduced to content management systems in Chapter 2. Their use is so pervasive within organizations today—often integrated with records management systems and collaboration systems—that they deserve additional attention in this chapter.

Content Management Systems

Content is described as all of the electronic information in an organization, including electronic records, e-mail, and even the organization's website. The term *content management system* can be used to describe specific types of systems in use for different purposes or within different industries, for example:

- Web content management systems (WCMS) allow users "to maintain a website using a simple web-browser-based interface (instead of manually authoring webpages)."[5] Most WCMS use a database to store and control a dynamic collection of web material (e.g., text, photos, sound, video, metadata, and other information assets) needed by the system. Among other features, a WCMS typically includes automated templates, access control, easily editable content, workflow management, content syndication (such as content distribution by RSS feeds to other systems), and versioning (which allows roll-back to a previous copy).
- Industry-specific web content management systems are available, such as the Care Converge healthcare WCMS that allows healthcare organizations to create and manage consumer websites and portals.[6]
- Social content management systems can combine social networking applications (e.g., blogs, wikis, image sharing) into one suite to make it easy to manage and share social content without building silos of information. Enterprise social content

Some Common Abbreviations

ECM or ECMS: enterprise content management or enterprise content management system
EDMS: electronic document management system
EDRMS: electronic document and records management system
ERM or ERMS: electronic records management or electronic records management system
RMA: records management application
WCMS: web content management system

management systems can authenticate users with a single sign-on, approve content with integrated workflow, and meet key compliance requirements. They allow the organization to capture, manage, and leverage social content generated from a wide variety of locations and devices. In some cases, social media can also be integrated with an organization's existing enterprise content management system to enable the enterprise to store and manage its unstructured social content in a single repository.

Enterprise Content Management Systems

Enterprise content management systems (ECMS) are used to control unstructured content so that the information can be put to use in daily operations. But they are also designed to protect digital documents (primarily text and graphics) that serve as accurate and complete evidence of transactions. Those records are regulated and contained, easy to search, and include core elements such as facts, dates, and commitments.

According to AIIM, ECMS are able to perform five major functions:

- *Capture:* Create, obtain, and organize information.
- *Manage:* Process, modify, and employ information.
- *Store:* Temporarily back up frequently changing information in the short term.
- *Preserve:* Back up infrequently changing information in the medium and long term.
- *Deliver:* Provide clients and end users with requested information.[7]

An organization may employ one or more ECMS to control the flow of information and manage its records. Electronic records management functionality may be integrated into a new ECMS or built upon the ECMS already in place. ECMS were initially used to manage records that provide evidence of business transactions. Today's ECMS must also be able to manage information resulting from social media and collaborative technologies. ECMS can be integrated with business processes, business rules technologies, and analytics to offer more than just the information stored. Content analytics, for example, can glean business intelligence out of unstructured content in order to discover patterns that provide additional insight into the business, such as patterns that reveal the factors that lead to customer churn (lost customers).

In addition to dedicated ECMS, software such as SharePoint 2010 can serve as a single point for information aggregation, search, and collaboration within an organization. SharePoint 2010 comes with web content management functionality, collaborative features that include blogs and wikis, document management features, search capability, and records management functionality.

Electronic Records Management

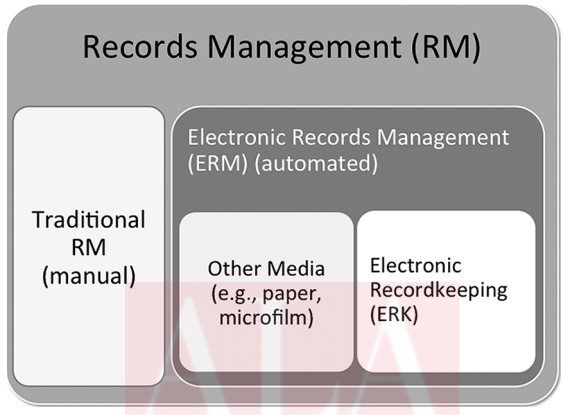
The term *electronic records management* (ERM) as defined by ARMA International presents two different scenarios—one in which an electronic system manages all records (including paper and microfilm) and another in which an electronic system applies records management principles to electronic records.[8] In 2000, NARA provided clarification by stating that the word *electronic* in ERM refers to automation, not to the nature of the record (see Figure 6.2, p. 150).[9]

electronic records management (ERM):

1. The application of records management principles to electronic records
2. The management of records using electronic systems to apply records management principles

Source: ARMA International, *Glossary of Records and Information Management Terms*, 4th ed. (Overland Park, KS: ARMA International, 2012).

Figure 6.2. Electronic records management (ERM).



Source: Adapted from information at National Archives and Records Administration (NARA), "Context for Electronic Records Management (ERM)," Records Managers, last modified March 27, 2000, http://www.archives.gov/records-mgmt/initiatives/context-for-erm.html.

On November 28, 2011, President Obama took steps to improve records management within the US federal government by signing the "Presidential Memorandum—Managing Government Records."[10] As a result, on August 24, 2012, federal agencies were directed to pursue the following goals related to e-mail and electronic records:

1. By 2016, manage both permanent and temporary email records in an accessible electronic format.
2. By 2019, manage all permanent electronic records in electronic format. Of note is the strong recommendation that agencies consider the benefits of digitizing permanent records created in hard-copy format or other analog formats (e.g., microfiche, microfilm, analog video, analog audio).[11]

These goals can be accomplished only by implementing the right type of electronic system: one that supports records management and litigation requirements, including the capability to identify, retrieve, and retain the records for use as long as they are needed.

Electronic Records Management Systems

An electronic records management system (ERMS) is a "system consisting of software, hardware, policies, and processes to automate the preparation, organization, tracking,

and distribution of records regardless of media."[12] The system must include retention scheduling and disposition.[13]

> **electronic records management system (ERMS):** A system consisting of software, hardware, policies, and processes to automate the preparation, organization, tracking, and distribution of records regardless of media. (Note: Electronic records management software includes retention scheduling and disposition.)
> *Source:* ARMA International, *Glossary of Records and information Management Terms*, 4th ed. (Overland Park, KS: ARMA International), 41.

An ERMS is sometimes referred to as a records management application (RMA). The ERMS/RMA selected to manage records will depend upon organizational needs and the functionality provided by various products. The primary management functions of an ERMS/RMA are categorizing and locating records and identifying records due for disposition. EMRS/RMA software also stores, retrieves, and disposes of the electronic records in its repository.

Functional requirements must be identified before making a decision to acquire an electronic records management solution. Typical functions of an ERMS/RMA include these:

- Marking an electronic document as a read-only electronic record
- Protecting the record against modification or tampering
- Filing a record against an organizational file plan or taxonomy for categorization
- Marking records as vital records
- Assigning disposal (archival or destruction rules) to records
- Freezing and unfreezing disposal rules
- Applying access and security controls (security rules may differ from the source electronic document in an EDMS or ECMS)
- Executing disposal processing (usually an administrative function)
- Maintaining organizational/historical metadata that preserves the business context of the record in the case of organizational change
- Providing a history/audit trail

Electronic Records Management Systems Guidance

Guidance is available for both the vendors who develop records management applications and the users of such systems. Two of the most important publications are these:

- US Department of Defense's *DoD 5015.02-STD: Electronic Records Management Software Applications Design Criteria Standard*[14]
- European *Modular Requirements for Records Systems* (*MoReq2010*)[15]

Neither *DoD 5015.2* nor *MoReq* have been endorsed by a standards development body to become a de jure standard, but both documents are considered de facto standards due to their universal appeal, availability, and adoption.

DoD 5015.02-STD: Electronic Records Management Software Applications Design Criteria Standard

DoD 5015.02-STD, published by the US Department of Defense (DoD), provides guidance for electronic records management information systems development. The DoD uses the

term records management application (RMA) rather than ERMS. This standard presents mandatory baseline functional requirements—as well as requirements for classified marking, access control, and other processes—and identifies nonmandatory but desirable features. Version 3 of the standard issued in 2007 also incorporates baseline requirements for RMA-to-RMA interoperability and archival transfer to the NARA.[16]

RMA products are tested for compliance with *DoD 5015.02-STD*, and certification by the Defense Information Systems Agency's (DISA) Joint Interoperability Text Command (JITC) indicates the product has met the baseline requirements for electronic recordkeeping for Department of Defense organizations. The JITC RMA Product Register publishes the test results online (as shown in Figure 6.3).

Note the plus signs in the Vendor column in Figure 6.3. Select one to learn more about that particular product. For example, a detailed report for the first listing, Open Text Records Management v10, indicates the following among the other useful features demonstrated: document imaging tools, bar-coding systems, workflow and document management features, printed labels, and web capability. Organizations investigating records management systems can use the RMA Product Register to identify applications with the features they desire.

Note also in Figure 6.3 the column labeled "FOIA & PA." Products certified compliant with both the Freedom of Information Act (FOIA) and the Privacy Act (PA) will have a checkmark in that column. Products certified for FOIA and PA but not shown in the image include Autonomy Records Manager r12.6, Oracle Universal Records Management-11g, Hewlett-Packard's TRIM Version 7, and Feith Document Database 8.

As mentioned in Chapter 2, ARMA International developed a technical report, *Using DoD 5015.02-STD Outside the Federal Government Sector*, which details the requirements considered to be relevant or nonrelevant outside of the federal government and identifies gaps in the standard's requirements where records management functions—such as bar coding, folder and box labels, physical records tracking systems, integration with offsite storage facilities, and development of (mandatory) destruction certificates—are not addressed.[17]

Figure 6.3. *DoD 5015.02-STD* compliance test results are shown on the RMA Product Register webpage.

RMA Product Register

Vendor	Product	Valid Thru	Baseline	Classified	FOIA & PA	RMA OS	RMA DB	RMA Email
+ Open Text Corporation	OpenText Records Management v10	15Dec13	X	X		MS Windows Server	MS SQL Server, Oracle	MS Outlook
+ Open Text Corporation	OpenText Application Governance & Archiving for Microsoft® SharePoint® 2010...	15Dec13	X			MS Windows Server	MS SQL Server	MS Outlook
+ Laserfiche	Laserfiche Records Management Edition for MS Office SharePoint 2010	22Jun13	X			MS Windows Server	MS SQL Server, Oracle	MS Outlook
+ warelTis Technologies, LLC	Records Studio Version 1.6.1	08Jun13	X			MS Windows Server	MS SQL Server	MS Outlook
+ Northrop Grumman Corporation	e.POWER 6.6 with EMC Documentum Records Manager 6.5	16Apr13	X			MS Windows Server	MS SQL Server, Oracle	MS Outlook

Source: Joint Interoperability Test Command (JITC), "RMA Product Register," Records Management Application, accessed December 22, 2012, http://jitc.fhu.disa.mil/cgi/rma/reg.aspx.

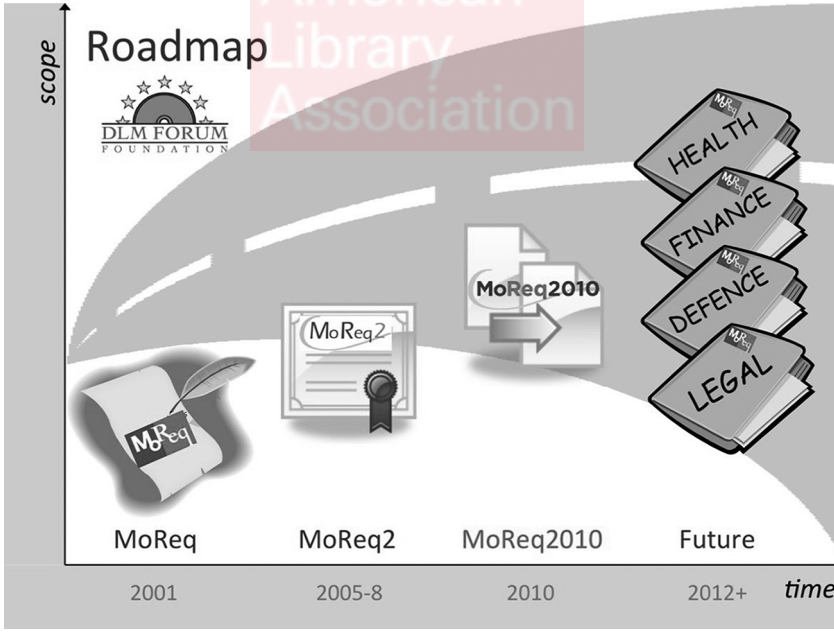
For example, *DoD 5015.02-STD* requires vendor products to manage records in physical as well as electronic formats/media. This could be interpreted to mean that the vendor product must merely provide the capability to create a profile (metadata representation of a physical record) and to include its physical location. The standard does not provide guidance beyond that. But the ARMA technical report recommends that the systems for management of physical records should also include capabilities for using bar codes and labels and for tracking, check-in, check-out, and inventorying.[18]

Modular Requirements for Records Systems (MoReq2010)

The *MoReq2010* specification was designed for users of electronic records, experts in records management, and suppliers of ERMS software outside of the United States. Launched in May 2011, this version contains functional and nonfunctional requirements for records systems as defined by *ISO 15489-1:2001*. *MoReq2010* does not specify any particular records system, but it outlines the essential elements a records system should possess.[19] It defines the core functionality required of records systems for public and private sectors. Because it is a modular specification, it can be extended to allow for specialized application in different jurisdictions, markets, and industry sectors, including healthcare, finance, defense, and legal as shown in Figure 6.4.

In previous specifications of *MoReq*, an ERM system was visualized as a stand-alone content repository that stood alongside other content repositories in the enterprise.

Figure 6.4. *MoReq* timeline.



Source: DLM Forum Foundation, *MoReq2010: Modular Requirements for Records Systems, Vol. 1, Core Services and Plug-In Modules*, 2010 and 2011, 16, http://moreq2010.eu/pdf/MoReq2010-Core+Plugin(v1-0).pdf. © DLM Forum, http://www.dlmforum.eu/.

MoReq2010, however, sees ERM as a capability that could be integrated within each separate application used by the organization or could sit behind those applications and manage records within them. For organizations that have invested heavily in different types of electronic systems, the idealistic view of one user interface and one repository/server may not be realistic. The introduction of products such as SharePoint for collaboration within the enterprise and its rapid adoption has introduced the potential for collaborative silos, and further complicates the issue.

There is a great deal of excitement about *MoReq2010*. It is described as the first of a new generation of systems and processes that will enable a single view of records and archives. Interoperability will be achieved by abstracting metadata for every record's records management characteristics, policy, security, and value from the underlying document repository, database, middleware, and operating system. This specification provides a layer of RM-inspired middleware between the underlying infrastructure and every application and service, which should provide an RM policy from cradle to grave.

MoReq2010 "enables commercial and government organizations to secure and develop critical information independent of email, document and content management, cloud and mobile systems, so that when systems are changed, updated, migrated or integrated, the security, value and probity of the records is maintained."[20]

The *MoReq2010* accreditation, certification, and testing program was announced in December 2011, and the first accredited test center, Strategy Partners, was named. The DLM Forum serves as the certifying body.[21] There are fees for testing and fees for licensing. Certified suppliers will be listed on the DLM Forum website and will be able to use the official *MoReq2010*-certified MCRS (*MoReq2010* Compliant Records System) logo on their own websites, product packaging, and advertising.

A number of benefits are derived from purchasing a certified *MoReq2010*-compliant product, including the fact that these products provide record level compatibility and interoperability with other *MoReq2010*-compliant products and that these products will enable the organization to meet its current regulatory and compliance obligations.

Public consultation for the 2012 round of additional plug-in and extension modules to *MoReq2010* (e.g., for health, finance, defense, and legal) officially began on June 30, 2012.

Electronic Records Management System Functionality

Not all organizations will rush to acquire the latest electronic records management products. The scope of the electronic records management system will be determined by other systems already in place, the functional requirements identified by the organization, and the resources available. Organizations have several options and can install:

- separate systems for electronic and paper records;
- a single system for all records, both physical and electronic;
- separate systems for some records types, such as e-mail and IM; and
- a separate system (or systems) for functional areas or subgroups.

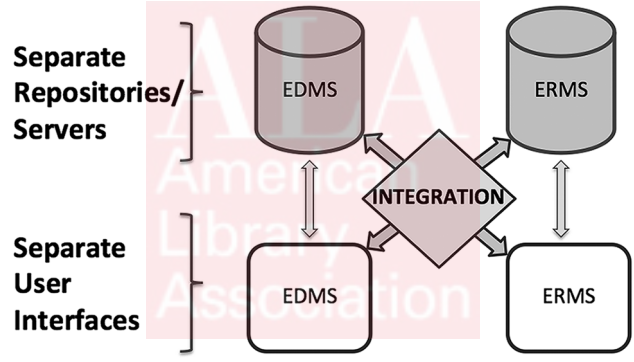
The most pressing challenge is to acquire a records management system that works with existing and planned business systems. This section provides examples of several different frameworks for integration to help you visualize where records under the control of a records management system might reside and how those systems could interact with one another.

Integration of EDM and ERM Systems

A technical report, *ANSI/AIIM/ARMA TR48-2006: Revised Framework for Integration of Electronic Document Management Systems and Electronic Records Management Systems*, proposed three approaches to implementing an integration of an electronic document management system (EDMS) with an electronic records management system (ERMS).[22]

The first model illustrated the integration of a stand-alone EDMS with a stand-alone ERMS. This situation exists, for example, when an EDMS system is in place and the organization decides to implement a separate ERMS system (see Figure 6.5). The existing EDMS interface and repository/server are used to manage documents produced in other systems. Documents considered records but residing in the EDMS could be classified as records by linking them to an ERMS folder. Both physical and electronic documents created in other systems (for example, e-mail messages) could be declared and classified directly into the ERMS. An e-mail attachment could be classified into the ERMS if considered a record or into the EDMS if considered a work in progress.

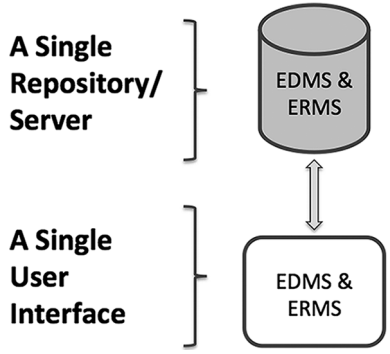
Figure 6.5. Model 1—Integration of stand-alone EDMS with stand-alone ERMS.



The second and third models show how one user interface could be used to manage documents and records in either a single repository/server (Model 2) or in separate repositories/servers for the EDMS and the ERMS (Model 3). From these early attempts to integrate the functionality of EDM and ERM systems, came the term *electronic document and records management system* (EDRMS).

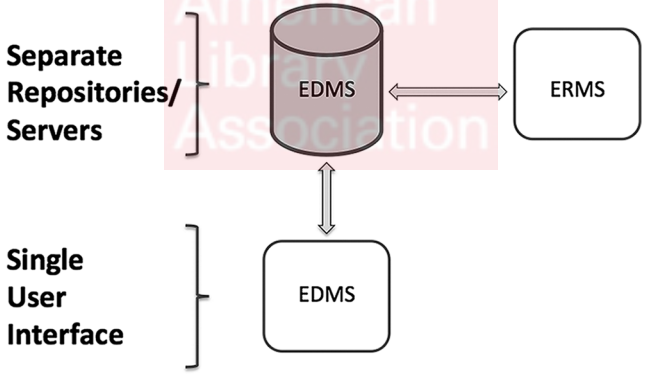
A full-featured EDMS with built-in ERMS is portrayed in Model 2. This product is the result of acquisitions of ERMS by vendors of EDMS in order to add records management functionality to their products. Management is simplified by providing the user with a single interface and single repository/server (see Figure 6.6, p. 156). Documents stored directly within the EDRMS along with their associated metadata utilize a consistent metadata schema. However, some electronic information, such as e-mail, will have to be imported from other systems, and their associated metadata will differ. Documents produced by other systems are saved to the EDRMS first and then declared, classified, and managed as records. An EDRMS can also identify and track physical documents such as incoming mail and patient records through the use of bar code labels or RFID (radio frequency identification) smart labels.

Figure 6.6. Model 2—EDRMS (integrated EDMS with ERMS).



The third approach integrates electronic records management functionality into the EDMS repository (see Figure 6.7). The user interface interacts with the EDMS repository/server, which then interacts with the ERMS. The records remain in one location, and the metadata residing within the ERMS is used to point to and manage them. The ERMS manages the enterprise file plan, retention schedule, and disposition processing.

Figure 6.7. Model 3—Integrated ERMS into an EDM repository/server.



Enterprise Content Management Systems and Records Management Functions

The previous models were designed at the same time the concept of enterprise content management systems was gaining momentum. Although one might say ECM goes back almost thirty years to the introduction of computer networks and document scanners, it wasn't until the early 2000s that managing web content and websites as corporate assets came under the control of ECM.

By the mid-2000s, Microsoft entered the collaborative content management market with SharePoint 2003 followed by SharePoint 2007. Large vendors got into the market

through acquisitions of content management systems: EMC bought Documentum, IBM bought FileNet, and Oracle bought Stellent. By 2011, two additional vendors joined these four leaders in the ECM space: OpenText and Hyland Software. Smaller vendors—some considered visionaries (e.g., Alfresco) and others considered niche players (e.g., Fabasoft)—have had an impact on the ECM products available in four key, emerging areas: the cloud, mobility, analytics, and big content.[23]

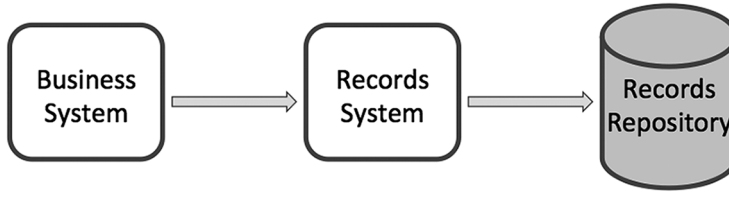
ECM is relevant to every business, and there are a variety of ways in which enterprise content management systems can be integrated with electronic records management functions. SharePoint 2010, for example, allows users to view content and declare records, apply retention schedules, move records to an archive, and place legal holds to traditional content, web content, or social content such as blogs. In spite of the records management functions, SharePoint 2010 is not compliant with *DoD 5015.2*. To comply with *DoD 5015.2*, organizations must purchase a commercially available plug-in product for SharePoint 2010. One such product listed on the JITC Records Management Application Product Register is the GimmalSoft Compliance Suite for Microsoft SharePoint.

Outside of the United States, *MoReq2010* moves beyond the concept of integrating either an EDMS or an ECMS with an ERMS to the integration of records management functions with all business systems.

MoReq2010 Architecture

The *MoReq2010* was originally based on one centralized repository model where all of an organization's stand-alone records systems would capture records into their own repository from a variety of external sources, including users and other business systems (see Figure 6.8). Figure 6.9 (p. 158) shows records managed in place by a records management system. This integration of a records management system with any type of *business system* rather than an EDMS or ECMS accommodates current and future types of business systems that create records. Another alternative is the adoption of records controls by the business system. This business/records system would manage only a specific set of records captured or generated by that business system as shown in Figure 6.10 (p. 158).

Figure 6.8. Model 4—Records are captured from a business system and moved into a records repository for control by the records system.



Single Records Repository/Server

Records captured by records system and moved to records repository for centralized management.

Figure 6.9. Model 5—Records managed by a records management system regardless of their location.

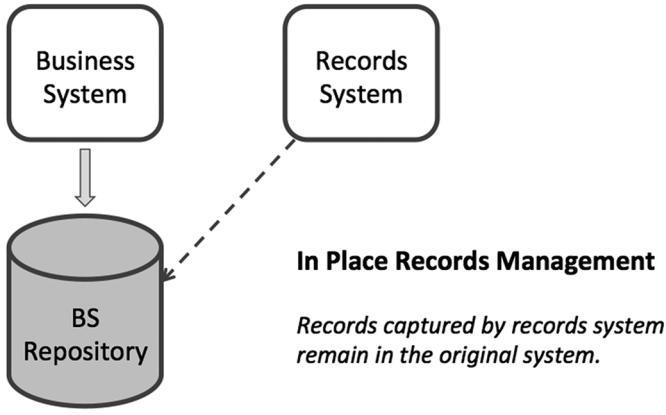
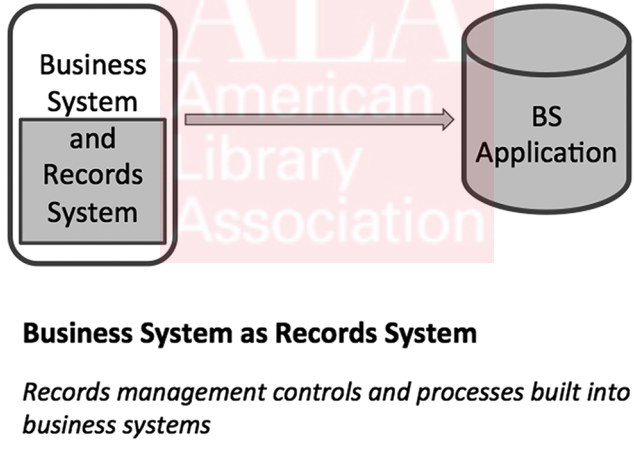


Figure 6.10. Model 6—Records management functionality built into a business system.



Interoperability enables different systems with different features from different suppliers to exchange records and other information. This is accomplished through the use of standardized metadata, in this case the *MoReq2010* XML schema. For testing and certification, *MoReq2010* requires that records systems be measured against the *MoReq2010* model metadata service in one of two ways:

- The records system implements the *MoReq2010* model metadata service in full.
- The records system implements its own native metadata model and (1) demonstrates that its native metadata model is equivalent to the *MoReq2010* model metadata service, and (2) that it can convert its native metadata into the same XML format used by the *MoReq2010* model metadata service.

The examples presented in Figures 6.8, 6.9, and 6.10 (pp. 157–158) represent three records control options, any combination of which may be employed within an organization to manage electronic records:

- intellectual and physical control of records within a records repository,
- intellectual control of records housed in a document management system or enterprise content management system, or
- intellectual control of the records housed within business systems (e.g., an e-mail system, an accounting system, or a GIS).

In some cases, the electronic records systems will also exert intellectual control over physical records housed on- or off-site.

Data and System Migration

Storing digital objects in a repository, identifying records, and managing them through the use of an electronic records management system is essential, but that is not the end of a records manager's responsibilities. The records must be managed "over time" as dictated by records retention requirements. Because some records have retention requirements that extend beyond the expected life of the systems in which they reside, the records manager must also understand the issues involved in migrating content from one system to another.

Data Migration Issues

Data migration issues must be addressed before moving on to system migration issues. Among the data migration considerations in which records managers may be involved are the following:

- *Data identification:* Identify all source data that must be migrated to the target system and where it is located. Identify gaps between the data required in the target system and the data existing in the source system. Consolidate data from more than one source system if necessary to fill in the gaps.
- *Unique identifiers:* When records from two or more databases are consolidated into one database during migration, there is a possibility that the same identifier is used more than once. For example, one database may use the prefix "P" for the planning while a second database uses the prefix "P" for purchasing. If conflicts are identified, a business rule can be written to change one of the identifiers (e.g., PR for purchasing or PL for planning) to avoid duplication and facilitate search and retrieval.
- *Data quality assessment:* Examine the value of the data. Remove duplicate data and identify data that no longer has value before implementing a system migration.
- *Metadata identification:* Decide which metadata should be migrated and which metadata is no longer relevant. Document the rationale behind these decisions.
- *Explicit metadata fields:* Search and retrieval depends upon the existence of explicit metadata. If the current system does not store all necessary metadata as required (e.g., separate fields for first name and last name), establish those new fields. If the current system applies metadata through inheritance from a parent record (e.g., disposal after audit), enter the metadata as an explicit value or preserve the functionality that will allow the value to be inherited from a parent record.

System Migration Issues

Systems may be upgraded or replaced to accomplish business goals, including enhanced security, increased productivity, and decreased costs. In addition, mergers and acquisitions can force an organization to transfer their data to a system used by a company with which they have merged. Among the issues to be considered when migrating content to new systems are:

- *Metadata mapping:* Content migration is challenging due to the potential loss of quality of existing metadata. It's important to map metadata between the existing business system and the new one. The metadata that must be mapped is metadata about the types of objects the application can hold (entities); a description of the document/object; the actions that users can perform on the entities (functions); and the roles users can be assigned (collections of functions users can perform such as access, view, download content).
- *Records management metadata:* Records management metadata—including records management controls (disposal authorities, security classifications, and record classification tools); metadata to automate activities; and metadata used to aggregate related documents into files, volumes, or series—must also be migrated.
- *Consider the alternative:* Migration can be time-consuming and costly. An alternative to migration is to use the new system going forward and maintain the legacy system to manage existing content. Disadvantages to this approach include the cost of maintaining both systems (e.g., licensing fees and technical support); loss of productivity because users will be required to use both systems to access information; and eventual loss of employees who know how to use the older system.
- *Keep abreast of new systems and standards:* For example, *MoReq2010* promises to make system integration less challenging by aiming to ensure that *MoReq2010*-compliant systems can export content and metadata (event history, access control list, and contextual metadata) in a way that other *MoReq2010*-compliant systems importing that content can understand and use. While moving to a *MoReq*-compliant system won't make it easier to integrate legacy systems with the new system, acquiring such systems moving forward will make future migration processes easier.

System Migration Process

Records managers who understand integration challenges are prepared to work with information technology personnel to plan and manage system migration. They can, for example, assist during the premigration and postmigration testing phases to ensure the output is accurate and complete, monitor data quality in the new system, and help prepare for the next migration.

Additional guidance on managing the migration of digital records is available from a number of sources, including the State Records Authority of New South Wales. Guideline 22, Section 4 of the *Government Recordkeeping Manual*, "Effectively Manage the Migration of Your Digital Records," provides a wealth of information to help manage the migration of digital records.[24] The topics covered include key record requirements critical to maintaining record authenticity, integrity, reliability, and usability during migrations; data and system issues to consider when developing a migration plan; the use of contractors to

perform migrations; pre- and postmigration testing; and creating records of the migration.

Records Management in the Clouds

What should be done about records residing on third-party servers? One option is to capture those records (e.g., tweets and posts) and bring them into an in-house system. Another option is to manage those records in the clouds. In order to decide which option is most appropriate for any organization, it is important to understand cloud computing.

Cloud computing involves web-based hosted services divided into the following three categories:

- *Software as a service (SaaS):* Software as a service means delivering software over the Internet, eliminating the need to install the software on the organization's own computers. For example, a number of SaaS-hosting providers are equipped to deploy Microsoft Office as a hosted service in a secure and reliable environment.
- *Platform as a service (PaaS):* The best-known example comes from Salesforce.com, which has been providing customer relationship management (CRM) applications since 1999. Salesforce.com offers a set of tools and application services called *Force.com* that Internet service vendors and corporate IT departments can use to build new and better applications for tasks such as human resource management (HRM), supply chain management (SCM), and enterprise resource planning (ERP).
- *Infrastructure as a service (IaaS):* Infrastructure as a service is the delivery of computer infrastructure, generally virtualized platform environments, as a service. This service typically is considered a utility, like electricity and water, which is billed based on the amount of resources consumed. Amazon.com Web Services and Rackspace are two examples of this type of cloud service.

The trend toward cloud computing offers the following benefits:

- Highly efficient storage of records that are rarely accessed but must be maintained, such as old e-mail messages and documents
- Economies of scale, giving the organization access to records platforms, functionality, and preconfigured compliance-driven solutions, which previously could not be afforded

Since cloud providers constitute an emergent sector, some cloud providers will likely fail or be forced to change their business models, resulting in a reduction of the functionality delivered for a specific price. For example, in 2011, one well-known storage provider discontinued its public cloud storage business. The firm said the end date for the service would be no sooner than 2013 and offered to help customers migrate to another provider or return their data. A competitor offered to migrate the data for customers to their own cloud storage network free of charge. The original company continues to offer a higher-value service that combines archiving with indexing and classification capabilities, but customers of the commodity-based service were forced to make other arrangements.

Due diligence is always advised, but it is not always easy to predict future events. In the case of cloud computing, it is essential to understand customer rights to terminate the agreement, migrate to another service, or fall back to a pre-cloud contract if one existed.

Planning and Managing an Electronic Records Management Program

The information in this chapter is provided to help you better understand electronic records and the systems that create and manage them. Selecting and implementing the ERM system is one phase in planning and managing an electronic records management program outlined as follows:

1. Conduct an electronic records survey.
2. Plan the electronic records management project.
3. Select and implement the ERM system.
4. Advocate effective electronic records management.
5. Manage organizational change.

The ERM program is one aspect of the organization's overall records management program, which is the topic of Chapter 12.

Summary

Electronic information systems are employed to improve the efficiency and effectiveness of an organization, not to create records. However, information is created by these systems, and a portion of that information is comprised of records that must be managed in order to provide evidence of business transactions.

Web 2.0 and social media technologies have changed the way we communicate, collaborate, and interact with others within and outside of the enterprise. They also generate information, some of which are records. Records and information managers play a vital role in identifying records and providing guidance to those responsible for capturing and managing them.

Various content management systems can be used to control unstructured content, including web content management systems, enterprise content management systems, and social content management systems. Electronic records management systems can be integrated with other business systems to manage the records residing in the systems of origin. Typical electronic records management system functions include protecting the record against modification or tampering, marking records as vital, and freezing and unfreezing disposal rules.

Two of the most important de facto standards that provide guidance to vendors creating records management applications are the US Department of Defense's *DoD 5015.02-STD: Electronic Records Management Software Applications Design Criteria Standard* and the European *MoReq2010: Modular Requirements for Records Systems*.

Organizations have several options for implementing records management systems, including installing separate systems for electronic and paper records and installing a single system for both electronic and physical records. A number of approaches to integrating electronic records management systems with other electronic systems exist, including those outlined in *MoReq2010: Model Requirements for Records Systems*.

The useful life of records and information that have value to the organization often extends beyond the lives of the systems in which they are created and stored. Migration is

an activity that transfers records and information from one system to another so they can be read and used as long as necessary. Records managers can contribute to data and system migration operations in various ways, including identifying records and the metadata required to describe and manage those records.

The growing trend to take advantage of cloud computing services presents additional records management opportunities and challenges for organizations.

In the next chapter, we'll explore emerging technologies and their impact on records management. But before we do that, we'll learn how the Oregon State Archives turned to the cloud to manage the state's records. Mary Beth Herkert, Oregon State Archivist, shares experiences and lessons learned in her piece on records management in the cloud.

PARADIGM

Records Management in the Cloud

Mary Beth Herkert, Oregon State Archivist, CRM, CA

The Oregon State Archives began in earnest to find a way to manage the state's electronic records for retention and disposition in a cost-effective and efficient manner in 2001. In fact, the roots of this project can be traced back to 1995, when then State Archivist, Roy Turnbaugh, along with a representative from the state's Department of Justice and myself, tried to manage e-mail by defining how e-mail could be used (i.e., e-mail could be used only for routine messages, and anything of substance would have to be sent as an attachment, thus keeping the "official copy" of the record outside of the e-mail system). Unfortunately, no one saw the need to manage such a small amount of e-mail. By 2001, the problem of what to do with the ever-increasing volume of e-mail and now electronic records was haunting the state's information systems directors and made the job of ensuring compliance to the state's records retention schedules cumbersome, confusing, and time-consuming. The State Archives started looking at electronic records management systems (ERMS) and Department of Defense standards as possible solutions, only to be discouraged by the hefty price tag on these solutions (in excess of $1,000,000) and a poor budget climate in Oregon.

In 2003, a state agency was found in contempt of court for failure to comply with a public records request; cost—$2,500,000. Next an Oregon city failed to produce the requested records relating to another public request, costing them upwards of $1,000,000 in fines and attorney's fees. Once again, the State Archives tried to get the state to invest in a statewide ERMS, and once again they were denied the request primarily because of cost. By 2007, the State Archives knew something had to be done to manage the growing electronic records problem and decided to take a different tact. This time they went to the state legislature only asking for an appropriation to implement ERMS in the secretary of state's agency, of which the Archives is a part, with the goal of possibly implementing statewide if the process worked internally. The legislature approved funding. HP TRIM, then Tower TRIM, was selected during a formal bid process because it was truly an off-the-shelf solution; it could work with Groupwise—the agency's e-mail system at the time—and most important, was end-user friendly. It didn't hurt that it was the least-costly product either.

As we were implementing HP TRIM in-house, we began looking at how we could use this system statewide. The goal of the statewide implementation was to provide an effective

and affordable ERMS to all state and local government entities, including the smallest cities and special districts. Ideally we wanted to keep it in-house, but could never get a price point that was cost effective. It was at this point, working with our agency's CIO, the state's CIO, and attorneys from the Department of Justice, that we came up with a software-as-a-service model whereby a private sector vendor would provide the hardware and software for the management of public agency records. We ensured that, through the request-for-proposal and contracting processes, what we had was a private government cloud where participating agencies retained custody of their records, followed authorized records retention schedules, and were able to control access to their records based on existing statutes, rules, and policies. The vendor would be responsible for the hardware, software, and helpdesk, and the Archives and the participating agency would be responsible for retention, file classifications, roles, and training in the use of the ERMS. Thus was born the Oregon Records Management Solution (ORMS). Whereas the secretary of state paid $915,000 to buy and implement HP TRIM and we were paying $75.56 per user, per month in maintenance fees, ORMS would cost users $0 in start-up costs and a monthly fee of $37.02 per user. This price point will decrease as more users come on, hitting a low point of $10.54 when we reach 20,000 users. In addition, the user works with the State Archives Records Management staff to input retention schedules, tie the schedules to file classifications, establish roles, train staff in getting records into and out of HP TRIM, and use the other features of the software as well. Since we went "live" in May 2011, we have four state agencies, one county agency, one special district, and six cities that have signed on to use ORMS. The largest agency, the Department of Human Services with a potential of 3000+ users, and the smallest agency, the City of Dundee with eleven potential users, are finally on an even playing field when it comes to managing their records.

So what have we learned throughout this process? A lot! And here are a few of the more important lessons. First is the need for careful evaluation and oversight of the ERMS products. Know what you want the system to do and make sure it can do it for you. Implementing an ERMS requires a change in behavior and is a great opportunity to update and change outdated or less-effective business processes. However, you should not change your business processes just because the software cannot accommodate what you want to do; in my opinion, this will guarantee failure. Our organization looked at over half of the *DoD 5015.2*-certified products to see what their strengths and weaknesses were. We went to organizations that had implemented the product or were in the process of implementation and interviewed not only the IT staff but the end user as well. In the end, it was the feedback of the latter group that carried the most weight.

Software as a service (SaaS) was the only way to go for us considering that cost-effectiveness was one of our top priorities. This option is working because our agency CIO and the state's CIO are well versed in SaaS solutions. In addition, we were able to write a contract that ensured that public agencies would not lose custody of their records. This is in large part due to getting all of the necessary players together—CIOs, business services and contracting, attorneys, agency directors (in our case the secretary of state), and the records managers—at the onset of the project. I am not saying that this will eliminate all of the problems you may face; we still had major roadblocks to overcome. Ironically, the largest obstacle was getting statewide procurement onboard. Ultimately we reached a point at which everyone was on the same page and the experts could talk to the experts.

Security is not standard. Levels of security vary from agency to agency and at some point, someone will forget about a firewall or other security measure that they have implemented, blaming the new kid—in this case the ERMS. When this happened with our first pilot agency, our vendor very patiently went through everything on their end to ensure that the ERMS was not the cause of the problem. Despite much protestation to the contrary, the pilot agency discovered a third firewall that they had forgotten. Once addressed, the ERMS worked fine. It can be frustrating but is a reality of the process; don't get discouraged.

Changing behaviors is a necessity of this process, and I can guarantee that not everyone will like it. Be consistent and patient and have upper-level management support. Every pilot agency has had their upper-level management, county commission, or city council approve this program before implementation.

Finally, ERMS is not a magic bullet. You still need to have strong retention schedules. What we found is that split retentions, conditional retentions, and vague retentions (i.e., until superseded or obsolete) need updating. Writing retentions for paper records where an individual calculates the retention and physically touches the record before destroying it is different than writing retentions where a piece of software calculates the destruction date based on data entered and provides a list of records meeting those requirements. You need to adjust for this.

Electronic records management solutions do not materialize overnight. In fact we have spent the better part of fifteen years not managing our electronic records; costing our organizations thousands if not millions of dollars in storage and litigation costs, becoming virtual hoarders in fear of being sued, and making the manual management of electronic records virtually impossible. Fortunately, after many years and much hard work, the Oregon State Archives has come up with a solution that holds great potential for all of our public agencies. What's next? We would like to see all public agencies in Oregon take advantage of ORMS and open up its use to other states wanting to take advantage of the work we have already done.

Notes

1. Tennessee State Library and Archives, s.v. "electronic record," *Glossary of Archival Language for Archives in Tennessee*, 2000, http://www.expertglossary.com/definition/electronic-record#.
2. National Archives and Records Administration (NARA), s.v. "electronic record," *NARA'S ERA Glossary*, accessed December 16, 2012, http://www.expertglossary.com/definition/electronic-record#.
3. International Organization for Standardization (ISO), *ISO 16175-1:2010—Information and Documentation—Principles and Functional Requirements for Records in Electronic Office Environments—Part 1: Overview and Statement of Principles* (Geneva: ISO, 2010).
4. Laurent Belsie, "Wal-Mart: World's Largest Company," *The Christian Science Monitor*, February 19, 2002, http://www.csmonitor.com/2002/0219/p01s04-usec.html.
5. Motive, Ltd., s.v. "content management system (CMS)," in *The Motive Web Design Glossary*, accessed December 16, 2012, http://www.motive.co.nz/glossary/cms.php.
6. Care Converge, "Care Converge Portal," Solutions, last modified 2010, http://www.careconverge.com/healthcare/healthcareportal.htm.
7. AIIM, "What Is Enterprise Content Management (ECM)?" accessed December 16, 2012, http://www.aiim.org/What-is-ECM-Enterprise-Content-Management.

8. ARMA International, s.v. "electronic records management (ERM)," *Glossary of Records and Information Management Terms*, 3rd ed., accessed December 16, 2012, http://www.arma.org/standards/glossary/index.cfm?id_term=169.
9. National Archives and Records Administration (NARA), "Context for Electronic Records Management (ERM)," Records Managers, last modified March 27, 2000, http://www.archives.gov/records-mgmt/initiatives/context-for-erm.html.
10. Barack Obama, "Presidential Memorandum—Managing Government Records," The White House, November 28, 2011, http://www.whitehouse.gov/the-press-office/2011/11/28/presidential-memorandum-managing-government-records.
11. Executive Office of the President, "M-12-18: Memorandum for the Heads of Executive Departments and Agencies and Independent Agencies," The White House, August 24, 2012, http://www.whitehouse.gov/sites/default/files/omb/memoranda/2012/m-12-18.pdf.
12. ARMA International, s.v. "electronic records management system," *Glossary of Records and Information Management Terms,* 3rd ed., accessed December 16, 2012, http://www.arma.org/standards/glossary/index.cfm?id_term=170.
13. Ibid.
14. Department of Defense, *DoD 5015.02-STD: Electronic Records Management Software Applications Design Criteria Standard* (Washington, DC: United States Department of Defense, April 25, 2007), http://www.dtic.mil/whs/directives/corres/pdf/501502std.pdf.
15. DLM Forum Foundation, *MoReq2010: Modular Requirements for Records Systems, Volume 1: Core Services and Plug-In Modules, Version 1.0* (DLM Forum Foundation, 2010/2011), http://moreq2010.eu/pdf/MoReq2010-Core+Plugin(v1-0).pdf.
16. Department of Defense, *DoD 5015.2-STD*.
17. ARMA International, *Using DoD 5015.02-STD outside the Federal Government Sector*, ARMA TR 04-2009 (Lenexa, KS: ARMA International, 2009).
18. Ibid.
19. DLM Forum Foundation, "About MoReq2010," accessed December 16, 2012, http://www.dlmforum.eu/index.php?option=com_content&view=article&id=17&Itemid=22&lang=en.
20. Gareth Morgan, "Leading Vendors Collaborate for Records Management Scheme," Computing.co.uk, July 14, 2011, http://www.computing.co.uk/ctg/news/2094155/leading-vendors-collaborate-records-management-scheme.
21. DLM is an acronym for Document Lifecycle Management. The DLM Forum is a European community of parties interested in archive, records, document, and information lifecycle management.
22. AIIM International, *ANSI/AIIM/ARMA TR48-2006: Revised Framework for Integration of Electronic Document Management Systems and Electronic Records Management Systems* (Silver Spring, MD: AIIM International, 2006).
23. Gartner, "Magic Quadrant for Enterprise Content Management," October 18, 2012, http://www.gartner.com/technology/reprints.do?id=1-1CKSZ07&ct=121021&st=sg.
24. The State Records Authority of New South Wales, "Effectively Manage the Migration of Your Digital Records (Guideline 22)," accessed November 21, 2012, http://www.records.nsw.gov.au/record keeping/government-recordkeeping-manual/guidance/guidelines/guideline-22/4-effectively-manage-the-migration-of-digital-records/4-effectively-manage-the-migration-of-your-digital-records.

CHAPTER

7

Emerging Technologies and Records Management

Introduction

Each year, analysts, futurists, and others attempt to identify the technologies most likely to alter industries, fields of research, and even the way we live. Many of those emerging technologies will impact the way records and information are created, stored, used, disposed of, and preserved. Some of the predictions made, if they materialize, will change the way we answer such questions as these:

- What is a record?
- How can we capture it?
- How can we preserve it?

Recordkeepers must consult a variety of sources to stay abreast of emerging technologies and trends. Emerging technologies are "new technologies that are currently developing or will be developed over the next five to ten years, and which will substantially alter the business and social environment. These include information technology, wireless data communication, man–machine communication, on-demand printing, biotechnologies, and advanced robotics."[1] It is important to keep in mind that emerging technologies are not only technologies that have not yet been introduced to the consumer market but also those that have been introduced and are in the process of refinement while in use.

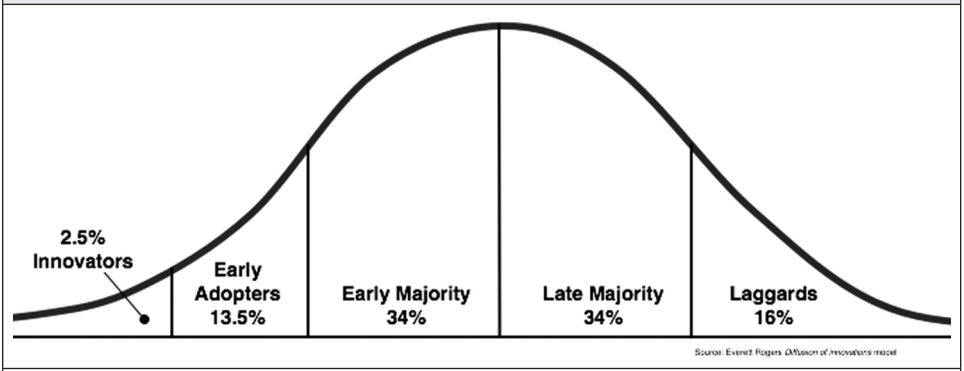
Diffusion of Innovation and Trend Spotting

Emerging technology will always require updates and adjustments to records management practices due to the rapid pace of change in this technological world. Records and information managers must not only deal with *what is* but must also be prepared for *what will be*. This is not an easy task but one that can be accomplished by identifying emerging technologies, monitoring their adoption rate, and evaluating their potential impact on the RIM program.

Diffusion of Innovation

Individuals, and even entire organizations, can be categorized according to their willingness to adopt emerging technologies. The diffusion of innovation model shown in Figure 7.1 (p. 168) plots the spread of a new idea or technology over time among members of a social system. Records and information managers must learn how to work with members of each category.

Figure 7.1. Information technology diffusion.



Source: Wikipedia, s.v. "File:DiffusionOfInnovation.png," last modified December 30, 2011, http://en.wikipedia.org/wiki/File:DiffusionOfInnovation.png.

The characteristics of members of each category and ways in which records managers might interact with them follow:

- *Innovators:* The adoption process begins with a small number of visionary, imaginative, well-informed risk-takers who are willing to try an unproven product. Innovators represent the first 2.5 percent to adopt the product. Records managers should become their first followers. Keep an eye on their ideas and projects.
- *Early adopters:* Once benefits begin to become apparent based on the positive response of innovators, early adopters begin to purchase the product or subscribe to the service. Early adopters tend to be educated opinion leaders and represent about 13.5 percent of consumers. Records managers should foster relationships with this group. Offer to assist them to identify and resolve records management challenges. They enjoy talking about their initiatives and welcome the opportunity to be part of a pilot records management project.
- *Early majority:* Members of this group are careful and tend to avoid risk. The early majority adopts the product once it has been proven by the early adopters. They rely on recommendations from others who have experience with the product or initiative. This group looks for simple, proven, better ways of doing what they already do. The early majority represents 34 percent of consumers. Records managers should be prepared to provide rationale and guidance to this group in managing records created through the use of emerging technologies.
- *Late majority:* Members of this group are conservative pragmatists who avoid risk. They are somewhat skeptical and will acquire a product or subscribe to a service only after it has become commonplace. The late majority represents about 34 percent of consumers. In the product world, their only fear is of not fitting in; this carries over to the workplace. Records managers should be prepared to provide concrete examples of how the members of the previously described categories address records management considerations surrounding emerging technology and the benefits they derive from doing so.

- *Laggards:* Laggards hold on to the status quo as long as possible. They avoid change and may not adopt a new product or service until traditional alternatives no longer are available. Laggards represent about 16 percent of consumers. Records managers should be prepared to address their criticisms and provide as much information about the new products or procedures as possible. Like the late majority, they should see examples of how others have successfully adopted the innovation. They may need to be granted a great deal of control over when, where, how, and whether they will modify their behavior to manage records resulting from new technology.

Trend Spotting

Those responsible for records management within an organization must learn to scan the environment to spot emerging technologies and trends that may impact RIM in the future.

trend: To extend in a general direction.*
trend spotting: The process of systematically monitoring and assessing both the internal and external environments to identify changes taking place over the short or long term, analyzing their implications for the organization, and interpreting their impact on professional practice.

**Merriam-Webster Online*, s.v. "trend," accessed December 16, 2012, http://www.merriam-webster.com/dictionary/trend.

Learn to Trend-Spot

Trend spotters identify changes taking place in both the short term and long term and share stories about the value of the change in order to influence others to adopt that change. Trend spotting is an industry, and expert trend spotters (e.g., forecasters and futurists) can be employed to help an organization understand both tangible (e.g., smartphones) and intangible (e.g., expectations) trends.

You can spot trends yourself by using these approaches:

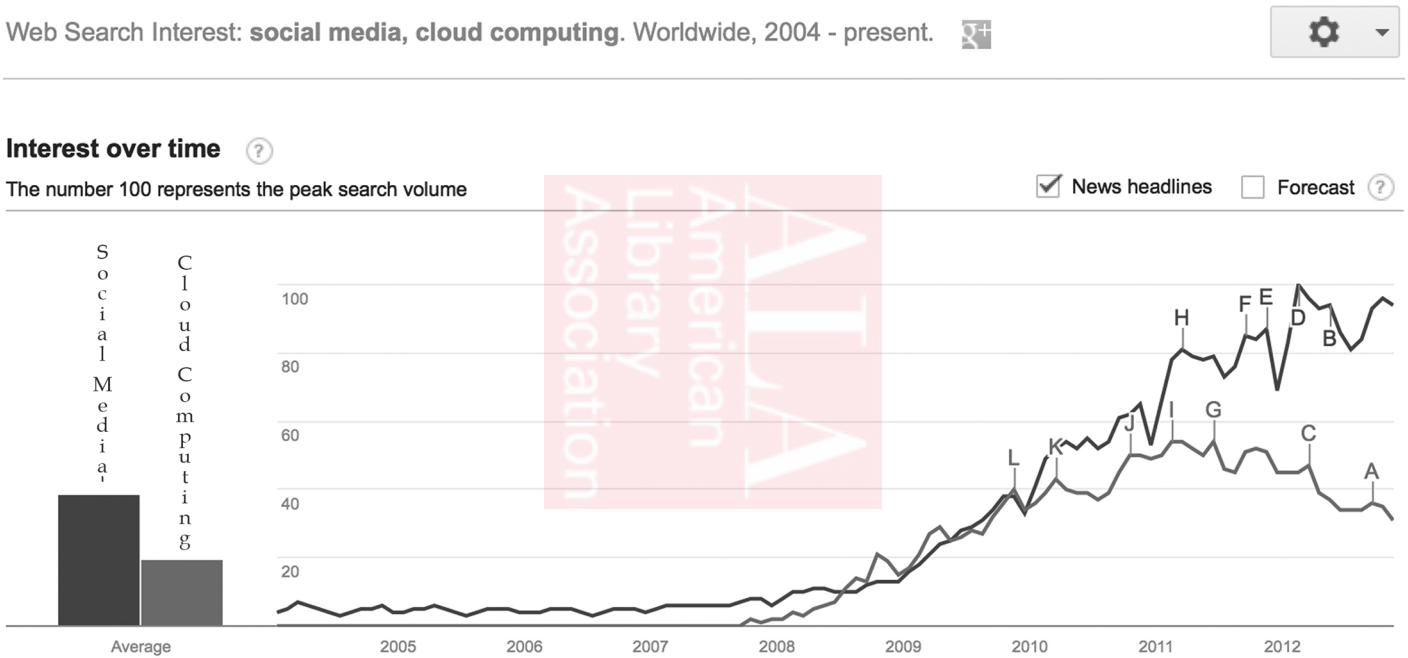
- Listen to others around you. Identify the innovators and early adopters in your organization. Get involved in innovative projects to experience change yourself.
- Listen and learn from those outside of your organization. Attend conferences and trade shows, speak to colleagues, and understand what is important to them before you see it in print.
- Watch/read/browse journals, newspapers, and the Internet. Learn what is happening with emerging technologies, in records management and related fields, and in the industry in which your organization operates.
- Look more broadly at other industries that may impact your own.
- Use software and/or services for spotting trends. Search the Internet for trend-spotting software and services.

Trend-Spotting Software and Services

Google Trends is a free online service that allows a search on one or multiple terms to determine the world's interest in topics of your choice (http://www.google.com/trends/). You can use commas in the search bar to search up to five different topics at one time. The results of the search are plotted on a line graph, showing two types of information for each topic:

- Search volume index (number of searches conducted for the terms you entered relative to the total number of searches over time)

Figure 7.2. Result of a Google Trends search on two topics, social media and cloud computing.



- News reference volume (number of times your topic(s) appeared in Google News stories)

A search on two key terms—social media and cloud computing—between 2008 and 2013 clearly shows an increasing interest in social media; however, interest in cloud computing peaked in 2011 and has trended downward since then (see Figure 7.2, facing page). The data on cloud computing reinforces a 2011 prediction by IDC that cloud computing as a buzzword will decrease as the use of cloud services becomes part of the mainstream.[2]

Yahoo! Clues is similar to Google Trends (http://clues.yahoo.com/). It reveals how many people had searched on specific topics on the day of the search and over the previous week, month, and year. Results are also displayed based on demographics (age, gender, and both) and location. Although you may find uses for trending services such as Google Trends and Yahoo! Clues, you should identify additional sources of trending information.

Journals and Research Firms

A number of analysts and research firms provide information on technologies and trends that you will find useful. A description of three of those resources—*MIT Technology Review*, International Data Corporation (IDC), and Gartner—as well as examples of recent predictions follow. Note the references to different groups along the diffusion of innovation curve shown in Figure 7.1 (p. 168) in their predictions.

MIT Technology Review, published by Massachusetts Institute of Technology (MIT), identifies emerging technologies and analyzes their impact for technology leaders, business leaders, and researchers who create and fund the innovations that drive the global economy. *MIT Technology Review* is also an invaluable resource for early adopters, the media, those in government, and anyone who needs to understand trends in technology.[3] Don't limit yourself to monitoring trends within your own industry. Advances in another industry may have a significant impact on your work in the future.

For example, according to *MIT Technology Review*, one area of research considered significant in 2011 was made by Harvard University electrical engineers to bring the benefits of tightly focused light beams to commercial applications. By adding nanoscale optical antennas to commercially available lasers, the team hopes to one day make DVD-like discs that store 3.6 terabytes of data—the equivalent of more than 750 of today's 4.7-gigabyte recordable DVDs. Obviously, this has far-reaching implications for those responsible for digital storage and, therefore, for records managers.

We could analyze innovation in terms of opportunities and threats for RIM. On the one hand, this technology would provide the ability to store more in less space—something those in information technology would welcome. On the other hand, many people equate the *ability* to store more with a *reason* to store more, which could further diminish their commitment to dispose of records and information no longer of value to the organization—a concern for compliance officers and records managers.

IDC, a provider of market intelligence, advisory services, and events for the information technology and telecommunications markets, is another valuable resource. In 2011, IDC analysts predicted that three disruptive technologies would move beyond the early-adopter phase and into the mainstream:

- The development of millions of mobile apps and increased number of mobile devices (e.g., smartphones and tablets) would bring the PC-centric era to an end.
- In response to consumer demand for web-connected televisions, 40-inch and larger televisions would have network connectors built in and the number of media and entertainment content clouds would continue to grow.
- Cloud computing as a buzzword would fade as more enterprise applications are built for the cloud.[4]

IDC considers these emerging technologies *disruptive technologies*, a term coined by Clayton M. Christensen in 1995. By 2003, Christensen had replaced the term *disruptive technology* with the term *disruptive innovation* to broaden the concept to include the strategy or business model that the technology enables that creates the disruptive impact.[5] Gartner, an information technology research and advisory company, provided a list of top ten disruptive technologies that would impact our lives from 2008 through 2012.[6] Augmented reality, cloud computing, social networking technologies, and web mashups were on the list. Those alerted to these technologies in 2008 would have had time to consider whether these technologies would produce records and, if so, how those records could be captured and managed. They would be better prepared for the records management challenges presented today.

You were introduced to these technologies in Chapter 1. Gartner was right—the use of all four technologies has grown. But that doesn't mean we should stop studying them. They are still emerging technologies, and as such will continue to develop. For example, Google's Project Glass integrates augmented reality with eyewear that can perform functions now conducted on smartphones, such as making video calls, snapping photos, scheduling appointments, and getting directions.[7] Google's goal is to put this technology into contact lenses in the distant future, eliminating the need to wear the glasses. What implications might this have for records creation and management?

Identifying, Capturing, and Scheduling Web Records

Of course, there is no records series named "Web Records," but the term is used here to help us focus on the considerations that must be made when planning to manage web-based records.

Web 1.0 versus Web 2.0 Websites and Records Management

Organizations launched websites before becoming engaged in social media initiatives. Websites created by businesses and government agencies in the 1990s, often referred to as brochureware, were static documents posted on the web in the hope that users would visit the website to read what was posted. Web 2.0 websites differ from their Web 1.0 counterparts in several ways. As shown in Table 7.1, Web 1.0 enabled one-way communications of read-only content but Web 2.0 websites encourage two-way interaction and user-generated content.

Recordkeeping Roles and Responsibilities

The duties of all individuals involved in developing, maintaining, or contributing content to the website must be clarified. Individuals with responsibilities related to website records

Table 7.1. Comparison of Web 1.0 and Web 2.0 website characteristics.	
Web 1.0	**Web 2.0**
One-way	Two-way
Authoritarian	Democratic
Passive	Active
Static	Dynamic
Closed	Collaborative
Read-only content	User-generated content

management may include content providers, website managers, records professionals, archivists and/or librarians, legal services, and end users.

Recordkeeping Requirements for Web-Based Records

Web-based records are subject to the same requirements as paper-based or other electronic records. They must be retained and disposed of in accordance with retention and disposal schedules based on their administrative, legislative, financial, and historical value. In some cases, content displayed on a website is information held elsewhere in hard copy or electronic format. The content on the web serves as a digital representation in order to disseminate information to a broader audience. The original records may already be held in a recordkeeping system. However, there are occasions when some records contained on an organization's website are not being kept in another form. When that is the case, it is essential to ensure that those records are managed by the organization's recordkeeping system. The records and information management policy must address website records responsibilities. Approaches to managing web-based records will differ based on the type of content contained: static or dynamic.

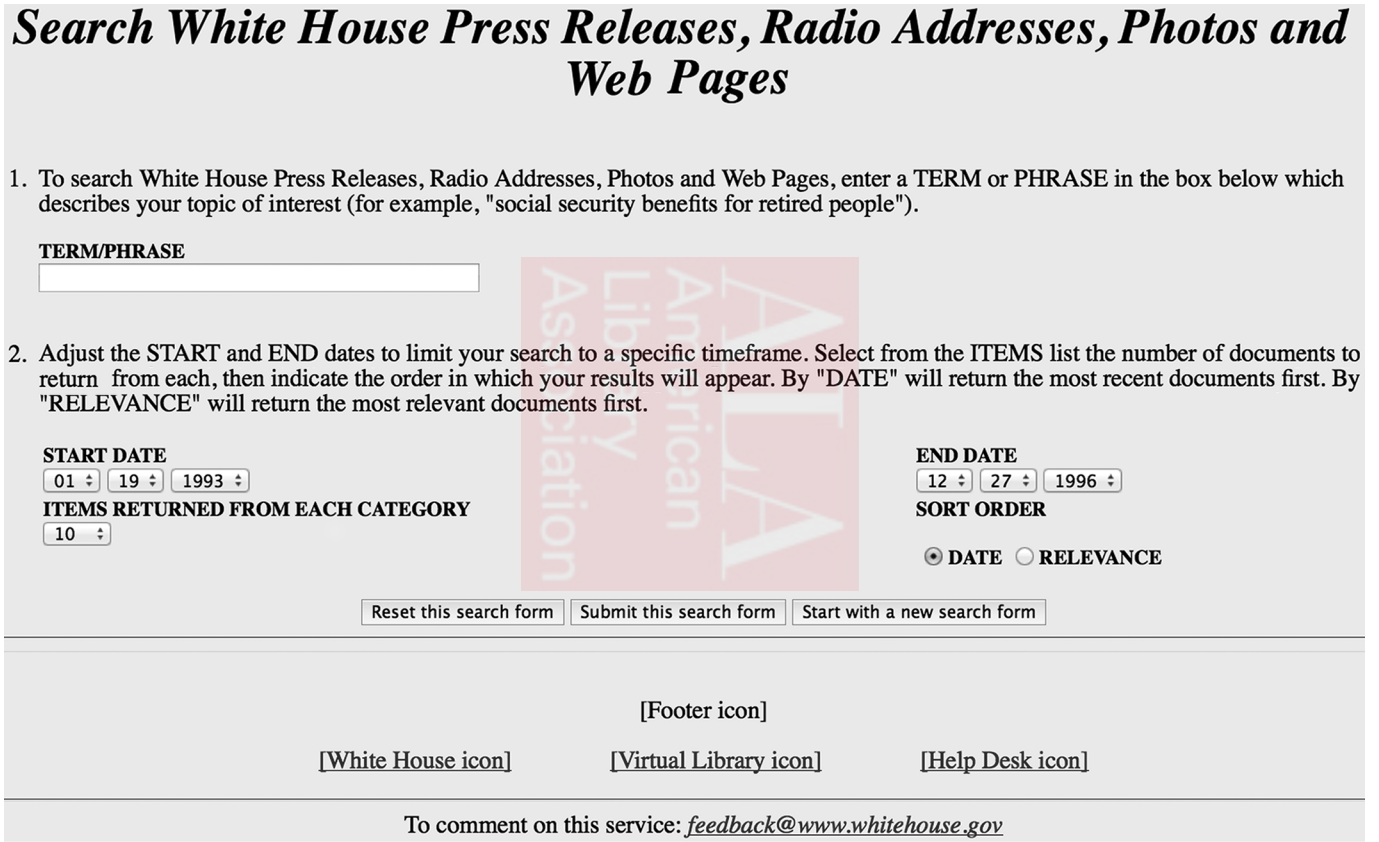
Static Web Content

A *static webpage* displays the content to each viewer in the same way. The viewer has no ability to control the information displayed. Static content can be developed quickly through the use of website development tools that publish HTML files for upload to the web. Static content can also be added to a website developed using a website content management system. Pages that represent static content considered records can be captured by a records management system before posting. A set of recordkeeping rules to provide guidance for custodians of the content (whether content contributors, website managers, or others) might include the following:

Addition of content:

- No action is required when the content published on the website already exists in a record controlled by the organization's recordkeeping system.
- If new versions of documents are added to websites or changes are made to existing content (excluding minor changes such as the correction of spelling errors), a copy of the updated document should be included in the organization's recordkeeping system.

Figure 7.3. WhiteHouse.gov site in 1996 (Web 1.0).



Search White House Press Releases, Radio Addresses, Photos and Web Pages

1. To search White House Press Releases, Radio Addresses, Photos and Web Pages, enter a TERM or PHRASE in the box below which describes your topic of interest (for example, "social security benefits for retired people").

TERM/PHRASE

2. Adjust the START and END dates to limit your search to a specific timeframe. Select from the ITEMS list the number of documents to return from each, then indicate the order in which your results will appear. By "DATE" will return the most recent documents first. By "RELEVANCE" will return the most relevant documents first.

START DATE 01 19 1993

END DATE 12 27 1996

ITEMS RETURNED FROM EACH CATEGORY 10

SORT ORDER (•) DATE ( ) RELEVANCE

Reset this search form | Submit this search form | Start with a new search form

[Footer icon]

[White House icon] [Virtual Library icon] [Help Desk icon]

To comment on this service: *feedback@www.whitehouse.gov*

Source: Internet Archive: Wayback Machine, accessed December 16, 2012, http://web.archive.org/web/19961227062541/http://www3.whitehouse.gov/.

- Content must be published with metadata to provide context (e.g., date of approval, authorization, disclaimer, copyright notice).

Removal of content:

- If a complete and current copy of a file published via the web exists in the record-keeping system or is held by the initiating party, it may be deleted from the website at any time.
- If a copy of the web-based record does not exist in the recordkeeping system or elsewhere, it may be deleted from the website only when all records retention requirements have been met.
- If the records are required for audit or legal purposes, or relevant to an e-discovery or freedom of information request, they must not be modified or destroyed even if their retention requirement has been met. In effect, a legal hold must be put into effect following procedures in place for all records (e.g., the legal department notifies the records manager, who then advises the IT security manager).

Preservation for archival purposes:

- If most of the content on the website is held in a content management system or controlled by a recordkeeping system, periodic snapshots of the website may be appropriate to create an accurate archive of a significant portion of the website at a particular point in time. A risk assessment should be conducted to determine which portions of the website(s) should be included and the frequency of the snapshots (e.g., annually or when major changes have been made to the design and/or content).
- The records created by capturing snapshots must be managed according to accepted recordkeeping principles (e.g., not overwritten until retention periods have been met, migrated through upgrades of hardware and software to ensure their continuing usability and authenticity).
- Snapshots are not recommended for websites that incorporate highly dynamic functionality, including databases and e-commerce transactions.

The last bullet indicates that snapshots are suitable for the static Web 1.0 websites but not appropriate for dynamic Web 2.0 websites.

Dynamic Web Content

It is easy to see the differences between early Web 1.0 websites and today's interactive sites by using the Internet Archives' Wayback Machine (http://archive.org/web/web.php) to locate an image of the earlier site (see Figure 7.3, facing page). The 1996 Whitehouse.gov site contains only text and links to other textual documents and does not allow for the public to leave comments. You can imagine the ease with which records could be managed, since content could reside in the same location as other electronic documents not posted to the web. For historical purposes, a periodic screenshot is sufficient, since the page would be changed very little over time.

A *dynamic webpage* is one that delivers custom content and is generated in response to a user request, drawing content from a database and displaying the content in a predetermined format.[8] Web 2.0 sites often contain links to other sites, including social media sites, that

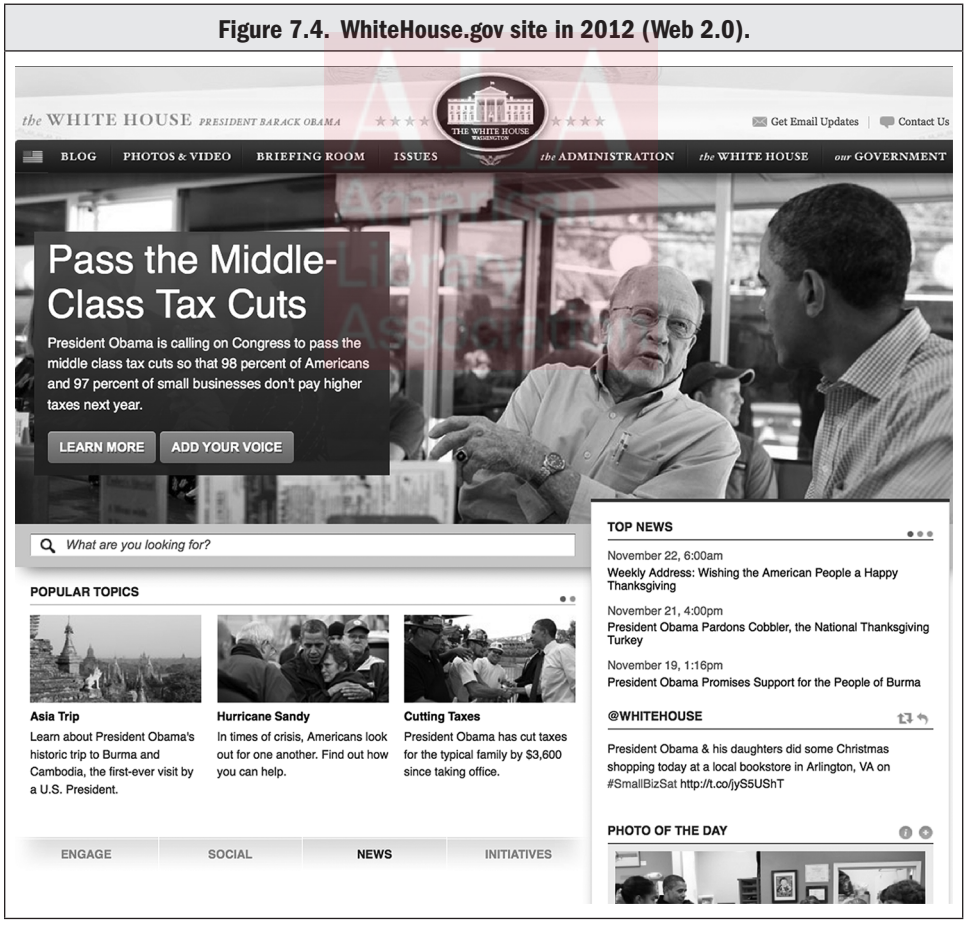
should be captured and preserved if a complete picture of the ways in which the organization communicates with those within and outside of their walls is desired. The current White House website shown in Figure 7.4 contains dynamic elements and encourages interactivity with the public. Users can check the president's schedule and view images of the activities in which he is engaged. The site encourages the public to become involved in government by creating and signing petitions. In addition to a link to *The White House Blog*, links to the following social media tools are located at the bottom of the homepage: Facebook, Twitter, Google+, YouTube, Flickr, LinkedIn, Foursquare, and Vimeo.

Web Archiving

Creating snapshots of websites may be acceptable for historical purposes when preserving static websites typical of the Web 1.0 era, but that method is not suitable for Web 2.0 websites.

In addition to hosting the Wayback Machine, a public archive containing over 240 billion webpages from 1996 through December 9, 2012,[9] the Internet Archive provides a web archiving subscription service, Archive-It, which allows institutions to build and preserve

Figure 7.4. WhiteHouse.gov site in 2012 (Web 2.0).



collections of born-digital content. Archive-It partners can harvest, catalog, manage, and browse their archived collections. The collections are hosted at the Internet Archive data center and are accessible to the public with a full-text search. Another tool developed by the Internet Archive is Heritrix. This tool is an open-source, scalable Web crawler capable of fetching, archiving, and analyzing Internet-accessible content. Heritrix is free software that can be downloaded by technical staff to crawl the Internet. Users of this tool include the Austrian National Library, the US Library of Congress, and the British Library. Archive-It and Heritrix are used to capture websites and, in some cases, social media sites to which they are linked; the primary purpose is for preservation.

web archiving: "Saving the pages from Web sites as they change over time for historical purposes. Using spiders similar to the ones search engines routinely deploy, there are services that archive the pages of a company's own Web site or pages from selected Web sites across the Internet."*

**PC Magazine*, accessed January 20, 2013, http://www.pcmag.com/encyclopedia_term/0,1237,t=Web+archiving&i=57897,00.asp.

Compliance Issues

In addition to meeting preservation requirements, the records manager is concerned with the need to capture content to support compliance. Comprehensive web-archiving practices are required to protect the organization from risks, including penalties for regulatory noncompliance, litigation challenges, and e-discovery costs. Emerging technology, which often poses challenges, can also present possible solutions. Reed Technology, a part of the LexisNexis family, offers the Web Preserver service, designed to capture, preserve, and view fully functioning website and social media pages, including all of the links and associated metadata. Additional features of the service include these:

- Automatically archiving entire websites or individual webpages
- Ability to browse and search the archives and view pages exactly as they appeared
- Archiving of RSS feeds
- Flexible archiving scheduling options
- An application console to manage the archives, with thumbnail images of archived pages and folders to organize the archives
- Mobile-enabled support for the service, which allows users the ability to capture, preserve, and view websites and social media pages using any pad, smartphone, or other handheld device

Now let's look more closely at social media and additional challenges presented for records and information managers before discussing additional solutions to capturing and preserving Web 2.0 records.

Social Media and Records Management

The term *social media record* is being used in this instance to represent all records posted to, created through, or residing in social media technologies. It is not a term used to classify records. Many of these records could potentially be categorized under existing series titles, such as electronic communications or press releases. If the content represents a new record series, the records retention schedule must be updated.

Social media records can reside in social media technology hosted by third-party providers or hosted by the organization itself. Social media technology hosted by the organization provides a greater degree of control over the content and is ideal for projects that don't require participation by the general public or that do require high levels of security. When the intent of the social media initiative is outreach to the public, the use of popular social networks hosted by third parties is the best approach.

Those who took advantage of social media tools within their organization early on were charting a new course. Those responsible for records management within those organizations often learned about social media initiatives and their impact on the records management program after initiatives had been implemented. This was the case within the executive branch of the US federal government. On President Obama's second day in office in January 2009, he directed all agencies within the federal government to create an environment of openness and transparency. Soon after, social media teams were formed and social media outreach initiatives were launched. These employees were the innovators and early adopters who paved the way for the rest of the government agencies.

It was not until October 2010 that the US National Archives and Records Administration (NARA) was able to provide guidance to federal government agencies to manage records created through, posted to, or stored within social media technologies by releasing "NARA Bulletin 2011-02: Guidance on Managing Records in Web 2.0/Social Media Platforms."[10]

In March 2011, the American Council for Technology and Industry Advisory Council, a nonprofit public-private partnership dedicated to improving government through the application of information technology, identified the following challenges presented by emerging technologies:

- Identification of a record
- Capture of the record
- Retention of the record
- Scheduling/distribution/disposition of the record
- Staffing and education (for employees, including executives)[11]

These challenges are no different from challenges that recordkeepers faced before Web 2.0, and the recommended actions for which the organization is responsible remain the same:

- Updating RIM policy "before" using social networks
- Updating the RIM training course
- Defining and applying strict access controls
- Defining a record and determining its status
- Developing and applying a comprehensive records retention schedule

Although the responsibilities are the same as in the past, the policies and practices need to be adjusted.

The 2011 Records Management Self-Assessment Report released in spring 2012 revealed that 70 percent of the federal agencies responding currently use social media, such as Facebook, Twitter, and blogs. However, only 50 percent of those employing social media have developed policies and procedures for capturing and managing *any* records created on social media platforms.[12] David S. Ferriero, Archivist of the United States, expressed this sentiment in testimony before a congressional committee in May 2011:

> Without changing recordkeeping policies to reflect the current environment, while simultaneously also supporting the development and deployment of more robust electronic recordkeeping systems, the permanent record of our nation that is in electronic form will be compromised.[13]

Lessons learned from the initial social media projects of the government and other organizations can be useful to anyone updating their own policies and practices to manage social media records.

Identifying Social Media Records

"NARA Bulletin 2011-02" mentioned earlier contains a nonexhaustive list of questions that employees can use to help determine records status.[14] The list is provided here; however, the term *organization* was substituted for the term *agency* used in the original list.

- Is the information unique and not available anywhere else?
- Does it contain evidence of the organization's policies, business mission, etc.?
- Is this tool being used in relation to the organization's work?
- Is the use of the tool authorized by the organization?
- Is there a business need for the information?

Even though social media content may not rise to the level of a record according to the definition in use, the organization may still be responsible for managing the nonrecord content. For example, an organization may consider a social networking profile a record, but consider comments nonrecords. That decision will have an impact on what must be retained according to the records retentions schedule. It does not, however, absolve the organization from monitoring and evaluating the comments. Security and privacy risks emerge, for example, through posts that reveal trade secrets or those that violate company policy.

Understanding the Origin of Social Media Records

Before we can determine how best to capture social media records, we must understand how that content was posted to social media sites.

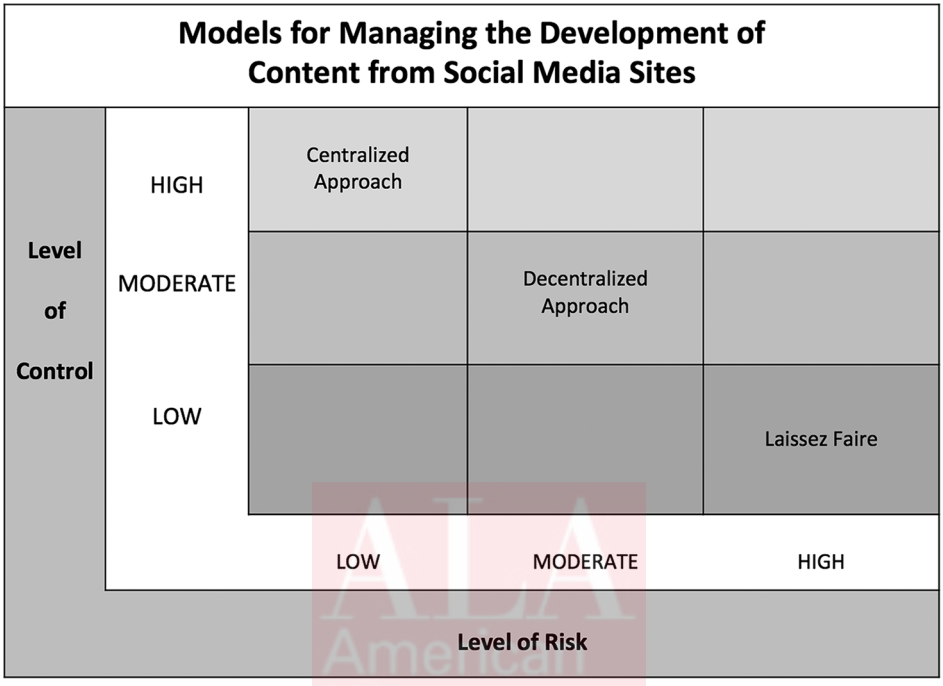
The New York State Archives offers three models for managing the development of content for social media sites based on an organization's desire for control and appetite for risk (see Figure 7.5, p. 180).[15] Although intended as guidance for the state government and its agencies, the models can easily be adapted for profit and nonprofit firms as well.

The following descriptions are modified slightly to accommodate both public and private organizations.

Model 1: Centralized Approach—Strict Internal Controls (High Control, Low Risk)

One staff member is responsible for uploading information to all sites and to the official website, although the staff member solicits ideas for content from across the organization or work unit or via a designated team. In many organizations, social media teams have been formed apart from the website development teams to handle all social media initiatives. Access to the site(s) is limited to a small number of staff, and those staff members who do have access represent the organization in an official capacity and must follow policies on appropriate use.

Figure 7.5. The inverse relationship between level of control and level of risk.



Source: New York State Archives, "Records Advisory: Preliminary Guidance on Social Media," Managing Records, last modified May 24, 2010, http://www.archives.nysed.gov/a/records/mr_social_media.shtml.

Model 2: Decentralized Approach—Control Distributed to Units of the Organization (Moderate Control, Moderate Risk)

Rather than create a single institutional account, an organization or work unit within the organization has multiple pages focusing on separate organizational functions or activities of interest to the public. This decentralized approach requires that authorization be given to a larger number of individuals and increases risk. But it can give the site a personal touch that may be more appealing than a generic site.

Model 3: Laissez-Faire—No Internal Controls (Low Control, High Risk)

This model assumes that social media technologies are not meant to be controlled at all. Instead organizations should *embrace the unexpected* and allow staff and users to have unmediated use of social media sites to enjoy the full benefits of this technology, and to ensure that social media deployment is a spontaneous, grassroots activity. This approach may seem reasonable during the early life of an emerging technology when innovators and early adopters are given permission to launch social media projects and see what develops. But uncontrolled participation by employees can result in harm to both the organization and the employees themselves.

Capturing Social Media Records

The models for the development of content for social media sites have a direct bearing on the methods that could be used to capture social media records. The methods used to capture these records also depend on the social media technology and the tools available to the organization. In this section, we'll analyze the content contained within three popular social media technologies—blogs, microblogs, and social networking sites—and consider alternate methods to capture that content from two different perspectives, the federal government and the finance industry.

Keep in mind that existing social media tools will continue to evolve or be acquired by larger competitors, and new technologies and services will be introduced to the public. Those that are not popular will disappear and those that are popular are likely to be acquired by larger companies. In spite of the fact that the tools, technologies, and services will change, the method used to analyze the content posted to Web 2.0 collaborative technologies in order to determine how best to manage that content can also be applied to technologies, tools, and services that do not yet exist.

Blogs, Microblogs, and Social Networking Sites

These three tools—blogs, microblogs, and social networks—possess features to facilitate interaction and community building.[16]

Blogs

Blogs are easy and inexpensive to create and publish. They may or may not accept comments. Organizations that allow comments can monitor the posts and delete those that are deemed unacceptable. An archive may be maintained for public access. Methods of capturing content will continually evolve. Blog content is fairly simple to capture, since content is created and then uploaded and comments are not necessarily considered records. Here are several options:

- If the blog does not contain comments, the blog posts can be captured and saved to a content management system before they are uploaded to the site.
- If the blog does contain comments, an RSS feed can be used to capture comments and forward them to the organization. Some organizations use a sampling technique to capture some but not all of the comments made by visitors to the blog.
- If the entire blog, not individual posts, rises to the level of a record, the entire blog site can be captured in the same way a website is captured. For example, institutions can harvest and preserve collections of digital content using Archive-It. The harvested content is hosted at the Internet Archive data center and is accessible to the public by full-text search.
- If the blog is to be retained by the organization rather than hosted by a third party—as is the case with the National Library of France—robots, or *bots*, can be used to carry out bulk harvesting to capture a blog at specific points in time.

Microblogs

To many, Twitter has become synonymous with the term *microblog*. Tweets can be posted in a number of ways, including by e-mail, text messaging, instant messaging, through the

Twitter website, or by using a social media management tool (dashboard). One of the easiest ways for an individual to archive tweets is by grabbing the RSS feed for the tweet stream of choice and then adding it to a preferred RSS reader. If you use Google Reader, for example, you can use the *infinite scrolling* feature to go back to the very first item ever tracked for that subscription. You can also use a search box to search for keywords or phrases in your feeds.

Organizations can avoid manual archiving by engaging a social media archiving service, such as RegEd's Social Media Archiving and Surveillance Solution for the financial services industry (https://www.arkovi.com/). This software as a service (SaaS) solution archives social content in the cloud; allows search, filter, and export to Excel or XML; and even exports directly to a third-party backup or archiving service. Content archived from Twitter accounts include tweets, retweets, and replies; conversation threads; direct messages; and backgrounds and bios.

Enterprise microblogs can be used as an addition or alternative to public microblogs. Enterprise microblogs are business tools that enable users to communicate, collaborate, and share files with those who are provided access to the network. Two prominent enterprise social networking tools are Chatter.com acquired by Salesforce and Yammer acquired by Microsoft. Both Chatter and Yammer are offered as free services, but the enterprise versions can transform the way employees work by integrating the microblogging application with business applications.

Salesforce, a leader in cloud services for sales and customer relationship management (CRM) services, offers Chatter Plus to allow employees to collaborate across the organization. The employee social network can be extended to allow customer social networks. Users can follow people or records (accounts, cases, opportunities, etc.). Application data (e.g., Microsoft Office documents, PDFs, and image files) can be previewed in the user's Chatter feed. Chatter posts, including those posted from Chatter Mobile, are stored forever unless deleted by an administrator or user. Apps are available to extend the functionality of Chatter. One app, Chatter Compliance, allows system administrators to archive and search Chatter posts, comments, and private messages.

Chatter can be integrated with other applications. For example, customers who use Salesforce Customer Relationship Management can integrate an app called Shipmate for UPS to prepare shipments, and print labels using data in Salesforce CRM. Shipmate for UPS can be "made social" by integrating Chatter to track shipments to customers without having the tracking number or logging into a separate system (https://www.chatter.com/).

Yammer is also available for free or for a fee per user/per month. One fee-based version allows access to both the enterprise social network and SharePoint Online. The enterprise version provides administrative features that include customization of the network, user management, security tools, and keyword monitoring. Administrators can export data for legal and regulatory compliance and lock down content as final to prevent editing and new versions. Files and notes can be marked as official and read-only. Those files and notes most actively shared, commented on, viewed, or marked as official appear higher in search results and content directories (https://www.yammer.com/).

Our review of enterprise microblogging tools furthers our discussion in Chapter 6 about system integration. At its SharePoint Conference 2012 in Las Vegas, Microsoft shared its plan for integrating the Yammer enterprise social networking tool with SharePoint. The

first goal was to unify the products by a single ID/sign-on and allow shared document management capabilities; a long-term goal is to integrate e-mail, instant messaging, and videoconferencing functions.[17]

Social Networking Sites

You were introduced to two popular social networking sites, Facebook and LinkedIn, in Chapter 1. Facebook allows users to download a copy of their Facebook data from the General Account Settings screen. By selecting *Download a copy of your Facebook data*, the user can instruct Facebook to create an archive of photos, wall posts, messages, and other information. An expanded archive can also be downloaded that includes historic information such as the mobile phone numbers added to the account, a list of log-ins stored for the account (not complete), and the IP addresses from which the user logged out.

One advantage of Facebook's download feature is the ability to gather and download data for storage and/or upload to another social networking site. However, the process is time-consuming. Persons wishing to download data must use their ID and password to log in and request the download. When the data is archived, an e-mail is sent to the address on the account for confirmation. This provides data up to a specific time, so if this method is selected to download data, a regular schedule should be developed and adhered to.

LinkedIn's user agreement contains the following statement: "LinkedIn may terminate the Agreement and your account for any reason or no reason at any time, with or without notice."[18] LinkedIn doesn't provide tools that make it easy to download all content from an account. But an individual or organization that has invested time in developing their contact list could protect that information by exporting a file containing those contact names through the Export connections link on the Contacts page on a regular basis. The data can be exported as a CVS file that can be downloaded and then imported into Microsoft Outlook, Outlook Express, or Yahoo! Address Book or a VCF file for import into the Mac OS Address Book. This is another approach that depends on being logged in to the service and exporting the data manually. A copy of the profile information can be saved before uploading, especially if approval is necessary before posting. Or, the profile information can be copied as text and pasted into a word processing program and saved.

As illustrated by these two examples, if an organization's social media initiatives are designed to take advantage of commercial technologies in the public domain, a number of challenges present themselves, including those resulting from the lack of standards across platforms, the rapid pace of change, and the lack of corporate control.

The American Council for Technology and Industry Advisory Council challenged vendors on behalf of the federal government to improve the ability of business and government alike to capture and manage social media records.[19] The agencies are looking for the vendor community to provide the government with the capability to configure the client or server to capture social media records without user intervention. A second suggestion is to provide a back-end solution where social media records are automatically tagged with metadata.

Until such solutions are available, organizations will continue to struggle to capture and manage social media records. Two approaches discussed next, one practiced by the Executive Office of the President of the United States and another recommended for members of the finance industry, illustrate that approaches are dependent upon a number of factors, including governing regulations.

Executive Office of the President

One blog ranked in the top 100 on a list of the most popular overall blogs compiled by Technorati is *The White House Blog* (http://www.whitehouse.gov/blog).[20] On May 2, 2011, shortly after midnight, a message announcing the death of Osama Bin Laden, the leader of al Qaeda, was posted to *The White House Blog* (see Figure 7.6). It contained a video of the president's address to the nation and a transcript of that address.

Figure 7.6. *The White House Blog* on May 2, 2011.

Source: Macon Phillips, "Osama Bin Laden Dead," *The White House Blog*, May 2, 2011, http://www.whitehouse.gov/blog/2011/05/02/osama-bin-laden-dead.

Because social media tools can be used to update content on a number of social networks simultaneously, the content of the blog could be found in other locations, including the White House website and YouTube. This prompts such questions as these:

- Are the objects themselves (e.g., video and transcript) records?
- Is this specific blog post a record?
- Is the entire blog containing all posts from the initial through the current a record?
- Should comments made by visitors be captured?

Records management guidance can be found in applicable laws and regulations. In the case of *The White House Blog*, guidance is provided by the Presidential Records Act of 1978 that requires the permanent preservation of all records created or received by the president, vice president, or the White House staff.[21] When a president leaves office, these records go to NARA, which eventually releases them to the public. A 2009 White House blog post clearly states, "This very blog post will be archived."[22] The question of how to handle comments from the public is easily resolved as well since this blog does not allow comments.

In testimony before the House Committee on Oversight and Government Reform on May 3, 2011, Brook M. Colangelo, Chief Information Officer for the Executive Office of the President (EOP), stated: "Currently, the management of this material [social media] is handled on a component-by-component basis within the EOP—the OCIO (Office of the Chief Information Officer) does not provide an enterprise solution."[23] Mr. Colangelo further explained:

> I am aware that the White House Office utilizes a combination of traditional manual archiving techniques (like saving content in an organized folder structure) and automated techniques (such as Real Simple Syndication (RSS) feeds and Application Programming Interfaces (APIs)) to archive records created by the White House on social network sites like Facebook and Twitter. Should technological solutions develop that allow OCIO to offer an enterprise-wide solution to archiving this material, we will certainly pursue those possibilities as we have other initiatives to improve management of electronic records at the EOP.[24]

One term in Mr. Colangelo's last statement demands further explanation—*archiving*. In this instance, he is referring to the process of capturing the content posted to social media sites and placing it under the control of the Executive Office of the President either on shared drives as explained or other repositories utilized by the government. The actual process of transferring the content to NARA for permanent preservation occurs at the end of the president's tenure in the White House.

The Finance Industry

The finance industry utilizes blogs, microblogs and social networking sites to reach out to current and prospective clients. Here, too, we can look to laws and regulations to provide guidance.

The Finance Industry Regulatory Authority (FINRA) was established to protect American investors by making sure the securities industry operates fairly and honestly. FINRA oversees nearly 4,700 brokerage firms, approximately 167,000 branch offices, and about 637,000 registered securities representatives. In 2010, FINRA Regulatory Notice 10-06 made it clear that "every firm that intends to communicate, or permit its associated persons

to communicate, through social media sites must first ensure that it can retain records of those communications as required by Rules 17a-3 and 17a-4 under the Securities and Exchange Act of 1934 and NASD Rule 3110."[25] Firms cannot delete, and must archive, all social media activities.

The treatment of blogs and social networking sites such as Facebook, Twitter, and LinkedIn under FINRA Rule 2210 would depend on whether the content was static or dynamic.[26] Static blog posts, for example, would constitute advertisements and require approval prior to posting. If the blog allowed users to engage in real-time interactive communications, the blog was considered an interactive electronic forum, and the contents did not need preapproval. Static content on social networking sites needed preapproval, but dynamic content on those same sites did not.

In 2012, FINRA Regulatory Notice 12-29, with an effective date of February 4, 2013, was released. This rule reduced the number of communication categories from six to three: institutional communication (distributed only to institutional investors), retail communication (distributed or made available to more than twenty-five retail investors within any thirty calendar-day period), and correspondence (distributed or made available to twenty-five or fewer retail investors within any thirty-day calendar period). Communications taking place through social media fall under the retail communication category.

Communications classified under the retail communications classification:

- are exempt from pre-use approval requirements (no approval needed before posting);
- must be managed "after" posting;
- must comply with NASD Rule 2210(b)(4)(A) concerning recordkeeping requirements; and
- must be retained for a period of three years (two years on the premises).

The fourth bullet implies the necessity of employing an archiving solution. If you use an archiving solution, be sure you can reconstruct conversation threads from multiple participants, as you would with e-mail. According to FINRA, third-party posts are not records unless endorsed by a representative of the firm. Actions have consequences. Do not *favorite* or *like* third-party posts and be careful of retweets.

Records Scheduling Challenges and Solutions

Some social media records can be considered duplicate records. This can easily be understood in the case of a video created in-house and uploaded to YouTube. The original is often stored within the enterprise in its native format and the version posted to the social media site is considered a copy. In a traditional paper-based world, a copy would be scheduled with a shorter retention period than the original. The copy would be destroyed based upon the retention schedule. In reality, once a digital object is shared through the use of a social media site such as YouTube, it is unrealistic to believe that all copies can be disposed of according to a retention schedule. Although an enterprise may have a terms of service agreement that allows the enterprise to close an account and remove the content, due to the viral networked-based nature of social networking, it is extremely likely that copies will exist that cannot be located and destroyed. Some social media records, such as a chief executive officer's blog, may have permanent value while others are transitory, such as routine notices of meetings or requests for information or publications and copies of

replies that required no administrative action, policy decision, or special compilation or research to reply.[27]

Once records are captured into an enterprise content management or records management system, records retention requirements can be applied. The granular nature of retention schedules designed for paper-based records poses a problem to those attempting to manage records created by social media technologies and provides additional support for the "big-buckets" approach to records retention introduced in Chapter 4.

Automated solutions may be the best option to records identification, capture, and scheduling challenges for organizations large and small, public and private. Although automated solutions are beginning to appear in the marketplace, many organizations continue to place the ultimate responsibility for records management decisions on the creators of the records, and mistakes can be made. To protect the organization, social media policies are crafted. An equally important reason for establishing such policies is to protect employees.

Social Media Policy Development

Policies are simply high-level plans that embrace the general goals and acceptable procedures of an organization. Organizational policies are established to document a definite course or method of action. Most firms have more than one policy to guide the actions taken by employees of all levels. Records management policies and electronic communication policies are two examples.

The social media policy may start out simple if the organization is in the early stages of embracing social media technology. It will grow as the company becomes more deeply or broadly engaged. Social media policies will contain general guidelines governing employee behavior as well as more specific information related to social media technologies in use by the organization. All stakeholders, including information technology, business units, human resources, records management, marketing, and compliance, must be involved in developing the policy. Some organizations have social media teams. If your organization does, members of this team can form the core of the social media policy development committee. A number of organizations have posted their social media policies online. For example, IBM published the "IBM Social Computing Guidelines" for blogs, wikis, social networks, virtual worlds, and social media online on its website.[28] The Social Media Governance website hosts a database with links to almost 200 social media policies.[29] It is wise to review some of these before beginning to write one for your own organization.

General Social Media Policy Contents

The social media policy should address security, privacy, and communications issues, as well as records management considerations. At a minimum, include the following general information:

- Specify who is authorized to represent the organization in social media (e.g., representatives from marketing and public relations).
- Encourage employees to include a standard disclaimer when publishing content that makes clear that the views shared are representative of the employee and not necessarily of the organization.

- Specify who is authorized to create social media accounts for your organization and/or provide an online form to allow an employee to apply for one or more social media accounts.
- Clarify the content of messages to be shared through social media on behalf of the organization; for example, sharing of personal messages on organization social media sites may be prohibited.
- Specify the criteria to be followed before implementing a new social media initiative to obtain approval that will guarantee the resources needed to ensure success.
- Include a reference to your organization's records management policy within the social media policy at a minimum.

Social Media Project Proposals

Both a social media policy and the records and information policy should refer to a form to be completed by the person or unit proposing a new social media initiative. The person completing the form should indicate if records will be created, and if so, how they will be managed. NARA developed a Web 2.0 and Social Media Project Proposal for employees who wish to propose a new Web 2.0 technology or social media site. This form requires that records management be considered in the planning stages of the social media initiative (see Figure 7.7).

Managing Mobile Devices

In 2010, a humorous video posted to YouTube portrayed an employee desperate to get his work done more efficiently by smuggling his own laptop and smartphone into the workplace. The skit highlighted a growing trend called "The Consumerization of IT" and illustrated the reaction of most IT departments at that time—prohibit the use of personal devices. By 2012, enterprise mobility was one of the top initiatives of CIOs. Several surveys revealed relevant trends and challenges:

- 81 percent of employed adults use at least one personally owned electronic device for business use.[30]
- $429,000 was the typical company loss due to mobile computing mishaps in 2011.[31]
- 72 percent of companies allow BYOD usages in some fashion.[32]
- 50 percent of companies in Australia have experienced a data breach due to insecure devices.[33]

BYOD (bring your own device) policies can reduce organizational risk; however only 26 percent of respondents to a recent survey reported they "sort of" have a management policy for consumer devices and 31 percent didn't have a policy at all.[34] BYOD policies must include language about the platforms, devices, and applications that are supported. User roles and responsibilities must be clearly outlined, and user awareness training focusing on security issues such as password protection, locking the device, and encrypting sensitive information must be provided.

Integration into the Electronic Records Management System

In Chapter 6, you were introduced to a number of integration models that provided records management control of content. Social media content must be managed following the same

Figure 7.7. Example of a social media project proposal.

Web 2.0 and Social Media Project Proposal

Send proposal via email to: (e-mail address)

Name of Project:
Date proposal submitted:
Target date for launch:
Brief description of project and its goals:

Type of Web 2.0 Technology or Social Media site:

- Hosted on an external site or on the agency's web servers?
- How does this project support the agency's Strategic Plan?

Intended Audience (please check):

- Agency staff (e.g., employees, interns, and volunteers) - Please specify a particular department, office, unit, or all staff): _____
- General Public
- Researchers
- Genealogists
- Veterans
- Media and Press
- Records Managers
- Educators and/or Students
- Preservation and Archives Professionals
- Other (please fill in): _____

Estimate of resources required (# of staff, hours, materials, software, etc):

Will proposed social media be used to create or maintain data or information meeting the definition of a Federal record per 44 USC 3301 and 36 CFR 1222? __ Yes __ No __ Maybe

If yes, how will the records, drafts, and other products from this project be captured and managed during their entire retention period?

Who will oversee or manage the project if approved?

Point of contact information:

- Name
- Organization
- Telephone
- E-mail

Proposal Approved by:

- Name and Title
- Organization
- Telephone
- E-mail

Source: National Archives and Records Administration (NARA), "Web 2.0 and Social Media Project Proposal," Social Media Policies, February 4, 2011, http://www.archives.gov/social-media/policies/831-2-proposal-form.pdf.

records policies and retention requirements as other content. The challenge is to find a way to enable records management systems to manage records created using social media tools. To do that, we must look at content created through enterprise solutions in the clouds and content created on public sites.

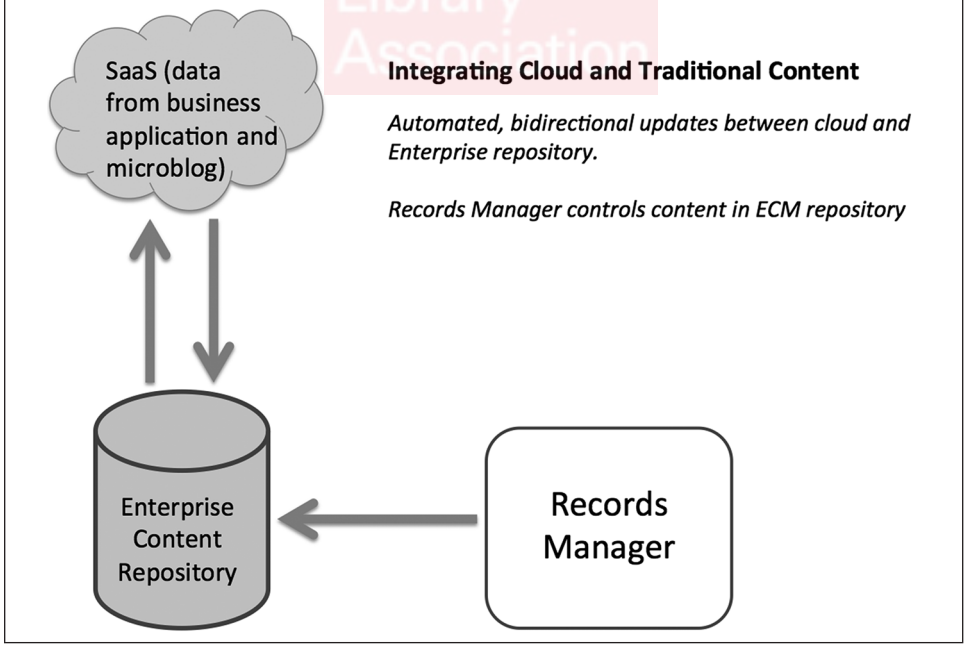
Enterprise Social Media and Electronic Records Management

We'll use the Salesforce/Chatter example we've discussed in this chapter to demonstrate one potential solution to apply records management control to data created in the clouds.

Salesforce is the leader in CRM cloud services. Chatter feeds are archived by the Force.com platform that enables both the CRM software and Chatter. A Salesforce customer has records from both business transactions and social interactions that must be managed. If the best solution for the organization is to store all of those records in an electronic document management system that can be integrated with a records management solution, our goal would be to integrate Salesforce with the document management system as shown in Figure 7.8.

If the organization employs an EMC Documentum Content Management System, they can use a Salesforce.com connector created by a third party, Perficient, to link Salesforce.com and the content management system to allow bidirectional updates between the two. Records management functionality can be added to the EMC Documentum Content Management System through the EMC Documentum Records Manager (http://www.emc.com/). This proposed solution depends on specific products, but the process used to determine the solution is the important lesson. As a records manager, you will need

Figure 7.8. Integration enables records management for data created in the clouds.



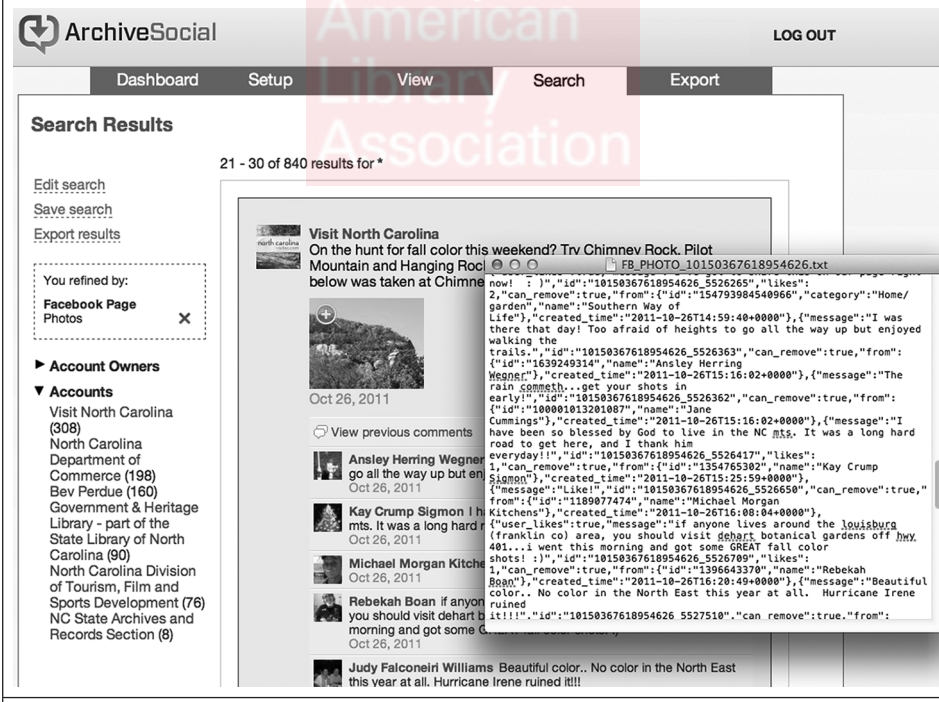
to understand both the legacy and cloud-based systems in place and then conduct some research in order to determine the best records management solution.

Public Social Media and Electronic Records Management

Although it is possible to download content from each social media site using the tools provided, the best approach to capturing content is to employ an automatic archiving solution. Recently, a number of social media archiving solutions for business compliance and records management have come on the market. Two examples are ArchiveSocial and Smarsh.

The ArchiveSocial system is entirely web-based and, at this time, archives data from Facebook, LinkedIn, and Twitter, with plans to add YouTube and RSS feed archiving in the near future. As illustrated in Figure 7.9, ArchiveSocial (http://archivesocial.com/) features a sophisticated search interface for filtering social media content and exporting results into PDF and Excel formats. In addition to preserving the look and interactivity of social media, ArchiveSocial also maintains the native format of each record in a legally sound format with complete metadata. Because proof of authenticity is required when providing electronic records as evidence in response to an e-discovery request, a time-stamped digital signature is applied to each individual record stored in the archive. The digital signature is proof that the data existed at a specific time and that it had not been changed.

Figure 7.9. ArchiveSocial interface showing Facebook page posts and underlying metadata.



Source: Courtesy of ArchiveSocial, http://archivesocial.com/.

Government agencies, faced with a growing number of Freedom of Information requests, can simplify search and retrieval of requested public records using this solution. By making as many public records available through a website as possible, they may even reduce the number of such requests. In 2012, the State of North Carolina turned to ArchiveSocial to capture social media, in full context, and make it available in real time. At its public launch in December 2012, the North Carolina State Government Web Site Archives and Access Program (Social Media Archive BETA) provided access to more than 55,000 social media records from selected state agencies.[35] Social media activity from those agencies continues to be captured and indexed, with plans to include additional state agencies in the future.

Smarsh is a SaaS firm that provides hosted archiving and compliance solutions for archiving electronic communications, including e-mail, instant messaging, and social media platforms (e.g., Facebook, LinkedIn, and Twitter). Captured social media is preserved in redundant, geographically dispersed data centers and burned to WORM optical storage. The social media is accessible via a web-based management console, and it is possible to track the entire thread of social media posts from multiple individuals, providing context to the conversation.

Records are retained according to the organization's retention policies, including legal holds. Administrators can retrieve as many messages as necessary in original form on demand. They can download content to a PC or portable media device, or export it for e-discovery in the electronic discovery reference model (EDRM) XML interchange format schema and transfer it to document review and processing systems. Part of this service is delivery of monthly copies of data on encrypted DVDs. Integration with enterprise social collaboration tools is possible, including archiving and compliance for Salesforce Chatter and for Yammer.

These examples are provided to help you understand the logic behind developing records management solutions for records created through the use of emerging technologies. By the time you read this, the landscape may have changed dramatically. But what will still be important is that you are prepared to investigate and understand solutions that will help you manage an organization's records and information.

Summary

Records and information managers must deal with day-to-day responsibilities and, at the same time, scan the horizon for emerging technologies that may impact their RIM programs in the future. The diffusion of innovation model introduced in this chapter plots the adoption of new technology over time. In addition to understanding how society at large adopts new technology, it is necessary to understand how members of the organization attempt to implement it in the workplace.

One way to keep abreast of emerging technologies is to identify trends. This can be accomplished by listening to others within and outside your organization; watching/reading/browsing journals, newspapers, and the Internet; looking more broadly outside of your own industry; and using software and/or services to spot trends.

Records created through or residing on an organization's websites must be managed according to the organization's retention schedule. Most of today's dynamic websites link to third-party social media sites.

Both Web 2.0 website content and social media content can be categorized as static or interactive. Static content can be preapproved and captured before it is added to a website or social media site. Interactive content must be monitored and captured after the fact.

Tools and services exist to capture and archive websites. Some of those services can also capture and manage social media content. However, automated solutions are not yet available to adequately capture and categorize social media records from all third-party sites. Therefore, a combination of manual and automatic solutions is employed by both public and private organizations. Once website and social media records are captured, they should be managed in the same manner as other electronic records. Vendors such as Microsoft and Salesforce.com are beginning to develop products that integrate content management and records management features. Cloud-based social media archiving solutions are becoming more prevalent; two examples are ArchiveSocial and Smarsh.

In his contribution to this chapter, Christian van der Ven, Coordinator of Digital Services for the Brabant Historical Information Center, the Netherlands, provides insight into the archive's foray into social media for digital services. His primary concern is with improving services, motivating staff to engage the public through social media, and evaluating the outcome of the effort using metrics appropriate to each particular initiative, not records management. Records and information managers must take a proactive approach to understand initiatives such as these. As you're reading this paradigm, ask yourselves the following questions: Are records being created? Where do they reside? How do we capture them? How long must we retain them? How do we preserve them?

PARADIGM

Discovering the South Land—Employing Emerging Technologies, Motivating Staff, and Measuring Success

Christian van der Ven, MA, Coordinator, Digital Services, Brabant Historical Information Center, the Netherlands

The Brabant Historical Information Center (BHIC), a regional archive in the city of Hertogenbosch (province of North Brabant, the Netherlands), successfully deploys emerging technologies such as social media into its digital customer services. How did this start and evolve? In what way did staff members become motivated to join in? And how do metrics show value and influence further development?

Introducing the BHIC

The BHIC keeps about 1,500 archives and collections for the province of North Brabant, seventeen of its municipalities, and two of its water boards (special government agencies for water management). It is the center for genealogy and historical research in North Brabant, accessible via several physical locations, and—equally important—its website.

The BHIC has deployed emerging technologies in a variety of ways since 2005. Its main goals are:

- reaching a larger and broader audience;
- connecting to people and keeping in touch with them;

- highlighting archives and collections; and
- crowdsourcing.

Two of the most unique services that the BHIC provides are the way it hosts and manages several forums, and the website's chat-with-an-archivist option. Due to the discussion forums, active communities for genealogy and local history in North Brabant have evolved. Those communities are now helping to answer questions that are sent to the BHIC by patrons, so the forum offers an alternative to traditional reference services. The chat service provides a help-within-a-click button on each webpage, offering a digital alternative to the traditional reference desk. During evening hours, patrons can live-chat with an archivist. The archive also highlights (local) photo collections through Flickr, where people comment on the photos and, by doing so, improve descriptions in the BHIC database. There is an active Twitter account for keeping in touch with current patrons and for outreach to new patrons. And several crowdsourcing projects allow people to share stories and photos and help improve the accessibility of the archives and collections.

"It's the Staff, Stupid!"

Even though it is common knowledge that the best base for successfully deploying new services in an organization is enthusiastic and motivated staff, too often the focus lies on the services instead. BHIC has tried to do things differently. We have accomplished this through a special project called Discovering the South Land, in which the staff were prepared for a new way of providing digital customer services.

Exploring the South Land

During the era of explorations, the South Land was an almost mythical continent, believed to be full of spices, treasures, and civilized people. No one knew exactly where this South Land could be found, but many had a vague idea of where it would be. Generations of explorers sailed out in discovery of this land, mapping new coastlines, surviving storms and shipwreck, but bringing home exotic animals and stories as well, which made other adventurers eager to join them.

Staff at the BHIC has also "sailed out" in a digital way, to discover their own "South Land," exploring the Internet, the social Web 2.0, e-communities, user participation online, and more. Unsure about where this would lead, the project was meant to map the coastlines of new ways of delivering customer services, and to motivate staff to become involved. The staff's explorations and their changing attitudes, not the services, were the most important results. T*o discover is not just about finding, but also about searching.*[36]

Traditional producer-consumer relationships on the web are transforming into new "prosumer" relations, wherein patrons and archivists work together to build collections, make archives accessible, and share knowledge. This requires a new attitude among archivists. And it raises questions about what value we as professionals can add to (existing) online communities.

A kickoff meeting was meant to inspire staff, to solidify ideas, and to initiate pilot projects. In small project teams, staff explored a variety of new technologies, such as blogs, photo-sharing websites, and forums. Team members brainstormed, found inspiring examples (often outside our field), and started working on pilot projects. In the end they shared feedback with all colleagues.

The staff discovered and experienced for themselves how the Internet is changing. Colleagues from front and back offices worked and learned together. Most of all, everyone was now convinced and enthusiastic about the need for—and opportunities of—new, digital customer services, a new role for archivists online, and a changing attitude. They were also motivated to develop and explore even more. Today, many staff members eagerly follow new online developments, pick up ideas, and start pilot projects. The South Land project eventually merged into regular work processes with success.

The South Land project was based on three key principles:

- *Care for people:* The focus is on the people—the staff—instead of the services. When staff members turn into believers with regard to digital services, they become enthusiastic initiators; the services follow automatically. And the foundation for a more durable change in your organization will have been laid. Change is a social process, and focusing on the attitude of the staff is the key.
- *Create space for experiments:* It is extremely important to give space to staff and the ideas they develop, even when you have doubts about the possible success of a project. It is more effective to experience anything yourself than being told about it. "Idea killers" should not be allowed in the early stages of the process. Show genuine trust and interest in the ideas of your colleagues, and ask how you might help to facilitate them. Whether the project becomes a success, a failure, or something in between, in one way it will always be a winner: everyone has learned valuable lessons and will continue to explore and discover. Having been trusted and having been given the space will always pay off.
- *Focus:* To prevent an eventual overload of new projects, you must focus. This may sound like a paradox compared with the previous principle, but in the end you simply cannot do everything for everyone. So you will need to focus on specific projects and services, balancing creating room for new projects with continuing the existing ones. This means you and your colleagues together may need to make (possibly painful) decisions.

To Measure Is to Know, in Time

In my experience, I found it important not to start with numbers, statistics, and targets during the start-up of any pilot project, because this could be extremely demotivating for participants. Metrics should help you, not make you nervous. Also, since you're often trying out new services, you will not have a good idea of the availability of metrics that you could use, or what to expect in terms of audiences (visits, views, clicks, comments, and such). The more projects develop, the more important metrics will become to measure success and to develop services even further.

Project Goals as a Base for Using Metrics

Rather than using only the raw numbers from your web analytics program or content management statistics module, ask yourself questions about what you need to know in order to measure success and further deploy projects. This naturally depends on the goal(s) of your services.

Let's say your goal for putting photos on a photo-sharing website such as Flickr is to reach large audiences. Of course you'll then be most interested in the amount of views your

photos receive. However, this number is only of secondary value when your goal is to crowdsource for descriptive information for your photos. In that case you should be more interested in the amount of comments that your photos receive and the quality that they have with regard to the photo descriptions.

With that said, focusing on the wrong statistics may mislead you. For example, it is natural to target large communities, because they receive a lot of views. But when, for example, your goal is to enhance the quality of your photo descriptions through crowdsourcing, you might be better off targeting specific communities where people with useful knowledge concerning the topics that your photos cover can be found. These communities may not be large and your photos may not receive a lot of views, but you'll often find that the response is much more useful.

Metrics as a Base for Developing Services

As told, the BHIC hosts several forums. It is important to have statistics on how many messages (both questions and answers) are posted on these forums. But these numbers tell little about the community itself without related statistics. How many unique users do the forums have? How many messages do they post? How many people posted one message only? How many posted two to five messages? How many posted more than fifty? How did these shares in community activity develop over time? What's your own share? You may find out that, although your forum is growing in number of messages, it could very well be because a shrinking group of people are increasing their participation or that your own colleagues have become more active (either of which is luckily not the case for the BHIC forums, I should add). For community management purposes, you need to ask the right questions and get the right statistics; based on those, make your decisions.

Metrics and decisions are also needed in the case of further development of services. Take, for example, BHIC's chat reference service. In order to know what days and times were best for having a chat service online—if at all—we went online for a few months at a variety of days (weekdays and weekends) and times (mornings, afternoons, and evenings). By doing this we found that people used the chat service most during weekday evenings. We used these experiences to make schedules, promote the service, and eventually organize staff.

Surprising Value

Finally, you may find surprising forms of value in your services. For example, through the forums we sometimes connect to people who are willing to offer us photos they made from documents in our collections or indexes they created to make them more accessible. We also receive many comments from patrons who use the chat service informing us of how very happy they are with this service. Both forums and chat were of much more value to the BHIC, for example, in terms of improving databases and image-building than the pure numbers could have ever made us believe.

Summary

Staff at the BHIC uses emerging technologies such as social media for reaching out to a larger and broader audience, for connecting to patrons and keep in touch with them, for highlighting archives and collections, and for crowdsourcing. During the Discovering the

South Land project, staff became motivated to explore the social web. They also developed ideas for new digital services. The focus during the project was on a changing attitude and role of the staff at BHIC. Its concept was based on three key principles: caring for the people, creating space for experiments, and focusing, thus making smart choices. The use of metrics in order to measure the success of projects and for further developing projects is based on project goals.

Notes

1. BusinessDictionary.com, s.v. "emerging technologies," accessed December 16, 2012, http://www.businessdictionary.com/definition/emerging-technologies.html.
2. CBS News, "3 Emerging Technologies to Go Mainstream in 2011," January 10, 2011, CBS Money Watch, video, http://www.cbsnews.com/video/watch/?id=10495949n?tag=bnetdomain.
3. *MIT Technology Review*, "About Us," Massachusetts Institute of Technology, accessed December 16, 2012, http://www.technologyreview.com/corp/about.aspx.
4. Ibid.
5. *Wikipedia*, s.v. "disruptive technology," last modified December 11, 2011, http://en.wikipedia.org/wiki/Disruptive_technology.
6. Gartner, "Gartner Identifies Top Ten Disruptive Technologies for 2008 to 2012," Gartner Newsroom: Press Releases, May 28, 2008, http://www.gartner.com/it/page.jsp?id=681107.
7. Jared Newman, "Google Project Glass: Contact Lenses a 'Long-Term Thing," *Time* Tech, May 31, 2012, http://techland.time.com/2012/05/31/google-project-glass-contact-lenses-a-long-term-thing/.
8. ARMA International, *Website Records Management: An ARMA International Guide* (Overland Park, KS: ARMA International, 2009).
9. Brewster. "Wayback Machine: Now with 240,000,000,000 URLs," *Internet Archive Blogs*, January 9, 2013, http://blog.archive.org/2013/01/09/updated-wayback/.
10. National Archives and Records Administration (NARA), "NARA Bulletin 2011-02: Guidance on Managing Records in Web 2.0/Social Media Platforms," Record Managers, October 20, 2010, http://www.archives.gov/records-mgmt/bulletins/2011/2011-02.html.
11. American Council for Technology (ACT) and Industry Advisory Council (IAC), *Best Practices Study of Social Media Records Policies: ACT-IAC Collaboration and Transformation (C&T) Shared Interest Group (SIG)*, March 2011, 11, http://www.actgov.org/knowledgebank/whitepapers/Documents/Shared%20Interest%20Groups/Collaboration%20and%20Transformation%20SIG/Best%20Practices%20of%20Social%20Media%20Records%20Policies%20-%20CT%20SIG%20-%2003-31-11%2%283%29.pdf.
12. National Archives and Records Administration (NARA), "National Archives Releases 2011 Records Management Self-Assessment Report," Press/Journalists, May 1, 2012, http://www.archives.gov/press/press-releases/2012/nr12-110.html.
13. David S. Ferriero, *Testimony of David S. Ferriero, Archivist of the United States, Before the House Committee on Oversight and Government Reform on "Presidential Records in the New Millennium: Updating the Presidential Records Act and Other Federal Recordkeeping Statutes to Improve Electronic Records Preservation,"* 112th Cong. 6 (2011), May 3, 2011, http://oversight.house.gov/wp-content/uploads/2012/01/5-3-11_Ferriero_Testimony.pdf.
14. National Archives and Records Administration (NARA), "NARA Bulletin 2011-02."
15. New York State Archives, "Records Advisory: Preliminary Guidance on Social Media," Managing Records, last modified May 24, 2010, http://www.archives.nysed.gov/a/records/mr_social_media.shtml.

16. Ibid.
17. Mary Jo Foley, "Microsoft Details Its Roadmap and Pricing for SharePoint-Yammer Integration," ZDNet, November 12, 2012, http://www.zdnet.com/microsoft-details-its-roadmap-and-pricing-for-sharepoint-yammer-integration-7000007268/.
18. LinkedIn, "User Agreement:7.1. Mutual Rights of Termination," accessed February 1, 2013, http://www.linkedin.com/static?key=user_agreement&trk=hb_ft_userag.
19. American Council for Technology (ACT) and Industry Advisory Council (IAC), *Best Practices Study*.
20. Technorati, "Politics/US Political Blogs," accessed January 21, 2013, http://technorati.com/blogs/directory/politics/uspolitics/.
21. National Archives, "Presidential Records Act (PRA) of 1978, accessed January 21, 2013, http://www.archives.gov/presidential-libraries/laws/1978-act.html.
22. Macon Phillips, "Reality Check: The Presidential Records Act of 1978 Meets Web-Based Social Media of 2009," *The White House Blog*, September 19, 2009, http://www.whitehouse.gov/blog/Reality-Check-The-Presidential-Records-Act/.
23. Brook M. Colangelo, *Testimony of Brook M. Colangelo, Chief Information Officer, Office of Administration, Executive Office of the President, Before the House Committee on Oversight and Government Reform*, May 3, 2011, http://oversight.house.gov/wp-content/uploads/2012/01/5-3-11_Ferriero_Testimony.pdf.
24. Ibid.
25. Finance Industry Regulatory Authority (FINRA), "Social Media Web Sites: Guidance on Blogs and Social Networking Web Sites," Regulatory Notice 10-06, January 2010, http://www.finra.org/web/groups/industry/@ip/@reg/@notice/documents/notices/p120779.pdf.
26. Finance Industry Regulatory Authority (FINRA), "2210. Communications with the Public," *FINRA Manual*, accessed December 17, 2012, http://finra.complinet.com/en/display/display.html?rbid=2403&element_id=3617.
27. National Archives and Records Administration (NARA), "General Records Schedule 23: Records Common to Most Offices within Agencies," National Archives and Records Administration General Records Schedules: Transmittal No. 22, April 2010, http://www.archives.gov/records-mgmt/grs/grs23.html.
28. IBM, "IBM Social Computing Guidelines," accessed December 17, 2012, http://www.ibm.com/blogs/zz/en/guidelines.html.
29. Chris Boudreaux, "Policy Database," Social Media Governance: Empowerment with Accountability by Chris Boudreaux, accessed December 17, 2012, http://socialmediagovernance.com/policies.php#axzz1iWXAyX1c.
30. Cameron Camp, "The BYOD Security Challenge: How Scary Is the iPad, Tablet, Smartphone Surge?," *ESET Threat Blog*, February 28, 2012, http://blog.eset.com/2012/02/28/sizing-up-the-byod-security-challenge.
31. Symantec Corporation, "2012 State of Mobility Survey," accessed January 21, 2013, http://www.symantec.com/en/uk/content/en/us/about/media/pdfs/b-state_of_mobility_survey_2012.en-us.pdf.
32. Aberdeen Group, "Prepare Your WLAN for the BYOD Invasion," Analyst Insight, July 2011, 2, http://research.aberdeen.com/internetcontent/somoclo/0161-7262-AI-WLAN-BYOD-AB-08.pdf.
33. Ponemon Institute, "Global Study on Mobility Risks, Survey Results for: Australia," February 2012, 2, http://www.computerworld.com.au/whitepaper/370729/global-study-on-mobility-risks-survey-results-for-australia/download/.
34. Johnson, Kevin, "SANS Mobility/BYOD Security Survey," SANS Analyst Program, March 2012, 6, https://www.sans.org/reading_room/analysts_program/mobility-sec-survey.pdf.
35. Anil Chawla, Founder and CEO, ArchiveSocial, telephone interview, Friday, November 30, 2012.
36. Christian van der Ven, *The Digital Archivist* (blog), accessed January 22, 2013, http://www.digitalearchivaris.nl/.

CHAPTER

8

Vital Records, Disaster Preparedness and Recovery, and Business Continuity

Introduction

What is a *records disaster*? Simply stated, it is a sudden and unexpected event that results in the loss of records and information essential to an organization's continued operation. Natural or man-made disasters—9/11, Hurricane Katrina's effect on the US Gulf Coast states in 2005, the earthquake in Haiti in 2010, and the tsunami in Japan in 2011—leave devastation in their wake. The loss of life is tragic, and the damage to the local infrastructure can be significant. Long-term recovery efforts are hampered by the interruption of normal economic activity. Even those businesses and public institutions that have disaster recovery and business continuity plans in place could find that the effects of the natural disasters exceed the scope of those plans. Not all records are essential to business continuity after a disaster, but those that are vital must be identified as part of the overall business continuity effort.

Business Resumption Strategies

By definition, a *business continuity plan* is a set of documents, instructions, and procedures that enable a business to respond to accidents, disasters, emergencies, and/or threats without any stoppage or hindrance in its key operations. Some sources use the terms *business continuity plan* and *disaster recovery plan* interchangeably. Others see the business continuity plan as an umbrella plan that consists of several component plans, among them the disaster preparedness and recovery plan.

Business resumption depends on the following:

- Business continuity plan
- Disaster preparedness and recovery plan
- Vital records program

ARMA International defines *disaster recovery plan* as "a written and approved course of action to take after a disaster strikes that details how an organization will restore critical business functions and reclaim damaged or threatened records."[1] A *disaster preparedness and recovery plan* includes steps to mitigate loss, as well as steps needed to recover from loss due to man-made or natural disasters.

A *vital records program* consists of the policies, plans, and procedures developed and implemented and the resources needed to identify, use, and protect the essential records needed to meet operational responsibilities under emergency or disaster conditions or to protect the organization's rights or those of its stakeholders.[2] This is a program element of an agency's emergency management function.

A *vital records manual* is a communications tool used to document the vital records program. It could be published separately or as part of a records management manual. It has three parts:

- Procedures and objectives
- Explanation of the vital records schedule (master list)
- Instructions for reconstructing the vital records, including the equipment that would be necessary

Identifying the vital records essential to the organization's continued operations is the first step toward developing both a disaster recovery plan and a business continuity plan.

Vital Records Program

Every organization, large or small, needs a vital records program to protect essential information from destruction due to earthquakes, floods, terrorism, and other disasters. Large organizations may survive such disasters because they have duplicate records at other sites. Small companies without a vital records program may never be able to reopen due to lost records.

Fact: One in four businesses never reopens its doors after a disaster.

Some companies feel a false sense of security because they have implemented a disaster recovery program. To most companies, this means protecting files on a computer system so that they can get it up and running again. Older records not stored on computer-readable media are not protected under these disaster recovery programs. It is estimated that one in four businesses never resumes operations after a major disaster strikes.[3]

The estimated $100 billion in damages from Hurricane Katrina in August 2005 is just one gauge of that hurricane's economic effect.[4] After Hurricane Katrina, business owners faced the enormous task of putting their companies back together. This included reconstructing lost or ruined business records (see Figure 8.1). Small business owners were particularly vulnerable. Those who didn't have their records backed up at a remote location or who were unable to take their records with them gathered as much information as they could find. In the short term, they needed the data to apply for Small Business Administration disaster loans. In the long term, they needed those records to prepare tax returns and to seek future financing.

Business records were not the only documents lost. Floodwater, wind, and mold damaged, soaked, and ruined vital records in Texas, Louisiana, Mississippi, and Alabama, including school records, law enforcement records, court records, and medical records. Unlike digital records, paper records are rarely backed up off-site. Without medical records, doctors were unable to treat people who needed medical attention but whose conditions and medications were unknown. Shortly after Hurricane Katrina, the federal government began a pilot test of KatrinaHealth.org, an electronic health record (EHR) online system, sharing prescription drug information for most of the hurricane evacuees with health care professionals.[5]

Although a natural disaster cannot be prevented, the impact of the disaster could be mitigated by the development of both a comprehensive disaster preparedness and recovery plan and a business continuity plan. These plans are often designed simultaneously, with the disaster preparedness and recovery plan a part of the overall business continuity plan.

Figure 8.1. More than five months post-Katrina, salvaged paper medical records remained inaccessible at Hancock Medical Center, Bay St. Louis, Mississippi.

Source: Electronic Health Record Association, "HIMSS Katrina Phoenix Battles Ongoing Hurricane Effects with Health IT Donations," Press Releases, February 13, 2006, http://www.himssehra.org/ASP/pr_20060213b.asp. Reprinted with permission from HIMSS. Photo by David Collins for HIMSS.

Planning a Vital Records Program

A vital records program is necessary to identify and protect those records that specify how an organization will operate during an emergency or disaster, those records necessary to the continued operations of the organization, and those records needed to protect the legal and financial rights of all stakeholders.[6] According to the ANSI/ARMA standard *Vital Records Programs: Identifying, Managing, and Recovering Business-Critical Records*, a vital records program must include at a minimum:

- a list of all records identified as necessary to protect assets; protect legal and financial status; preserve rights and obligations of employees, customers, stockholders, and citizens; and ensure continuity of business operations;
- procedures and practices to be followed to protect these records; and
- procedures to permit effective use of selected records in an emergency.[7]

The Vital Records Protection and Disaster Recovery Handbook published by the California Department of General Services makes it clear that the "primary concern of a vital records program is the protection of *information* rather than the protection of records [emphasis added]."[8]

Information contained within vital records can be protected by establishing a program that consists of:

- the assignment of vital records program responsibilities;
- the identification of vital records through a vital records inventory;
- a review of the protection methods currently in place for vital records and information;
- the establishment of vital records policies and procedures;
- the creation of a disaster preparedness and recovery plan;
- the development of a business continuity plan; and
- the implementation of auditing procedures to maintain ongoing and effective programs.[9]

Who Is Responsible for a Vital Records Program?

Clear authority for a vital records program must be established through policies and procedures. A vital records manager must be designated. Often, the organization's records manager fills this role. This person must work with other stakeholders throughout the organization to identify, inventory, protect, store, make accessible, and update as needed the copies of vital records required in an emergency, including records that document legal and financial rights.

The following people should be involved in preparing the vital records inventory:

- *Vital records manager:* to manage the program
- *Records manager (if different from vital records manager):* to work with the vital records manager
- *Department, bureau, division records liaison officers:* to serve as vital records coordinators and implement the vital records program for their areas, including preparing the inventory and ensuring protection for records within their area
- *Management:* to demonstrate support for the vital records program by making it a priority
- *Information technology (IT) staff:* to ensure electronic systems in their control are regularly backed up and accessible in an emergency
- *All other employees:* to cooperate and assist where and when needed

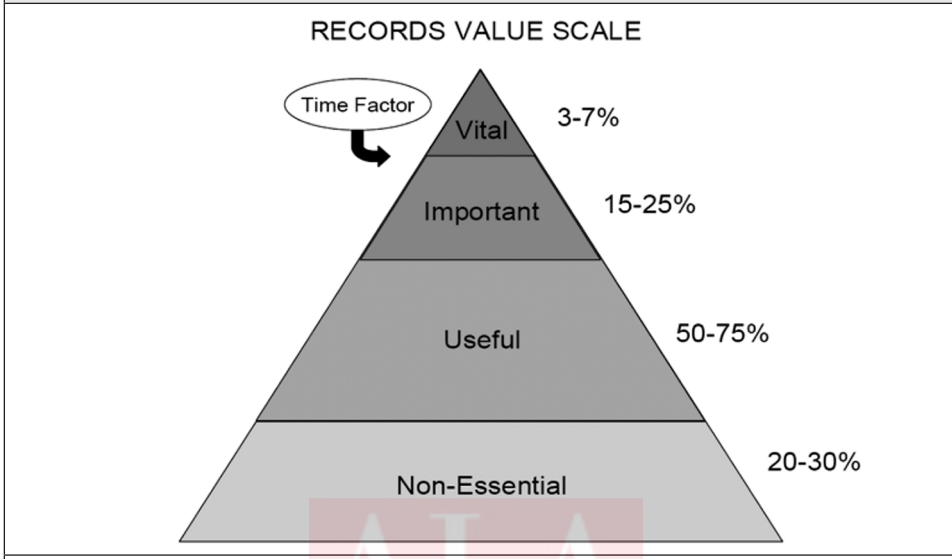
Under some circumstances, the organization may hire a consultant to speed up the process. This may also help to ensure quality; however, this option will also increase costs.

What Is a Vital Record?

A *vital record* is recorded information, regardless of format (e.g., paper, digital, electronic, film, and tape) that contains information required by an organization to re-create its legal and financial status and to preserve the rights and obligations of stakeholders, including employees, customers, investors, and citizens. As a rule, not more than 7 percent of an organization's records are considered *vital*, and it is more likely that the figure would be between 3 percent and 5 percent (see Figure 8.2).[10]

To continue or resume operations and to meet customer needs, the organization should protect records that identify fixed assets, identify and fulfill existing commitments to customers, rebuild facilities, develop new business, identify the nature and value of inventory, and resume computer system operations and telecommunications. To ensure the rights of employees, the organization should protect records that state salaries and benefits due employees and former employees and document any other corporate commitments to employees, such as union contracts. To safeguard legal, financial, and shareholder interests, the organization should protect records that document receivables, determine liabilities,

Figure 8.2. Records value scale.



Source: Guillermo Avilés-Mendoza et al., *National Institutes of Health Vital Records Program White Paper*, October 2006, 6–7, http://oma.od.nih.gov/ms/records/VRPWP.pdf.

identify the locations and amounts of cash and securities owned by the company, establish and defend the organization's tax position, identify shareholders and their holdings, meet all legal requirements for establishing the corporate status, and protect intangible assets such as patents and trademarks. Emergency operations records, such as staff contact and assignment information and the business continuity plan itself, are examples of vital records needed during an emergency.

What Is Vital?

If a catastrophic event occurred, what information would be *absolutely necessary* to resume business?

In many instances, the loss of information included in vital records can be more devastating to the continuation of an organization's operations than damage to or the loss of physical space or equipment that is often insured and replaceable.[11]

The loss of vital records can result in:

- disruption of essential customer services,
- exposure to unplanned expenses of financial settlements or loss of revenue,
- increased vulnerability to litigation, and
- loss of productivity due to gaps in information.

Vital records should not be confused with *permanent records*. Records retain their vital status only as long as they are essential to the continued existence of the organization.

How Do You Identify a Vital Record?

When it comes to protecting vital records, the first step is to identify the records required to continue functioning during the disaster or to reestablish operations immediately after

the event. This step is also one of the most difficult because too often *vital information* is interpreted as *archival or historical information* preserved for the benefit of researchers and posterity. Some people also believe the term *vital records* is limited to *vital statistics*, which are records such as birth, death, and marriage certificates.

Each unit within the organization must analyze its own operations to determine what information is necessary to its continued existence and the attainment of its critical missions. This will feed into the overall vital records inventory for the organization. On the unit level, a committee of senior staff should be convened to undertake this task. It is recommended that the committee meet on a regular basis (e.g., every two weeks) until the records have been identified and a vital records program is in place. The individuals on the committee should be very familiar with their areas and the records in those areas and be willing and able to devote time to the program until it is operational. One person from this committee should assume the role of records liaison to communicate with the vital records program manager.

There are several ways to classify records. Some classification systems do not take into account nonessential records. However, including such a classification makes it easier for employees to understand which records they can immediately disregard when compiling their inventory. The Delaware State Archives classifies records as *vital*, *important*, *useful*, or *nonessential* and provides the descriptions of each category (see Table 8.1).[12]

The committee should begin with the comprehensive records retention schedule. The first task is to eliminate all nonessential records. Then eliminate those records that contain essential information but can be easily reproduced. Identify all situations where information is or can be protected through computer system backups. Finally, reevaluate the remaining records to see if they are vital. To do this, ask two questions:

- What would we be unable to do if this record were destroyed?
- How critical is our inability to do this or what is the impact on our organization?

Vital Records Inventory

The goal of a comprehensive records inventory is to identify records categories, not every record that exists. A physical inventory conducted by properly trained personnel is essential. Be sure to inventory not only paper but also computer printouts, microfilm, magnetic

Table 8.1. Classification of records as vital, important, useful, or nonessential.

Category	Description
Vital records	These records are essential to the continuity of services during a calamity or the restoration of daily business if it has been interrupted. These records are irreplaceable, and copies do not have the same value as originals.
Important records	This category of records is replaceable only at considerable expense of funds, time, and labor.
Useful records	These records, if lost, might cause some inconvenience but could easily be replaced. Loss of these records does not present any real obstacle to restoring daily business.
Nonessential records	Loss of these records presents no obstacle whatsoever to restoring daily business.

Source: Adapted from information at State of Delaware, "The Process of Vital Records Management: Records Classification," Vital Records Management, accessed January 5, 2010, http://archives.delaware.gov/govsvcs/records_policies/vital%20records%20management.shtml.

media, photographs, slides, engineering drawings, and any other recorded information. Don't forget the digital files stored in enterprise content management systems and with third-party vendors in the clouds.

When a retention schedule is developed, the operational, legal, administrative, and/or historical value of the record is considered. Vital records are appraised in a similar manner with one major difference: the archival/historical value does not make a record vital, but the value of the record during an emergency can. Vital records can be thought of as either *rights and interests* records or *emergency operations* records. Rights and interests records can be subcategorized as operational, legal, and fiscal (see Table 8.2).

The complete records inventory—which identifies all records, their locations, and the format in which they are maintained—is the basis from which the records retention schedule is created. A vital records inventory can be carried out independently of or at the same time as the comprehensive records inventory introduced in Chapter 4. As new records are created, they should be analyzed to determine their status. A records inventory form should be completed for each records series and include information such as the title of the record, a description, the location, and its format. Figure 8.3 (p. 206) is one example of a records inventory form. Note that the Record Characteristics section includes a checkbox for vital records.

Vital Records Analysis

Once the records inventory forms have been completed or gathered, they can be used as the basis for interviews with the organization's management staff. The task is to determine their perception of the value of the records under their jurisdiction and the consequences that would be incurred if those records were lost.

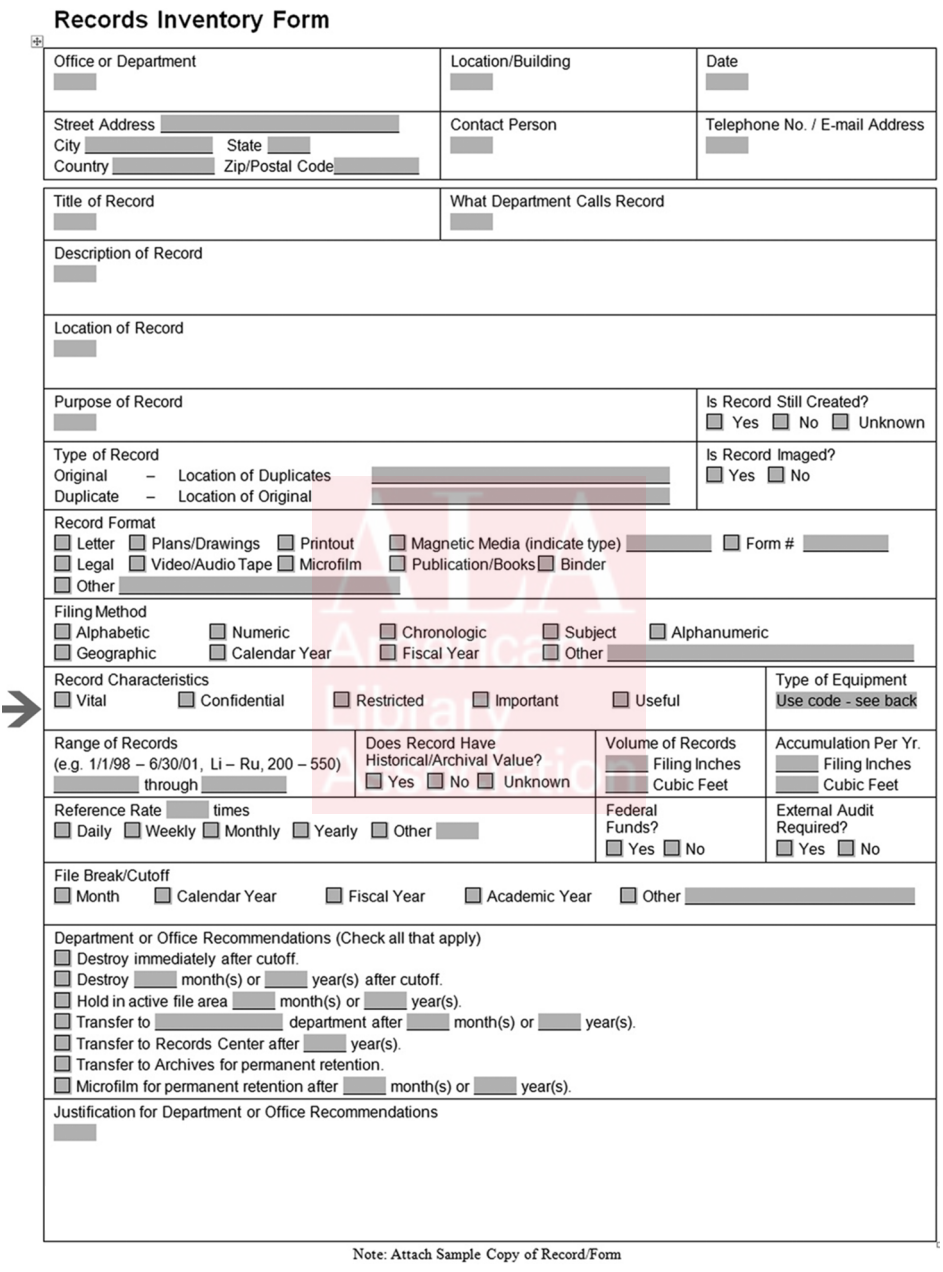
Questions to be asked during the interview could include the following:

- Who are the stakeholders of the unit or organization?
- What records are produced as a result of each function (operational, legal, fiscal, emergency management)?
- What is the impact of not providing the records necessary to support each function (i.e., can the work be carried on if the record is gone)?
- How long can you carry out those key functions without the records?
- Which of the records are vital (unique and required in their original form to meet evidential requirements, not easily reproducible, or can only be reproduced or replaced at a disproportionately high cost)?

Table 8.2. Vital records categories and subcategories.

Category	Subcategory	Description
Rights and interests	Operational	Any functions necessary to the operation or continuation of your unit or the organization as a whole
	Legal	Any functions that provide proof of the organization's legal status
	Fiscal	Any functions that prove the unit's or the organization's financial status
Emergency operations		Any functions needed during an emergency

Figure 8.3. Example of a records inventory form.



Records Inventory Form

Office or Department	Location/Building	Date

Street Address City State Country Zip/Postal Code	Contact Person	Telephone No. / E-mail Address

Title of Record	What Department Calls Record

Description of Record

Location of Record

Purpose of Record	Is Record Still Created? ☐ Yes ☐ No ☐ Unknown

Type of Record Original – Location of Duplicates Duplicate – Location of Original	Is Record Imaged? ☐ Yes ☐ No

Record Format
☐ Letter ☐ Plans/Drawings ☐ Printout ☐ Magnetic Media (indicate type) ☐ Form #
☐ Legal ☐ Video/Audio Tape ☐ Microfilm ☐ Publication/Books ☐ Binder
☐ Other

Filing Method
☐ Alphabetic ☐ Numeric ☐ Chronologic ☐ Subject ☐ Alphanumeric
☐ Geographic ☐ Calendar Year ☐ Fiscal Year ☐ Other

Record Characteristics ☐ Vital ☐ Confidential ☐ Restricted ☐ Important ☐ Useful	Type of Equipment Use code - see back

Range of Records (e.g. 1/1/98 – 6/30/01, Li – Ru, 200 – 550) through	Does Record Have Historical/Archival Value? ☐ Yes ☐ No ☐ Unknown	Volume of Records Filing Inches Cubic Feet	Accumulation Per Yr. Filing Inches Cubic Feet

Reference Rate times ☐ Daily ☐ Weekly ☐ Monthly ☐ Yearly ☐ Other	Federal Funds? ☐ Yes ☐ No	External Audit Required? ☐ Yes ☐ No

File Break/Cutoff
☐ Month ☐ Calendar Year ☐ Fiscal Year ☐ Academic Year ☐ Other

Department or Office Recommendations (Check all that apply)
☐ Destroy immediately after cutoff.
☐ Destroy month(s) or year(s) after cutoff.
☐ Hold in active file area month(s) or year(s).
☐ Transfer to department after month(s) or year(s).
☐ Transfer to Records Center after year(s).
☐ Transfer to Archives for permanent retention.
☐ Microfilm for permanent retention after month(s) or year(s).

Justification for Department or Office Recommendations

Note: Attach Sample Copy of Record/Form

Source: Sample Forms for Archival and Records Management Programs (Lenexa, KS: ARMA International, 2002). © ARMA International, http://www.arma.org/. Used with permission.

- Can these records be replaced from another source?
- Are these records on computer, microfilm, other?
- Are these records duplicated in a different format?
- Is the format easily accessible during or after an emergency?

The records manager should analyze the information gathered from these interviews to determine the protection status of the vital records.

Vital Records Protection

The goal is to use the simplest, most economical method that fits the circumstances. The two methods of protection, which apply to both physical and electronic records, are duplication and dispersal and protective storage.

Duplication and Dispersal

Records can be protected by making copies and storing the copies in one or more locations apart from the original records. Methods of dispersal include:

- *Routine dispersal:* This low-cost method is the result of keeping a copy of the record at more than one location as a normal part of business operations. If this method is used, procedures must be put in place so that records can be retrieved easily when necessary.
- *Planned (designed) dispersal:* This method entails duplicating the record for protection purposes rather than as a normal part of the business operation. This involves storing the duplicate off-site with a few exceptions, such as microfilming the records and storing in a vault on-site or creating an extra copy of vital data residing on a computer and transferring that copy to a secure, remote location.
- *Derivative dispersal:* Although this is not a method of dispersal any organization should rely on, it deserves mention when considering the actual life of information. This is a term used to represent information and records intentionally (with or without malice) spread through the use of the Internet and Web 2.0 technologies. It is a direct by-product of the information age. Information that may or may not be considered *records* of the organization can be shared virally once made public and have a life of their own beyond that of the useful life determined by the organization. Examples include the documents released through the nonprofit organization WikiLeaks and the tweets now preserved in perpetuity by the Library of Congress.

Protective Storage

Dispersal does not ensure the protection of either the original or the copies. Steps must be taken to provide storage to protect vital assets, for example:

- *On-site storage:* Some organizations, including many local governments, maintain vital records in a vault, fireproof cabinet, or fireproof container on their premises. If this option is elected for vital records, the storage equipment must conform to the rating requirements of the National Fire Protection Association (NFPA) standards.[13]
- *Off-site facility:* A large company may invest in its own off-site storage facility for vital records on a variety of media, including paper, microfilm, tapes, and discs. Others use commercial off-site storage. The facility should be accessible twenty-four hours a day

Figure 8.4. Vital records schedule form.

Vital Records Schedule

Records Series	Original Location: Building, Floor, Room, other.	Person Responsible	Vol. in Feet/ Bytes	Media Type	Years Covered	Name of Electronic System, Version Number, and Operating System		Vital Record Security Copy Location	Media Type	VR Contact and Phone	Method of Transporting the Record to Emergency Location (if record is not stored at central off-site facility)	Cycling Schedule

by appropriate officials, have twenty-four-hour climate control with a temperature of approximately 20°C or 68°F and a relative humidity of 30–40 percent, and be located far enough away from the site that the same disaster will not affect records stored at both.

- *Electronically stored information (ESI):* Identify "hot," "warm," and "cold" sites to accommodate electronic records. Consider cloud-based solutions. Be sure systems, applications, and system documentation is stored along with the records. We'll address these options in more detail later in this chapter.

Storage Media

When possible, store vital records on a medium that will last as long as the record is needed. Because a vital record may not have permanent retention status, a life span of 500 years for a storage medium is not necessarily required. Compare the expected retention period of the records with the length of life of different media when determining how to store records (see Table 8.3).

Table 8.3. Storage media and length of record life.

Media	Retention period
Microfilm	500 years
Acid-free paper	300 years
Regular office paper	20–30 years
Electronic storage media	Availability of equipment and software to assess information (review every 3 years)

The actual length of time that storage media remain viable will depend on a number of factors, including:

- the quality with which the media were manufactured,
- the care with which the media were handled,
- the number of times the media were accessed,
- the quality of the device used to write to or read from the media, and
- the cleanliness, temperature, and humidity maintained within the storage environment.

In addition to the danger of loss due to longevity of storage media selected, some media will fail. Therefore, vital records must be stored redundantly (backed up on more than one type of media). The media must be tested periodically to ensure that the data is readable and has not been altered.

The Vital Records Schedule

The *vital records schedule* is a listing of an organization's vital records along with an explanation of how each is to be protected from destruction in the event of a disaster. This information is gathered from the records inventory. The easiest way to create this schedule is to create a database. Fields to include in the database may vary; examples include record title, descriptions of records, records media, method of protection, storage location, cycling schedule of records, and critical functions supported by records (see Figure 8.4, facing page).

Records management software and services can be used to manage both paper and electronic vital records. Applications that comply with *DoD 5015.2-STD: Electronic Records Management Software Applications Design Criteria Standard* will allow for a periodic review and cycling of vital records to ensure they are accurate and up-to-date.[14] This involves designating a category or folder as containing vital records and assigning a *vital review period* (time between reviews) and a *vital records reviewer* (a user or a group of users) to receive e-mail notifications when a review is due. Obsolete copies of vital records would be replaced with copies of current vital records. Once the review is complete, a new *last review date* would be appended.

Testing and Updating the Program

Test your disaster recovery and vital records programs by picking a team of employees who would have to reconstruct operations in the event of a disaster. Provide the employees with the list of information needs the organization would have after a disaster. Have them reconstruct the data and provide the information needed using only the protected records. Test the program and revise it annually.

What to Do If a Disaster Does Occur

The need for emergency operations plans is immediate. A copy of the vital records/disaster recovery plan should be stored at or close to the facility and available on a twenty-four-hour basis. In case the immediate area is inaccessible, key employees should also have access to the vital records/disaster recovery program from home either as a print or electronic copy or available online.

In the event of a cataclysmic disaster, communications breakdowns will occur. For example, as a result of Hurricane Sandy in 2012, the communication, transportation, and utility infrastructure in the northeast United States was ravaged. Private residences and businesses were left without power, cable, or landline service, and mobile reception was spotty or nonexistent. In a situation like this, the local print copies, if any survive, may be all that are accessible.

Disaster Preparedness and Recovery Planning

The *disaster recovery plan* is an emergency plan that outlines the steps your organization will take to protect itself from loss due to a disaster and the steps the organization will take if actually hit with a disaster. The plan coordinates the efforts, staff, and other resources needed to protect the business's information and equipment, as well as its employees and customers.

The disaster preparedness and recovery plan should identify procedures to be implemented to prevent disasters from occurring in the first place, and steps that can be taken to mitigate the effect of those disasters that cannot be prevented. Hazards to be evaluated include natural hazards (geological, meterological, and biological), human-caused events (accidental and intentional), and technologically caused events (accidental and intentional).[15] Any information that may prove useful in preventing disasters, or in being prepared for disasters, should be included in the vital records disaster preparedness and recovery plan.

Predisaster Preparedness

Predisaster preparedness involves identifying the types of risks most likely to impact your organization, including natural hazards, human-caused events, and technologically caused events.

Natural Hazards

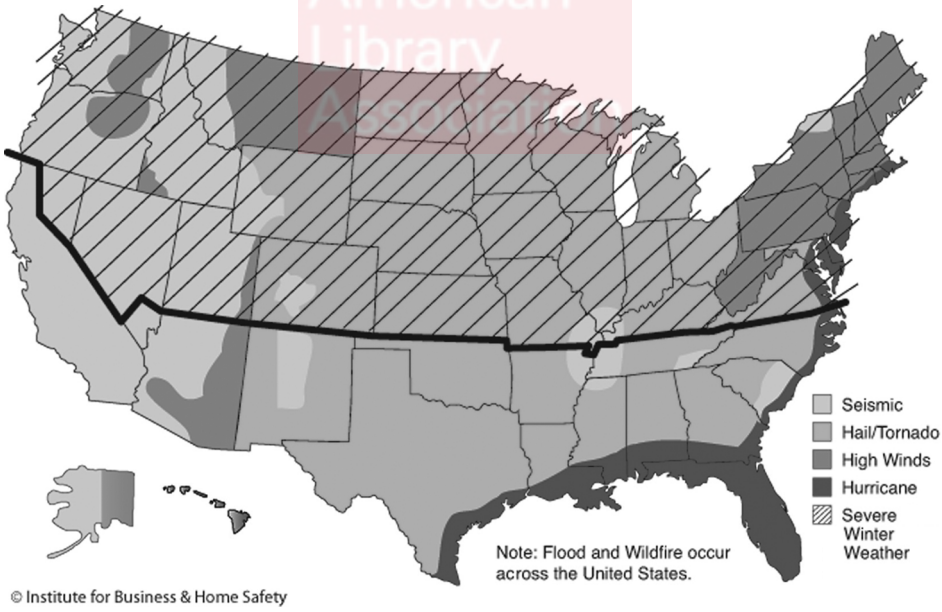
Every business faces some sort of risk from natural hazards regardless of its geographic location. Some parts of the globe are more likely to be affected by certain types of disasters than others. You should determine the risks presented to the organization based on its geographic location. Figure 8.5 is a map prepared by the Institute for Business and Home Safety, a nonprofit initiative of the insurance industry, to help the public identify the natural hazards to which they may be exposed.

This type of map is useful when assessing the risks due to natural disasters that may occur within your region in order to best protect your physical and digital assets. It will also come in handy when determining the location for a disaster recovery site. When finding the right spot for a disaster recovery site, you need to select an area that is not likely to be affected by the same type of disaster your primary site faces.

Human-Caused Events

In spite of the attention devoted to loss of information due to major disasters, records damage most often comes from preventable conditions such as equipment failures, arson,

Figure 8.5. Natural hazards exposure map.



Source: Institute for Business and Home Safety, "What Is at Risk?," in *Open for Business: A Disaster Protection and Recovery Planning Toolkit for the Small to Mid-Sized Business*, 2007, 4, http://ofb.ibhs.org/content/data/file/OpenForBusiness_new.pdf. © Institute for Business and Home Safety.

terrorism, vandalism, and carelessness. Damage can also occur due to leaking roofs, burst pipes, and damp conditions in basement storage areas. Although most damage is localized and affects only a small percentage of an organization's vital records, valuable information may still be lost if the recording media is damaged by water, fire, smoke, mold, or chemicals. Salvage and restoration efforts can be expensive if even possible.

Predisaster preparedness efforts require team members to determine if potentially hazardous substances have been used in constructing or equipping offices. If those substances are present in the workplace, vital records should be stored off-site and copies used on a daily basis.

Technologically Caused Events

The US Department of Defense places technologically caused events that affect central computers, mainframes, software, or internal and external applications in this category. Also included are events that disrupt ancillary support equipment, telecommunications, and sources of energy, power, or utilities.[16]

Increasingly, organizations are entering into agreements to store electronic records in the clouds. The same procedures used to protect records controlled by the organization must be used to protect records stored by service providers. Proof that the service provider has an adequate backup and recovery plan in place is necessary. This information should be included in a terms of service agreement (or service contract) negotiated between the organization and the service provider. Periodic tests should be conducted to ensure that the backup recovery systems and processes work as agreed upon. Just as with organization-owned sites, the physical location of both the service provider's primary site and its own backup site must be checked to determine risk due from natural disasters.

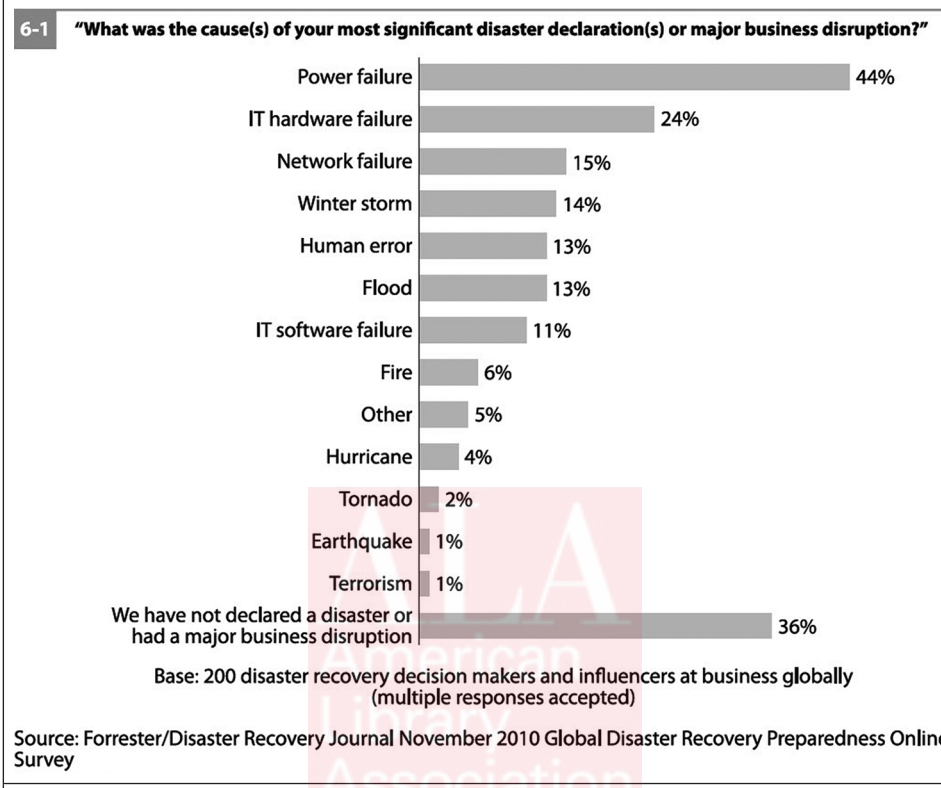
Disaster Recovery

According to the United Nations, 2010 was one of the deadliest years for natural disasters experienced in the last two decades. Some 373 natural disasters claimed 296,800 lives and affected nearly 208 million people at an estimated cost of $110 billion.[17] According to a survey of 200 businesses belonging to subscribers of the *Disaster Recovery Journal*, the most significant disasters causing business interruption were technological, followed by winter storms and human error (see Figure 8.6).[18]

Developing a disaster recovery plan takes a great deal of time and effort—just how much depends on the size of the organization and the risks identified. It is important to remember that human safety is the first priority. Recovery of information and records comes only after all employees and visitors are safe. Experts disagree on the format of a disaster recovery plan, but when comparisons are made, common elements emerge. The *Federal Depository Library Handbook*, for example, suggests that the disaster plan include:

- an introduction statement;
- emergency telephone numbers and e-mail addresses including disaster response team coordinators and members;
- threat assessment or risk analysis;
- prevention (mitigation) measures;
- a backup plan for digital data;

Figure 8.6. Causes of significant disaster declarations or business disruptions.



Source: Rachel Dines, "The State of Disaster Recovery Preparedness," *Disaster Recovery Journal*, January 6, 2011, http://www.drj.com/2011-articles/winter-2011-volume-24-issue-1/the-state-of-disaster-recovery-preparedness.html. Courtesy of Forrester Research, Inc.

- a list of high-priority publications;
- recovery methods;
- floor maps, charts, and graphs, including the location of disaster response supplies, exits, and fire-alarm pulls;
- a list of vendors and service providers;
- disaster response and recovery reports;
- annual review and revision schedule; and
- a list of disaster recovery companies.[19]

The format recommended for libraries is suitable for other types of organizations, including museums, archives, and records centers.

A cursory review of disaster recovery plans available on the Internet reveals that most tend to emphasize either physical records or digital records. The steps outlined to recover from a disaster may be specific to the medium used to store a majority of the records, but vital records must be protected regardless of the medium.

Recovering Physical Records

Vital records will be listed on your vital records schedule. Depending on the type of organization, vital records could include:

- contracts, leases, and license and franchise agreements;
- laboratory notebooks and other research data;
- engineering drawings and blueprints;
- product formulas and production specifications;
- insurance policies;
- articles of incorporation, bylaws, and board minutes;
- patents, trademarks, copyrights; and
- deeds and title to property.

As soon as possible, a *records damage assessment* site survey should be conducted to determine the type of damage that has occurred. Records should be treated based on priorities set previously and the severity of the damage. The site survey would include:

- the name of the surveyor and the date and time of the survey;
- the location (floor, room);
- the type of damage (mold/mildew, mud, water, smoke, fire, sewage, insects, rodents, other);
- the type of media (paper, books, photographs, slides, tapes, microfilm, maps, hard drives, CD-ROMs/DVDs, other); and
- additional information based on type of record.

For vital records, the following information would be recorded: types of records/record series, volume in feet, and dates of records. Figure 8.7 can be used as the basis for your own records damage assessment site survey.

In the event of a disaster affecting your vital records stored on-site in physical formats, you would follow the steps outlined in your own vital records disaster recovery plan. The following steps are provided as one example:

- Stabilize the site and gain access as soon as the building is safe for reentry armed with the vital records schedule and a list of all safe and vault combinations, location of keys to all file cabinets, vaults, or containers that house vital records.
- Restore environmental controls and allow the heating or air-conditioning systems to run 24/7 with the goal of maintaining a temperature below 70°F and a relative humidity below 50 percent.
- Document the damage. The coordinator of the vital records disaster management team is responsible for documenting the damage by taking photographs and videos and/or completing a records damage assessment site survey.
- Toss duplicate records and replaceable or disposable materials to remove a source of humidity and reduce the volume of materials the team must inspect.
- Keep an inventory of material disposed of for insurance, replacement, and tracking.
- Assess the damage. This can be accomplished by analyzing the records damage assessment site survey to determine the extent of the damage and the approximate volume of records affected. Prioritize treatment by handling essential records first.

Figure 8.7. Records damage assessment site survey form.

Records Damage Assessment Site Survey

Surveyor:	Location of Building:
Date:	Floor Number:
Time:	Office Number:

Description of Damaged Materials (check all that apply)

Record Characteristics ☐ Vital ☐ Confidential ☐ Restricted ☐ Important ☐ Useful	Volume in feet: Dates of Records:

Type(s) of records/file names:

Type of Damage (check all that apply)		Type of Media (check all that apply)	
Debris		Paper	
Mold/Mildew		Books	
Mud		Photographs	
Water, High (dripping wet)		Slides	
Water, Low (damp)		Videos/Audiotapes	
Smoke		Microfilm/Microfiche	
Fire		Oversized materials (maps, posters)	
Sewage			
Insects		Glossy paper (magazine stock)	
Rodents		Computer Tapes	
Other		CD-ROMS/DVDs	
		Other	

Determine which records are official records on vulnerable media that have not been backed up.

- Stabilize the records. Salvage wet records within forty-eight hours to avoid costly restoration efforts. Photographs, magnetic media, and coated-stock paper should be given highest salvage priority, since they deteriorate more quickly. It may be necessary to move these records off-site if stabilization is not possible in the original environment.
- If necessary, move records off-site following previously agreed to procedures that include identification of a suitable vendor for handling and restoration, tracking method, relocation destination, transportation, necessary clearances, and personnel assigned to accompany the records.

Recovering Electronic Records

The terrorist attacks of September 11, 2001, sent shock waves around the world. That day Americans awakened to the fact that natural disasters were no longer the greatest threat to our lives and our economy. Several top financial services firms had offices in the World Trade Center, including Morgan Stanley Dean Witter, Credit Suisse, Commerzbank, and Deutsche Bank. The attacks exposed one area of vulnerability to business continuity: almost no paper records survived the attacks on the World Trade Center (see Figure 8.8).

Those businesses with offices in and near the World Trade Center site that had disaster recovery plans in place for electronic data moved to off-site locations and took steps to resume business operations. As a direct result of 9/11, all businesses began to question their own ability to recovery from such an event. Whether you develop your own data recovery center or contract with a service provider, keep in mind the following lessons learned:

- Don't place backup facilities near each other. One business located in the World Trade Center had a backup facility several blocks away and data was lost at both sites.
- Do regular backups of data residing on desktops and laptops. Synchronize data with the server daily. One data recovery service provider was able to recover 100 percent of the data for their clients—except for data that had not been backed up. Critical works in progress are often neglected when it comes to backing up.

Figure 8.8. Almost no paper survived the attacks of 9/11 on the World Trade Center.

Source: Doug Kanter/AFP/Getty Images, http://www.gettyimages.com/detail/news-photo/new-york-united-states-to-go-with-afp-story-americans-mark-news-photo/55315897.

- Don't just back up your data. In order to restore the data, copies of data catalogs and directories are needed in order to organize the data and obtain the appropriate permissions to access the data.
- Do avoid incompatibility issues when recovering data by running backup and storage environments similar to those in daily use.
- Do make sure that backup facilities have the hardware, software, network connectivity, and services needed to run your entire operation.
- Do be prepared to reestablish systems management capabilities quickly, including monitoring, job execution, and security features.
- Do prepare by training internal disaster response teams and identifying the applications and business operations that should be recovered first.[20]

Taking a lesson learned from 9/11, disaster recovery sites should be not only off-site but also in a geographic location that would not be exposed to the same risks due to disasters as the original site. The choice must be made between establishing and managing a company-owned site or contracting with a disaster recovery service provider, but a decision on the most appropriate type of site for the organization must be made. Traditional options include these:

- *Disaster recovery cold sites:* A *cold site* is available space without the equipment and data needed to continue business operations. This type of site is attractive for businesses that want to save money and have eighteen or more hours to get up and running. The disadvantage of a cold site is the need to set up your own equipment, load software and data, and make all Internet and phone connections.
- *Disaster recovery warm sites: Warm sites* provide not only space but also the equipment you need to continue operations. However, you would need to load or restore your data to the system. This type of site relies on backups for recovery. In the past, the use of tape-based backups meant it might take days to recover from a disaster. When tape-based backup is replaced by electronic vaulting—the transfer of data by electronic means to a backup site—recovery times are near those for hot sites but at a fraction of the cost.
- *Disaster recovery hot sites:* It is essential that financial institutions retain the trust of the public in times of crisis by minimizing disruption to services. Therefore, they use *hot sites* as the basis for their disaster recovery system. A hot site is a duplicate of the original site, with full computer systems and near-complete backups of user data. This is the most expensive option.

Disaster Recovery in the Cloud

Cloud-based disaster recovery services started to appear toward the end of 2009 as one method of meeting the need for data protection in a way that reduces the cost of infrastructure, business processes, and other applications. According to the Cloud Convergence Council, by the beginning of 2011 one in four end users were asking for cloud-based disaster recovery and backup services in order to increase efficiency, security, and scalability while reducing cost.[21]

Although interest in cloud solutions is on the rise, of 180 disaster recovery decision makers surveyed by Forrester in 2011, only 4 percent said they were actually using

cloud-based disaster recovery sites; 46 percent stated they owned their own disaster recovery sites.[22]

As with other third-party service providers, you should select one that provides service level agreements that meet your needs at an acceptable risk level. Questions to ask include these:

- Will the organization's data be held within the organization's desired geographic boundary?
- Is the data being backed up by the cloud provider to another system for redundancy?
- Is the physical location of the alternate system acceptable?
- Can the data be restored within an acceptable time frame?
- Does the provider meet the organization's security standards and allow for periodic facility audits by the customer?
- Does the service provider's network meet the organization's network requirements related to issues such as compatibility of architecture and bandwidth capabilities?
- Can the service provider offer uninterrupted access to the organization's data?
- How easily and at what cost can you move your data to another cloud provider if you are dissatisfied with their services or a change in their policies?

Although businesses look to cloud-based disaster recovery services to reduce costs that would be incurred with other options, it is essential to understand the manner in which the organization will be billed for storage and disaster recovery services. Consideration must be given to the ways in which vital records are handled, for example, stored in a separate location from the organization's other records and the records of other organizations. If the multitenant nature of the public cloud poses an unacceptable risk, the organization may want to consider the use of a private cloud for vital records.

Integrating Mobile Devices into the Disaster Recovery Plan

IT often overlooks the fact that business-critical information may exist on mobile devices. There is no one answer, but the following steps will help:

- Inventory the mobile devices. (Where are they? To whom are they assigned? Do employees use personal mobile devices to conduct business?)
- Determine the importance of the mobile device data and applications. (Do they contain business critical data?)
- Determine how quickly you can recover from a disaster. (What steps can be taken before and after an event to prevent data loss?)

Records managers are responsible for including records that may be stored on mobile devices in their records management programs. IT is responsible for information protection and data recovery. Although most devices will be used to run applications that collect data to be transmitted back to a central server, it is important to plan for cases in which sensitive data does exist on a lost or stolen mobile device.

A number of tools are available to protect sensitive data on mobile devices by providing a device lock, enhanced passwords, and a device wipe that can be used by the organization to remotely delete all data on the device and removable storage cards. Recovery will take less time if the organization standardizes mobile devices and has a replacement plan in the

event of a wide-scale hardware failure. Upper management will need to be aware of the necessity of standards and support the replacement plan.

Disaster Recovery Policies

Organizations, both public and private, have a responsibility to employees, partners, customers, and other stakeholders to improve their disaster recovery capabilities. The tactical decisions addressed previously must be performed within an overall disaster recovery policy framework. The governing policy statement should include, at a minimum, the following instructions:

- The organization should have a comprehensive disaster recovery plan.
- A formal risk assessment should be undertaken to determine requirements for the disaster recovery plan.
- The disaster recovery plan should be tested in a simulated environment to ensure it can be implemented in an emergency. Two full tests per year along with several component tests throughout the year are recommended for electronic systems.
- The disaster recovery plan should cover all mission-critical and business-critical activities.
- The disaster plan should be updated as necessary as part of configuration management and change management.
- All staff must be made aware of the disaster recovery plan and their role in it.

The transition from paper to electronic records means that time can be saved restoring important and useful records. Tape is still considered the dominant backup technology. If stored off-site, information is backed up locally and transported to an off-site facility. However, replication is becoming more popular to protect both mission-critical and business-critical records. After tape backup, synchronous and asynchronous replication methods are favored for critical applications, while periodic point-in-time copies and remote backup over a wide area network are used most often for noncritical applications and data.

Disaster recovery is often seen as the organization's ability to recovery its IT resources, including infrastructure, databases, and applications. A 2010 IBM Global IT Risk Study, *The Evolving Role of IT Managers and Chief Information Officers (CIOs)*, revealed that 74 percent of survey respondents agreed that investing in IT risk management can provide significant business benefits by ensuring business continuity.[23]

Business Continuity Planning

The disaster recovery plan, however well designed, does not exist in isolation. It is part of a larger business continuity management (BCM) program that is most effective when grounded in generally accepted standards and built to meet the business's objectives. *Business continuity* (BC) is the strategic and tactical capability of the organization to plan for and respond to incidents and business disruptions in order to continue business operations at an acceptable predefined level.[24] The Business Continuity Institute provides a broad definition of vital records as any information, documents, or data deemed essential for recovery from a disaster or major incident.[25] The protection and recovery of vital records is an essential component of a business continuity plan. The vital records schedule is an important resource for those preparing this plan.

Various standards and legislation relate to business continuity management. The British Standards Institution (BSI) produced a two-part standard, *BS 25999-1:2006: Business Continuity Management: Code of Practice* and *BS 25999-2:2007: Business Continuity Management: Specification*.[26, 27] In 2010, the American National Standards Institute (ANSI) approved the *ASIS/BSI BCM.01-2010: Business Continuity Management Systems: Requirements with Guidance for Use* standard.[28] This standard shares the core of *BS 25999* and the two standards are interchangeable in many areas, while reflecting the differences between the infrastructures, systems, and terminology of the United Kingdom and the United States. The common elements used in *BCM.01* and *BS 25999* can be used by international organizations to build business continuity programs.

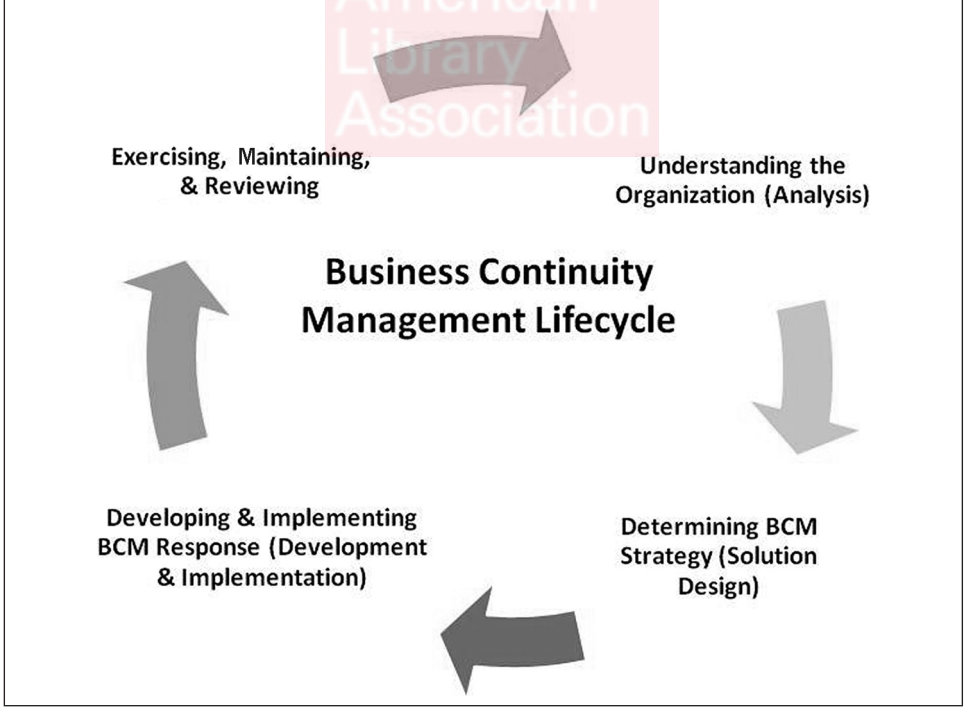
Business Continuity Planning Lifecycle

The business continuity planning lifecycle depicted in Figure 8.9 is comprised of four phases: analysis, solution design, development and implementation, and exercise, maintenance, and review. The cycle should be repeated at predetermined intervals to ensure that it remains current.

Phase 1: Analysis

The *analysis phase* of the business continuity planning lifecycle represents a business impact analysis (BIA) designed to prioritize business functions by assessing the potential

Figure 8.9. The business continuity management lifecycle.



impacts that might result if an organization were to experience a business interruption. A risk analysis is an essential element of this phase.

Phase 2: Solution Design

The business continuity plan is developed during the *solution design phase*. Alternative business recovery operating strategies for continuation of business within recovery time and/or recovery objectives while maintaining the organization's critical functions are determined. Plans and procedures to communicate with internal stakeholders during incidents are formulated, and provision is made for postincident support and guidance for employees and their families.

Phase 3: Development and Implementation

The *development and implementation phase* includes developing and implementing emergency response procedures in order to stabilize the situation following an incident. Designing, developing, and implementing business continuity and incident management plans that provide continuity within recovery time and/or recovery objectives takes place during this phase.

Phase 4: Exercise, Maintenance, and Review

The *exercise, maintenance, and review phase* includes:

- preplanning and coordinating the plan through walk-throughs and exercises;
- evaluating, updating, improving, and documenting the results of the exercises;
- developing processes to maintain the currency of continuity capabilities, business continuity plans, and incident management plans in accordance with the organization's strategic direction;
- establishing policies and procedures for coordinating incidents, continuity, and restoration activities with external agencies while ensuring compliance with applicable statutes and/or regulations; and
- practical experience in dealing with external agencies.

A number of resources exist to help you with your disaster recovery and business continuity plans, including standards documents such as *NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs*, 2010 edition.[29] This standard establishes a common set of criteria for disaster/emergency management and business continuity programs. This edition was expanded to emphasize the importance of leadership and commitment and includes new requirements for records management. The standard calls for the development of a records management program, as well as policies created, approved, and enforced to address records classification, confidentiality, integrity, retention, storage, archiving, destruction, access control, and document control.

Summary

Vital records protection, disaster planning, and business continuity management are essential to the survival of an organization impacted by a major disaster. Records and information managers have a key role to play in each of these initiatives.

Vital records contain information required by the organization to re-create its legal and financial status and to preserve the rights and obligations of stakeholders, including employees, customers, investors, and citizens. These critical business records are in most instances irreplaceable, and the organization cannot exist without them. Records managers, already tasked with responsibility for inventorying and appraising records for retention purposes, may also be tasked with developing and managing a vital records program.

Disaster planning should be conducted by a committee that includes representatives from all functional areas of the organization with upper-management support. Because of the volume of digital information produced, IT departments play a major role in developing the disaster plan. A well-devised plan cannot, of course, prevent disaster, but it can serve to mitigate loss through both protection and recovery efforts. Records managers possess the skills and knowledge necessary to assist the organization in developing the sections of the plan related to protection of records in both paper and digital formats and in developing the procedures necessary to recover records affected by a disaster.

Business continuity stresses the importance of *continuing business activities* in spite of interruptions. Some think of business continuity as synonymous with disaster recovery. But while the two may overlap, there are key differences. A disaster plan focuses on preventing or mitigating loss due to a disaster and recovering the vital records and information needed to continue operations after a disaster. Business continuity planning involves developing a process to ensure that critical business processes can continue in spite of any type of interruption, including power failure, vandalism, employee theft, human error, and work stoppages. Records managers can contribute to business continuity planning because of their familiarity not only with vital records but also with essential business operations that contain records that must be available even during a critical event.

Taking steps to protect vital records and to resume operations after a major disaster is required for an organization's survival. In today's fast-paced world, however, this is not enough to instill confidence in customers, suppliers, patrons, or citizens. Business continuity management is necessary to ensure continued operations to meet legal, regulatory, and contractual obligations in the face of any disruption to business, large or small. Records managers have unique knowledge, skills, and perspectives on the business activities of the organization that should be tapped by the organization when developing plans to protect vital records, recover from a disaster, and continue business operations.

Hurricane Katrina, the terrorist attacks on 9/11, and the 2011 earthquake and tsunami in Japan are catastrophic disasters that often result in changes to daily operations of those organizations that are fortunate enough to resume business.

The contribution to Chapter 8 is a case study contributed by HP (Hewlett-Packard) that chronicles the steps taken by the Archdiocese of New Orleans, under the direction of Emilie Gagnet Leumas, Director of Archives and Records, to rebuild their archives after Hurricane Katrina and develop a process to protect their records from future disasters.

PARADIGM

Archdiocese of New Orleans Rebuilds Archives after Hurricane Katrina

Emilie Gagnet Leumas, PhD, CA, Director of Archives and Records, Archdiocese of New Orleans

Problem Statement

When Hurricane Katrina made landfall in southeast Louisiana on August 29, 2005, the storm surge left 80 percent of New Orleans flooded. Many of the city's surrounding parishes were also under water. Homes, businesses, churches, and schools were damaged. The Archdiocese of New Orleans was no exception.

The church's records—which date back to 1718—are vitally important to approximately 500,000 Catholics living in the city and surrounding counties. Among the most important records are the sacramental registers that record the sacramental life of an individual (e.g., baptism, marriage, death). These documents are also recognized as legal documents and are often needed to document births, establish marital status, enroll in school, or for nursing home placement. In the aftermath of Katrina, many people desperately needed those records for establishing their identities, to demonstrate eligibility for social security and other government aid programs, and replace lost driver's licenses and passports.

Objective

Rebuild the archives of the Archdiocese of New Orleans in the aftermath of Hurricane Katrina and make vital records accessible to parishioners.

Approach

Implement a state-of-the-art digital records management environment that supports streamlined, centralized access to historical and current records and helps to protect those records against future disasters. New Orleans had a robust and rigorous paper-based archives and records management program under Dr. Charles Nolan, its archivist at the time. Then Katrina hit! Leumas, the Director of Archives and Records for the Archdiocese of New Orleans, launched a program to retrieve, restore, and digitize its records in consultation with John J. Treanor, Vice Chancellor of the Archdiocese of Chicago, and Pat Rowley, Director of the information management consulting firm Insight Knowledge Management Systems (IKMS).

Sixteen days after the hurricane, a team of archivists from New Orleans and Baton Rouge, including Leumas and Nolan, visited New Orleans' three main archive facilities to assess their contents. Some of the materials were relatively undamaged; other records were already covered in mold. The team immediately began moving the materials most at risk to Baton Rouge for salvaging. The archive team had two priorities. One was restoration. Students from the Louisiana State University Graduate School of Library and Information Science were enlisted to help with this. Mud-covered registers had to be rinsed, drained, and catalogued. A conservation room was set up at the Diocese of Baton Rouge and equipped with dehumidifiers and fans to dry wet records. The second priority was to decide how to manage the New Orleans records in the future.

Before the hurricane, the prospect of implementing a digital document management system seemed too daunting—and expensive—to undertake. After Katrina, everything had changed. Twenty-seven Catholic churches in the Archdiocese of New Orleans were too damaged to repair. Their records needed to be stored in the archdiocese's central archives but made readily available to parishioners. The archdiocese also wanted to put better safeguards in place to protect its archives. Leumas wondered, "How could we ensure that these records would not be put at that kind of risk again?"

Solution

The solution in this case was HP TRIM software. When the Archdiocesan Archives staff moved back to New Orleans, they had to deal with a local infrastructure that was crippled. Electricity and Internet access was intermittent at best. But the Archdiocesan IT staff made implementing HP Trim a priority. The data was housed in an HP StorageWorks Enterprise Virtual Array 4000 (EVA4000) that is continuously protected by another EVA4000 that is 300 miles northwest of New Orleans in Monroe, Louisiana. The IT department was convinced that the Archdiocesan data would be safe in case of another event.

"Should we ever endure another event like Katrina, we'll be able to access our church records remotely," Leumas explained. "We've lowered the risk that our church operations will be interrupted."

Once the software was in place, the team began importing scans of restored documents and records into the system. They focused on three types of records: sacramental records, marriage files, and school records. The team indexed the records against scans of church registers so that records can be retrieved based on criteria recorded in the registers—for example, the baptismal record of someone born in 1958. This made it possible for parishioners to enlist the church's help in re-creating ID papers, getting driver's licenses, and enrolling their children in schools.

The archdiocese planned to add the rest of its archives to the HP TRIM environment, including financial, administrative, legal, property, and organizational records, as well as historical documents, photographs, and publications. The archdiocese also decided to record images of its patrimonial goods—over 3,000 objects—along with metadata describing their condition, value, and provenance. The digital inventory could help parishes decide which objects can be restored and which must be replaced, as well as track the location of the objects in the future. The Office of Archives and Records gathered information about records that were permanently lost, so that if they are requested in the future, the archdiocese can certify their disposition.

IT Improvements

- Records are now centralized, digitized, and more easily accessed.
- The system can manage inventories of sacred objects as well as documents.
- Archiving is more aligned with the archdiocese's long-term records management needs.
- The environment is mirrored at a second site to reduce risk.

Business Benefits

- The archdiocese supports New Orleans' recovery from Katrina.
- Parishioners gain access to records they need to rebuild their lives.

- The history of the Archdiocese of New Orleans is now better protected.
- The environment supports improved business continuity and disaster recovery.

As a result of this project, the Archdiocese of New Orleans has the tools and processes it needs to preserve its past.

Notes

1. ARMA International, s.v. "disaster recovery plan," *Glossary of Records and Information Management Terms*, 3rd ed., accessed December 17, 2012, http://www.arma.org/standards/glossary/index.cfm?id_term=148.
2. Linda A. Travers, EPA *Information Procedures: Vital Records Procedures*, CIO 2155.P-01.0, Office of Environmental Information, June 8, 2009, 2, http://www.epa.gov/irmpoli8/policies/CIO2155P010.pdf.
3. Institute for Business and Home Safety, *Open for Business: A Disaster Protection and Recovery Planning Toolkit for the Small to Mid-Sized Business*, 2007, iii, http://ofb.ibhs.org/content/data/file/OpenForBusiness_new.pdf.
4. RAND Gulf States Policy Institute, *The Workforce and Economic Recovery: Effects of Hurricane Katrina*, Research Brief, 2010, 1, http://www.rand.org/pubs/research_briefs/2010/RAND_RB9531.pdf.
5. Gina Marie Stevens, *Hurricane Katrina: HIPAA Privacy and Electronic Health Records of Evacuees*, Congressional Research Service (CRS) Report for Congress, RS22310, updated January 23, 2007, 1, http://library.ahima.org/xpedio/groups/public/documents/government/bok1_034961.pdf.
6. Justia.com, "Management of Vital Records," US Law, 36 CFR § 1236.20 (1995), http://law.justia.com/cfr/title36/36-3.0.10.2.17.html.
7. ARMA International, *Vital Records Programs: Identifying, Managing, and Recovering Business-Critical Records*, ANSI/ARMA, 5-2010 (Prairie Village, KS: ARMA International, 2010).
8. California Records and Information Management, Department of General Services, *Vital Records Protection and Disaster Recovery Handbook* (Sacramento, CA: California Department of General Services, n.d.), 2, http://www.documents.dgs.ca.gov/osp/calrim/disasterhndbk12-03.pdf.
9. Ibid.
10. National Archives and Records Administration (NARA), Northeast Region, "Vital Records Management: A Briefing for Federal Agencies" (PowerPoint, Pentagon, September 11, 2004), http://www.nctcog.org/ep/Special_Projects/COOP/Vital_Records_Management_Presentation.pdf.
11. William Saffady, *Records and Information Management: Fundamentals of Professional Practice* (Lenexa, KS: ARMA International, 2004), 124.
12. State of Delaware, "The Process of Vital Records Management: Records Classification," Vital Records Management, accessed January 5, 2010, http://archives.delaware.gov/govsvcs/records_policies/vital%20records%20management.shtml.
13. National Fire Protection Association (NFPA), *NFPA 232: Standard for the Protection of Records*, 2012 ed. (Quincy, MA: NFPA, 2012).
14. Department of Defense, Chief Information Officer, *DoD 5015.02-STD: Electronic Records Management Software Applications Design Criteria Standard* (Washington, DC: United States Department of Defense, April 25, 2007), http://www.dtic.mil/whs/directives/corres/pdf/501502std.pdf.
15. National Fire Protection Association (NFPA), *2009 Fall Revision Cycle Report on Proposals*, 2008, http://www.nfpa.org/Assets/Files/PDF/ROP/1600-F2009-ROP.pdf.
16. John J. Young Jr., *DoD Installation Emergency Management (IEM) Program*, Department of Defense, January 13, 2009, 29, http://www.dtic.mil/whs/directives/corres/pdf/605517p.pdf.

17. Phil Worms, "Why Cloud Computing Must Be Included in Disaster Recovery Planning," *Cloud Computing Journal*, January 26, 2011, http://cloudcomputing.sys-con.com/node/1689928.
18. Rachel Dines, "The State of Disaster Recovery Preparedness," *Disaster Recovery Journal*, January 6, 2011, http://www.drj.com/2011-articles/winter-2011-volume-24-issue-1/the-state-of-disaster-recovery-preparedness.html.
19. Federal Depository Library Program (FDLP), *FDL Handbook*, FDLP Desktop, 2008, http://www.fdlp.gov/administration/handbook. The *FDL Handbook* (2008) has been superseded by the *Legal Requirements and Program Regulations of the Federal Depository Library Program* (June 2011), but the *FDL Handbook* can still be used for background information.
20. Jan Stafford, "Lessons Learned from 9-11: Disaster Recovery Dos and Don'ts," SearchWinIt, December 5, 2001, http://searchwinit.techtarget.com/news/784938/Lessons-learned-from-9-11-Disaster-recovery-dos-and-donts.
21. Rack Packer, "Blue Cloud Thinking—Why Cloud Computing Must Be Included in Disaster Recovery Planning," *Rack Pack Blog*, January 25, 2011, http://rackpack.iomarthosting.com/?p=596.
22. Rachel Dines and Chris Nicolini, "Data Centers: Outsource or Own?" (PowerPoint), Windstream Hosted Solutions, November 17, 2011, Slide 7, ,http://www.windstreambusiness.com/media/251805/datacenters-outsource_or_own-2011.pdf.
23. IBM Institute for Business Value, T*he Evolving Role of IT Managers and Chief Information Officers (CIOs): Findings from the 2010 IBM Global IT Risk Study*, IBM Global Business Services Executive Report, accessed January 21, 2013, ftp://ftp.support.lotus.com/software/uk/itsolutions/risk-study/The_2010_IBM_Global_IT_Risk_Study__UK_version.pdf.
24. Lyndon Bird, s.v. "business continuity," *Dictionary of Business Continuity Management Terms, Version 2,* January 2012, 10–11, http://www.thebci.org/glossary.pdf.
25. Ibid, 62.
26. British Standards Institution (BSI), *BS 25999-1:2006 Business Continuity Management: Code of Practice* (London: British Standards Institution, 2006).
27. British Standards Institution (BSI), *BS 25999-2:2007 Business Continuity Management: Specification* (London: British Standards Institution, 2007).
28. American National Standards Institute (ANSI), *ASIS/BSI BCM.01-2010: Business Continuity Management Systems: Requirements with Guidance for Use* (New York: ANSI, 2010).
29. National Fire Protection Association (NFPA), *NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs* (Quincy, MA: NFPA, 2010).

CHAPTER

9

Monitoring, Auditing, and Risk Management

Introduction

The management of records must be monitored and audited to ensure the effectiveness and efficiency of recordkeeping systems and processes and conformity with the associated legislation, standards, and best practices. Today's records and information management professionals must know how to monitor the performance of employees as well as the performance of the records management program. They must understand the auditing process and be able to assist with internal and external audits. And they must be in a position to identify and analyze records and information risks—including those posed by new technology, cloud computing, contracts with third parties, e-discovery requests, and freedom of information requests—and make recommendations to manage them.

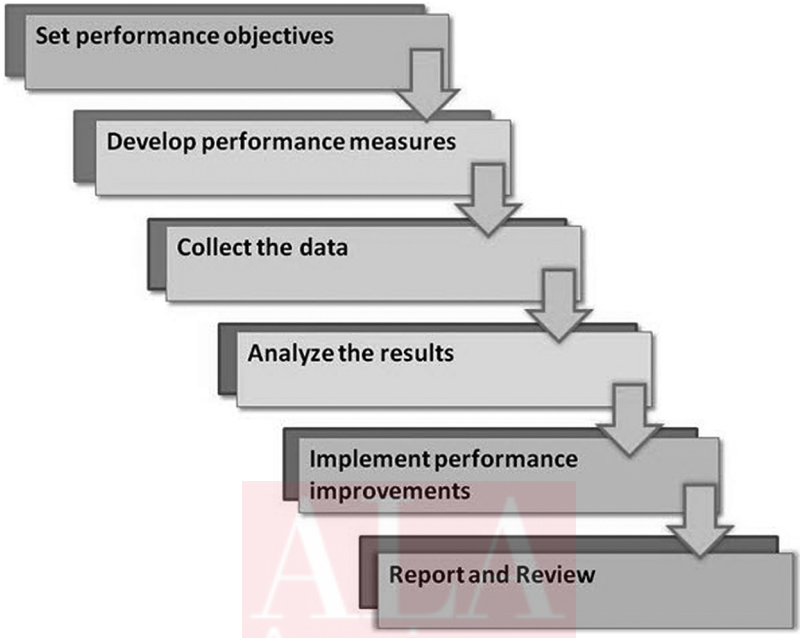
Monitoring the Management of Records

In Chapter 2, you learned that records management programs are undertaken with specific objectives in mind, including providing effective control, appropriate security, and management over the creation, maintenance, use, and disposition of all records within the organization. *Monitoring* is a process conducted by departmental staff and may involve the internal audit or compliance department in order to uncover fraud and abuse, measure progress toward goals, and identify the need for an audit. Monitoring includes conducting analyses and making adjustments accordingly. Organizations generally conduct two types of monitoring activities to understand how well the program is performing and to identify areas that need attention: performance monitoring and compliance monitoring.

Performance Monitoring

Performance monitoring is conducted to measure performance and provide ongoing feedback to employees and workgroups on their progress toward reaching their goals. It is a continuous process that involves developing criteria, conducting interviews, and examining documentation to determine whether a process is efficient and effective. In addition to monitoring the performance of individuals, performance monitoring can include monitoring overall performance of the records management program, effectiveness of the records management process, efficiency of records management systems, and strength of the organization's capacity to support records management. The development of a performance monitoring program involves identifying action to be taken during each stage of the process shown in Figure 9.1.

Figure 9.1. Steps in the performance monitoring process.



Source: Adapted from State Records Authority of New South Wales, "Guideline 19—Monitoring Recordkeeping Performance," Guidelines, accessed December 18, 2012, http://www.records.nsw.gov.au/recordkeeping/government-recordkeeping-manual/guidance/guidelines/guideline-19.

Performance measurements are based on predetermined internal or external criteria. Industry benchmarks are often used to compare an organization's performance to that of industry leaders. Individual employees can also be rated based on their performance over time or among other employees. Employee performance plans with accompanying rating systems are used as a basis for pay increases and retrenchment decisions.

Some organizations provide incentives to motivate employees and teams to excel. An employee pay raise is an example of an individual reward. Other rewards can be in the form of an informal or formal thank-you—a pizza party, a bonus, or time off. Microsoft has integrated records management responsibilities into the annual job review of its executive vice presidents, tying it to their bonuses.[1] Recognizing excellence is an effective way to honor those who have contributed to a superior records management program.

Recognition can be awarded to the entire organization as well. In 2008, ARMA International instituted the Cobalt Award for organizational excellence in managing records and information. Recognition is made in the form of a one-of-a-kind glass work of art along with airfare, lodging, and complimentary registration for one representative to attend the next ARMA annual conference, where the award is presented during the opening general session. The first recipient of this prestigious award was New York Life Insurance Company. Additional winners include Prudential Financial, Procter and Gamble, Cisco Systems, and CUNA Mutual.

Monitoring is an essential component in measuring employee and organization progress toward goals so that appropriate feedback can be given, corrective action can be taken, and informal and formal rewards can be granted for meeting standards of excellence. Monitoring can also be used to gauge the organization's ability to comply with internal policies and standards as well as external standards, laws, and regulations.

Compliance Monitoring Using Self-Assessments

Compliance monitoring can include targeted assessments of recordkeeping based on the identification of a business issue or problem. One way to measure progress is by conducting an initial evaluation and then using that as a baseline for future studies. In large public and private organizations, self-evaluations may be the most efficient way to gather data. In 2009, the US National Archives and Records Administration (NARA) implemented a mandatory self-assessment process for all federal agencies that required the agencies to complete and return a survey form to NARA. The main focus of the 2009 self-assessment was e-mail because of the widespread public interest in this topic.[2] Four additional topics were evaluated: program management, records disposition, vital records, and electronic records. Over 90 percent of the federal agencies responded to this self-assessment, and the responses indicated that 79 percent of those agencies were at high to moderate risk of compromising the integrity, authenticity, and reliability of their records.

In 2010, NARA conducted a second records management self-assessment (RMSA).[3] The report released in May 2011 revealed that 95 percent of the 251 respondents were at high to moderate risk of comprising the integrity, authenticity, and reliability of their records. In 2010, there were fewer agencies considered low risk with regard to their compliance with federal records management regulations and policies than in 2009, possibly because the survey instrument was revised by increasing the nature and number of questions. Therefore, NARA determined the responses to the 2010 survey would be used as the new baseline for future annual self-assessments.

The special topic area in the 2010 survey was training, where the findings indicated:

- a widespread dearth of formal training for staff (and contractors) at all levels;
- training that slights or neglects important records management topics, including vital records; and
- a lack of effective and long-term evaluation mechanisms.

In May 2011, NARA issued the third annual mandatory RMSA to federal agencies with the goal of determining whether federal agencies are compliant with statutory and regulatory records management requirements. The results, released in May 2012, revealed several positive indicators, including a slight increase in the number of agencies scoring in the Low Risk category, a number of agencies that had in place or were working on guidance for managing records in social media and Web 2.0 platforms as well as cloud-computing environments, and agencies that were increasingly transferring their permanent electronic records to NARA using the Electronic Records Archives. However, many of the findings changed little from 2010, including:

- Most agencies do not have adequate controls for major activities of their records management programs.

- Many records management staff have insufficient knowledge and understanding of electronic records, which leads to continued implementation of poor recordkeeping practices.
- The majority of respondents provided materials that did not support their responses to one or more questions in the self-assessment.
- Nearly a quarter of the respondent agencies do not conduct records management training for their senior officials.[4]

Based on the results, NARA concluded the recommendations from the previous year were still valid. Two additional recommendations were made: Agencies must address the need to establish verifiable performance measures, and they must address the need to establish annual electronic records training requirements for records management personnel.

As with private organizations, it helps when high-level officials provide support for records management improvements. On November 28, 2011, President Obama took steps to improve the management of federal records by issuing a presidential memorandum directing agencies to move into a digital-based recordkeeping system. The memorandum read:

> The current federal records management system is based on an outdated approach involving paper and filing cabinets. Today's action will move the process into the digital age so the American public can have access to clear and accurate information about the decisions and actions of the Federal Government.[5]

The federal government is not the only sector facing compliance challenges. Let's turn our attention to issues confronting other industries.

Compliance Monitoring and Laws and Regulations

Compliance officers are often employed by organizations to ensure that programs are in line with federal and state regulations, as well as industry-specific regulations, such as the Health Insurance Portability and Accountability Act, the Health Information Technology for Economic and Clinical Health Act, the Financial Regulatory Authority, and the Sarbanes-Oxley Act. Organizations may rely on records management personnel to conduct internal reviews, which can help prepare the organization for formal external audits.

Health Insurance Portability and Accountability Act (HIPAA)

One goal of HIPAA is to protect patients' privacy. The privacy rule of HIPAA protects personally identifiable information (PII) as it moves through the healthcare system. Healthcare organizations, including providers, payers, and clearinghouses, must comply with the privacy rule. HIPAA security standards were developed to help organizations protect PII. The implementation of administrative, physical, and technical safeguards—such as access controls, auditing controls, and workstation security—are necessary to protect PII.

A classic example of the violation of an individual's HIPAA-protected medical information involves a well-known actor, George Clooney. In 2007, he and his girlfriend were riding their motorcycle when they were hit by a car. They were hospitalized briefly at Palisades Medical Center in North Bergen, New Jersey. According to the Associated Press, as many as twenty-seven hospital employees were not only tempted to look at the actor's medical information but some even tried to sell the records to the tabloids. How do we know? A routine internal records management audit for HIPAA compliance conducted by the hospital's

records management personnel uncovered the violation.[6] Those actions resulted in the suspension of dozens of medical personnel without pay. Records managers uncovered lapses in records management practices that resulted in changes to prevent future federal statute violations, and they emerged from this situation as the heroes rather than the scapegoats.

Health Information Technology for Economic and Clinical Health Act (HITECH)

In 2009, the HITECH provisions of the Economic Stimulus Act expanded HIPAA regulations to include mandatory breach notifications, heightened enforcement, expanded patients' rights, and increased penalties of up to $50,000 for each violation and up to $1.5 million per calendar year.

In November 2011, a $1 billion class-action lawsuit was filed against Sutter Health of Sacramento, California, over the breach of 4.25 million unencrypted medical records residing on a stolen company-issued desktop computer. The lawsuit filed on behalf of the patients claimed that Sutter Health's failure to safeguard the information violates the California Confidentiality of Medical Information Act and state law that requires notification within 30 days. The plaintiffs requested a court order requiring Sutter Health to secure and encrypt patient medical information, notify patients in a timely manner, and pay each class action member $1,000 plus attorney's fees and court costs.[7]

Today, encryption issues involve not only data stored within the enterprise but also data stored in the clouds. A recent survey of 420 Fortune 500 firms and government agencies revealed that 64 percent of the respondents failed to meet cloud data encryption best practices.[8] Third-party technologies that encrypt cloud data both at rest and in transit should be employed to enhance security and privacy, since cloud applications do not always encrypt data by default.

Managing the Compliance Process

The best approach to managing compliance is to establish an intelligent information governance process—one supported by enabling technology. A number of vendors offer software and services to assist organizations with the compliance process.

Some solutions providers take a holistic approach by offering integrated governance, risk, and compliance (GRC) technology that can be used for internal audits, risk management, and compliance. Thomson Reuters offers Accelus, an integrated enterprise GRC suite of products that provides one point of entry for audit, risk management, and compliance process owners (http://accelus.thomsonreuters.com/). One of the products in the suite is the Policy Manager, which connects internal policies to external regulatory rulebooks. Once a rule has changed, compliance team members are alerted. The recordkeeping function of the product tracks who has read the updated policy, providing evidence to regulators that the changes have been made and employees informed.[9]

Some companies offer limited, specific compliance solutions as part of their products and services. For example, in 2012, Google announced Google Apps Vault, an archiving and records management solution. Google Apps Vault is an add-on for Google Apps that allows organizations to retain, archive, search, and export e-mail and chat messages in response to e-discovery and compliance requests. Features include setting e-mail retention policies and placing user accounts and related data on litigation hold to preserve e-mail data.[10]

Technology to accomplish your goals will continue to evolve and new solutions will be available to you. In order to select the right product or service, keep in mind the following six critical compliance needs:

- Centrally controlled document access management
- Document classification policy management
- Retention policy management
- Destruction and disposition policy management
- Legal hold management
- Metadata generation and management

These are the three main records management standards you can refer to when determining your needs:

- *ISO 15489-1:2001: Information and Documentation—Records Management—Part 1: General* (*ISO 15489-1*)
- *DoD 5015.02-STD: Electronic Records Management Software Applications Design Criteria Standard* (*DoD 5015.2*)
- *MoReq2010: Modular Requirements for Records Systems* (*MoReq2*)

If you are responsible for records management programs at your organization, you should be familiar with available products and services so you can discuss these options with others involved with compliance issues, such as the information technology (IT) and legal departments. The cost of such products or services can be minor compared to potential losses incurred due to fines, penalties, and loss of reputation related to poor recordkeeping practices.

Auditing the Records Management Program

Auditing is a formal review governed by professional standards that includes:

- completion by professionals independent of the operation under review;
- a structured approach that includes planning, sampling, testing, and validating; and
- formal communication with recommendations, followed by corrective actions and documented follow-up of those corrective actions.

Over time, organizations will be subject to different types of audits, including compliance audits and operational (program) audits.

Records Management Program Audits

Program audits are systematic studies conducted to assess how well a program or operation is working. Similar to performance monitoring but more formal, program audits are used to assess either achievement or progress toward a goal. The audits can be used to monitor an entire program or one portion of it, for example, electronic records management. The audit can evaluate not only practices but also systems, technologies, and facilities.

An audit could be conducted by an internal official of the organization, such as the director of internal audits or chief compliance officer. It could also be conducted by an outside auditor. In either case, the audit results would be formally communicated to the appropriate high-level executive or board of directors. The data gathered must be evaluated

in order to identify if and where problems exist. The results should indicate if the records are complete and if security breaches were identified. Policies and procedures should be modified as necessary based upon the findings.

Auditing Procedures

To prepare for an upcoming audit, it is necessary to understand the audit process. Three phases of the audit are planning, conducting, and reporting the findings:

- *Planning the audit:* The *audit plan* is a description of the expected scope and conduct of the audit with sufficient detail to guide the development of the audit program. Auditors meet with management to discuss plans for the audit process and to discover specific risks to the organization to be given special attention by the auditors. To prepare for the meeting, management should uncover areas of concern, such as issues related to e-mail or social media use.
- *Conducting the audit:* Auditors will conduct fieldwork by meeting with employees (including management) responsible for handling sensitive records to ensure they are following standard operating procedures. In order to assure maximum coordination of staff time and availability of records, audit visits should be prepared for as soon as notification is received.
- *Reporting the findings of the audit:* An audit report is completed after the fieldwork has been conducted and the auditors have identified areas of weakness related to government regulations and/or standard operating procedures. The auditors then meet with management to discuss the results and may recommend scheduling a remedial audit in the future to see if the weaknesses have been remedied.

Auditing Against a Standard, ISO 15489-1

An audit must be conducted against some type of measure, and an assessment tool must be acquired or developed. For example, an external audit could be conducted to determine compliance with the *ISO 15489-1*.

ISO 15489-1 contains seven major areas in which an organization could be evaluated:

- Regulatory environment
- Policies and responsibilities
- Records management requirements
- Design and implementation of a records system
- Records management processes and controls
- Monitoring and auditing
- Training

The relevant requirements of *ISO 15489-1* could be turned into a series of questions and used as a checklist or audit assessment tool. We'll use the section "Regulatory Environment" as an example of how questions might be developed to evaluate compliance based on this standard.

Auditing the Regulatory Environment

Section 5 of *ISO 15489-1*, "Regulatory Environment," asserts that an organization's policies and procedures should reflect the application of the regulatory environment to the business

process.[11] In addition, the organization is expected to provide evidence of its compliance within the records of its activities. The regulatory environment, according to *ISO 15489-1*, consists of:

- statute and case laws, and regulations governing the sector-specific and general business environment, including laws and regulations relating specifically to records, archives, access, privacy, evidence, electronic commerce, data protection, and information;
- mandatory standards of practice;
- voluntary codes of best practice;
- voluntary codes of conduct and ethics; and
- identifiable expectations of the community about what is acceptable behavior for the specific sector or organization.[12]

To prepare for an audit dealing with the regulatory environment, the organization should determine if they are meeting the obligations outlined in the standard. Each item would be analyzed and questions would be developed. For example, section 5 of *ISO 15489-1* specifies that issues related to records as evidence must be considered.[13] The audit assessment tool might ask the following questions:

- If records are requested as the result of legal action, could the records and associated metadata be produced, and in a timely fashion?
- Is a process in place to redact PII from those records where necessary?

An auditor would expect to see not only positive responses but also evidence to support those positive responses.

ISO 15489-1 is a general records management standard with requirements that apply across industries. But, as with compliance monitoring, organizations facing compliance audits must understand their industry-specific regulatory obligations.

Industry-Specific Audits: Higher Education

The higher education sector is responsible for complying with a complex legal and regulatory environment relating to privacy and security. Just as in the healthcare industry, higher education institutions must address compliance activities around the HIPAA, including developing policies and procedures and training for handling information about patients and research subjects.

In addition, higher education institutions must address the Family Educational Rights and Privacy Act of 1974 (FERPA).[14] Complying with FERPA involves notifying students of their FERPA rights, training faculty and staff on the appropriate uses of student records, and providing tools for students to consent to online and offline sharing of records and to opting out of sharing directory information.[15]

Higher education institutions in the United States experienced a total of eighty-nine reported breaches between January 2009 and August 2010, and the number of records compromised was in excess of one million.[16] It is important to remember: compliance *does not* equal security. Even institutions that are fully compliant with governing laws and regulations run the risk of potential data breaches.

Industry-Specific Audits: Government of South Australia

The Government of South Australia employs a combination of assessment and auditing to examine and evaluate records management practices in order to assist state and local government agencies to comply with the eleven outcomes of the *Adequate Records Management Standard* (adequacy standard).[17] The *Assessment and Audit Guideline*, released in January 2012,[18] outlines a process consisting of two related parts: self-monitoring by agencies, including regular completion of an online records assessment survey and formal monitoring of agencies by State Records, which includes completion of agency audits by State Records and formal surveys of agency practices following receipt of a complaint or where an issue has been brought to the attention of the Director, State Records.

State Records uses the data from the assessment process to:

- identify areas requiring improvement within an agency,
- identify and report on trends across government,
- structure services and resources to best meet government needs, and
- determine which agencies may need assistance or formal monitoring.

Each of the eleven outcomes can be rated on a scale of 1–5 indicating levels of achievement, with 1 as the lowest score indicating Achievement of the Records Management Baseline and 5 as the highest indicating a Breaking Through to Best Practice. Each agency must not only rate itself but also provide evidence of its current assessed position. Based on the results of the assessment, recommendations for improvement are made and agencies may be selected for a formal audit. Examples of evidence sufficient to support ratings of 3, 4, or 5 are these:

- Register of schedules
- Approved disposal program
- Audit trails
- Risk management plan that references records management
- Training plan

Note that a risk management plan is one of the documents considered supporting evidence of achievement in the audit and assessment guideline. So, let's turn our attention to the topic of risk management.

Risk Management

Organizations of all types and sizes face internal and external factors and influences that make it uncertain whether and when they will achieve their objectives. The effect this uncertainty has on an organization's objectives is *risk*. The *level of risk* is determined by multiplying the *probability of the event occurring (likelihood)* times the *level of impact (consequences)* the event would have on the organization if it did occur.

Level of Risk = Probability × Impact

Risk Management Process

ISO 31000:2009: Risk Management—Principles and Guidelines provides guidance on risk management and can be used to assess risk for a wide range of activities, including

processes, operations, and functions. According to *ISO 31000*, the risk management process includes:

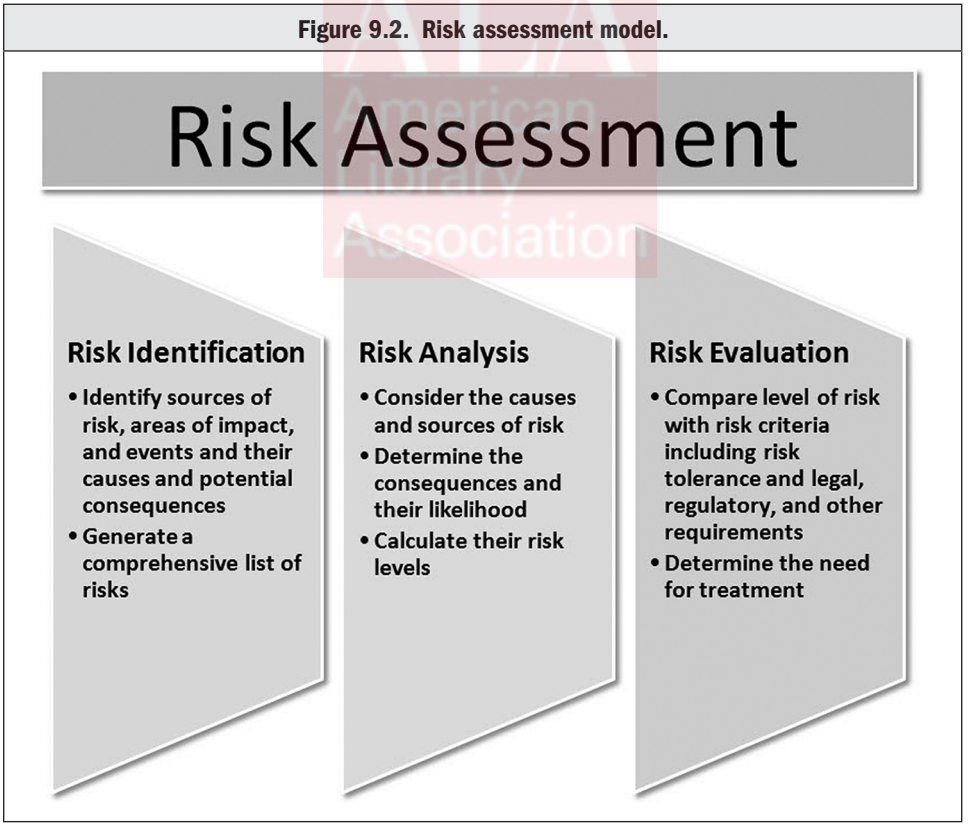
- communication and consultation with internal and external stakeholders throughout the process;
- establishing the context, including objectives, scope, and risk criteria;
- conducting the risk assessment;
- selecting and implementing the risk treatment to modify risks; and
- monitoring and reviewing the risk management process.[19]

Risk assessment includes risk identification, risk analysis, and risk evaluation as shown in Figure 9.2.

ISO 31000 is a general risk management standard. Additional guidance can be obtained from publications developed specifically to evaluate and mitigate risks related to records and information management. ARMA International's publication *Evaluating and Mitigating Records and Information Risks* categorizes risks into four quadrants: administrative, records control, legal/regulatory, and technology.[20]

Risks related to records residing in third-party social media networks, as well as in cloud services, are considered when assessing technology risks. Technology risks are also

Figure 9.2. Risk assessment model.



presented by the use of mobile devices, including the current trend to bring your own device (BYOD) to work. Risks related to volunteers, contractors, and student workers must be considered when identifying administrative risks.

Risk Identification

The four categories into which ARMA divides risks can be explained as follows:[21]

- *Administrative risks* are related to the management of the records and information management program, including information governance, change management, and emergency management. Example: Employees may consider records they have been working on *their* records rather than the organization's. Others actually plan to steal confidential data when leaving their jobs, with intellectual property and customer records topping the list. The lack of a policy to secure and/or recover the records of employees in *transition*—due to dismissal, retirement, transfer, or completion of time-bound projects for the firm—could result in the loss of valuable information. A 2010 survey of 1,026 Londoners revealed that 70 percent of respondents planned to take some information with them upon leaving their jobs.[22]
- *Records control risks* relate to records classification, records retention and disposition, and records storage. Example: Organizations don't take the necessary steps to secure universal serial bus (USB) drives for a variety of reasons, including uncertainty about monitoring and tracking USB use in the workplace, a desire not to diminish productivity, and the reliance on employee integrity and trustworthiness.[23] Yet, the loss or theft of unencrypted USB drives is one of the top causes of data leakage incidents. More than 70 percent of respondents in a recent study said they were absolutely certain (47 percent) or believe that it was most likely (23 percent) that a data breach had been caused by sensitive or confidential information contained on a missing USB drive.[24] A study conducted of 500 dry cleaners and launderettes from around the United Kingdom revealed more than 17,000 USB sticks left behind in clothing to be dry-cleaned in 2010 alone.[25]
- *Legal and regulatory risks* include risks related to compliance and arising from litigation. Example: E-mail is no longer the primary source of information for an e-discovery request. Organizations that focus too heavily on e-mail to the exclusion of other electronically stored information run the risk of being unable to present requested information. They must implement an effective, holistic information retention policy. A 2011 survey of 2,000 enterprises worldwide revealed the following types of documents being requested: files and documents (67 percent), database or application data (61 percent), and e-mail (58 percent). In addition to these now more traditional types of electronic documents, companies had to produce SharePoint files (51 percent), instant messages and text messages (44 percent), and social media (41 percent).[26]
- *Technology risks* are associated with information security, electronic communications, and software applications. Example: Records storage in the clouds may be seen as a panacea to some organizations striving to reduce their capital investment in digital infrastructure and software while leveraging the ability the cloud offers to scale up or down depending on the needs of the enterprise. But cloud service providers face the same risks as their customers, and their problems, such as system malfunction, will

affect cloud customers. In April 2011, Amazon Web Services suffered a major four-day crisis at a Virginia data center that took out a number of other online sites, some of whom not only lost access but some of their data.[27]

Risk Assessment Matrix

Once risk has been identified, it must be analyzed and evaluated. Some organizations are in industries that are more heavily regulated than others, and they may have a lower tolerance for certain types of risks. *Risk tolerance* reflects the organization's *attitude* toward risk, how much risk an organization wants or is willing to assume. The amount of risk the organization wants to assume may or may not align with its *risk capacity*—what it needs to assume in order to reach its goals. *Risk capacity* also reflects the amount of loss the organization can incur and still reach its goals.

The organization can develop its own risk assessment matrix to determine the level of risk presented by various events (see Figure 9.3). The events that present risk are slotted into the appropriate categories depending on how likely they are to occur and the severity of the consequences of their occurrence. Action is taken to mitigate risk based on the levels of risk and the organization's tolerance and capacity for risk. For example, events that result in extreme levels of risk require immediate action, while those that result in low levels of risk might be ignored. Resources are assigned to mitigate risks that negatively impact the organization and from which it would have a difficult time recovering.

Risk Mitigation: Cloud Computing, Electronic Discovery, and the Freedom of Information Act (FOIA)

Risk mitigation is the systematic reduction in the extent of exposure to a risk and/or the likelihood of its occurrence.[28] A benefit of using the risk assessment matrix is the fact that

Figure 9.3. Risk assessment matrix.

Probability of Occurrence	Severity of Consequences: Insignificant	Minor	Moderate	Major	Catastrophic
Almost certainly in most circumstances	High	High	Extreme	Extreme	Extreme
Likely and frequently	High	High	High	Extreme	Extreme
Possible and likely at some point	Significant	High	High	High	High
Unlikely, but could happen	Moderate	Moderate	Significant	Significant	Significant
May occur rarely or exceptional circumstances	Low	Low	Moderate	Moderate	Significant
	Levels of Risk				

risks are categorized according to both probability and severity, and those risks can be prioritized for the risk mitigation plan. Once administrative, records control, legal/regulatory, and technology risks are identified and prioritized, mitigation strategies can be identified for each risk that has a high level of adverse impact on the organization in the event it occurs. The risk mitigation strategies can be incorporated into the risk management plan as procedural guidelines or a code of practice.

Emerging technologies and new or revised laws and regulations will continue to present challenges to the organization. The external environment must be monitored to identify new risks that should be considered in developing the organization's risk management plan. The issues presented next are examples of risks introduced by today's new technologies and the current legal environment.

Risk Mitigation and Cloud Computing

As you have already learned, cloud computing presents both benefits and risks. Fortunately, guidance is available from a number of sources. In June 2011, the Records Management Advice Paper (no. 10) "Cloud Computing and Recordkeeping" was released by the Department of Business and Employment of the Northern Territory Government of Australia (NTG).[29] Although it was issued to inform NTG agencies of the issues they need to consider when using cloud computing technology, the information can be useful for private organizations as well.

The publication identified ten risks related to cloud services, including these:

- Security and privacy of information in a shared environment may increase the risk of unauthorized access, particularly when service providers subcontract operations to other companies.
- If a service provider goes out of business or is sold to another company, an agency's access to its records may change.
- If stored in other jurisdictions, NTG records may become subject to other [non-Australian] legislative requirements and practices.[30]
- The evidential value of records may be damaged if it cannot be proven that such records have remained inviolate and if appropriate audit trails and descriptions of management processes performed are not maintained by the service provider (i.e., outside the mandated NTG records management system).

In a May 2011 article based on information gathered from a research project supported by the Archives and Records Association (ARA) of the United Kingdom and Ireland, Convery and Ferguson-Boucher of Aberystwyth University suggest that those managing cloud services must have a clear picture of:

- the information management processes that need to be performed in the cloud,
- the compliance environment in which the organization and the cloud provider operate,
- the specific contractual terms that relate to outsourcing to the cloud,
- the total cost involved in moving information and processes into the cloud, and
- the strategies needed to ensure a seamless exit from cloud services.[31]

The risks identified could be analyzed, prioritized, and potentially used as questions for a self-study or audit.

Who Audits Third-Party Providers?

If you use public social media or cloud computing services, your organization is working with third-party providers. The provider must also be audited. In the United States, when the social media provider is as large as Facebook or Google, the government takes the responsibility for ensuring that independent audits are conducted not just to protect information from unauthorized access (as with a security audit) but to protect information from both authorized *and* unauthorized access (privacy audit).

In 2011, the Federal Trade Commission (FTC) settled with Google and Facebook after receiving complaints of unfair and deceptive practices in the way they handled their users' personal information. The result? Twenty years of independent audits going forward to be paid for by Google and Facebook. Problems that are uncovered by future audits could result in $16,000 per violation per day if the FTC decides to pursue the issue in court.[32] We can all learn something from the conversations surrounding this type of audit. Google's chief privacy lawyer complained on his personal blog about the lack of many auditing firms' ability to do more than complete "rudimentary checklists (e.g., 'do you have a written privacy policy in place? Yes, check!')."[33] While developing audit checklists is important, the checklist alone is not the answer. An associate director at the FTC emphasized that "the auditors would also be looking at the technologies and what information is being kept, talking to the engineers, inspecting privacy policies, and talking to product managers to make sure the companies are following through with those policies."[34] Valuable lessons can be learned from on-site inspections and interviews.

Risk Management and E-discovery and FOIA Requests

What's the worst that can happen if you can't respond to an e-discovery or FOIA request in a timely fashion? Formulating the response to that question is part of the risk management process.

E-discovery and Legal Preparedness

In large firms, corporate counsel or the legal department may manage the discovery process, but the records management team will be involved when requests are made for records and information. *Discovery* is part of the pretrial litigation process during which each party requests relevant information and documents from the other side in an attempt to *discover* pertinent facts. Because of the 2006 changes to the *Federal Rules of Civil Procedure* (FRCP), electronically stored information (ESI) is discoverable. The 2006 amendments to the FRCP describes ESI as "writings, drawings, graphs, charts, photographs, sound recordings, images, and other data or data compilations—stored in any medium from which information can be obtained either directly or, if necessary, after translation by the responding party into a reasonably usable form."[35]

E-discovery, or *electronic discovery*, refers to the process of locating, securing, and searching ESI with the intent of using it as evidence in a civil or criminal legal case. The pertinent rules in the revised FRCP are rules 16, 26, 33, 34, 35, 37 and 45.[36] You were introduced to rules 26 and 37 in Chapter 2. The intent of these and additional applicable FRCP rules are shown in Table 9.1.

Complying with an e-discovery request can be time-consuming and expensive. Microsoft, for example, spends an average of $20 million for e-discovery *per litigation*. Microsoft's

Table 9.1. Sampling of 2006 FRCP rules affecting discovery of electronically stored information.

FRCP rule	Intent
16(b)	Alerts the court to the possible need to address handling of discovery of electronically stored information (ESI). Directs the parties to discuss e-discovery if it is contemplated in the action. Among the topics to be discussed are agreements the parties reach related to waiver of privilege and work-product production.
26	Provides protection from unmerited, excessive, or expensive e-discovery requests.
26(b)(5)	Clarifies procedures for settling claims when privileged ESI is inadvertently sent over to the requesting party (retrieval of that information).
26(f)	Meet and confer rule. Requires all parties to meet within ninety-nine days of the filing of the lawsuit and at least twenty-one days before the initial scheduled discovery conference.
33	Includes business records created or kept in electronic format as discoverable.
34(b)	Establishes protocols for how documents are produced to requesting parties; most often in native file format, since this tends to reveal the most information.
37(e)	Provides a safe harbor from sanctions when electronic evidence is lost and unrecoverable as a matter of regular business processes.
45(c)(2)(B)	45(c) provides protection to a person subject to a subpoena. 45(c)(2)(B) allows such persons who are asked to produce documents, including ESI, to file an objection to production.

records management analysis manager described e-discovery and records management as two sides of the same coin, adding that the success of a company's e-discovery strategy relies on the strength of its records management function.[37]

E-discovery software and services are available from a number of vendors. Lawyers working on behalf of the organization must understand how e-discovery software works. In one recent case in Illinois, a team of lawyers accidentally handed 159 privileged documents to opposing counsel because they didn't realize they had to manually remove the documents flagged as privileged before sending the file to opposing counsel.[38]

The requesting party may wish to see all documents about a specific project or created by a specific individual. The requesting party will not be concerned with the organization's decision to declare some information a record and other information a nonrecord. Therefore, the organization's retention policy should include all information. This can be handled by adding at least one *transitory* records series to the schedule and applying a brief retention period to the category. The retention and disposition instructions for transitory records resemble the following: advertising and promotional material received—destroy immediately upon receipt when the material is not required or when it has been replaced by a newer version or is no longer actively referred to.[39]

Although an organization may not be able to control the increasing number of lawsuits, audits, and investigations it faces, it can establish guidelines and policies, employ e-discovery software and services, address e-discovery issues when contracting with third parties, and provide training for employees to mitigate risk to the organization and to the individual.

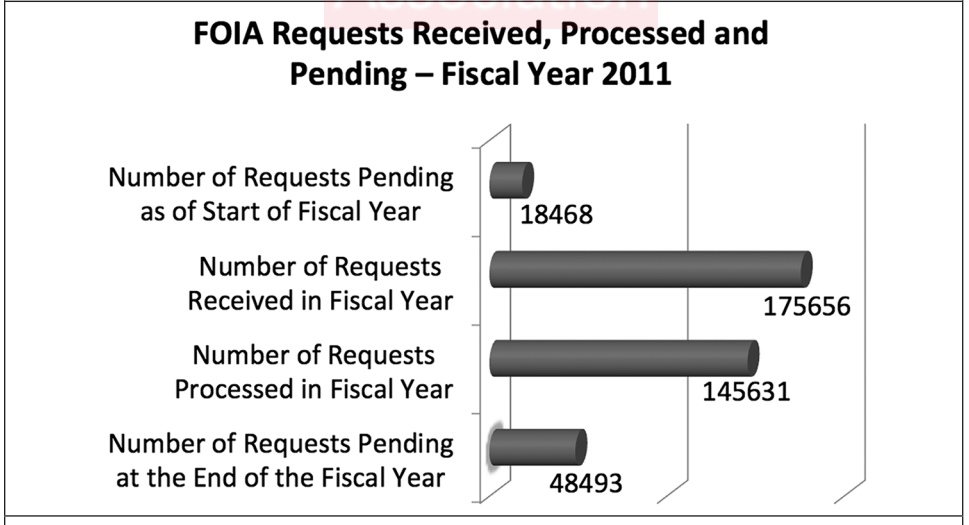
The Freedom of Information Act

The records of the government belong to the people, and the US Freedom of Information Act ensures public access to US government records. Upon written request, US agencies are required to disclose records requested unless the records can lawfully be withheld under nine specific exemptions in the FOIA.[40] In January 2009, one of the first memoranda President Obama signed was on the subject of FOIA. The fundamental message was that FOIA should be administered with a clear presumption that "in the face of doubt, openness prevails."[41] But some agencies are still struggling to respond to FOIA requests in a manner acceptable to those making the requests.

The US Department of Justice hosts the FOIA.gov website which provides FOIA data, including requests received, disposition of requests, and backlog. More than 20 percent of all requests are for information from the Department of Homeland Security, followed by requests to the Departments of Justice, Defense, and Treasury. The total requests received in 2011 by the Department of Homeland Security alone were 175,656, and a backlog of 48,493 remained by the end of the year (see Figure 9.4).

The twenty-day timeframe for a response is a challenge for agencies that need to locate and retrieve the documents and then review and redact sensitive information before releasing the documents. This short time frame, even with one allowed extension under FOIA, makes it difficult for some agencies to meet their obligations. States have their own public records laws, which provide for a response within a set number of calendar days. Fees for copies of requested documents may be charged. The state of Massachusetts, for example, charges up to 20 cents per page for photocopies and up to 50 cents per page for computer printouts.

Figure 9.4. Department of Homeland Security FOIA requests received, processed, and pending for FY 2011.



Source: United States Department of Justice, "Data: Create a Basic Report," FOIA.gov, accessed December 18, 2012, http://www.foia.gov/data.html.

There are two sides of the public records issue. Access to public information is a right, and the government is obligated to be open and transparent, but the agency responsible to comply with FOIA requests faces challenges. Among those challenges are:

- searching for, retrieving, and duplicating requested information takes time away from activities that relate to the core mission of the agency;
- the current staff may not be sufficient to handle the number of public records requests, so extra staff may be required, resulting in higher payroll costs;
- the charges allowed to be passed along to the requester may not be sufficient to cover the expenses incurred in complying with requests;
- staff training may be needed to ensure that employees gather requested information correctly and redact sensitive information before releasing records to the public; and
- FOIA requests generate new records for agencies that must be managed, including FOIA request logs, copies of forms indicating response (approval/denial), and copies of forms indicating time and cost of information provided.

Most countries have some version of a public records act. For example, Armenia adopted its Law on Freedom of Information in 2003, Liberia adopted its Freedom of Information Act in 2010, and Yemen's parliament approved its Right to Information Bill in 2012.[42]

What are the consequences for the agency that does not comply with public records requests in a timely manner or at all? Obviously, ill will on the part of the public is one. Organizations such as the Electronic Frontier Foundation in the United States exist to champion the public interest and provide the means for citizens to advocate for openness and transparency. This organization often submits its own FOIA requests, including appeals when necessary.[43]

In the United States, if a federal agency denies a request for public information, the requester has the right to appeal the decision to the agency. A nonresponse is treated the same as a denial. If the appeal is not responded to within twenty working days, the requester has the right to file a lawsuit to compel disclosure. This will result in additional work for the agency. If a court finds in favor of the requester, it might allow the requester to recover attorney fees and other reasonable costs incurred in filing the litigation.

Summary

How do you know that you have an effective, efficient, and compliant records management program? One way is to set objectives for your program and then monitor progress toward those objectives. Monitoring can reveal fraud and abuse, provide spot checks on performance, and identify the need for an audit. Performance monitoring is used to monitor the performance of individuals as well as the overall performance of the records management program. Compliance monitoring can determine an organization's adherence to governing regulations, including industry-specific laws and regulations.

Internal compliance officers or records management personnel can conduct internal audits to gather data and to help prepare the organization for formal external audits. A formal audit is a review conducted by professionals independent of the program being audited, using a structured approach, and resulting in a formal report with recommendations for improvement.

Auditing is conducted against some type of measure, such as the records management standard *ISO 15489-1*, to determine compliance with the regulatory environment, including statute and case laws and regulations governing the sector-specific and general business environment. Industry-specific audits reveal the extent to which the organization complies with laws and regulations affecting that particular industry; for example, higher education institutions must comply with the Family Educational Rights and Privacy Act (FERPA) and the Government of South Australia must comply with the *Adequate Records Management Standard*.

Organizations must identify sources of risk, analyze risks, and develop an action plan to mitigate those risks. A risk assessment matrix can be used to determine the level of risk and provide data that can be used to prioritize risks. New technologies present additional risks that must be considered, as do risks resulting from agreements with third-party providers.

E-discovery and FOIA requests also present challenges to the organization. The cost of complying with e-discovery requests can be high, with fines and other penalties imposed for failure to produce records requested. The inability of government to produce records requested by the public in a timely fashion can result in ill will on the part of citizens. The success of the organization's ability to respond to either e-discovery or public records requests relies on the strength of its records management program.

Audits measure, among other things, compliance with governing laws and regulations. Identifying the appropriate laws and regulations is essential to developing a defensible records retention policy. In his contribution to this chapter, Fred V. Diers, Vice President and General Manager of the Solutions Group of GRM, Inc., describes the process used to develop a defensible records retention schedule for a law firm using GRMpedia, an online retention and reporting regulation database.

PARADIGM

Creating Defensible Records Retention Programs

Fred V. Diers, CRM FAI, Vice President, General Manager, Solutions Group, GRM, Inc.

Records retention schedules are developed and implemented for various types of organizations from private and public corporations to nonprofits, government agencies, accounting firms, and yes, even law firms. These retention schedules provide the organizations with the ability to retain and access information, regardless of media, that is required to be preserved by regulation and to confidently dispose of information in the normal course of business using established retention periods. In the majority of records management programs, setting retention periods for document classifications resides with either the legal department counsel or outside counsel who research regulations and recommend retention periods. In most of these cases, retention periods are set based on hearsay or misinformation due to the lack of time or understanding of the complex nature or plethora of retention regulations. At the US federal level alone, there are over 5,000 retention and reporting regulations, not counting state retention requirements. The problem is to identify which of these regulations impact a specific segment of business in which an organization may be engaged.

Even law firms want to effectively manage the mountain of information that is created, received, and continually accessed. Internal law firm records managers struggle with managing

administrative records (e.g., personnel, financial, marketing), internal governance information, and law practice area client matter information. Both of these record segments (administrative and client files) have multiple media issues, from paper documents to electronic counterparts, including e-mail and social network data. How can law firms achieve viable information volume reduction while preserving relevant information for compliance and reference requirements? This was the question posed by a law firm with offices in three states and five principal practice areas that required a fact-based records retention schedule for all locations and staff.

Approach Taken

The first step was to collect data about the record or document types the firm created, collected, and retained, including the names and locations of paper and electronic document repositories, the owners of original information, document definitions, and terminology used to identify firm information. Once the information about the document types was collected and documented (metadata), the next step was organizing this metadata into logical grouping or record series to provide ongoing indexing standards for the firm's information. Common record groupings enable easy classification and accession of all forms of information, reducing the time one takes to decide on indexing structures that were once reserved for skilled archivists, librarians, and records managers. Once a record series structure grouping all document types is agreed upon within the firm, a master classification plan or taxonomy emerges that provides common categorization of the firm's information. This taxonomy can be translated into various administrative tables in records and document management software, enabling users to select from drop-down lists to index created or received documents.

Concurrently, research into federal and state record retention and reporting regulations was underway to identify regulations that impacted the operations and information codified in the taxonomy. In the case of the law firm with operations in three states and under federal jurisdiction, the number of regulations researched and citations selected that impacted the firm was 564. These regulations covered the spectrum of records retained by the firm from human resources to finance to marketing to fulfillment to governance. These regulations also provided a baseline for the firm's practice areas to determine the length of time they required to preserve client matter files. Of the 564 regulations, citations with the longest retention requirements were selected and mapped to the appropriate record series, thus setting realistic and fact-based retention periods for the firm's records and ensuring compliance both at the federal and state level.

All record series previously developed from the firm's document type lists were assigned a retention period with their responsive citations listed. If a record series did not have any responsive citations, then a suggested retention period was listed based on benchmarking other firms with similar records. As with the taxonomy, the retention periods associated with the record series were entered into the firm's records and document management software administrative tables, enabling automatic retention calculation and disposition based on the document dates entered. This minimizes user decision making as to the disposition of documents while consistently applying retention periods. The completed retention schedule was posted to the firm's intranet, enabling staff to conform to the firm-wide policy for management of their information resources.

Results

Because of the approach outlined, this law firm has a defensible records retention program based on fact, not hearsay or speculation. The retention schedule data elements standardized indexing of all paper and electronic documents, applied uniform retention periods, and enabled access of information today and in the future.

Lessons Learned/Next Steps

The primary lesson learned by the firm is to let the records and information professionals develop the taxonomy so that all of the firm's data, documents, and records are clearly and completely identified. Regulatory research should be performed by research professionals who understand what regulatory resources, both electronic and paper, need to be reviewed. The resource used for this law firm was GRMpedia, an online retention and reporting regulation database where responsive citations were selected that impacted the firm. This expedited the development of the retention schedule, which took only three months. A list of the selected responsive citations used to make up the retention period provided the attorneys with evidence about how the policy was derived. No longer did one question the validity of the retention period.

Conclusion

A law firm with offices in three states now has a uniform defensible retention policy that all attorneys and staff can use to create, classify, retain, and dispose of information confidently, compliantly, and decisively.

Notes

1. Angela Natividad, "Microsoft Calls E-Discovery, Records Management Inseparable Halves," *CMS Wire*, April 30, 2007, http://www.cmswire.com/cms/records-management/microsoft-calls-ediscovery-records-management-inseparable-halves-001238.php.
2. National Archives and Records Administration (NARA), *Records Management Self-Assessment Report 2009*, accessed January 22, 2013, http://www.archives.gov/records-mgmt/resources/self-assessment.html.
3. National Archives and Records Administration (NARA), *Records Management Self-Assessment Report 2010*, accessed January 22, 2013, http://www.archives.gov/records-mgmt/resources/self-assessment.html.
4. National Archives and Records Administration (NARA), *Records Management Self-Assessment Report 2011*, accessed January 22, 2013, http://www.archives.gov/records-mgmt/resources/self-assessment.html.
5. The White House, Office of the Press Secretary, "We Can't Wait: President Signs Memorandum to Modernize Management of Government Records," November 28, 2011, http://www.whitehouse.gov/the-press-office/2011/11/28/we-cant-wait-president-signs-memorandum-modernize-management-government-.
6. Associated Press, "Hospital Workers Suspended for Allegedly Peeking at Clooney Medical Info," *FoxNews.com*, October 10, 2007, http://www.foxnews.com/story/0,2933,300648,00.html.
7. Kathy Robertson, "Sutter Health Sued Over Patient Data Breach," *The Sacramento Business Journal*, November 23, 2011, http://www.bizjournals.com/sacramento/news/2011/11/23/sutter-health-sued-over-patient-data.html.

8. Venafi, Inc. and Echelon One, *2011 IT Security Best Practices Assessment: Security and Compliance Best Practices and Rankings*, 2011, http://www.venafi.com/wp-content/uploads/2011/09/2011_IT_Security_Best_Practices_Assessment_Executive_Overview.pdf.
9. Thomson Reuters Accelus, "Policy Manager," accessed January 22, 2013, http://accelus.thomsonreuters.com/solutions/compliance-management/policy-manager.
10. Google Apps for Business Vault, accessed January 22, 2013, http://www.google.com/enterprise/apps/business/products.html#vault.
11. International Organization for Standardization (ISO), *ISO 15489-1:2001: Information and Documentation—Records Management—Part 1: General* (Geneva: ISO, 2001), 4.
12. Ibid, 5.
13. Ibid, 4.
14. Ed.gov, "Family Educational Rights and Privacy Act (FERPA)," accessed January 22, 2013, http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html.
15. Lauren Steinfeld and Kathleen Sutherland Archuleta, "Privacy Protection and Compliance in Higher Education: The Role of the CPO," *EDUCAUSE Review*, September–October 2006, 62–71, http://net.educause.edu/ir/library/pdf/erm0654.pdf.
16. Application Security, Inc., *An Examination of Database Breaches at Higher Education Institutions* [white paper], 2010, http://www.appsecinc.com/techdocs/whitepapers/Higher-Ed-Whitepaper-Edited.pdf.
17. State Records of South Australia, Government of South Australia, *Adequate Records Management Standard, Version 2.5*, July 2008, http://www.archives.sa.gov.au/files/management_standard_ARM.pdf.
18. State Records of South Australia, Government of South Australia, *Assessment and Audit Guideline, Version 1*, January 2012, http://www.archives.sa.gov.au/management/accreditation.html.
19. International Organization for Standardization (ISO), *ISO 31000:2009: Risk Management—Principles and Guidelines* (Geneva: ISO, 2009).
20. ARMA International, *Evaluating and Mitigating Records and Information Risks* (Overland Park, KS: ARMA International, 2009).
21. Ibid.
22. Pichayada Promchertchoo, "Most Employees Would Pilfer Company Secrets," *TechWeek Europe*, December 24, 2010, http://www.techweekeurope.co.uk/news/most-employees-would-pilfer-company-secrets-14229.
23. Ponemon Institute and Kingston Technology, "Ten USB Drive Security Best Practices," IT Business Edge, accessed December 18, 2012, http://www.itbusinessedge.com/slideshows/show.aspx?c=92432.
24. Ibid.
25. Credant Technologies, "Research Shows More Than 17,000 USB Sticks Left at Dry Cleaners," *Information and Records Management Society Bulletin*, May 2011, 161.
26. Symantec Corporation, "Symantec Survey Finds Emails Are No Longer the Most Commonly Specified Documents in eDiscovery Requests," Press Release, September 19, 2011, http://www.symantec.com/about/news/release/article.jsp?prid=20110918_01&om_ext_cid=biz_socmed_twitter_facebook_marketwire_linkedin_2011Sep_eDiscoverysurvey.
27. Amazon Web Services, "Summary of the Amazon EC2 and Amazon RDS Service Disruption in the US East Region," April 29, 2011, http://aws.amazon.com/message/65648/.
28. BusinessDictionary.com, s.v. "risk mitigation," accessed December 18, 2012, http://www.businessdictionary.com/definition/risk-mitigation.html.
29. Department of Business, Northern Territory Government, Australia, "Cloud Computing and Recordkeeping," Records Management Advice Paper, no. 10, 2011, http://www.dob.nt.gov.au/services-government/it-communications/records/records-management/Pages/advice10.aspx.
30. Ibid.

31. N. Convery and K. Ferguson-Boucher, "Storing Information in the Cloud," *Information and Records Management Society Bulletin*, May 2011, 162–164.
32. Kashmir Hill, "So, What Are These Privacy Audits That Google and Facebook Have to Do for the Next 20 Years?" *Forbes*, November 30, 2011, http://www.forbes.com/sites/kashmirhill/2011/11/30/so-what-are-these-privacy-audits-that-google-and-facebook-have-to-do-for-the-next-20-years/.
33. Ibid.
34. Ibid.
35. Cornell University Law School, "Rule 34(a)(1)(A), Producing Documents, Electronically Stored Information, and Tangible Things, or Entering onto Land, for Inspection and Other Purposes," Legal Information Institute, accessed December 18, 2012, http://www.law.cornell.edu/rules/frcp/rule_34.
36. The *Federal Rules of Civil Procedure* are accessible at Cornell University School of Law, Legal Information Institute at http://www.law.cornell.edu/rules/frcp.
37. Natividad, "Microsoft Calls E-Discovery, Records Management Inseparable Halves."
38. Ryley Carlock and Applewhite Document Control Group, "Misunderstanding of Vendor's Software Leads to Waiver of Privilege," Document Control Group E-Discovery Center, accessed December 18, 2012, http://www.rcalaw.com/E-Discovery/Document-Control-Blog/Misunderstanding-of-Vendor-Software-Leads-to-Waiver-of-Privilege.php.
39. Archives of Ontario, Government of Ontario, Canada, *Transitory Records*, Government of Ontario Common Records Series, 2008, accessed January 22, 2013, http://www.archives.gov.on.ca/en/recordkeeping/documents/Transitory-Records-Common.pdf.
40. National Archives, "The Freedom of Information Act (FOIA)" (5 USC § 552), accessed January 22, 2013, http://www.archives.gov/about/laws/foia.html.
41. Barack Obama, "Freedom of Information Act," Memorandum for the Heads of Executive Departments and Agencies, WhiteHouse.gov, accessed December 18, 2012, http://www.whitehouse.gov/the-press-office/freedom-information-act.
42. Right 2 Info, "Constitutional Provisions, Laws and Regulations," last modified October 24, 2011, http://right2info.org/laws/useful-resources-and-web-links. This website has listings for more than 80 countries.
43. Electronic Frontier Foundation, "Updates," accessed December 18, 2012, https://www.eff.org/.

CHAPTER

10

Inactive Records Management, Archives, and Long-Term Preservation

Introduction

Every organization possesses records that are rarely used in daily operations but must be retained for administrative, legal, regulatory, historical, or research purposes. Often these records occupy valuable office space. If the records are referred to infrequently, they should be moved to less expensive storage locations. *Records centers* are designed specifically to retain inactive records until they meet their retention requirements. The majority of records stored in records centers are paper and microfilm, but the growth of digital information has resulted in the addition of media vaults to store digital media such as CDs, DVDs, tapes, and hard drives as well.

Records with long-term or permanent retention requirements need more stringent storage controls than provided in a records center. Therefore, they are usually transferred to an *archive*—a repository designed to store and preserve documents that are of value to researchers and historians.

In this chapter, we'll explore the use of records centers for inactive business records, the role of archives in retaining records and information for research or historical purposes, and the issues related to the long-term preservation of and access to records and information based on their retention requirements and options available.

Inactive Records and Records Centers

An *inactive record* is a record "no longer needed to conduct current business but preserved until it meets the end of its retention period."[1] Access to inactive records will be infrequent, if at all; therefore, separating active records from inactive records yields numerous benefits, including these:

- Freeing additional space for active files
- Decreasing the chances of misfiling
- Improving inactive reference services
- Increasing efficiency in records disposition
- Avoiding the purchase/use of unnecessary, costly storage equipment (e.g., additional file cabinets)

The definition of *inactive records* used by the Society of American Archivists (SAA) omits reference to a retention requirement and describes inactive records as "records that

are no longer used in the day-to-day course of business, but which may be preserved and occasionally used for legal, historical, or operational purposes."[2] Inactive records can be identified by frequency of access. If a file drawer is opened once a month or less to pull a record, the records contained in the drawer can be considered inactive. Moving them to inactive storage will save space that can be put to better use.

Some organizations store inactive records in their own records centers, in on-site or in off-site facilities located on property that is less expensive per square foot than real estate used for administrative offices. Organizations can maximize the use of their space and potentially reduce costs by offering records storage services to others free of charge or for a fee. Some organizations take advantage of the services of commercial records centers for their inactive records; still others use a combination of the two—in-house and commercial. Once all options are considered, a decision is made, and a program is initiated, the outcome should be evaluated periodically to determine if adjustments are necessary. Circumstances attributed to organizational changes, such as those occurring through acquisitions or mergers, can impact the organization's inactive records management strategy.

Records Center Planning and Design

The term *records center* usually evokes an image of a room with floor to ceiling shelving units packed with boxes of paper records such as the one shown in Figure 10.1.

Figure 10.1. Upper level of a three-tier mezzanine shelving system.

Source: Image courtesy of EZR Shelving, http://www.ezrshelving.com/Solutions/Archive-Shelving/Archive-Records-Storage.html.

Records centers may also contain vaults to house vital records and records stored on different media, including microfilm and computer tapes. Environmental controls vary according to the type of medium on which the record is stored and the retention period. Smart space planning, including choice of storage equipment, maximizes the volume of records that can be contained in the records center. Staffing depends on the size of the organization, volume of records, and services provided. Environmental, access, and security controls protect the records. Automated processes, including the use of bar coding or radio frequency identification (RFID), help staff manage physical files so they remain accessible and the company remains compliant. Not every records manager will be responsible for planning, designing, and managing a records center. But it is important to understand the criteria that must be considered and the resources that are available if the opportunity presents itself.

Estimating Volume and Space Requirements

The information gathered from both the records inventory and the retention and disposition schedule covered in Chapter 4 will be put to good use in estimating current and future space needs. The inventory lists the records on hand in active and inactive storage locations. If the inactive records are stored in an existing space, the volume of those records needs to be planned for when designing new or improved space. One recommended rule for estimating space states that one-third of all records are active and can be found in offices, one-third are inactive and should be stored in a records center, and one-third (or more) have no value and should be destroyed.[3] Before moving to a new or improved records center, dispose of records that have met their retention requirement to reduce the cost of transferring records to the new space.

Once you determine the volume of existing inactive records identified through the records inventory, you need to consider expansion needs. The estimate for expansion is also one-third, barring unusual circumstances. The volume of inactive records may increase, for example, if a legal hold is placed on records that would normally be disposed of. It is not unusual to have such records retained years past the disposition date while the case or investigation runs its course. The volume of records in inactive storage may decrease over the years, however, if automated processes are put in place that result in an increase in digital information and a decrease in paper records.

The size of space selected or built should be based upon the estimated volume of records to be housed. Floor space and height of ceiling must be considered. Robek, Brown, and Stephens used the formulas in Figure 10.2 (p. 252) for estimating space requirements for the stack area of the records center.[4]

A records manager familiar with these formulas can use them to make preliminary decisions. There are times when the only option is to use space currently available. In that case, the floor area times the stack height possible (based on structural features such as ceiling height and low-hanging pipes and light fixtures) will reveal the volume of records that can be moved to the inactive storage space. By comparing this figure with the current volume of inactive records plus anticipated growth, one can quickly determine the adequacy of the space for the organization's needs.

Publications such as the New York State Archives' *Recommendations for Shelving for Inactive Records Storage* are available to help you determine the shelving best suited to your needs.[5] Steel shelving that is 42 inches high and 32 inches deep is recommended to allow

Figure 10.2. Formulas used to estimate volume, capacity, and floor area for space planning.

$$\frac{\text{Volume of records}}{\text{Stack height x .333}} = \text{Floor area required}$$

$$\frac{\text{Volume of records}}{\text{Floor area x .333}} = \text{Stack height required}$$

$$\text{Floor area x stack height} = \text{Volume capacity}$$

Source: Mary F. Robek, Gerald F. Brown, and David O. Stephens, *Information and Records Management: Document-Based Information Systems* (New York: Glencoe/McGraw-Hill, 1996), 465.

for a row of three standard records center cartons that are 10" × 12" × 15"(h). Consultants can be employed to help with space planning, and vendors that specialize in shelving and storage systems can provide advice and examples of floor plans using their products. Archive Storage Solutions, for example, provides floor plans called *footprints* to illustrate shelving in various size rooms, specifying the maximum number of boxes that could be stored using each configuration (see Figure 10.3).

Storage and Handling

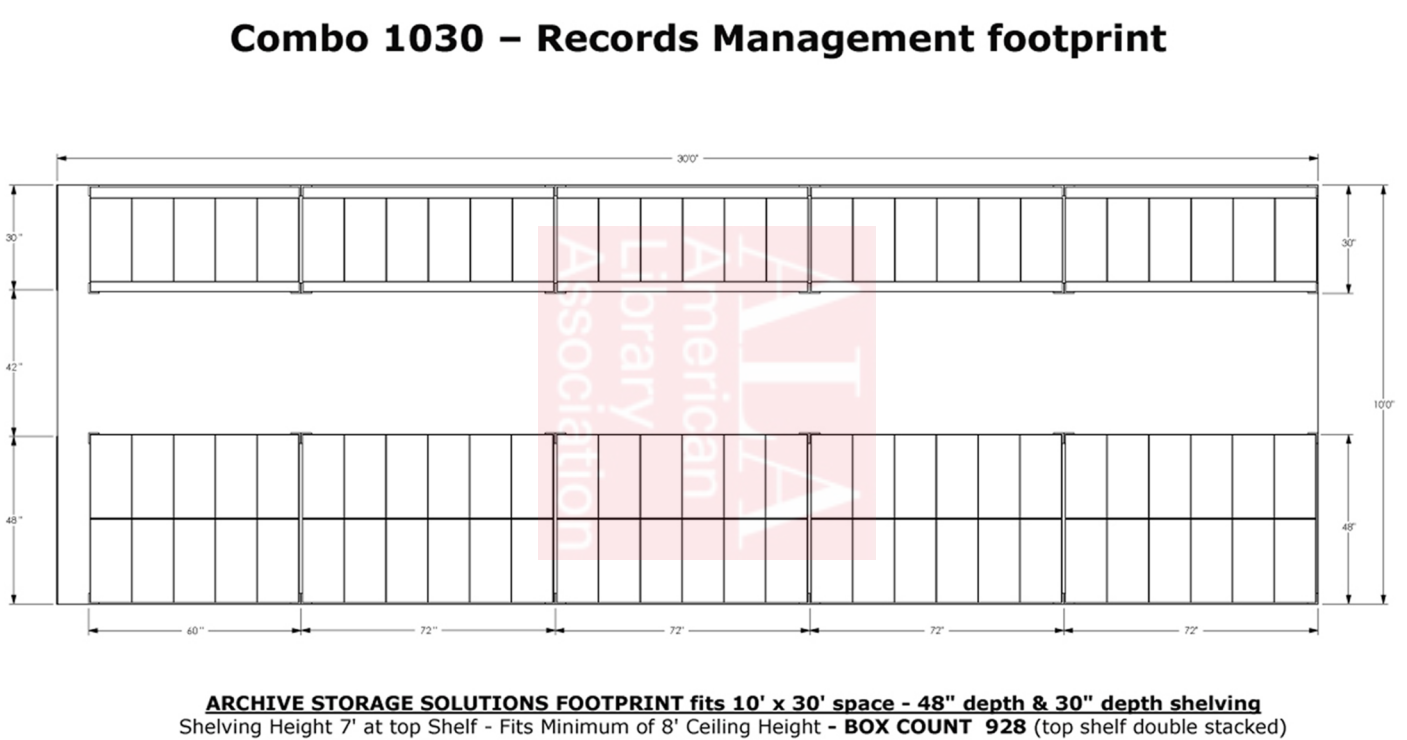
For economical use of space, records centers may restrict the type of storage boxes they will accept. Standard sizes include the following:

- Standard records center box: 15" × 12" × 10". They can hold 1 cubic foot of letter-size or legal-size documents (a letter-size file drawer contains 1.5 cubic feet of records and a legal-size file drawer contains 2 cubic feet).
- Standard storage boxes for CD-ROMs, microfiche, and roll film: 15" × 12" × 5". These are half the height of a standard records center box.
- Map, blueprint, and plan boxes: 12" × 10" × 30".

When packing boxes, space should be left so the lid fits and the box does not bulge. Staff responsible for packing boxes should be instructed to remove metal fasteners, three-ring binders, and binder clips from the materials. Some centers allow staples and paper clips, although these items can rust when stored for long periods.

The primary concern should be access, security, and preservation of records. Records should be stored as part of a records series and remain in file folders when placed in boxes. Records with long-term or permanent value should be stored in acid-free folders and storage boxes.

Figure 10.3. Floor plan for records storage in a 10' × 30' space.



Source: Archive Storage Solutions, "Archive and Records Management Catalog," http://www.archivestoragesolutions.com/. Archive Storage Solutions, LLC created "Footprints," a layout of shelving expressly designed to fit the interior space of self-storage units. Archive Storage Solutions, LLC specializes in archive shelving and storage systems for warehouse, office, and self-storage facilities.

Be sure to take the weight of the records into account. Each of the standard boxes weighs between 30 and 50 pounds when full and more if water-soaked from overhead sprinklers activated due to a fire. A structural engineer should determine floor strength, and the records manager should use the findings to determine how many cubic feet of records could be stored in the space. The results of these calculations may limit the volume of records that can be stored and perhaps even lead to a decision to identify alternate storage space.

Additional Space Requirements

In addition to stack space to store inactive records, space is needed for use by the records center staff and clients, including these areas:

- *Administrative area:* This is the office area used by records center staff. It should be close to the stack area, clean, well lit, and air-conditioned. The space required depends on the size of the facility and staff.
- *Reference area:* This area is set aside for visitors/clients of the records center to review materials. The equipment needed depends upon the services provided; for example, a copier and microfilm/microfiche reader/printer. At a minimum, it should include tables arranged to allow staff to observe users and files and to allow conversation with the users if necessary. Proximity to the administrative area is ideal.
- *Records staging area:* This is the area where records are first brought into the records center. It should be clean and secure with a doorway wide enough to allow a forklift and pallet to transfer records cartons from the loading dock to the staging area. Space should be available to house two to three days' worth of records awaiting accessioning.
- *Records processing area:* This area should also be near the loading dock, the stacking area, and the administrative area. The processing area will be utilized for returned files, interfiles (items placed in their proper place within an existing body of materials), and assembling records boxes. It should be furnished with at least one worktable, and the doorways and aisles must be wide enough to accommodate records-handling equipment.
- *Records disposal area:* This is a temporary area for storing records awaiting disposal. Ideally, it should be near the loading dock but separate from the staging area to prevent destruction of the wrong records. If documents are shredded on-site, a commercial shredder and bailer could be housed here, but the space would need an air ventilation/exchange system and soundproofing. An alternative to shredding in-house is to contract with a commercial shredding/recycling service that will remove your records for shredding/recycling at their facility or provide on-site shredding services using mobile shredding trucks.

Records Protection

The main goal of the records center is to protect the records within its care from damage due to environmental conditions, natural and man-made disasters, theft, sabotage, and vandalism.

Environmental Factors: Temperature, Humidity, Lighting, and Pollution

Media on which records are stored can be damaged by fluctuations in temperature and humidity. Modern paper has a life expectancy of only about twenty years due to the high level of acidity in the paper composition and pollution in the atmosphere. Life expectancy

Table 10.1. Optimal temperature and humidity ranges for paper, film, and electronic media.		
	Temperature	**Relative humidity**
Paper	65–70°F (± 2°)	40–50%
Film	55–68°F (± 2°)	30–40%
Electronic media	68°F (± 2°)	30–40%

can be reduced by exposure to extreme temperatures. Heat causes paper and microforms to become brittle, and humidity promotes the growth of fungus that rots paper and breaks down the composition of microfilm. Table 10.1 contains optimal ranges for paper, film, and electronic media. Avoid temperature fluctuations of more than 5 percent in either direction. If storing mixed media in the same space in a records center, temperatures between 65 and 70 degrees and relative humidity between 40 and 45 percent is safe for paper, film, and electronic media.

Heating, ventilation, and air conditioning (HVAC) controls can be used to maintain fairly consistent temperature and humidity levels. If humidity is difficult to control, fans can be used to keep air circulating in order to prevent mildew. Dehumidifiers may be required in some climates, especially in the summer. If used, a drain line should be installed to remove water automatically and checked periodically to be sure it's unobstructed. HVAC systems should be equipped with filters to remove dirt and other harmful particles from the air. These filters should be cleaned or replaced on a regular schedule.

Ultraviolet (UV) light, strongest in sunlight and fluorescent lighting, can shorten the life of paper and microforms. Light weakens paper fibers, contributes to brittleness, bleaches or yellows paper, and fades print. To protect records from sunlight, attach ultraviolet-filtering film to windows and/or use blinds or drapes. If using fluorescent lighting, buy low-UV fluorescent bulbs, install UV-filtering film on the light diffuser panels, and/or use UV-filtering sleeves on the tubes. It's best to run lighting over the aisles parallel to the shelves rather than over the shelves. Locate the light fixtures 14 inches above the highest box or shelf, keep lights off as much as possible, use zone lighting to avoid lighting the entire area, and consider the use of light timers or motion sensors to minimize the use of electricity, to protect records, and to reduce overhead costs.

Pests, including rodents and insects, feed on paper, leather, and pastes found in records storage areas. Inspect records for insects before placing them into storage. Pests can be controlled by chemical means if necessary, but their presence can be discouraged by minimizing the elements essential to their survival, including food and moisture. This can be accomplished through good housekeeping, ongoing monitoring, routine inspection, and staff education.

Natural and Man-Made Disasters: Fire, Water, Theft, Sabotage, and Vandalism

Potential hazards to records include threats caused by fire, water, theft, sabotage, and vandalism.

Fire Prevention

Fire prevention techniques can minimize the chance a fire will start and maximize the chance it can be extinguished. Consult the local fire marshal when constructing new

records storage space. Local requirements may impact the floor plan, including height of stacks, width of aisles, and specifications for fire extinguishers, firewalls, fire alarms, and exits. The records spaces should be separated from other portions of the building by firewalls that can withstand fire for a minimum of four hours. An early warning system consisting of fire alarms for heat and smoke detection should be installed. Fire prevention techniques, such as implementing a *no smoking* policy, keeping records storage areas free of chemicals and cleaning supplies, and keeping records away from sources of heat (e.g., furnace, radiator, heater) will minimize the chance of a fire.

The National Fire Protection Association (NFPA) is the leading authority on fire, electrical, and building safety. One resource specifically related to archives and records that should be a part of a records manager's reference library is *NFPA 232: Standard for the Protection of Records*. This standard provides requirements for records protection equipment and facilities and records-handling techniques that protect records in a variety of media forms from the hazards of fire. The standard covers the following records storage environments in ascending order of risk tolerance:

- Vaults
- Archives
- File rooms
- Compartmented records centers
- Records centers[6]

Several options exist to contain a fire, including waterless fire suppression systems. Dry chemical fire suppression systems can be installed in areas that contain equipment or records that would be damaged by water. Sprinkler systems, once thought to do more harm to records than good, are still popular solutions that can contain a fire near the source and limit the amount of damage to records in adjacent areas.

Water Damage

Water damage is the most likely event to impact records. In addition to sprinkler systems, sources of water damage include leaking roofs or pipes, backed-up plumbing, malfunctioning HVAC equipment, and inclement weather. Preventative measures include keeping records boxes off the floor and away from water pipes. If water damage occurs, a damage assessment tour is required. The problem should be described in broad terms, such as linear feet or number of storage containers, type of materials damaged, and whether they are replaceable. Refer to the inventory of records to classify the records damaged. The extent of damage may include soaked, partially wet, damp, charred, smoke-damaged, and debris-covered records. This assessment must be made quickly, efficiently, safely, and without actually handling records when possible.

Water-damaged records can be treated in-house or by contracting with a professional document recovery service. If records can be treated in-house, the first step is to stabilize the environment to inhibit the growth of mold by reducing the temperature to 50°–60°F and reducing the humidity as much as possible to help remove moisture from the records. The choice of treatment depends on the extent of damage incurred and expertise and availability of staff. If records cannot be treated within twenty-four hours, they should be packed for freezing. Records removed from their original location should be inventoried

(e.g., name/title of record, dates covered, original location). This information must be kept with the records whether they are sent to a commercial service or spread out to dry on-site.

The options available for treatment of wet records include the following:

- *Air-drying:* Depending on the extent of damage, this may be all that is needed. Air-drying should take place in a temperature- and humidity-controlled space at 50°–60°F and 25–35 percent relative humidity. If air-drying does not begin within twenty-four hours, the records should be packed for freezing either in boxes that are lined with plastic garbage bags or in plastic milk crates.
- *Freezing:* If air-drying is not practical, freezing should be used to provide time to determine a course of action. It stabilizes the material so mold does not grow and records do not continue to deteriorate. Freezing also eliminates smoke odor from materials that have been water-damaged due to a fire. Rapid freezing at temperatures below 15°F is recommended to minimize damage from ice crystals when drying out wet materials.
- *Vacuum freeze-drying:* A sublimation process is used to remove water (moisture) from frozen documents while they remain in a frozen state in order to maintain their shape and biological structure. The goal is to retain the composition and structure of the material by drying it without applying heat to begin an evaporation process. The freeze-drying process converts water into ice crystals and ice crystals into a gaseous state (vapor). The vapor is then removed from the chamber by vacuum pumps. This is the most expensive but effective process for drying documents.

The recovery process must also include recovery of other types of media, such as computer tapes, microform, and video/audiotapes. This recovery process should be included in the organization's disaster recovery plan.

Theft, Sabotage, and Vandalism

Physical and logical access controls were covered in detail in Chapter 5. In addition to the controls introduced there, the following controls are appropriate for records centers:

- Limit daily access to records center staff.
- Require visitors to sign in and out on a visitor's log and wear a visitor's badge.
- Require all visitors to be accompanied at all times by a records center staff member.
- Utilize windowless spaces when possible. If windows are present, cover the panes with UV film to protect records from sunlight and bar them to prevent access.

Records Center Management

In addition to space and equipment needs already discussed, well-trained staff is essential to the success of the records center operations.

Records Center Staff

In small organizations, the records manager or a member of the records management staff might manage the in-house records center. However, in larger organizations, an in-house records center demands dedicated staff to ensure it runs smoothly. The staff should include a manager, administrative staff, and a number of individuals dedicated to tasks related to the services provided. If reference areas are made available, administrative staff must be

trained to deliver quality customer service. If offering hard-copy storage, staff will be needed to transport records to and from the facility and to move records within the facility (such as from the loading docks to the processing area and stacks). If scanning and microfilm services are offered, staff well trained in scanning and microfilming is required. A records center that provides storage of computer media and/or remote electronic backup and restore services will need staff with the requisite technical expertise to manage and preserve those records. Job descriptions to fill positions within the records center would not only include a description of duties and knowledge and skill requirements but also physical requirements as needed.

Example of Physical Requirements for an Applicant for a Records Center Position

- Occasional climbing of 10-foot ladder.
- Occasional lifting and moving objects up to 50 pounds.
- Subject to standing, walking, sitting, bending, reaching, kneeling, pushing, and pulling.
- Work is primarily performed in a standard office environment.

Records Center Operating Procedures

The records center manager is responsible for establishing records control and disposition procedures.

Records Control: Forms and Technology Solutions

Records control involves a number of activities, including coordinating transfer of records to the center, accessioning records, logging storage assignments and storing records, responding to records retrieval requests, performing refiles and interfiles, and disposing of records. One of the easiest and fastest ways to inform clients of the services of the records center is to develop a website that includes physical location, days/hours of operation, contact information for records center staff, records center forms, and answers to frequently asked questions.

Records forms can be made available for download to be completed and transmitted electronically, sent with the records, or completed online. *Sample Forms for Archival and Records Management Programs*, available from ARMA International and the Society of American Archivists, contains examples of forms for the records center.[7] Forms specific to records center/records control and records destruction/disposition are listed in Table 10.2.

Software solutions are available to manage commercial, corporate, and government records centers. Products can handle physical records and/or electronic records. Software with tracking and inventory control features permit updating, sorting, and reporting

Table 10.2. Records center/records control and records destruction/disposition forms.

Records center/records control	Records destruction/disposition
Records Transfer/Transmittal Forms	Records Destruction Authorization
Records Retrieval Request Form	Certificate of Destruction
Records Outcards	
Records Retrieval Authorization From	
Records Center Box Labels	

capabilities. Some software packages produce bar code or RFID labels that can be used to designate a physical location to cartons so they can be retrieved efficiently. The labels could also be used for check-in, check-out, and a records audit. Internet-based software allows the client to generate requests and access and control account information from anywhere in the world.

Disposition/Destruction of Records

When referring to disposition within the records lifecycle, there are two options: destruction or transfer to an archive. When speaking of disposition in relation to the records center, disposition is synonymous with destruction, and destruction must be irreversible. There are factors that can require extending the disposal date, including pending lawsuits, merger negotiations, audits, and changes in laws and regulations. The requirement that a destruction authorization form be completed before destruction takes place offers the client an opportunity to extend the disposal date by providing a written explanation on the form with the extended disposition date. The client may wish or even be required to send a copy to legal staff for their approval. The legal staff may be aware of litigation about which the client has not yet been informed.

Records destruction should be authorized, appropriate, secure and confidential, timely, and documented. Document destruction methods include the following:

- *Shredding:* Shredding can be performed in-house or by employing a records-shredding service. To avoid document reconstruction, the center may opt for shredder models that produce crosscuts (cut paper lengthwise and widthwise) or those that produce rotary cuts (disintegrators) that result in fine particles.
- *Recycling:* If records are not confidential, commercial services can be employed to remove and recycle the documents.
- *Maceration:* This process involves using chemicals to soften the paper and destroy the writing before pulverizing the documents.
- *Pulping:* This is a process that involves adding water to documents that are then forced through cutters and screens to reduce the paper to pulp. After the water is removed, the pulp is discarded.[8]

A bonded service can be engaged to pick up records for destruction. If preferred, a representative of the center can accompany the vendor to witness the destruction of materials. Customers using commercial services will receive a certificate of destruction (COD), which certifies shredding has taken place. However, the service does not certify that the itemized list of documents presented for destruction were actually in the containers. The COD will contain a unique serial or transaction number, a date and location of destruction of materials, the method of destruction, a signature of a witness to the destruction (employee of records center, representative of shredding company, and a representative of client/agency who owns the records if desired).

Commercial Records Centers

Commercial records centers, also known as information management centers due to the increased need for storage of digital media, offer an alternative to an in-house records center. They are designed and equipped to store records in an efficient and economical

manner, provide environmentally controlled security for records, and employ procedures that facilitate location, retrieval, and delivery of records when needed.

Services Offered

Records centers manage physical records and often offer additional services, such as these:

- Web access to data and digital delivery of files
- Confidential and secure destruction services
- Document-imaging services converting paper and film to an electronic records format
- Digital archives
- Consulting
- Records retention scheduling
- Disaster recovery and business continuity services
- Archival records storage
- Vault storage providing fireproof and temperature- and humidity-controlled environment for digital data
- Electronic vaulting providing online backup services
- Security
- Protection against disasters (e.g., fires, earthquakes, floods)
- Accessibility

Many of the benefits of managing an in-house records center can be attributed to a commercial records center, such as space cost savings and reduced operating costs. Additional benefits are a climate-controlled environment, authorized and secure destruction, vital records protection, online backups, and enterprise content management/digital archives.

Media Vaults

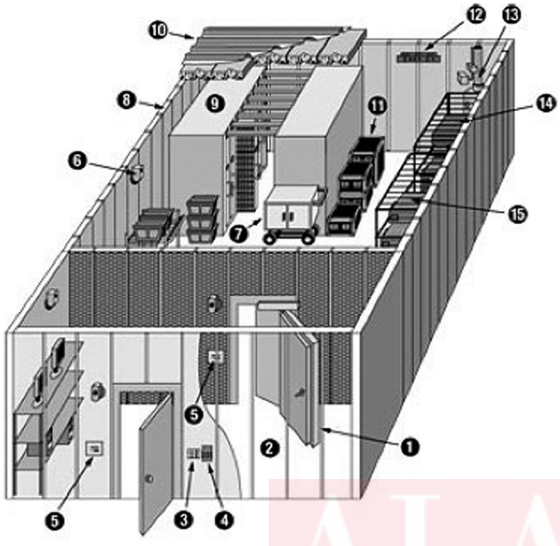
Digital media is damaged at temperatures above 125°F and 80 percent relative humidity. Media vaults are designed and built to protect these assets. An option to installing a custom-designed media vault is to contract with a records center that offers this service. Figure 10.4 illustrates the framework of a media vault that provides fire and environmental protection to magnetic media, IT equipment, removable hard drives, micrographic media, optical disks, paper documents of enduring value, and historic artifacts. When considering commercial storage vendors, the presence of a media vault is a factor that should be considered.

Request for Information and Request for Proposal

Initially, when considering the option of using the services of a commercial records storage provider, you may wish to gather information informally. A *request for information* (RFI) is an information document designed to collect information about a prospective vendor. The entire RFI process—from preparation to dissemination to receipt of information—may be accomplished within several weeks.[9]

The RFI may be all that is needed for a small, low-budget project, but it may be just the first step for a high-budget project. When considering moving existing records to a commercial records center, it is necessary to determine space and service needs, prepare a *request for quotation* (RFQ), and then compare vendor proposals. Savings can be considerable in making such a move, but errors in preparing the request and interpreting quotes received

Figure 10.4. Custom-designed media vault.



1. Class 125 Four-Hour Rated Vault Door
2. Man Trap Staging Area
3. Suppression System Abort Panel
4. Annunciator Alarm Status Panel
5. Biometric or Card Access Control Unit
6. CCTV Surveillance
7. Full Recovery Set — Transfer Cart
8. Vapor Barrier/Magnetic Shielding
9. High Density Slotted Media Storage
10. Watershield Roof Deck
11. Business Recovery Computers, Servers and Software Sets for Recovery Suite
12. Environmental/Alarm Monitoring
13. 3M™ Novec 1230™ Fire Suppression
14. Secure Transit Containers
15. Insta-Recovery Sets

Firelock vaults are custom designed and components may vary by client need. Not all vaults will include all of the possible components shown in this schematic design.

Source: Firelock, "Medial Vault Tour," Vault Design and Engineering, accessed December 18, 2012, http://www.firelock.com/mediasecurity2.htm. Courtesy of Firelock.

can seriously impact the decision made. The development of the *request for proposal* (RFP), as well as the final contract, should involve the records manager, the records manager's immediate supervisor, procurement/purchasing staff, and the legal department.

Mistakes Were Made in the Original RFQ for This Outsourcing Project!

In December 2011, the Niagara, New York, regional council approved a contract to privatize their inactive records storage. The region currently stores 12,000 boxes internally. Savings were expected to be more than $563,000 over the next five years. The region has the option of renewing for a second five-year term, with resulting savings of between $1 million to $2 million.[a]

But the successful vendor, Safe Stor, initially lost the bid due to an error in the original RFQ released 15 months earlier. The company was turned down because those reviewing the proposal said the facility didn't have the square footage needed to meet their requirements. John Ravenda, the president of Safe Stor called that proposal flawed, due to the fact that the records management industry uses cubic feet to determine storage capacity because documents are stored vertically, not square feet as mandated in the earlier regional report. Ravenda also reported that his state-of-the-art facility has climate control and a dry sprinkler fire suppression system—something that should have been included in the original call for bids. Once the call for bids was revised and open for proposals, Safe Stor beat all other bidders, including multinational firms.[b]

[a]Paul Forsyth, "Records Privatization Okayed: Region Opts to Hire Out Management of Inactive Files," *NiagaraThisWeek.com*, December 12, 2011, http://www.niagarathisweek.com/news/article/1261586—records-privatization-okayed.

[b]Paul Forsyth, "Records Storage Contract Eyed: Private Records Management Could Save Region $563,000 Over Five Years," *Niagara ThisWeek.com*, December 5, 2011, http://www.niagarathisweek.com/news/article/1256755—records-storage-contract-eyed.

Developing the Request for Proposal

In preparing a request for proposal (RFP), William Benedon provides a list of items to be analyzed, including the type of records involved, length of time the contract will cover, cost of the initial move to the storage facility, service and reports requirements, inventory count, safety and security requirements beyond those offered by the vendor, service charges, and termination costs.[10] Another resource, ARMA International's *Guideline for Evaluating Offsite Records Storage Facilities*, provides guidance for developing both a RFI and a RFQ process.[11]

Evaluating Records and Information Storage Options

PRISM (Professional Records and Information Services Management), the global trade association for information management companies, provides guidance to those selecting an off-site information management company in the form of a publication, *Demand the Best*.[12]

Sample Categories to Consider and Questions to Ask in Rating Vendor Services

- *General security:* Are loading and unloading areas secure?
- *Disaster prevention/planning:* Are adequate smoke detection systems in place?
- *Facility:* Is the location desirable/convenient?
- *Courier vehicles:* Are courier vehicles climate controlled?
- *Policies and procedures:* Are employees required to sign a confidentiality agreement?
- *Storage capabilities* (select the services you need): Is the vendor equipped to store computer media?
- *Customer services:* Is bar code tracking employed?

Source: Based on information from PRISM International, "Demand the Best" (Garner, NC: PRISM International, 2002), http://dmashredding.com/demandthebest.pdf.

The guide suggests the first step is to develop a profile for each alternative by determining their overall mission and how it meets your goals and needs, how long they have been in business, how they differentiate from competitors, if they can provide references, and if they are a member of PRISM. The evaluation process should involve rating factors that are also considered when designing an in-house records center.

When evaluating inactive storage options, there is no substitute for a tour of the physical plant and conversations with current customers.

The following additional resources are available to assist you in determining the best solution for your long-term records storage needs:

- ARMA International's technical report *Records Center Operation* (3rd ed.) covers the establishment and operation of a records center under the control of an organization or through the use of a commercial records center.[13] This report also provides guidance on preparing an internal records center budget.
- ARMA's *Guideline for Outsourcing Electronic Records Storage and Disposition* provides information for contract management of electronic records storage using a third-party service provider, including secure transmission of data and protection and security of e-records.[14] A valuable message to the reader is that "continued accessibility remains the responsibility of the owner of the records" and not the storage provider.[15] If records have long-term retention requirements, the owner of the records must understand the capability of the storage provider to maintain those records, work with the storage provider to develop practices to transition the records to other media over

time, and consider the necessity of converting records to a different format in order to comply with long-term retention requirements.

Inactive records can be transferred to a records center or, if they have enduring value, to an archives.

Archives Management

The purpose of this section is not to cover all archival theory and practice but to introduce some archival concepts to those who are also responsible for records and information management.

The term *archives* has a number of definitions, among them:

1. Materials created or received and preserved because of their enduring value or as evidence of the functions and responsibilities of their creator.
2. The division within an organization responsible for maintaining the organization's records of enduring value.
3. An organization that collects the records of individuals, families, or other organizations.
4. The professional discipline of administering such collections and organizations.
5. The building (or portion thereof) housing archival collections.
6. A published collection of scholarly papers, especially as a periodical.[16]

The Society of American Archivists provides guidelines for a graduate program in Archival Studies that describes core archival knowledge that must be mastered by a professional archivist. The core knowledge consists of three facets of archival studies: knowledge of archival material and archival functions, knowledge of the profession, and contextual knowledge. The knowledge of archival material and functions provides a list of topics that describe the elements involved in an archival program:

- Appraisal and acquisition
- Arrangement and description
- Preservation
- Reference and access
- Outreach and advocacy
- Management and administration
- Records and information management
- Digital records and access systems

Several of these areas will be addressed in this chapter.

Archives management (also called archives administration) is defined as "the general oversight of a program to appraise, acquire, arrange and describe, preserve, authenticate, and provide access to permanently valuable records."[17] *Archival science*, the systematic body of archival theory, supports archives management practice.

The views of two influential archivists impact decisions made by archivists today, including the appraisal process: Sir Hilary Jenkinson and Theodore R. Schellenberg. Sir Hilary Jenkinson (1892–1961) held that archives are "documents which formed part of an

official transaction and were preserved for official reference."[18] He further argued that the records creator is responsible for determining which records should be transferred to the archives for preservation. Because of his belief that records are evidence of transactions, he did not recognize historical documents as archives, although he did believe collections of personal papers were of value to historians. These collections, he believed, complement archives, and the repositories in which they are stored are called *manuscript repositories*.

Other archivists, especially in the United States, follow the more inclusive view of archival holdings held by Theodore R. Schellenberg (1903–1970). Schellenberg cites primary and secondary values and the need for archivists to appraise records for transfer to the archives on the basis of their secondary value (e.g., research, evidential, or informational). Schellenberg's views form the basis for the policy set forth in the *Appraisal Policy of the National Archives and Records Administration*.[19]

Appraisal

Two definitions of appraisal are relevant to archives and records and information management. Records managers view *appraisal* (also referred to as *records appraisal*) as defined by ARMA International: the "process of evaluating records to determine their retention based on administrative, legal, and fiscal requirements and historical value."[20] Like records managers, archivists consider records retention requirements based upon administrative, legal, and fiscal requirements. But archivists regard appraisal in the "archival context" as the process of determining whether records and other materials have permanent (archival) value. Appraisal decisions are based on a number of factors, including provenance and content, authenticity and reliability, order and completeness, condition and costs to preserve, and intrinsic value (e.g., unique physical format).[21]

The US National Archives and Records Administration (NARA) has established a high-level framework for the analysis of federal records no longer needed for current business operations. The three broad categories into which permanent records may fall are these:

- Records documenting the rights of citizens
- Records documenting the actions of federal officials
- Records documenting the national experience

Additional criteria were established for each of these categories, and general guidelines were provided. Only those records with enduring value can be transferred to the National Archives. The following set of questions was developed to provide consistent appraisal judgments:

- How significant are the records for research?
- How significant is the source and context of the records?
- Is the information unique?
- How usable are the records?
- Do these records serve as a finding aid to other permanent records?
- Do the records document decisions that set precedents?
- Are the records related to other permanent records?
- Do the files contain nonarchival records?
- What are the cost considerations for long-term maintenance of the records?

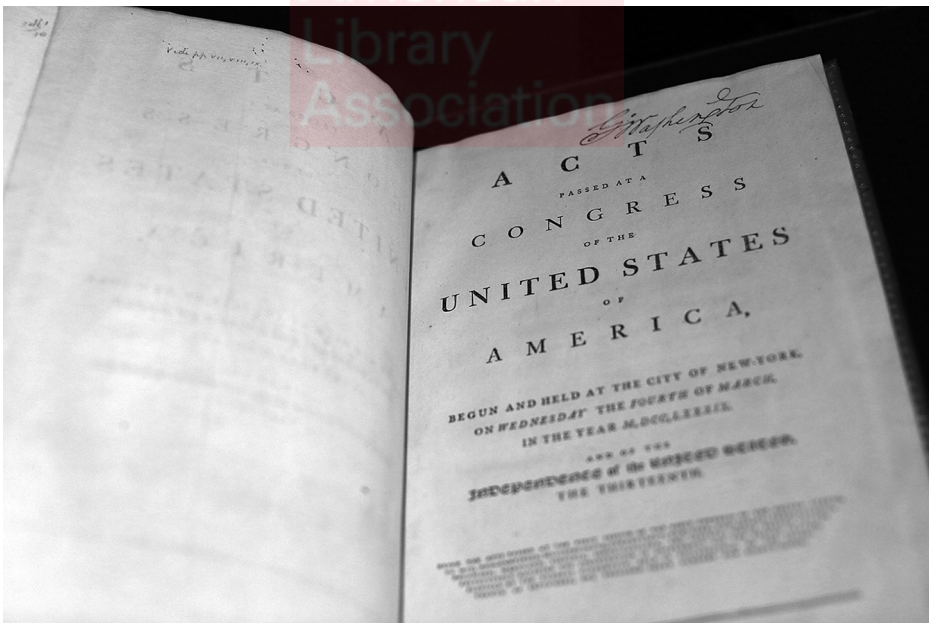
- What is the volume of records?
- Is sampling an appropriate appraisal tool?

Although most records are born digital and it is possible to digitize physical records, some documentary materials, such as the book shown in Figure 10.5, have intrinsic value and possess qualities and characteristics that make the physical form the only acceptable form for preservation. A book once owned by US President George Washington containing his annotated copy of the US Constitution and Bill of Rights was sold at auction for $9.8 million dollars in 2012. The 223-year-old book has "President of the United States" on the cover. Washington added brackets and notes highlighting key passages about the responsibility of the president. The book was purchased by the Mount Vernon Ladies' Association of the Union to be returned to the library at George Washington's Mount Vernon Estate, Museum, and Gardens.[22] The book, which has value because of its contents, was even more valued by collectors because of the signature and annotations made by the first president of the United States.

Acquisition and Accession

The materials received by a repository as a unit are known as an *acquisition*. Acquisitions are guided by an *acquisition policy*, an official statement issued by an archives or manuscript

Figure 10.5. President George Washington's personal copy of the Acts of Congress, including the US Constitution and a draft of the Bill of Rights with Washington's own signature and handwritten notations.



Source: Spencer Platt/Staff/Getty Image News/Getty Images, http://www.gettyimages.com/detail/news-photo/copy-of-former-president-george-washingtons-personal-copy-news-photo/146392699.

repository identifying the kinds of materials it accepts and the conditions or terms that affect their acquisition. It serves as a document for the guidance of archival staff and organizations and persons interested in donating their records or papers.

If materials meet the criteria established by the archives collection development policy, a decision may be made to accept some or all of the materials. Once the archivist decides to accept a group of records, the following steps must be taken:

- A record of the accession should be created either on paper or using an electronic system.
- A Deed of Gift should be executed to record the transaction between the archives and the donor.
- A preliminary inventory of the materials received should be prepared and attached to the Deed of Gift.

Next, the items must be arranged and described. Archival management software programs, such as the Archivist's Toolkit (http://www.archiviststoolkit.org/), support accessioning and describing archival materials; establishing names and subjects associated with archival materials, including names of donors; managing locations for the materials; and exporting EAD finding aids.

Arrangement and Description

According to ARMA International, *arrangement* is (1) "the process of organizing materials with respect to their provenance and original order, to protect their context and to achieve physical or intellectual control over the materials" and (2) "the organization and sequence of items within a collection."[23] Archivists strive to arrange materials in the order established by the creator. *Provenance*, also known as *respect des fonds*, requires that every document be traced to its origin and maintained as part of a group having the same origin rather than arranged by subject groups established by the archivist. This principle dictates that records of different origins (provenance) be kept separate to preserve their context.

Archivist Oliver Wendell Holmes, who worked at the US National Archives beginning in 1935, identified five levels of arrangement: repository; collection or record group (subgroups); series; folder (filing unit); and item (document).[24] These levels of arrangement are independent of their containers.

The SAA *Glossary of Archival and Records Terminology* defines *description* as (1) the process of creating a finding aid or other access tools that allow individuals to browse a surrogate of the collection to facilitate access and that improve security by creating a record of the collection and by minimizing the amount of handling of the original materials, and (2) (as applied to records management) a written account of the physical characteristics, informational content, and functional purpose of a records series or system.[25]

Archival description includes information about the content, intellectual and physical attributes of the material, and context of their creation and use. The SAA *Glossary* defines *archival description* as (1) the process of analyzing, organizing, and recording details about the formal elements of a record or collection of records, such as creator, title, dates, extent, and contents, to facilitate the work's identification, management, and understanding, and (2) the product of such a process.[26] Archival descriptions will be updated if materials are added to the collection.

Varieties of Archives

If you are considering a career as an archivist, you'll want to explore the environments in which you might work. SAA provides an extensive list of repository types shown in Table 10.3.[27]

There is variation in archival materials collected and maintained even within archives in the same category. For example, the description of a corporate archives states that the goal is to manage and preserve the records of a business. However, physical artifacts are kept as well, such as product packaging, advertising signs, toys, and even stories about how the product played a part in customers' lives. Corporate archives exist for the use of members of the organization and are often referred to when gathering information for celebrations and anniversaries or as a basis for marketing efforts. Some corporate archives are open to the general public; others make portions of their collections available online or as exhibits in corporate museums. Archival materials can be housed within facilities designed for visitors, such as the World of Coca-Cola, which is a must-see attraction in Atlanta, Georgia. The vault constructed to house the company's 125-year-old secret formula for Coca-Cola is shown in Figure 10.6 (p. 268).

Often, artifacts can be used as the basis for replication of an authentic setting or for costumes used by actors in movies or television. The 2011 television show *Pan Am* attempted to evoke the glamour of the early days of jet air travel. This required replicas of the uniforms worn by flight stewardesses. An image from the Northwest Corporate Archives (shown in Figure 10.7, p. 268) can provide the basis for retro uniforms such as those once worn by air stewardesses of Delta and related airlines, including Northeast, Northwest, Western, and Pan Am.

Two other terms you should be familiar with from the archival world are *dark archives* and *digital archives*.

Table 10.3. Repository types.

Repository type	Description
Colleges and universities	Preserve materials related to the specific academic institution. May contain a "special collections" division.
Corporate archives	Manage and preserve the records of a business.
Government archives	Collect materials related to local, state, or national government entities.
Historical societies	Preserve and promote the history of a region, an historical period, nongovernment organizations, or a subject.
Museums	Preserve and exhibit items of historical significance (artifacts or artwork rather than books and papers).
Religious archives	Preserve materials related to traditions or institutions of a major faith, denominations within a faith, or individual places of worship.
Special collections	Protect materials from individuals, families, and organizations deemed to have significant historical value. Topics vary widely (e.g., music, literature, technology, and law).

Source: Society of American Archivists (SAA), "Types of Archives," Using Archives: A Guide to Effective Research, accessed December 18, 2012, http://www2.archivists.org/usingarchives/typesofarchives.

Figure 10.6. The vault located in the World of Coca-Cola, Atlanta, Georgia.

Source: World of Coca-Cola, "Vault of the Secret Formula," http://www.worldofcoca-cola.com/secret-vault.htm. Courtesy of the Coca-Cola Company.

Figure 10.7. Flight attendants wearing retro uniforms of Delta and related airlines: Northeast, Northwest, Western, and Pan Am.

Source: Marie Force, Archives Manager, "Vintage Uniforms Flying Again," *Delta Air Lines Blog*, March 27, 2009, http://blog.delta.com/2009/03/27/vintage-uniforms-flying-again/. Courtesy of Delta Air Lines Corporate Archives.

Dark Archives

A *dark archives* is a collection of materials (not a space) preserved for future use but with no current access. The term *dark archives* is "principally associated with collections of online serial publications and databases that are held by an organization other than the publisher. These materials are kept in escrow for future use in case they are no longer available from the publisher."[28]

Digital Archives

A digital archives is more difficult to describe. In her article "Digital Archives: Democratizing the Doing of History," Cheryl Mason Bolick describes *digital archives* as "collections of numerical data, text, images, maps, videos, and audio files that are available through the Internet."[29] Bolick emphasizes *access* to digital objects. Ludäscher, Marciano, and Moore describe *digital archives* as "dedicated to the long-term preservation of electronic information" and further describe the digital archives mandate as enabling "sustained access despite rapid technology changes."[30] Both *access* and *preservation* are emphasized. Another perspective was added by Haber and Kamat in "A Content Integrity Service for Long-Term Digital Archives." This work describes a content integrity service that has as its goal "to demonstrate that information in the archive is authentic and has not been unintentionally or maliciously altered, even after its bit representation in the archive has undergone one or more transformations."[31] This work brings to the conversation the need to ensure that the *integrity* of the digital objects is being preserved.

Digital archives can also refer to the building that houses the digital repository. The Washington State Digital Archives, opened in October 2004, is an example of a facility designed to blend the latest technologies with traditional archival theory to create a first of its kind repository. It was celebrated as the nation's first archives dedicated to the preservation of electronic records from both state and local agencies that have permanent legal, fiscal, or historical value.[32]

The Washington State Digital Archives includes a research room complete with computer research stations, a high-tech presentation classroom, and a world-class data center. Statistics visible on the homepage of the Washington State Digital Archives informs visitors not only of the number of records preserved and searchable, but also how many were recently added.[33]

Archives Planning and Design

An archives building or space is designed to house records and artifacts of enduring value. Ownership and control of the records is transferred to the archives. The advice for the planning and design of a records center—including fire protection, security measures, screening of employees, environmental controls, and appropriate storage containers and shelving—applies to the planning and design of an archives building as well. However, because the goal of an archivist is to "provide fair, equitable, and timely access to materials for researchers" who may require access at some indeterminate time in the future, archivists strive to preserve holdings for as long as possible.[34] The fact that researchers wish to view and handle (if possible) the original records poses the danger of damage or loss due to access and use.

Storage Conditions: Mixed Media

Keep these pointers in mind if storing paper records in the archive:

- Utilize open steel shelving to allow air flow.
- House records in acid-free folders and boxes to slow deterioration.
- Protect records from fire.
- Reduce ultraviolet light by covering windows and fluorescent lighting with UV-protective film.

More challenging is determining the appropriate temperature and humidity for archival collections that include mixed media that must be preserved as a unit or group. A *record group* includes all of the records created by an individual, family, organization, government, office, business, or other entity.[35] The objects in the record group may be photographs, sound recordings, letters, and journals. The information may be stored on paper, film, magnetic tape, optical disks, and, more recently, hard drives of computers considered part of the collection.

The International Organization for Standardization (ISO) publishes storage standards for individual storage materials based on laboratory studies of records stored on each medium. When possible, it is best to house these materials in the environment most conducive to long-term preservation for each media type. But this desire has to be balanced with the available resources. Realistically, the archivist cannot separate objects in a collection based on media type without destroying the integrity of the collection. Therefore, ISO provides guidance for mixed media in *ISO 18934:2011: Imaging Materials—Multiple Media Archives—Storage Environment*.[36]

Access: Providing and Controlling

One way to preserve a collection is by controlling access. You learned about physical and logical access to active records in Chapter 5. Now let's turn our attention to access controls for archival records.

Controlling Access to Physical Objects

Documents of value to collectors run the risk of damage or loss due to theft, vandalism, or accident. Lessons can be learned from events or actions that result in lost, stolen, or damaged documents. Safeguards to prevent additional similar occurrences must be implemented.

Classified Documents Removed from the National Archives in Washington, DC

Sandy Berger, former national security advisor to President Clinton, removed classified documents from the National Archives in 2003 by requesting privacy to speak on the phone and then stuffing the documents into his socks and pockets. Fortunately, Berger was discovered by an observant archivist who notified the senior archivist, Nancy Kegan Smith. Smith set a trap for Berger using a pencil to number the backs of the classified documents he requested to review on his next visit. Berger eventually pleaded guilty to a misdemeanor count of "unauthorized removal and retention of classified material" for which he received a $50,000 fine and was ordered to give up his security clearance for three years.

The US National Archives and Records Administration (NARA) encourages the public to help identify lost or stolen historical US government documents and report them to the NARA. In addition to a website devoted to the topic, the NARA Archival Recovery Team hosts a Facebook page to educate the

public and to network with collectors to enlist assistance in recovering lost and stolen artifacts.[37,38]

In 2009, in response to theft of documents from the New York State Library and Archives, a state and national archival grant was obtained to develop and conduct workshops for local governments and historical records repositories on how to achieve and maintain security for their collections and steps to be taken in the event records are stolen, lost, or alienated from their holdings.[39]

New York State Library and Archives Employee Steals Artifacts and Sells Some on eBay

In 2008, Daniel Lorello of Rensselaer, New York, was charged with grand larceny, possession of stolen property, and fraud. As a department of education archivist, he had the opportunity to steal hundreds of documents, including an 1823 letter written by US Vice President John C. Calhoun, which drew bids of more than $1,700 on eBay. An observant collector alerted authorities to a pending sale of the Calhoun letter. Lorello pleaded guilty to stealing more than $50,000 worth of historic documents and artifacts and was sentenced to two to six years in prison and required to pay $73,000 to people to whom he sold stolen property, plus a $56,000 confession of judgment to the department of education.

Maryland: Guilty Plea in Thefts at Archives

In 2011, a presidential historian and author, Barry H. Landau, and his assistant, Jason Savedoff, were arrested in Baltimore on charges of stealing historical documents from the Maryland Historical Society and conspiring to steal from other archives. The documents included papers signed by President Lincoln, inaugural ball invitations, and programs worth about $500,000, as well as signed commemorations of the Statute of Liberty and the Washington Monument. Savedoff was spotted by an employee putting a document inside a laptop case and leaving the building. Landau was arrested because he had signed the documents out for a viewing in the building. Both eventually pleaded guilty to stealing historical documents worth well over a million dollars from museums in Maryland, New York, Pennsylvania, and Connecticut. The pair distracted workers, sometimes with offers of candy, and concealed the documents inside hidden pockets sewn into their sports coats and other outerwear.

Source: Terry Frieden, "Historian Guilty of Stealing Documents Worth Millions to Learn Fate," CNN Justice, May 7, 2012, http://articles.cnn.com/2012-05-07/justice/justice_new-york-historian-theft_1_jason-savedoff-documents-museums?_s=PM:JUSTICE.

In addition to access and security controls discussed already in relation to records centers, it is vital to put in place a system to monitor patrons who use archival materials; some recommendations follow:

- Request identification of researchers.
- Ensure the researcher is in good standing (no late fees/not banned from facility).
- Require materials to be used only in the assigned archival reading area, adjacent to a staff member who can monitor use.
- Allow only one item to be reviewed at a time—return one before providing another.
- Ensure that materials are not written on, cut, torn, folded, or damaged.
- Institute a copy policy to ensure that fragile documents are not copied.
- Instruct patrons that they will have to hand-copy materials from the archives when necessary.
- Install video cameras in research rooms.
- Limit what researchers can bring into and take out of the research rooms.
- Search bags taken out by both researchers and staff.

The previous tips relate to monitoring the use of archival materials, but artifacts can be stolen from storage areas as well. David Carmichael provides guidance for the control of materials in storage areas, which is the basis for the following recommendations:

- Prevent patrons from entering storage areas.
- Lock all storage areas and keep off limits to all but staff.
- If there is no separate, locked storage area, screen or rope off the storage areas and post *staff only* signs to define the storage spaces.
- Place valuable items in a closet, file cabinet, or small storage cabinet that can be locked.
- Don't include location information in public finding aids. Use a separate location guide to find specific containers.
- Consider concealing the contents of boxes by using only numbers (not titles) on the boxes.[40]

Long-term preservation of physical records can be accomplished through effective access, control, and storage practices. Long-term preservation of digital objects is more problematic.

Long-Term Preservation

A recent headline announced, "Today's Digital Documents Are Tomorrow's Dinosaurs."[41] This was a reflection on President Obama's order to federal agencies to "improve the management of federal records" and embrace a "digital-based records-keeping system."[42] Digital documents are either born digital (never having existed in another form) or have been digitized (converted from analog form to digital form). A broad term used to describe digital objects is *digital materials*. Converting documents from analog form to digital form shifts the focus from analog storage to digital preservation.

When speaking of preservation of *permanent records*, we use the term *long-term preservation*. To some that means more than ten years; to others it means more than fifty. Some consider long term to mean *indefinitely*. The Digital Preservation Coalition (DPC) defines *digital preservation* as "a series of managed activities necessary to ensure continued access to digital materials for as long as necessary."[43]

Digitization and Digital Preservation

The point of preservation is to provide access to the content of the materials preserved. Digital technologies are used to convert text, images, sound, and video to digital materials. Text and images (e.g., photographs) can be digitized through the use of a scanner, which captures the image and converts it to an image file, such as a bitmap. If access involves text searching, an optical character recognition program is used to convert each character (alphabetic letter or numeric digit) into an ASCII code. Metadata considerations must be addressed. Many institutions, such as the Smithsonian Institution Archives, have experience digitizing objects and share their standards online.

JPEG 2000 is the preferred format for digitization of objects to be transferred to the National Archives of the United Kingdom, and the following spot checks are recommended to ensure consistency across all digital objects within any project:

- Correct metadata and file-naming conventions
- Size and positioning of images

Digitization Standards for Still Images

Resolution

- 6,000 pixels on the long axis of the image (600 pixels per inch (ppi) for an image 10 inches long).
- Minimum value is 600 ppi, increasing resolution in intervals of 25 ppi as necessary to achieve a minimum of 6,000 pixels along the long axis.

Digital File Format

- Tagged Image File Format (TIFF) using Windows (PC) byte orientation.
- For color images, a 24-bit RGB setting is used, yielding 8 bits per color channel.
- For black-and-white images, a 24-bit RGB setting is used. *Note:* For images from microfilm, a resolution of 300 ppi grayscale is acceptable.

File Compression

- None.

Metadata Standards

The Smithsonian Archives collects and maintains cataloguing data as part of its collections management system. Selected elements are embedded in digital content. Metadata embedded elements are: Document Title, Copyright Notice, Source, and Creator.

Source: Based on Smithsonian Institution Archives, "Digitization Standards for Still Images," Digitization, accessed December 19, 2012, http://siarchives.si.edu/services/digitization.

- Acceptable borders and margins on images
- Image completeness and cropping of images
- Files are created such that each file represents one single page
- File format including format extension, bit-depth, image type, and resolution[44]

Digitization of sound and video is accomplished through the use of an analog-to-digital conversion process that changes a continuously variable (analog) signal, without altering its content, into a multilevel (digital) signal.[45]

Public and private grants provide funding for digitization. For example, in 2010, the Woody Guthrie Archives received a grant from the George Kaiser Family Foundation to digitize seventy-six one-quarter-inch, reel-to-reel audiotapes, a postcard collection that spanned from 1940 to1960, and additional materials. Before the grant, access to the tape collection was denied to researchers due to their fragile nature, and the annotations on the boxes were the only indication of their contents. Because of this grant, the entire audio reel collection and postcard collection are now accessible to researchers in digital format.[46]

Resources are available to assist those who wish to set up a digitization program. SAA offers continuing education courses on digitization and preservation. The Federal Agencies Digitization Guidelines Initiative, started in 2007, defines common guidelines, methods, and practices for digitizing historic content.[47] Two workgroups were formed as part of this initiative—one to study issues related to still images and the other to study issues related to audiovisual materials.

Born Digital and Digital Preservation

Born-digital documents are created and managed in electronic form. They are not objects digitized through scanning. They were never expected to have an analog equivalent. An essay by Ricky Erway, OCLC Research, provides a list of various types of born-digital materials, among them digital photographs, digital documents, harvested web content,

digital manuscripts, electronic records, static data sets, dynamic data, digital art, and digital media publications.[48]

Digital photographs are an example to which we can all relate. Digital cameras allow users to create as many digital images as they wish without additional cost, as long as they fit on the active storage device. Images stored in digital cameras and on digital camera memory cards are often stored in a JPEG format. A JPEG file can be compressed to save space and allow for faster transmission over the Internet, but JPEG uses a lossy compression algorithm that discards information the human eye is least likely to notice. This makes the JPEG format popular for use on the web but unacceptable for preservation purposes. Because digital images and digital cameras for personal and business use are inexpensive, digital photos are one of the fastest-growing forms of born-digital content.

Preservation of digital images starts with making sure the desired images are moved from the camera (or, in some cases, smartphone) to a durable media for storage and stored in an archival format. Unlike the JPEG format, the JPEG 2000 standard is an archival format. JPEG 2000, the international standard for image compression, is the successor to the familiar JPEG format written by the ISO Joint Photographic Experts Group (JPEG). Among the advantages to JPEG 2000 (compared to JPEG) are higher compression without compromising quality, lossy (small file size but loss of quality) and lossless compression (larger file size but no loss of quality) options, and the fact that the JP2 (JPEG 2000) file format (.jp2) is XML-based metadata.[49]

Those who are responsible for providing access to images in the present and preserving images for future generations may use different file formats for different purposes; for example, they might elect to use the JP2 file format with lossy compression as service images but retain masters in the JP2 format with lossless compression or as uncompressed bitmaps in the Tagged Image File Format (TIFF).

Building a Business Case for Digital Preservation

There is a growing concern over *digital rot*. This doesn't mean the digital bits die, but that the media and file formats holding them fail to remain viable. Data *dies* because hard drives crash, tapes are stored in poor environmental conditions, CDs fail, and objects are pulled from the Internet before they can be captured. A preservation plan is necessary to ensure long-term viability of digital information. But preservation entails a cost that not every organization is willing to pay. Business cases are frequently used to justify spending money on large or small purchases. The same approach can be used to justify funds needed for preservation of digital material.

The National Digital Information Infrastructure and Preservation Program (NDIIPP) of the Library of Congress (LOC) prepared a report, *Strategies for Sustainable Preservation of Born Digital Public Television*, that examines the requirements for long-term preservation of born-digital video files created for viewing on public television.[50] The goal is to promote the notion that a sustainable preservation approach is necessary to preserve these files for future use. This approach is built on the notion that digital preservation is not an additional optional expense but can be incorporated into production budgets as a necessary requirement for ongoing usability of the materials. It is an example of the beginnings of a business case for digital public television that could be applied to digital materials generated in other industries. Because management is concerned with the bottom line—making a profit—the problem is best

stated in business terms. Records and archives management programs are considered cost centers rather than profit centers, but a case might be made that they can be either.

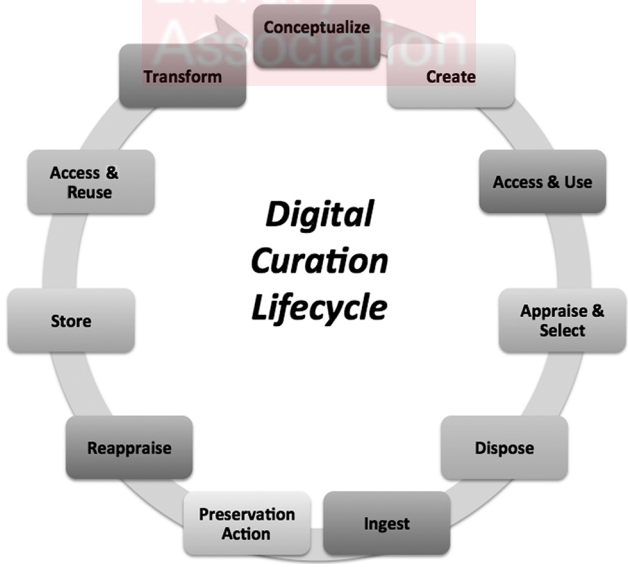
A *business case* is essentially a proposal that states a problem, describes the solution, explains how much it would cost to implement the solution, and describes the value to stakeholders, including return on investment (ROI) or cost avoidance (CA), that could be realized if the solution were implemented. When building a business case, include the following elements at a minimum:

- Executive summary
- Current situation
- Proposal
- Value of the information objects (including financial proof in terms of ROI and CA)
- Conclusion
- Supporting materials

Digital Curation and Preservation

According to the Digital Curation Centre (DCC) of the United Kingdom, *digital curation* is "maintaining and adding value to a trusted body of digital research data for current and future use; it encompasses the active management of data throughout the research lifecycle."[51] According to the DCC, "Digital curation involves organizing and preserving digital information so it will be available for future use."[52] The digital curation lifecycle includes preservation and much more (see Figure 10.8).

Figure 10.8. Digital curation lifecycle.



Source: Adapted from terms listed at Digital Curation Centre (DCC), "What Is Digital Curation?," accessed January 15, 2013, http://www.dcc.ac.uk/digital-curation/what-digital-curation.

Institutions that generate research data must put a data preservation plan in place to ensure that digital research data, as well as digital media content and information acquired from third parties, remains authentic, reliable, and usable while maintaining integrity. The DCC website is a valuable resource for custodians of digital research data. The Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan in the United States is another reliable source of information on digital curation, including long-term digital preservation (http://www.icpsr.umich.edu/icpsrweb/landing.jsp).

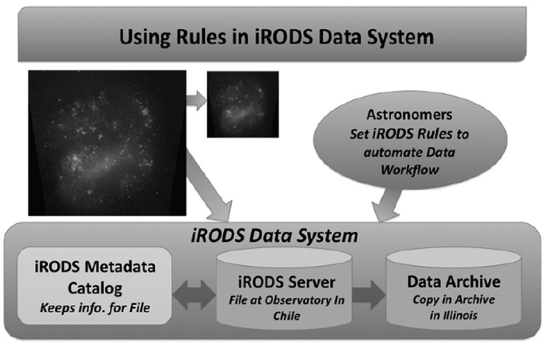
Lifecycle Management and Preservation Strategy

How can we ensure that digital information (research data and other digital objects) is available now for those who need access and yet preserved for future researchers and historians? The answers lie in digital/data management and preservation strategies. The Data Intensive Cyber Environments (DICE) Center at the University of North Carolina (USA) has led an effort for over ten years to promote the use of the Integrated Rule Oriented Data System, iRODS. iRODS is an open source data grid designed to help users organize and manage large collections of data distributed across file systems and tape archives. The iRODS data system, shown in Figure 10.9, has the following components:

- *iRODS Interfaces* (GUI, Web, WebDAV, command line) let users search for, access and view, add/extract metadata, annotate, analyze and process, manage, replicate, copy, share, repurpose, control and track access, subscribe, and more.
- *iRODS Server Software and Rule Engine* run on each data server.
- *iRODS iCAT Metadata Catalog* uses a database to track metadata describing data and all actions/events affecting it.

The US National Archives uses iRODS as the basis for the National Archives and Records Administration Transcontinental Persistent Archive Prototype, its preservation

Figure 10.9. Rules are used to automate workflows to manage photographs taken by astronomers within the iRODS Data System and enable management of large-scale data collections.



Rules for Automated Workflows

When astronomers take photographs in a sky survey and add to a data collection, they can set iRODS Rules to automatically extract descriptive metadata and record it in iRODS Metadata Catalog, create a thumbnail image for a Web-based gallery, replicate copies to other repositories for backup, and run an analysis program to identify related images. This **distributed workflow automation** makes management feasible for today's terabyte and petabyte scale data collections.

Source: iRODS Fact Sheet, https://www.irods.org/pubs/iRODS_Fact_Sheet-0907c.pdf. Courtesy of Data Intensive Cyber Environments, DICE.

environment with storage resources currently at five sites. Each of the five sites uses different vendor storage products, but the same preservation policies (iRODS rules), and manages 26 terabytes (20 million files) of NARA digital holdings.[53] This extensible environment can be federated with additional research and education sites.

The ability of future archivists to access data preserved in this system depends upon the policies established. The essential elements for *policy-based data preservation* are as follows:

- *Purpose:* reason a preservation environment is assembled
- *Properties:* attributes needed to ensure the purpose
- *Policies:* controls (workflows) for enforcing desired properties
- *Procedures:* functions that implement the policies
- *State information:* (metadata attributes) results of applying the procedures
- *Assessment criteria:* validation that state information conforms to the desired purpose
- *Federation:* controlled sharing of logical namespaces

These policies not only establish the purpose for which the preservation environment was created but also provide the information needed by future archivists to interpret what was done and to verify that the system has worked correctly to preserve records that possess the characteristics of authenticity, reliability, integrity, and usability.

Trusted Digital Repositories

In 2000, the Research Libraries Group (RLG) and the Online Computer Library Center (OCLC) recognized the development of national and, increasingly, international systems of digital repositories that are or will soon be responsible for the long-term access to the world's social, economic, cultural, and intellectual heritage in digital form. This working group emphasized that to encourage contributions to this system of digital repositories, content creators, owners of information, and current potential users must be able to trust repositories with the responsibility to provide access to and preserve content; what is needed are trusted digital repositories.[54]

A *trusted digital repository* is one whose mission is to provide reliable, long-term access to managed digital resources to its designated community, now and in the future. As with other repositories mentioned earlier for document management, content management, records management, and information management, standards are necessary to ensure that the repositories meet certain requirements. Before standards were developed, a framework called a *Reference Model for an Open Archival Information System* was designed that could be used to describe and analyze digital preservation issues, provide a basis for future standards-building activity, and serve as a point of reference for vendors interested in building digital preservation products and services. The *Open Archival Information System* (OAIS) was published as standard *ISO 14721:2003* and later revised as *ISO 14721:2012*. Among the mandatory responsibilities identified for an OAIS-type archive are two that illustrate the different parties served and their needs:

- Follow documented policies and procedures which ensure that the information is preserved against all reasonable contingencies, including the demise of the Archive, ensuring that it is never deleted unless allowed as part of an approved strategy. There should be no ad-hoc deletions.

- Make the preserved information available to the Designated Community and enable the information to be disseminated as copies of, or as traceable to, the original submitted Data Objects with evidence supporting its Authenticity.[55]

A view of the framework developed for trusted digital repositories is shown in Figure 10.10. The process involves ingesting digital files from producers, then storing, managing, and preserving those objects, with the purpose of providing long-term access to consumers. Beyond providing basic functionality, the trustworthy digital repository must be able to understand threats to and risks within its system. This requires monitoring, planning, and maintenance, as well as all of the actions necessary to carry out the mission of preservation.

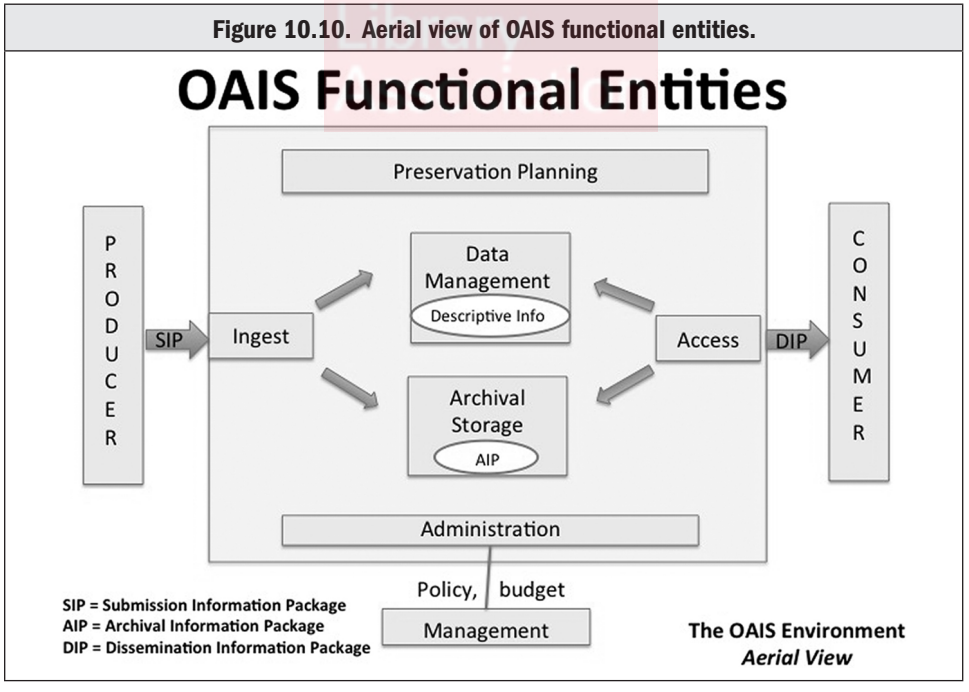
ISO 16363 Standard for Trusted Digital Repositories and Related Work

International standards efforts toward developing the infrastructure for ISO certification of trustworthy digital repositories are making good progress.

ISO 16363:2012: Space Data and Information Transfer Systems—Audit and Certification of Trustworthy Digital Repositories was released in February 2012. It defines a recommended practice for assessing the trustworthiness of digital repositories and is applicable to a wide range of digital repositories. It can be used as the basis for certification.[56] *ISO/DIS 16919: Space Data and Information Transfer Systems—Requirements for Bodies Providing Audit and Certification of Candidate Trustworthy Digital Repositories* is under development.[57]

Recommended practices for the audit and certification of trustworthy digital repositories were released in September 2011 in the form of a publication called the *Magenta Book*.[58] The main purpose of this document is to define recommended practice on which to

Figure 10.10. Aerial view of OAIS functional entities.



base an audit and certification process for assessing the trustworthiness of digital repositories. Although the document is meant primarily for those who audit digital repositories or seek objective measures for evaluating the trustworthiness of their repository, the metrics can be used during a design or redesign process for a digital repository.

The APARSEN (Alliance for Permanent Access to the Records of Science in Europe Network) Project, funded by the European Union, combines and integrates European digital preservation efforts with the goal of creating a virtual research center in digital preservation. One goal is to reach common agreement on terminology, evidence, standards, services needed for preservation, and access and reuse of data holdings over the whole lifecycle (http://www.alliancepermanentaccess.org/).

Digital Preservation Approaches and Media

Approaches to digital preservation can be classified as *passive* and *active*. *Passive preservation* ensures continuing integrity of and controlled access to digital objects along with their associated metadata. The original digital objects are kept intact without changing the technologies used to store or process them. *Active preservation* seeks to ensure the continued accessibility of electronic records over time by actively intervening in how records are stored and managed.[59] Examples of passive preservation are refreshing data, replication, and emulation. Migration is the most often used method of active preservation.

Microfilm

We're all familiar with microfilm's benefits, including longevity (500-year life expectancy), sustainability, and fixity. Innovations in archive writers and scanning equipment make it possible to convert from digital format to microfilm and back again. The benefits of computer output to microfilm (COM) include reduction of paper, cost reduction, and electronic record retention/archiving.

Hard Disks and Tapes

When searching for reliable solutions to long-term storage, the Library of Congress comes to mind. Its mission is twofold: "to support the Congress in fulfilling its constitutional duties and to further the progress of knowledge and creativity for the benefit of the American people."[60] For digital content, the LOC uses a mix of hard disks and tapes, including Oracle's StorageTek T100000B 1TB tape drives, with a thirty-year life expectancy. In the LOC video preservation lab, a robotic SAMMA system is used for analog-to-digital reformatting. The LOC policy of redundancy and diversity requires two to three copies of material stored in different locations and on different kinds of hardware running different kinds of software.

M-DISC

A recent innovation suitable for individuals and small businesses is the M-DISC, a "write once read forever" (WORF) medium that cannot be overwritten, erased, or corrupted by natural processes. The files are laser-engraved on a natural stone-like substance (the M-DISC) using an M-READY writer drive. The M-DISC is compatible with any DVD player. One estimate is that data engraved on an M-DISC should be reliable for at least 1,000 years. The storage capacity of one M-DISC is equivalent to 100,000 documents, 1,200 photos, or three hours of video. The Naval Air Warfare Center at China Lake, California,

tested the M-DISC under conditions based on 185°F/85 percent relative humidity with full-spectrum sunlight. The results revealed that the M-DISC suffered no data loss. These discs run about $3 each and come with a lifetime warranty. The challenge in 1,000 years will be to find a DVD or Blu-ray player that can read the M-DISC.[61]

Waferfiche

NanoArk Corporation is a firm that provides long-term storage services using their own technology, Waferfiche.[62] The silicon wafers, a "write once read many" (WORM) technology, have a life expectancy of 500 years, similar to microfilm. But the advantage over microfilm is that short-term exposure to high temperatures, water, electronic/magnetic fields, and sunlight does not affect the silicon wafers.

The Waferfiche fabrication process involves using photolithography to reduce document sizes to small dimensions, and then using a process of oxide deposition, metal deposition, and metal etching to create the Waferfiche. The technology can archive up to 2,000 textual, grayscale images, and line drawings that include graphs as well as construction and industrial drawings. In 500 years, the images etched into the Waferfiche would still be visible with a light source and magnification. For current business use and disaster recovery purposes, digital versions of the images are stored in flash memory on the wafer. The PNG format images with accompanying metadata stored as XML files can be reviewed and transferred to the customer's computer using a USB interface and software that is also embedded on the silicon wafer.

Cloud Digital Preservation Service

Cloud computing services, such as cloud storage, offer advantages in terms of convenience and cost. *Cloud storage* is archive storage (e.g., e-mail archives and image archives) designed to secure, retain, and protect digital information for extended periods of time, but not for the long term. Cloud digital preservation services go beyond cloud archive services by adding management and curation functions in order to accomplish digital preservation goals, including long-term preservation.

Barriers to adoption of cloud digital preservation services are similar to those for any cloud service (e.g., handing over sensitive data to a third party, threat of data breach or loss, uptime/business continuity, and financial strength of the cloud computing provider).

Digital Preservation Research

A number of additional digital preservation projects are underway at this time. One is the KEEP (Keeping Emulation Environments Portable) project, cofunded by the European Union's 7th Framework Programme. The goal of the project is the development of emulation services to enable accurate rendering of both static and dynamic digital objects: text, sound, and image files; multimedia documents; websites; databases; and videogames.[63]

TIMBUS (Timeless Business Processes and Services) is an EU-cofunded project that goes beyond focusing on static and dynamic digital objects by studying resilient business processes (http://timbusproject.net/). This project seeks to make the execution context—within which the data is processed, analyzed, transformed, and rendered—accessible over long periods. TIMBUS extends traditional preservation approaches by introducing the need to analyze and sustain accessibility to the business processes and supporting services.

It further aligns preservation actions more closely with enterprise risk management (ERM) and business continuity management (BCM).

Digital preservation experience and research has grown. Digital preservation depends upon the integration of preservation requirements built into systems used at every stage of the digital lifecycle. There is both good news and bad news to report. First, the bad news—the information provided in this chapter will surely change even by the time you read this book. Second, the good news—*the information provided in this chapter will surely change even by the time you read this book*. Change will bring about improvements to systems that will allow us to ensure the integrity and authenticity of archived content.

Summary

Inactive records are those that are no longer needed for current business but have not yet met the end of their retention period. Benefits can be derived from moving inactive records to a less-expensive storage facility. Records and information managers may be involved in planning and designing in-house record storage spaces or in identifying and recommending commercial storage services.

Records that have historical or research value are sent to various types of archives for long-term storage, including archives controlled by corporations, universities, and governments. Digital archives are dedicated to the long-term preservation of electronic information.

Collections are increasingly comprised of information stored on a variety of media types. *ISO 18934:2011* sets standards for collections that include mixed media from glass plates to photo prints to magnetic media and CDs. Historical artifacts are in danger of theft, loss, or damage from employees as well as patrons, and controls must be introduced to protect the holdings.

Scanners can be used to convert text and photographs into digital images that will save space (only if the originals are discarded) and enhance access to collections. Optical character recognition software can be used to enable full-text searching of text. Standards have been established that facilitate long-term retention. The JPEG 2000 compression standard, for example, reduces file size and produces high-quality images that provide an acceptable alternative to the traditional TIFF format for digital preservation.

Born-digital objects are created and managed in a digital form. Examples are digital photographs, digital documents, harvested web content, digital manuscripts, electronic records, static data sets, dynamic data, digital art, and digital media publications.

Preservation comes at a cost. An archivist or records manager should be able to develop a business case that includes return on investment (ROI) or cost avoidance (CA) figures that would be realized if a recommended solution were accepted.

Digital curation involves maintaining and adding value to a trusted body of digital research data for current and future use. The Digital Curation Centre (DCC) of the United Kingdom and The Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan in the United States are valuable sources of information on digital curation and long-term preservation. Producers and consumers of digital research data must be able to trust the systems that store and provide access to that data. International efforts related to trusted digital repositories is ongoing. *ISO 16363*: *Space Data and Information Transfer Systems—Audit and Certification of Trustworthy Digital Repositories* was

released in 2012, and work on *ISO/DIS 16919: Space Data and Information Transfer Systems—Requirements for Bodies Providing Audit and Certification of Candidate Trustworthy Digital Repositories* is in progress.

A number of digital preservation approaches exist, including refreshing data, replication, emulation, and migration. Research continues to find better storage solutions. Microfilm, because of its 500-year life and ability to be read by the naked eye, is still regarded as the most effective option.

Cloud digital preservation service is a natural progression from cloud storage and archiving services. But preservation services must include management and curation functions that will accomplish digital preservation goals, including long-term preservation. Research is ongoing. The key to digital preservation may be the integration of preservation requirements built into systems at every stage of the digital lifecycle. Archivists and records and information managers must constantly scan the environment for new technologies and approaches to inactive records and information management and preservation.

In spite of the growth of digital information, paper records still exist and must be managed. The theme of *controls* appeared throughout this chapter as a method to protect both physical and digital records. In their piece for this chapter, Barb Ricci and Jeffrey Cox describe a project that was implemented to control inactive physical records in the City of Los Alamos, New Mexico, before tackling the city's electronic records.

PARADIGM

Chaos to Control—A Continuing Journey

Barb Ricci, Records Administrator, Los Alamos County, New Mexico
Jeffrey W. Cox, Problem Solver, Improve Group, Albuquerque, New Mexico

Introduction to the Project

Los Alamos, well known for being the birthplace of the atomic bomb, is home to a unique municipality situation where the county is also the city. This, combined with its age and—for years—virtually a lack of any record management program, provided for some unique challenges to be overcome.

Problem Statement

Over time, some departments did attempt to implement some sort of records management practices. However, ultimately, records loosely deemed as inactive were placed in boxes, as well as a variety of other containers, and moved to a central warehouse. Records were intermingled with old furniture and disposed-of equipment. The fact that the warehouse leaked severely and served as a place of refuge for local wildlife led to an even greater challenge when the building was targeted for demolition. What records were truly there? Had they met retention requirements? To compound the situation, a disaster known as the Cerro Grande wildfire destroyed 400 homes and a large portion of the county in 2000. Records used to support claims and emergency operations, now classified as permanent, were held by Los Alamos County. Just how many permanent records existed within the thousands of containers that needed to be removed from this warehouse? These were all questions, and problems, that needed to be solved—and quickly.

Approach Taken

Systematic Evaluation

Time and staff was short. Newly hired County Records Administrator Barb Ricci immediately set forth with an army of temporary and volunteer employees to systematically inspect and inventory each and every box. A file plan was developed concurrently to give categorization and consistency to the inventory. Having the inventory in hand allowed the records administrator and the county to start getting an idea of what they had; 5,500 boxes were inventoried in less than one year.

Disposal of What Could Go

With a file plan and inventory in hand, approval was obtained from the proper state entities to dispose of what could legally be disposed of. Being able to quickly apply this retention greatly helped with the next task at hand—how to properly store and be able to access the remaining archive records.

Proper Storage of What Could Stay

First, finding a new home for these records was needed. The county was in the midst of building a new county complex, but thought had never been given to records storage. Space was quickly chiseled out of a new maintenance facility, and a new high-density storage system was rapidly procured and installed.

Partnering with Experts

Being able to get the right storage figured out and quickly installed did not happen by accident or luck. The county had a partner they had relied on in the past who came through once again, designing and installing storage facilities on time before the destruction of the old facility occurred. Storage was only one aspect though; how to access the records moving forward was also critical.

Once again utilizing this partnership of a records administrator who now knew their records intimately and a problem solver who knew how to provide access, the team designed and quickly implemented an effective records management tracking system. It could not only import and make searchable the previously created inventory, but could also provide functions specific to the county, as well as position the county for future records management needs.

Results

What was complete chaos before is now control. Inactive records are properly and securely stored. County departments can now request and have delivered to them records that previously had been literally needles in a dirty haystack. Chaos to control was accomplished in the following ways:

- 5,500 boxes were evaluated and inventoried.
- A user-friendly file plan for classification and a retention schedule were developed.
- 3,000 boxes were properly destroyed under the guidance of state regulations.
- The remaining records were successfully transferred to the new records management location and high-density storage system.

- The remaining records, and related inventory, were brought under custodial control in a records management system.

Lessons Learned/Next Steps

- Dealing with something that is out of control requires organizational intuitiveness, vision, and tenacity to overcome obstacles as the paradigm shifts.
- A task of this magnitude required leadership, resources, and good partners who are experts in their fields.
- Next steps—to tackle the electronic records while maintaining the continuous paper records that don't seem to be going away anytime soon.
- The tools created for the physical records will now be part of the toolbox when undertaking the enormous task of purging, reclassifying, and reorganizing the electronic chaos of e-mail and unstructured data.

Conclusion

Control is a continuous theme throughout this study. Records management plays a vital role in dealing with challenges such as this, for it provides the tools to implement control over the situation and turn a problem into an opportunity. Having an experienced leader who can apply these tools is critical. The leader also knows that control involves having the right people on the team, internally and externally, so the ultimate mission can be accomplished.

Notes

1. ARMA International, s.v. "inactive record," *Glossary of Records and Information Management Terms*, 3rd ed., accessed December 18, 2012, http://www.arma.org/standards/glossary/index.cfm?id_term=241.
2. Richard Pearce-Moses, s.v. "inactive record," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed December 18, 2012, http://www.archivists.org/glossary/term_details.asp?DefinitionKey=65.
3. Mary F. Robek, Gerald F. Brown, and David O. Stephens, *Information and Records Management: Document-Based Information Systems* (New York: Glencoe/McGraw-Hill, 1996), 463.
4. Ibid., 465.
5. Nancy Graham Moreland, *Recommendations for Shelving for Inactive Records Storage*, Publication No. 65, New York State Archives, revised July 2004, http://www.archives.nysed.gov/a/records/mr_pub65.pdf.
6. National Fire Protection Association (NFPA), *NFPA 232: Standard for the Protection of Records*, 2012 ed. (Quincy, MA: NFPA, 2012), http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=232.
7. ARMA International and Society of American Archivists, *Sample Forms for Archival and Records Management Programs* (Lenexa, KS: ARMA International, 2002).
8. New York State Archives, *Administration of Inactive Records*, New York State Archives Technical Information Series 49, 1996, http://www.archives.nysed.gov/a/records/mr_pub49_accessible.html#introduction.
9. Denise Brandenberg, "Request for Information vs. Request for Proposal," eHow, accessed December 18, 2012, http://www.ehow.com/about_6462623_request-information-vs-request-proposal .html.

10. William Benedon, "Outsourcing: The Right Decision?" *Information Management Journal*, January 2000, 34–41.
11. ARMA International, *Guideline for Evaluating Offsite Records Storage Facilities* (Lenexa, KS: ARMA International, 2007).
12. PRISM International, *Demand the Best* (Garner, NC: PRISM International, 2002), http://dmashredding.com/demandthebest.pdf.
13. ARMA International Standards Development Program Workgroup, *Records Center Operations*, 3rd ed., ANSI/ARMA TR01-2011 (Overland Park, KS: ARMA International, 2011).
14. ARMA International, *Guideline for Outsourcing Electronic Records Storage and Disposition* (Lenexa, KS: ARMA International, 2008).
15. Ibid., 13.
16. Richard Pearce-Moses, s.v. "archives," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed December 18, 2012, http://www2.archivists.org/glossary/terms/a/archives.
17. Richard Pearce-Moses, s.v. "archives management," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed December 18, 2012, http://www2.archivists.org/glossary/terms/a/archives-management.
18. Richard Pearce Moses, s.v. "archives," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed January 23, 2013, http://www2.archivists.org/glossary/terms/a/archives.
19. National Archives and Records Administration (NARA), *Appraisal Policy of the National Archives and Records Administration*, 2007, https://www.archives.gov/records-mgmt/publications/appraisal-policy.pdf.
20. ARMA International, s.v. "appraisal," *Glossary of Records and Information Management Terms*, 3rd ed., https://www.arma.org/standards/glossary/index.cfm?id_term=21.
21. Richard Pearce-Moses, s.v. "appraisal," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed December 18, 2012, http://www2.archivists.org/glossary/terms/a/appraisal.
22. Associated Press, "George Washington's Annotated US Constitution Book Sells at Auction for Record $9.8 million," *Washington Post*, June 22, 2011, http://www.washingtonpost.com/national/george-washingtons-annotated-us-constitution-book-sells-at-auction-for-record-98-million/2012/06/22/gJQAxzg8vV_story.html.
23. ARMA International, s.v. "arrangement," *Glossary of Records and Information Management Terms*, 3rd ed., http://www.arma.org/standards/glossary/index.cfm?id_term=32.
24. Oliver W. Holmes, "Archival Arrangement—Five Different Operations at Five Different Levels," National Archives and Records Administration (NARA), 1964, http://www.archives.gov/research/alic/reference/archives-resources/archival-arrangement.html.
25. Richard Pearce-Moses, s.v. "description," *A Glossary of Archival and Records Terminology,* Society of American Archivists, accessed December 18, 2012, http://www2.archivists.org/glossary/terms/d/description.
26. Richard Pearce-Moses, s.v. "archival description," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed December 18, 2012, http://www2.archivists.org/glossary/terms/a/archival-description.
27. Society of American Archivists (SAA), "Types of Archives," in *Using Archives: A Guide to Effective Research*, accessed December 18, 2012, http://www2.archivists.org/usingarchives/typesofarchives.
28. Richard Pearce-Moses, s.v. "dark archives," *A Glossary of Archival and Records Terminology*, Society of American Archivists, accessed December 18, 2012, http://www2.archivists.org/glossary/terms/d/dark-archives.

29. Cheryl Mason Bolick, "Digital Archives: Democratizing the Doing of History," *International Journal of Social Education* 21, no. 1 (Spring–Summer 2006), 122, http://eric.ed.gov/PDFS/EJ782136.pdf.
30. Bertram Ludäscher, Richard Marciano, and Reagan Moore, "Preservation of Digital Data with Self-Validating, Self-Instantiating Knowledge-Based Archives," *ACM SIGMOD Record*, September 2001, 54–63, 10.1145/603867.603876.
31. Stuart Haber and Pandurang Kamat, "A Content Integrity Service for Long-Term Digital Archives" (published in and presented at the IS&T Archiving 2006 Conference, Ottawa, Canada, May 23–26, 2006), http://www.hpl.hp.com/techreports/2006/HPL-2006-54.pdf.
32. Washington State Archives, "Digital Archives Background," accessed December 18, 2012, http://www.digitalarchives.wa.gov/StaticContent/background.
33. To search the Washington State Digital Archives, visit the digital archives homepage at http://www.digitalarchives.wa.gov/Home.
34. Attributed to SAA President Anne Kenney in testimony in 1993 US Senate Hearings. Quote taken from secondary source: Randall Jimerson, "Responding to the Call of Justice," Tidsskriftet Arkive, under no. 6, accessed January 23, 2013, http://www.tidsskriftetarkiv.no/index.php?option=com_content&task=view&id=15&Itemid=1.
35. David W. Carmichael, *Organizing Archival Records: A Practical Method of Arrangement and Description of Small Archives* (Walnut Creek, CA: AltaMira Press, 2004), 6.
36. International Organization for Standardization (ISO), *ISO 18934:2011: Imaging Materials—Multiple Media Archives—Storage Environment* (Geneva: ISO, 2011).
37. You can view the website at http://www.archives.gov/research/recover/.
38. You can view the Facebook page at http://www.facebook.com/archivalrecoveryteam.k/.
39. New York State Historical Records Advisory Board, "Lessons from a Theft: Bringing Security Tools and Knowledge to New York's Historical Records Community," Projects, 2009, http://www.nyshrab.org/about/about_projects.shtml.
40. Carmichael, *Organizing Archival Records*, 6.
41. Rob Hummel and Jimmy Kemp, "Today's Digital Documents Are Tomorrow's Dinosaurs," *Washington Times*, December 22, 2011, http://www.washingtontimes.com/news/2011/dec/22/todays-digital-documents-are-tomorrows-dinosaurs/.
42. Ibid.
43. Digital Preservation Coalition (DPC), "Digital Preservation," Introduction—Definitions and Concepts, accessed December 19, 2012, http://www.dpconline.org/advice/preservationhandbook/introduction/definitions-and-concepts.
44. The National Archives, United Kingdom, *Digital Records: Digitised Image Specification* (Kew, Richmond, UK: National Archives, 2011), http://www.nationalarchives.gov.uk/documents/information-management/digitisation-image-specification.pdf.
45. WhatIs.com, "digitization," last modified April 2007, http://whatis.techtarget.com/definition/0,,sid9_gci896692,00.html.
46. Woody Guthrie Archives, "Archives Concludes George Kaiser Family Foundation Digitization Grant," *Woody Guthrie Archives Blog*, January 5, 2011, http://woodyguthrie.org/archives/newsletter/?p=476.
47. Federal Agencies Digitization Guidelines Initiative, Digitization Guidelines, last modified December 21, 2011, http://www.digitizationguidelines.gov/.
48. Ricky Erway, *Defining "Born Digital,"* OCLC Online Computer Library Center, Inc., November 2010, http://www.oclc.org/research/activities/hiddencollections/borndigital.pdf.
49. Morgan Multimedia, "JPEG2000 Advantages Versus JPEG?," News, accessed January 23, 2013, http://www.morgan-multimedia.com/morgan/php/support.php?iId=8.

50. Yvonne Ng et al., *Strategies for Sustainable Preservation of Born Digital Public Television*, Preserving Digital Public Television Project, February 2010, http://www.thirteen.org/ptvdigitalarchive/files/2009/10/PDPTV_SustainabilityStrategies.pdf.
51. Digital Curation Centre (DCC), "What Is Digital Curation?" DCC Charter and Statement of Principles, accessed December 19, 2012, http://www.dcc.ac.uk/about-us/dcc-charter.
52. Ibid.
53. National Archives and Records Administration (NARA), "Policy Based Preservation Environments (iRODS)," YouTube video, 51:06, accessed June 23, 2012, http://www.youtube.com/watch?v=SYqEVgdtnes.
54. Research Libraries Group (RLG), *Trusted Digital Repositories: Attributes and Responsibilities, An RLG-OCLC Report*, May 2002, http://www.oclc.org/programs/ourwork/past/trustedrep/repositories.pdf.
55. The Consultative Committee for Space Data Systems (CCSDS). *Reference Model for an Open Archival Information System (OAIS): Recommendation for Space Data System Practices*, June 2012, accessed March 25, 2013, http://public.ccsds.org/publications/archive/650x0m2.pdf.
56. International Organization for Standardization (ISO), *ISO 16363:2012: Space Data and Information Transfer Systems—Audit and Certification of Trustworthy Digital Repositories* [abstract], accessed January 23, 2013, http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=56510.
57. Center for Research Libraries (CRL), *ISO 16363/TDR*, "A Standard for Trusted Digital Repositories," accessed January 23, 2013, http://www.crl.edu/archiving-preservation/digital-archives/metrics-assessing-and-certifying/iso16363.
58. Consultative Committee for Space Data Systems (CCSDS), *Recommendation for Space Data System Practices: Audit and Certification of Trustworthy Digital Repositories—Recommended Practice (Magenta Book)*, CCSDS 652.0-M-1, CCSDS Secretariat, September 2011, http://public.ccsds.org/publications/archive/652x0m1.pdf.
59. International Records Management Trust, *Training in Electronic Records Management—Module 4: Preserving Electronic Records*, Laura Millar, ed., 2009, http://irmt.org/documents/educ_training/term%20modules/IRMT%20TERM%20Module%204.pdf.
60. Library of Congress, "Mission," accessed December 19, 2012, http://www.loc.gov/about/mission.html.
61. Millenniata, M-DISC, accessed December 19, 2012, http://millenniata.com/m-disc/.
62. Information on Waferfiche can be viewed at the NanoArk website at http://www.nanoarkcorp.com/.
63. KEEP, "Keeping Emulation Environments Portable," accessed December 19, 2012, http://www.keep-project.eu/ezpub2/index.php.

CHAPTER

11

Records Management Education and Training

Introduction

Records management is perceived as a program for which a few dedicated employees are responsible. Managing records, on the other hand, is the responsibility of every employee who creates or maintains them. This distinction means that organizations must consider the education and training of two different types of individuals: records professionals and *everyone else*. There is also a distinction between the terms *education* and *training* that must be understood.

A formal education program "will introduce the learner to the theory and principles underpinning professional practice in the discipline."[1] "Training programs usually aim to provide participants with a new skill quickly and are often very short" in duration, ranging from one to two hours to a few days.[2] Training can be used for a variety of purposes, including orientation, policy updates, and the use of new software or hardware.

Today's records professional must be a specialist when it comes to records management but a generalist when it comes to understanding the core business responsibilities of the organization and possessing the skills and abilities to interact with professionals from other domains, including legal, compliance, business units, information technology, and security/risk management.

In this chapter, we'll first explore the options available to individuals who wish to prepare for positions in records management, and then we'll look at the ways in which those individuals can use their skills and knowledge to develop and implement enterprise-specific records management training for employees who create and/or maintain records.

Preparation for Records Management Professionals

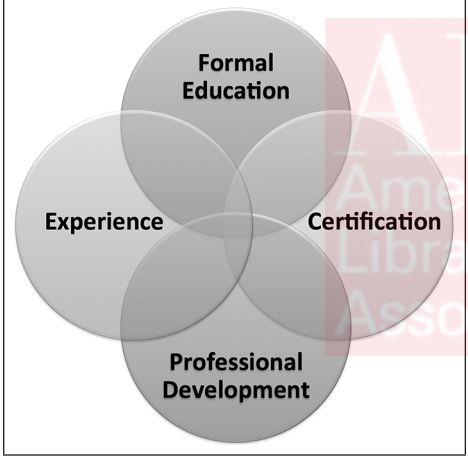
In the United States, the records management profession can credit its existence to archivists employed to help the United States federal government manage its records. In 1949, Emmett J. Leahy, a founding member of the Society of American Archivists (SAA), called for *records engineers* to serve the needs of management in identifying records to be destroyed, leaving only those of value for preservation by the US federal government.[3] These records engineers were archivists who assumed records management responsibilities.

Although *archivist* is recognized as a distinct occupation by the US Office of Personnel Management, *records manager* is not.[4] Records management is included within the Support

Services Administrative Series.[5] *Records manager* is not listed in the *Occupational Outlook Handbook* as a distinct occupation. Instead, the term *information and records clerks* can be found under the "office and administrative support" occupations.[6] In spite of this, many records and information managers assume positions of responsibility equivalent to their peers in other functional areas of the organization, including finance, human resources, and marketing. Others rise even higher within the organization to assume responsibilities as chief records officers.

In response to a growing recognition of the value of well-trained records management professionals, the US Office of Personnel Management was called upon to establish a formal records management occupational series by the end of 2013. The August 24, 2012, memorandum *Managing Government Records* states that the goal of establishing the records management occupational series is "to elevate records management roles, responsibilities, and skill sets for agency records officers and other records professionals."[7] What does this mean for records management professionals? It means that employees who are hired specifically to manage records fill a variety of positions from entry-level through management positions and that the job titles vary widely from *records clerks* to *chief records officer*. But it also means there is a growing appreciation for the value a well-trained, experienced records management professional brings to the organization.

Figure 11.1. Records management education and training.

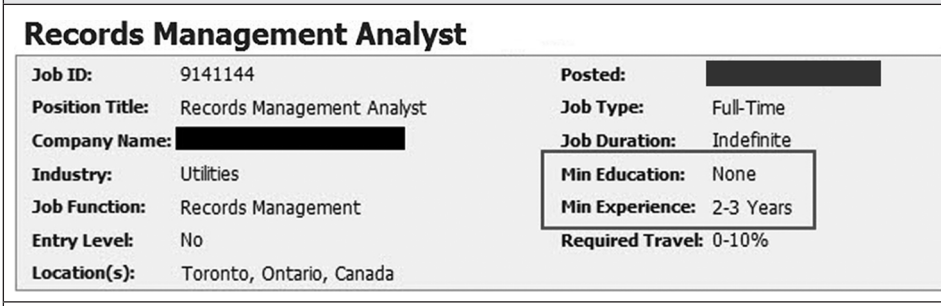


Records management skills and knowledge can be acquired through experience, certification, formal education, and professional development (see Figure 11.1). Over the course of their careers, records professionals will probably take advantage of all four avenues to improve their employment prospects.

Experience

"Experience is the best teacher" is an often-quoted proverb that aptly describes the value of professional experience to the records manager. There is no substitute for the opportunity to learn from other records management professionals, especially when it comes to accepted practices and technical skills. A recent advertisement (shown in Figure 11.2) seeks a person to fill a position based on the applicant's previous experience and not specific records management education. The responsibilities for this position (not shown in the image) are varied but include supporting the senior records manager in the development of a best-in-class records management team and collaborating with the enterprise content management (ECM) team to ensure content/document management systems effectively enable records management requirements. The qualifications cited include *experience* in physical and electronic records/document management and *experience* with content/document management systems such as Livelink and SharePoint. Some of the experience could

Figure 11.2. Job posting for records management analyst.



Records Management Analyst

Job ID:	9141144	**Posted:**	[redacted]
Position Title:	Records Management Analyst	**Job Type:**	Full-Time
Company Name:	[redacted]	**Job Duration:**	Indefinite
Industry:	Utilities	**Min Education:**	None
Job Function:	Records Management	**Min Experience:**	2-3 Years
Entry Level:	No	**Required Travel:**	0-10%
Location(s):	Toronto, Ontario, Canada		

Source: AIIM, "Job Seeker Section," Welcome to the AIIM Job Center, accessed December 16, 2011, http://jobs.aiim.org/c/job.cfm?vnet=0&exclude=7934465&site_id=1633&jb=9141144. (*Note:* This job posting has expired and is no longer listed on the website.)

have been acquired while in a previous paid position or in a nonpaid volunteer or internship position. The fact that the advertised position involves working with a senior records manager indicates the successful candidate will have continuing opportunities to learn on the job.

Certification

When seeking a position in response to an advertisement such as the one in Figure 11.2, an applicant will probably be asked to provide evidence to support the his or her claims. The applicant would, of course, provide documentation, such as letters of support and job descriptions. Since such recommendations are subjective, the prospective employer may also seek an objective means to evaluate applicants, such as requiring certification of skills and knowledge (see Figure 11.3).

Figure 11.3. Position for records manager in Bridgewater, New Jersey.

- Graduate-level coursework in archives management, library/information science
- Certified Archivist (CA) and/or Certified Records Manager (CRM) certification preferred
- Experience in an archives, records management and/or information management environment
- Prefer experience with automated content management, storage and retrieval environments (especially Microsoft SharePoint 2010 or other commercial content management system), electronic records, database design/management and electronic publication
- Some knowledge of the real estate/property management is preferred
- Prefer some supervisory experience, especially with managing projects

Source: NJSLA: New Jersey Chapter of the Special Libraries Association, "Records Manager," Special Libraries Association (SLA), December 15, 2011, http://sla-divisions.typepad.com/njslajobs/2011/12/records-manager.html. (*Note:* This job listing may have expired by the time of publication.)

Certified Records Manager (CRM)

The Institute of Certified Records Managers (ICRM) is an international certifying organization of professional records and information managers. The ICRM was incorporated in 1975 to establish a standard by which persons involved in records and information management could be measured, accredited, and recognized according to criteria identified by their peers. The primary mission of the ICRM is to develop and administer the professional certification of records and information managers, including the relevant examinations and certification maintenance program. Applicants who meet the requirements set by ICRM for education and experience will be approved to take the first five parts of the examination. Those who pass all five parts are eligible to sit for the sixth part. The six parts are as follows:

- Management Principles and the Records and Information Management Professional
- Records and Information: Creation and Use
- Records Systems, Storage, and Retrieval
- Records Appraisal, Retention, Protection, and Distribution
- Technology
- Case Studies

CRMs must pay an annual membership fee and maintain certification by earning certification maintenance credits for participation in professional development activities.[8]

Certified Archivist (CA)

The traditional records management lifecycle ends when records are destroyed or transferred to an archive. However, an archivist may become involved with records of enduring value at any stage of the records lifecycle. It has been said, "archivists have a dual personality."[9] They understand the importance of records within an organization as evidence of transactions and events, but they also appreciate the potential historical and research value of the same records for future generations. The same could be said of records managers, who often—especially when employed in local, state, and federal government positions—must deal with both active use and preservation of records. It is becoming more common to see records professionals who are not only certified records managers (CRMs) but also certified archivists (CAs).

A CA is an individual who has met the Academy of Certified Archivists' requirements for education, experience, and knowledge. The Academy of Certified Archivists is a not-for-profit accrediting agency developed through the efforts of SAA to improve educational opportunities and establish credentials for the archival field. The examinations test the applicant's mastery of a body of knowledge categorized into seven domains:

- Selection of documents
- Arrangement and description of documents
- Reference services and access to documents
- Preservation and protection of documents
- Outreach, advocacy, and promotion of documentary collections and archival repositories
- Managing archival programs
- Professional, ethical, and legal responsibilities

Examinations are administered at various locations around the United States each August.[10]

Additional Professional Certifications

Additional certifications can demonstrate mastery of knowledge related to a specific industry or related knowledge domains.

Nuclear Specialist (CRM/NS)

The Institute of Certified Records Managers (ICRM) offers a specialty certification on behalf of the Nuclear Information Records Management Association (NIRMA). Candidates for this designation must pass the core CRM exam before sitting for an additional exam section related to nuclear information records management. The successful candidate receives the CRM/NS designation.[11]

Project Management Professional (PMP)

Sooner or later, every records manager will be involved in a project that calls for project management skills, whether serving as team leader or a contributing member of the team. The PMP designation, certified by the Project Management Institute, provides evidence that the PMP has the experience, education, and competency to successfully lead and direct projects.[12] Applicants who meet the education and experience requirements are eligible to sit for a 200-question exam covering the following project management domains:

- Initiation
- Planning
- Executing
- Monitoring and controlling
- Closing

Certified Information Privacy Professional (CIPP)

The growth and volume of electronic records, including emerging technology, presents unprecedented privacy and data protection challenges for the enterprise. Candidates for the CIPP must first pass a certification foundation exam currently comprised of 120 objective questions on three topics:

- Introduction to privacy
- Information security
- Online privacy

Following successful completion of the foundation exam, applicants are eligible to sit for the CIPP or one of four other credentials. The CIPP exam is considered the industry-standard certification in compliance with US private sector privacy laws and regulations, as well as European requirements for transfer of personal data.[13]

Certified Information Professional (CIP)

In 2011, AIIM announced the certified information professional (CIP) designation for those who wish to demonstrate they can meet information management challenges both on-premises and in the cloud and can bridge the gap between enterprise information

technology and business executives. The 100-question objective test, administered at test centers around the world, covers six domains:

- Access/use
- Capture/manage
- Collaborate/deliver
- Secure/preserve
- Architecture/systems
- Plan/implement

To help individuals prepare for the CIP examination, AIIM has developed free videos, one for each focus area under each of the six major domains. These videos are valuable resources to anyone interested in expanding their knowledge in the area of information management.[14]

Formal Education

The value of formal education for archivists and records managers is increasingly being recognized across the globe. At a December 2011 meeting of the 2nd National Archives Congress in Bacolod City, Philippines, the participants called for "the inclusion of records and archives management in the general subjects or curriculum for undergraduate courses."[15] Guest speaker Jian Wang shared the China experience in archiving by explaining that there is a demand for professionals who can maintain documents, underscoring that the public and private sector—companies, universities, associations, and government departments—found the services of recordkeepers necessary.[16]

Guiding Principles and Core Competencies

A number of programs in archives and records management are offered throughout the United States and Canada. SAA maintains a directory listing of archival education that can be searched by program delivery method (on campus, online, on campus and online) and by degrees/certificates offered (certificate, associate, bachelor, graduate certificate, master, and PhD). Currently, the list includes programs from twenty US states and two Canadian provinces. Many of these programs are offered through library and information science schools or information and computer science departments.

SAA does not endorse any programs, but it does provide guidelines for developing a graduate program in archival studies to prepare students for careers in archives and records management as mentioned in Chapter 10, including digital archives management and historical records preservation. According to the SAA, the graduate-level program should be comprised of both core archival knowledge and complementary knowledge from other disciplines, including economics, history, information studies, law, management, and technology as they relate to archival work.

ARMA International also provides guidance for institutions developing records management programs and courses. ARMA identified core competencies that define the knowledge, skills, characteristics, and traits that contribute to performing successfully in the records and information management (RIM) profession. This document, *Records and Information Management Core Competencies*,[17] can be used by RIM professionals to identify their level of proficiency in six defined domains:

- Business functions
- RIM practices
- Risk management
- Communications and marketing
- Information technology
- Leadership

The core competencies can also be used by those designing records and information management educational offerings or training programs.

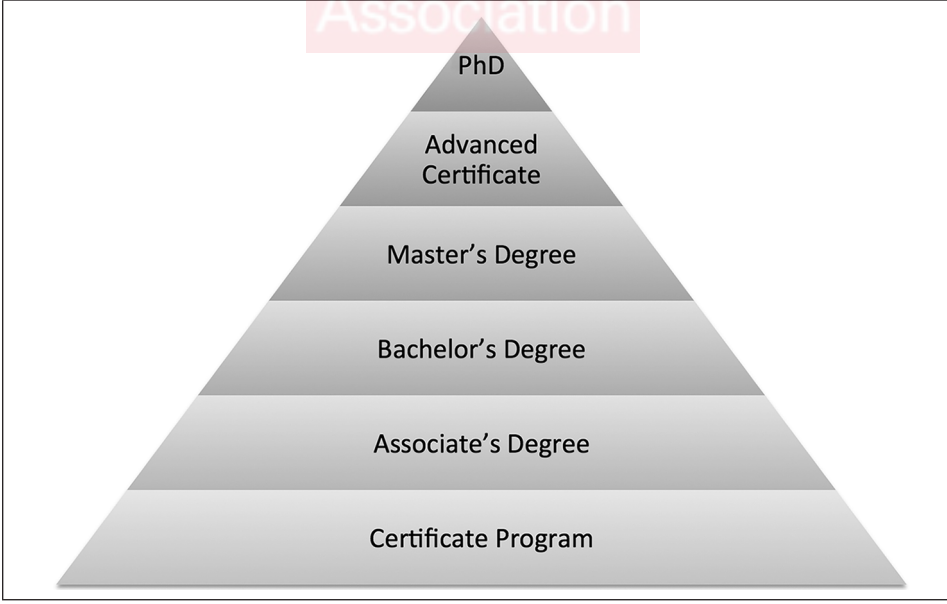
Credit Courses and Programs

Records and information are created and must be managed in all organizations and at all levels. Accordingly, employees can find themselves interacting with records and information regardless of their position within the organization. The type of education most useful to individuals depends on their previous knowledge, skills, and experiences; their current position within the organization; and their career goals. The hierarchy of credit-bearing educational programs is illustrated in Figure 11.4, with certificate programs, often nine to twelve months in duration, at the base and doctoral programs, which generally take an additional five to seven years beyond a master's, at the top.

Certificate Programs

Individuals employed as or interested in positions as records and document-imaging analysts, records technicians, and office or administrative personnel may benefit from

Figure 11.4. Increasing levels of formal education can prepare a records professional for increasing levels of responsibility and authority.



completing a technical certificate in records and information management, such as the Records and Information Management Specialist technical certificate offered through Chippewa Valley Technical College. This five-course, fifteen-credit certificate is valuable for those who "need to provide the right information to the right people at the right time at the best possible cost."[18]

Associate Degree Programs

Associate degree programs are often associated with technical preparation programs offered through community colleges, such as the Associates in Applied Science (AAS) degree in Records Management offered through San Antonio College, San Antonio, Texas.[19] Courses in this degree program, in addition to records and information management, include business math, business English, introduction to spreadsheets, and database applications. This type of degree would be useful to a student preparing to enter the workforce.

Bachelor Degree Programs

Very few colleges and universities offer bachelor's degrees in records management. Students interested in archives and records and information management often concentrate in history, business, or information science at this stage of their educations. However, those specializing in a particular industry, such as healthcare, may find programs to fit their needs, such as the Bachelor of Applied Science in Healthcare Technology and Management degree offered through Bellevue College, Washington.[20]

Master Degree Programs

A number of programs exist on this level for archives, records, and information management. These programs honor the term *management* by preparing individuals to assume management positions related to archives and records/information management. The programs include both theory and practice and encourage research that contributes to the profession.

Records management courses are included in archival studies programs and can be found within many of the programs listed in the SAA's Directory of Archival Education.[21] The degrees earned by students are often in a related field, such as Library and Information Science. For example, the University of Maryland offers a Master of Library Science (MLS) degree through the College of Information Studies that contains an archives, records, and information management specialty.[22]

ARMA International's Education Foundation developed a new Award for Academic Excellence in Records and Information Management and presented the Inaugural Award in June 2012 to the Master of Archival Studies (MAS) Programme of the School of Library, Archival and Information Studies of the University of British Columbia.

Recently, recognition of the value of records management and the need to educate records professionals in both archival studies and records and information management for positions in public and private organizations has resulted in new degree titles, such as the Master of Archives and Records Administration (MARA) degree through the School of Library and Information Science at San José State University.[23] This unique program, delivered 100 percent online, was built upon the core competencies identified by ARMA International and the five knowledge domains that comprise the Certified Records Manager

examination, as well as guidance for graduate programs in archival studies from the SAA and the seven domains that comprise the Certified Archivist examination.

Advanced Certificates

Advanced certificates in archives and records management are available to those pursuing a degree in another field or as a post-master's option. Long Island University, for example, offers an advanced certificate in archives and records management that can be earned concurrently with the library science master's degree or by students who hold a previously completed master's degree in any discipline.[24]

Some advanced certificate programs have specific course prerequisites. For example, students pursuing the Archives and Records Management Certificate Program at Western Washington University must either possess a master's degree in history or take at least one history course in addition to the courses required in the certificate program.[25]

The online post-master's certificate program in Library and Information Science at San José State University is best suited to individuals who already possess a master's degree in any field and want to either update existing skills and knowledge or acquire new skills and knowledge following several career pathways, including digital archives and records management.[26]

Doctoral Studies

The archives, preservation, and records management specialization within the PhD program offered through the School of Information Sciences at the University of Pittsburgh is geared to educating individuals for faculty positions in graduate archives and records management education.[27] This program allows students to focus their research on some aspect of archives and records systems. Recent dissertations, for example, include "The Public's Use of Federal Recordkeeping Statutes to Shape Federal Information Policy: A Study of the Profs Case" and "The Influence of Warrant on the Acceptance and Credibility of the Functional Requirements for Recordkeeping."[28]

The PhD in Library, Archival and Information Studies Program at the University of British Columbia provides advanced research-intensive education for outstanding students who possess a master's degree in archival studies, library and information science, or an equivalent, related degree.[29]

Options abound for those who wish to advance their education through formal channels, but there also are countless opportunities to acquire new skills and knowledge through less formal channels often labeled as professional development.

Professional Development

Professional development can be defined as "the process of obtaining the skills, qualification, and experience that allow you to make progress in your career,"[30] often through continuing education. Continuing education is a condition certifying bodies impose in order to retain certification. Professional development experiences that count toward maintenance credit for the CRM, for example, range from attendance at workshops and conferences to publishing articles and teaching courses. Certified archivists must recertify every five years either by retaking the examination or submitting a petition for recertification based on participation in activities and events including: full-time professional archival employment, courses

taken in any of the archival domains, attendance at professional archival meetings, participation in conferences as panelists, delivering a paper, and teaching a semester course in an accredited college or university on topics in the archival domain.[31]

Professional associations offer continuing education opportunities either as stand-alone courses or certificate programs (not to be confused with certification). ARMA International offers both online courses for a fee and web seminars that are free to members.[32] AIIM offers a variety of training programs in such topics as enterprise content management, electronic records management, business process management, and SharePoint.[33] SAA offers online on-demand courses in the form of archived audiovisual recordings of live presentations, as well as live courses, seminars, and webinars on topics such as style sheets for encoded archival description (EAD), digital curation, and project management for archivists.[34] SAA recently launched a Digital Archives Specialist (DAS) curriculum and certificate program comprised of online on-demand and on-premises courses.[35]

Records professionals would be wise to expand their knowledge and skills by taking advantage of education and training programs.

Records Management Training Programs

At some point, records professionals may be expected to design a training program for other records professionals and/or for all employees who create or manage records during the course of daily operations.

Records Management Program Requirements

In Chapter 9, you were introduced to the Cobalt Award for outstanding records and information management programs. Applicants for the award are required to answer twelve prequalification questions before moving on to the formal application process. One of the questions asks if the organization provides all employees with formal training on their roles and responsibilities in managing records and information and describes best practices for training programs.[36]

Best Practices for Training Programs: ARMA International's Cobalt Award

The organization should ensure the policies are distributed to all employees. It may be desirable to have key stakeholders specifically acknowledge that they received the policy and understand their responsibilities. New employee orientation is a good time to ensure that all staff are aware of the records offices, the records classification plan, and the importance of recordkeeping to the health of the organization. Periodic records and information management training of all employees is critical to ensure the success of the records management program. Training programs may consist of in-house seminars, workshops, online web based education or even simple review of professional development needs.

Employees must understand the records implications of their actions. An introduction to the records lifecycle and specific topics such as retention schedules, information access, and search and retrieval methods will help the individual understand her or his role in the entire process. A good first step is orientation to the records management policy and procedures manual.

Records Management Policies and Procedures Manuals

The term *manual* evokes the image of a physical book of instructions. At one time, records management policies were distributed exclusively in

physical format, often as pages in a three-ring binder that could be updated by removing pages that contain information no longer valid and inserting new pages. Today most businesses post policies and procedures manuals on their intranet or within a collaborative workspace such as SharePoint, while many government agencies, in the spirit of openness and transparency, publish policies and procedures on their public websites.

For example, the *Records Management Policy* of the Limpopo Provincial Government, Republic of South Africa, Department of Agriculture is available on the web. The policy manual includes the statutory and regulatory framework for records management, the policy statement, relationship with other policies, roles and responsibilities, records classification systems, disposal, security, training, legal admissibility and evidential weight, inspection by the Provincial/National Archives, valuation criteria, and a list of terms.[37]

Sending hard or electronic files or posting digital versions of records management policies online isn't enough, however. The policy manual must be written clearly, and employees must acknowledge they received or accessed the policy, have read it, and understand it. As stated previously, all new employees should be introduced to the records management policy as part of the new employee orientation. At that time, employees could be required to acknowledge receipt of the manual and initial training. In addition, all current employees should receive periodic reminders of their responsibilities, including updates to current policies and procedures. If notification is made using an electronic distribution list, a copy of the names on the distribution list must be retained for compliance purposes.

Records management policy manuals and training programs will differ depending on the industry in which the organization conducts business and its governing laws and regulations.

Department of the Navy—Records Management Annual Refresher Training Guide

Annually, all US Department of the Navy employees (military, government, civilian, and contract personnel) must be reminded of their responsibilities regarding records management. A guide provides information necessary for conducting refresher training to fulfill this requirement. Specifically each employee of the US Department of the Navy is reminded that it is their responsibility to:

- create, maintain, and properly preserve records;
- identify records and distinguish them from nonrecords;
- identify personal papers and maintain them separately from federal records; and
- not remove records from government custody or destroy them, except as required or allowed under authorized records schedules. Sanctions are imposed for the unlawful removal or destruction of federal records.

Several additional topics were called out in this manual that would apply to public and private organizations alike: records holds, litigations, investigations, and claims; e-mail records; and electronic records management. In addition, one topic is of particular concern to the armed forces: records of armed conflict.

Source: Excerpted from Department of the Navy Chief Information Officer (DON CIO), *2011 Annual Records Management Refresher Training Guide* (US Department of the Navy, 2011), http://www.doncio.navy.mil/ContentView.aspx?ID=1885.

Developing a Records Management Training Program

Regardless of the content of the training, the steps listed in Table 11.1 (p. 300) can be used to develop the training program.

Basic RIM Training Topics

The following topics should be included in a basic records management training workshop:

Table 11.1. Steps to design and develop a records management training program.

Steps to take	Tasks to perform
Identify purpose; set goals and objectives	• What do you want the training to accomplish? • Identify both short- and long-term goals.What do you want learners to know and be able to do? Define learning objectives that are concrete, measurable, and attainable. • Differentiate training according to staff responsibilities.
Choose a training method and tools	• Classroom training (lectures, case studies, simulations, hands-on software instruction, role play, and behavioral modeling). • Distance learning (books, videos, web-based instruction such as e-learning, computer-based instruction). • On-the-job training (job rotation, apprenticeship, coaching, mentoring, performance appraisal).
Determine a delivery method	• Who will conduct the training? (in-house staff, external trainers, local universities) • Where will it be held? (on-site, off-site, virtual) • How long should it last? (1–2 hours, half day, full day, several days) • What adjustments must be made for the audience based on size, demographics, ability, readiness? (level of content, amount of discussion, types of technology, types of exercises)
Motivate employees	• To attend training (required, voluntary). • To perform well in training (incentives such as job security, money, advancement). • To use their training on the job (opportunity to use newly acquired skills, recognition for performance improvement).
Institute review and reporting mechanisms	• Maintain records of individuals and of the program offered. • Evaluation of results of training (track success of individuals and of all employees). • Revise and update the training program as necessary. • Develop a method to ensure ongoing training for all employees.

- Definition of records management
- Key records management laws and regulations
- Definition and example of electronic records
- Electronic records management (ERM)
- Steps to safeguard records
- Personal papers versus corporate records
- Recordkeeping responsibilities
- Records retention
- Records schedules
- Identifying and managing vital records
- Managing web records
- Ethics and behavioral norms

Specific topics should be added as new technologies and practices emerge, such as those dealing with social media, cloud computing, and the use of mobile devices. Both training and tracking can be automated using learning management systems, training tracking software, and solutions that combine both.

Automating the Regulatory Training Process

Industry-specific training, such as compliance training, can be added to the basic RIM training topics, especially for organizations in heavily regulated industries. Rather than develop training programs and courses in-house, it is possible to take advantage of commercial, web-based services that automate the regulatory training process, including regulations emanating from the following departments and agencies:

- *Department of Health and Human Services (HHS):* health information privacy and security
- *Department of Labor (DOL):* human resources and labor law compliance training
- *Department of Justice (DOJ):* corporate ethics, compliance, and risk management training
- *Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA):* health and safety compliance training
- *Securities and Exchange Commission (SEC):* financial services and banking compliance training[38]

These services can also manage workflow (capturing employee and supervisor or manager e-signatures), automatically notify employees of recertification requirements, and assign appropriate training.

Automating the Records Management Training Program

The irony of developing training programs for employees and contractors to help them manage records is that the training programs themselves produce records that must be managed. Much of the administrative function of providing a training program can be automated with the commercial services described in this chapter.

Training management software is also available merely to keep track of training. This responsibility may be a part of the human resources function or of a training manager and not specifically the records manager, but it is important to understand what is available to manage training records and ensure employees are compliant with training requirements. Common features of a training records database include the ability to assign required training by individual, job function, or group; the ability to record attendance, training completion, and cancellations; and the ability to print status reports on a companywide basis, or for a specific individual, to demonstrate compliance.

Records Management Training Programs for Records Management Staff

A modular approach to training for records management works well, since it is important to provide training geared to the individual's level of involvement with records management activities. Training for records management staff will be more complex than that for all other employees and will depend upon the size and configuration of the records management function, which in turn depends on the size and structure of the organization. Syracuse University, for example, has an Archives and Records Management (ARM) department that "is responsible for both preserving the historical record of the University and providing systematic control over the University's records from creation to final disposition."[39] The ARM staff directory reveals a seven-member team comprised of the positions shown in

Figure 11.5. Positions listed in Syracuse University Archives and Records Management Staff Directory, January 3, 2013.

Source: Adapted from Syracuse University, "Staff Directory," Archives and Records Management, accessed January 3, 2013, http://arm.syr.edu/directory.html.

Figure 11.5.[40] Note that the director serves as both the university archivist and the university records manager.

Individuals hired to fill recordkeeping positions are expected to possess the skills required to conduct the duties specified in their job descriptions. However, an introduction to the organization and the department in which they will work should be planned as part of the new employee orientation. In addition, there may be systems and procedures specific to the department that will need to be introduced. This can occur during a workshop at the start of employment or by learning on the job with the guidance of more experienced staff members.

Take advantage of the training and resources provided by hardware and software vendors when appropriate, such as Microsoft's free online video, "Introduction to Records Management and Compliance" (SharePoint 2010), which familiarizes viewers with the concept of *in-place* records management and the SharePoint Records Center.[41]

Records Management Training Programs for All Employees

Because all employees who create or manage records have recordkeeping responsibilities, training should be provided to help them carry out those responsibilities and reduce both individual and organizational risk. The National Archives and Records Administration (NARA) provides a training model that can be used as the basis for records management training in large organizations.

The NARA Training Model

In keeping with the concept that all federal government employees have federal records management responsibilities, NARA makes training and resources available to all employees

and contractors who create and manage records and information. A website dedicated to information about records management serves as a hub to records management-related resources.[42] In addition to news and events, guidance and regulations, a records management toolkit, and frequently asked questions (FAQs), information about the National Records Management Training Program can be found there.[43] Registered users of the system have access to a portal that allows them to check and change classes they're enrolled in, view their learning progress (including courses completed and exams passed), and print out certificates for classes completed.

The NARA model employs a modular approach to training that takes into account the training needs and time constraints of participants and covers a variety of topics, including knowledge areas that can result in a Certificate of Federal Records Management Training.[44]

Face-to-Face Classes

NARA provides a one-day, high-level overview of records management within the federal government targeted to employees in managerial positions. The course, Knowledge Area 1 (KA1), provides an overview that is recommended as a foundation for newcomers to the records management field and anyone interested in NARA's optional certificate program.[45] Five additional knowledge area courses are required within the certificate track:

- Knowledge Area 2: Creating and Maintaining Agency Business Information
- Knowledge Area 3: Records Scheduling
- Knowledge Area 4: Records Schedule Implementation
- Knowledge Area 5: Asset and Risk Management
- Knowledge Area 6: Records Management Program Development[46]

Candidates for this certification must complete each training course in person and then take and pass a test administered online. If the test is not passed, the candidate has the option of retaking it without repeating the course. Once all tests are successfully completed, the applicant will receive a certificate in the mail. This certification does not result in a CRM designation as established by the ICRM. NARA's Certificate of Federal Records Management Training was designed to focus only on the policies and procedures unique to the federal government.[47] Additional courses are offered on the topics of emergency planning and response and specialty classes, such as records management classes for IT professionals, legal counsel, and program managers.

Webinars and Agency-Specific Training

In addition to face-to-face classes, federal employees and contractors can participate in webinars on several topics including basic records operations, vital business information, and electronic records formats. NARA trainers will on occasion come to an agency to train records management staff.

Summary

Formal education introduces the learner to the theory and practice of a discipline, and training programs introduce participants to new skills they can apply directly to their work.

Records professionals can acquire skills and knowledge through experience, certification, formal education, and professional development (including training programs). Experience can be earned through employment, internships, and even volunteer work.

Certification provides a standard by which professionals can be measured, accredited, and recognized according to criteria established by their peers. The certifying organization for records professionals is the Institute of Certified Records Managers (ICRM), and the successful candidate is designated a certified records manager (CRM). Archivists can earn the certified archivist (CA) designation from the Academy of Certified Archivists (ACA).

Records managers who wish to assume additional responsibilities may expand their skills and knowledge into other domains and seek certification to demonstrate those competencies. Related certifications include nuclear specialist (CRM/NS), project management professional (PMP), certified information privacy professional (CIPP), and certified information professional (CIP).

Formal education is valued for records professionals throughout the world. In the United States, archives and records management programs are taught in community colleges, colleges, and universities. Master's degree programs and professional certificates are becoming more common.

Professional associations offer continuing education opportunities in a variety of formats, including annual conferences, webinars, publications, and even courses or certificate programs. The primary records management association in the United States and Canada is ARMA International. In the United States, records professionals often also belong to AIIM and SAA.

Records managers can be expected to develop and conduct records management training programs for other records professionals and for all employees. The type of training varies depending upon the purpose, goals, objectives, and target audience.

Training may be as short as a few hours or as long as several days. Instruction can take place in face-to-face classes or web-based courses. An introduction to the organization and the records management program should be included in every new employee orientation. The records management policies and procedures manual is usually introduced at that time. Components of the manual can be the focus of more intense training, for example, records retention and vital records management.

Curriculum can be developed in-house or acquired through commercial training providers. It is advisable to investigate external providers for complex topics such as regulatory compliance for specific industries. Records management training programs generate records that must also be managed. Training management software can keep track of training and generate reports that can be used as evidence of compliance. A challenge facing educators today is finding a way to provide students with practical experience using software and strategies to manage, recover, and preserve digital objects. The Digital Curation Laboratory at Simmons College was established to support archives and preservation courses by providing open-source software, standards, and tools to challenge students to experiment and solve problems as they build skills they need to manage digital resources. In his contribution to this chapter, Ross Harvey describes this unique laboratory and the exercises students can complete, including migrating and verifying files, encapsulation, metadata extraction, and workflow automation.

PARADIGM

Digital Education for a Digital World—The Digital Curriculum Laboratory at Simmons College

Ross Harvey, Graduate School of Library and Information Science, Simmons College, Boston, MA

Introduction to the Project

The Digital Curriculum Laboratory (DCL) was established to support archives and preservation courses in the Graduate School of Library and Information Science (GSLIS) at Simmons College, Boston. Planning began in 2008, and full development commenced in 2010 and continues at the time of this writing. Grants from Simmons College, the National Historical Publications and Records Commission, and the Institute of Museum and Library Services have supported its development,[48] and universities in Sweden, the United Kingdom, and the United States are partners in the initiative. The DCL aims to enhance archives and preservation education by providing open-source software, standards, and tools for use in curriculum-based scenarios that challenge students to experiment and solve problems as they build the skills they need to manage digital resources effectively.

Problem Statement

Educators need to identify and implement methods of teaching about digital materials that acknowledge the global virtual environments these materials are created and reside in. These methods must lead students to an understanding of the digital materials and their digital environments. Because experimentation and problem solving are at the heart of experiential learning, students need a place in which to experiment and compare approaches to the management of digital materials. The DCL is a virtual laboratory intended to provide such a place.

Approach Taken

Three partners, GSLIS at Simmons College, Boston; the Department of Information Technology and Media at Mid Sweden University in Härnösand, Sweden; and the Department of Information Studies at University College London are cooperating in the DCL's development. Two further partners in the United States, the University of Wisconsin–Milwaukee and New York University are helping to evaluate the DCL.

The DCL has three main components: digital content; tools for describing, preserving, and managing the content; and instructional learning scenarios. It is designed to be flexible and extensible so that new content, tools, and scenarios can be added as they become available. The structure allows users of the DCL to apply and assess a range of archival and preservation procedures and techniques, thus encouraging them to develop skills in problem solving, evaluation, and tool utilization. The DCL is designed to be shared with others in the archival education community with similar educational aims and has benefited already from the collaborative development of scenarios and tools. The sharing of courses among the three development partners is to begin shortly.

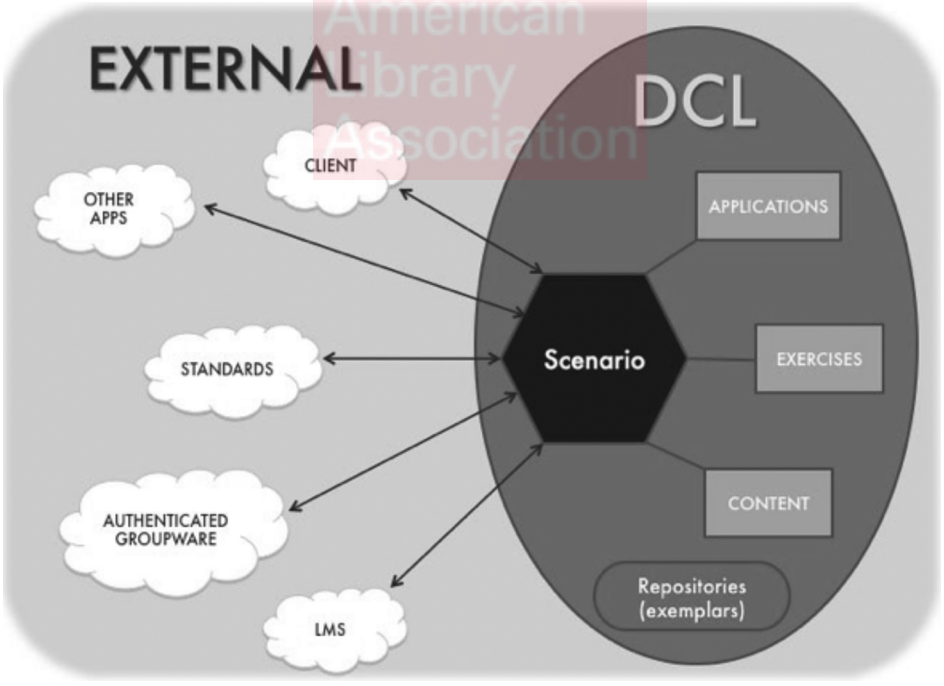
The role of the DCL's scenarios is to bring together applications, content, and exercises. A scenario describing a situation or organization raises a set of questions. In order to address these questions, the DCL user or class instructor selects specific exercises and/or

applications, and indicates relevant content. The scenarios, content, applications, and exercises together form the teaching or learning "package." Figure 11.6 illustrates the relationships between sections of the DCL.

An example used in teaching digital preservation concepts illustrates one way in which the DCL is being integrated into course delivery. A *scenario* describes a university archive that has received a donation of old digital storage media (three-and-a-half-inch diskettes and Zip disks) containing files that need to be preserved for future use. The files were created in superseded word processing software and DOS-based database software; they date from the mid-1980s to about 2005. An associated *exercise* is preservation exercise 3, "Preserving personal digital files," one of seventeen preservation-focused exercises currently available on the DCL. This exercise requires students to identify file formats, open the files, save them in a format that can be accessed by current software, and submit copies of the files in preservation-friendly formats. The *content*—disk images and the files from the mid-1980s to 2005—are accessible from the exercise.

In addition to two scenarios for use in teaching digital preservation, three other scenarios are well developed. The Trust scenario, still under development, involves evaluation of competing standards for metadata and of how these display in different digital asset management systems. The Archival Arrangement and Description scenario is based on Archiveopteryx, a tool written for the DCL that provides students with hands-on experience in arrangement

Figure 11.6. The DCL model.



Source: Designed by Rebecca Meyer, GSLIS, Simmons College, http://calliope.simmons.edu/dcl/lab.

of digital materials. Most introductory archives courses have an arrangement exercise in which students place analog, print documents into acid-free folders. The DCL version of this exercise creates a digital environment in which digital objects are placed in digital series (folders) and subseries within the Archiveopteryx environment. Series names can be changed; digital documents can be added, deleted, and reordered within a series; the work can be saved by each student within a group so that he or she sees it when they log in again, and the instructor can view the work of all the students. The E-Services and Information Flow scenario, developed at Mid Sweden University, describes the components of a modern e-service in which students undertake various roles in an e-service information flow, immersing themselves in the flow components. Its purpose is to familiarize students with modern e-government and have a basic knowledge of the components that interact in a digital management system. Several other scenarios are under development at Simmons College and University College London.

The seventeen exercises available on the DCL at the time of this writing all relate to preservation:

1. Migrating and Verifying Files
2. Assessing Robustness of File Formats
3. Preserving Digital Personal Files
4. Defining a Designated Community
5. Working with Submission Information Packages
6. Encapsulation
7. Extracting Metadata from Digital Files
8. Creating Manifest Files for Digital Transfers
9. Automating a Workflow
10. Data Management Planning
11. Policies for Digital Preservation
12. DRAMBORA
13. Emulators
14. Archiving and Curating Personal Digital Files
15. Building a Web Archive
16. Digital Preservation Tools and Services
17. Making a Video about Digital Preservation

The preservation exercises can be accessed either as a list or by clicking on images of the OAIS Reference Model and the DCC Curation Lifecycle Model. More exercises are being developed.

The applications available to date on the DCL are all open source, in accordance with one of the DCL's development principles. They include a content management system (Alfresco), collections management applications (Collective Access, ResourceSpace), archives applications (Archon, Archivists' Toolkit), repository applications (DSpace, EPrints, Fedora), and exhibition/presentation applications (Greenstone, Omeka). New open-source applications are continuously assessed for inclusion.

Results

After two years of development, the DCL is on the way to becoming an integral part of courses at Simmons College. The preservation scenarios and exercises are being used in

face-to-face and online courses about digital preservation to provide some of the basic technical skills needed in this field and to expose students to relevant services and applications. Students and instructors at Mid Sweden University and the University of Wisconsin–Milwaukee have also used the preservation exercises. The Archiveopteryx tool is being readied for use in the Introduction to Archives courses at Simmons College, and Alfresco has been used in records management courses.

Lessons Learned/Next Steps (If Any)

The DCL is not yet complete. Some of the issues that have been identified will be addressed in the next development phase, among them a redesign to improve the integration of the public interface with the Drupal back end, and the refinement of user authentication procedures. More scenarios, exercises, and content will be developed and added. It is expected that more extensive use of the DCL in international collaborative activities will identify further issues to be addressed; one that has already arisen is the need to translate directions about a particular application from Swedish into English.

Conclusion

The DCL has already proved its value and effectiveness in courses offered by several of its partners. Ensuring its sustainability is the most important issue for its future; resources available through the DCL must be updated constantly, its infrastructure maintained, and students and instructors trained in its use. To achieve sustainability, the DCL needs to become integrated into more and more of the courses offered by its partner institutions.

Notes

1. K. Anderson, "Education and Training for Records Professionals," *Record Management Journal* 17, no. 2 (2007): 95.
2. Ibid., 98.
3. Emmett J. Leahy, "Modern Records Management," *American Archivist* 12, no. 3 (July 1949): 239, http://archivists.metapress.com/content/52344260u1064020/fulltext.pdf.
4. US Office of Personnel Management, *Position Classification Standard for Archivist Series*, GS-1420, 1965 (revised 2005), http://www.opm.gov/fedclass/gs1420.pdf.
5. US Office of Personnel Management, *Position Classification Standard for Support Services Administration Series*, GS-0342, May 1979, 3, http://www.opm.gov/fedclass/gs0342.pdf.
6. United States Department of Labor, Bureau of Labor Statistics, "Office and Administrative Support Occupations: Information and Record Clerks," *Occupational Outlook Handbook*, 2010–11 Edition, last modified December 17, 2009, http://www.bls.gov/oco/oco1005.htm.
7. Executive Office of the President, "Memorandum for the Heads of Executive Departments and Agencies and Independent Agencies," National Archives and Records Administration, August 24, 2012, 6, http://www.whitehouse.gov/sites/default/files/omb/memoranda/2012/m-12-18.pdf.
8. Additional details about the CRM designation and examination can be found at the ICRM website, http://www.icrm.org/.
9. Barbara L. Craig and James M. O'Toole, "Looking at Archives in Art," *American Archivist* 63, no. 1 (Spring–Summer 2000): 125, http://archivists.metapress.com/content/11m20568371583v7/fulltext.pdf.

10. Additional information, including an exam handbook, is available from the ACA website at http://www.certifiedarchivists.org/.
11. Nuclear Information and Records Management Association (NIRMA), "Application for Certification Nuclear Information and Records Specialist," Reference Documents, last modified May 2, 2011, http://nirma.org/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2fShared%20Documents%2fResource%20Information%2fLibrary&FolderCTID=0x012000B19C261FEEF39243A305B644A4FF4A4C&View=%7b9B6C8A7E%2dFD0A%2d4F45%2dACAA%2d8687E0A09E5C%7d.
12. Additional information can be found at the PMI website, http://www.pmi.org/.
13. Learn more about the CIP by visiting the International Association of Privacy Professionals (IAPP) website, https://www.privacyassociation.org/.
14. Learn more about the CIP designation by visiting the AIIM website, http://www.aiim.org/training/certification.
15. Levine Lao, "Formal Archives Education Needed for Heritage Conservation," *Philippine Daily Inquirer*, December 11, 2011, http://lifestyle.inquirer.net/27069/formal-archives-education-needed-for-heritage-conservation.
16. Ibid.
17. ARMA International, *Records and Information Management Core Competencies* (Lenexa, KS: ARMA International, 2007). This book can be downloaded from the ARMA website at http://www.arma.org/competencies/document.cfm.
18. Chippewa Valley Technical College, "Records and Information Management Specialist," Programs and Courses: Certificate Catalog, accessed December 20, 2012, http://www.cvtc.edu/programs/certificate-catalog/Pages/Records-and-Info-Management-Specialist.aspx.
19. San Antonio College, "Records Management (Tech Prep Program) A.A.S.," Archived Catalog, accessed December 20, 2012, http://mysaccatalog.alamo.edu/preview_program.php?catoid=72&poid=3685&returnto=1997.
20. The bachelor degree programs can be viewed at http://bellevuecollege.edu/programs/degrees/bachelor/.
21. The SAA directory can be viewed at http://www2.archivists.org/dae.
22. The MLS program can be viewed at http://ischool.umd.edu/content/master-library-science-mls.
23. The MARA program can be viewed at http://slisweb.sjsu.edu/programs/mara.
24. The certificate information can be viewed at http://www.liu.edu/CWPost/Academics/Schools/CEIS/PSLIS/Graduate-Programs/AC-ARM.aspx.
25. The certificate program can be viewed at http://catalog.wwu.edu/preview_program.php?catoid=7&poid=2787&returnto=1031.
26. See http://slisweb.sjsu.edu/certificate/index.htm for information on the certificate program.
27. The program can be viewed at http://www.ischool.pitt.edu/lis/degrees/phd.php.
28. School of Information Sciences, University of Pittsburgh, "PhD in Archival Studies," Library and Information Science Program, accessed December 20, 2012, http://www.sis.pitt.edu/~dlis/academics/specializations/archives/phd.html.
29. The program can be viewed at http://www.grad.ubc.ca/prospective-students/graduate-degree-programs/phd-library-archival-information-studies.
30. *MacMillan Dictionary*, s.v. "professional development," accessed December 20, 2012, http://www.macmillandictionary.com/dictionary/british/professional-development.
31. You can view the requirements at http://www.certifiedarchivists.org/members-area/certification-maintenance.html#petition.
32. View the ARMA courses at http://www.arma.org/learningcenter/index.cfm.
33. View the AIIM courses at http://www.aiim.org/Training/Information-Management-Courses.
34. View the SAA courses at http://saa.archivists.org/Scripts/4Disapi.dll/4DCGI/events/ConferenceList.html?Action=GetEvents.

35. Ibid.
36. ARMA International, "Question 8: Does Your Organization Provide All Employees with Formal Training on Their Roles and Responsibilities in Managing Records and Information?" Cobalt Award: Application Pre-Screening, last modified 2012, http://www.arma.org/excellence/prescreen.cfm.
37. Department of Agriculture, Limpopo Provincial Government, Republic of South Africa, *Records Management Policy, Version 3*, 2011, http://www.lda.gov.za/downloads/policies/LDA%20RECORDS%20MANAGEMENT%20POLICY%20version%203.pdf.
38. Cobent, "Streamline Compliance Training," Compliance Training, accessed December 20, 2012, http://www.cobent.com/Solutions/Regulatory-Compliance-Training.aspx.
39. Syracuse University, "Welcome," Archives and Records Management, accessed December 20, 2012, http://arm.syr.edu/.
40. Syracuse University, "Staff Directory," Archives and Records Management, accessed January 3, 2012, http://arm.syr.edu/directory.html.
41. Microsoft, "Introduction to Records Management and Compliance" (SharePoint 2010), video, 4:14, Microsoft Office, accessed December 20, 2012, http://office.microsoft.com/en-us/sharepoint-server-help/identify-and-manage-records-anywhere-RZ101825173.aspx?section=2.
42. National Archives and Records Administration (NARA), "Records Managers: Records Management Frequently Requested," Records Managers, accessed December 20, 2012, http://www.archives.gov/records-mgmt/.
43. Ibid.
44. Ibid.
45. National Archives and Records Administration (NARA), "FAQs about NARA's Certificate of Federal Records Management Training Program," Records Managers, last modified October 2011, http://www.archives.gov/records-mgmt/training/certification-faq.html.
46. Ibid.
47. Ibid.
48. Jeannette Bastian, Ross Harvey, Martha Mahard, and Terry Plum, "Building a Virtual Archives and Preservation Curriculum Laboratory at Simmons College: A Case Study in Collaborative Construction," *Journal of Education for Library and Information Science* 51, no. 4 (October 2010), 249, http://bing.exp.sis .pitt.edu/308/1/Building_a_virtual_archives_an.PDF.

CHAPTER

12

From Records Management to Information Governance: An Evolution

Introduction

In today's world, records managers used to focusing on details, such as completing an inventory or developing a records retention schedule, must be prepared to take a holistic approach to managing the records and information of the organization. This chapter builds upon the previous eleven chapters by illustrating how records managers can use their skills and knowledge to develop a strategic records management plan and an efficient and legally defensible records management program.

The increased awareness of the value of enterprise-wide information governance provides an opportunity for records and information managers to use their expertise and expand their sphere of influence by becoming invaluable members of the information governance team. Therefore, this chapter also provides guidance for those involved in developing and implementing an information governance strategy.

In 2009, ARMA International identified eight Generally Accepted Recordkeeping Principles (see Figure 12.1, p. 312) that can be used as a best-practice framework to develop both a records management program and an information governance strategy. A year later the ARMA International Maturity Model for Information Governance was devised to define the eight principles at differing levels of maturity, completeness, and effectiveness. Detailed descriptions of the Principles and the Maturity Model will be provided by Diane K. Carlisle, CRM, Deputy Executive Director, ARMA International, at the end of this chapter.

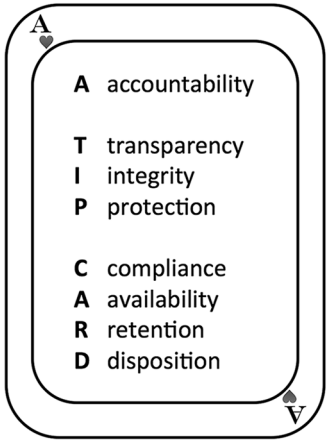
Let's turn our attention first to the primary role of records management—developing an effective and legally defensible records management program.

Developing a Records Management Program

With the current attention on governance structures, it is important to point out that a records management program is also a governance structure that assesses risks and compliance needs to manage records and information assets across the organization. It is one component of the information governance structure and incorporates records retention schedules, disaster recovery and business continuity, training, change management, monitoring and auditing, and continuous improvement.

Whether the intent is to implement a records management program where none exists or to improve an existing program, the work involves developing a records management strategy, records management policies and procedures, and a records management strategic

Figure 12.1. Generally Accepted Recordkeeping Principles.



Source: Adapted from ARMA International, "Generally Accepted Recordkeeping Principles," accessed February 14, 2013, http://www.arma.org/garp/. Courtesy of ARMA International.

records and information management plan as shown in Figure 12.2.

Records Management Strategy

A *records management strategy* is defined in a publication issued by the Public Records Office of the State of Victoria as "a high level document that provides an overview of the records management environment of an agency."[1] Their strategy is comprised of two documents:

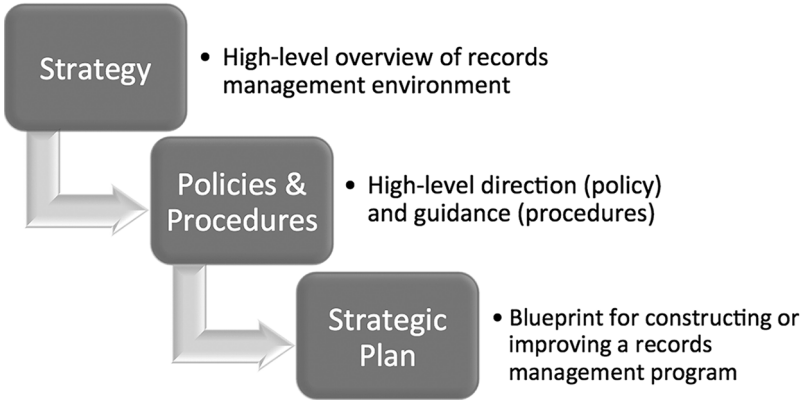
- The records management strategy itself
- The action or implementation plan[2]

The records management strategy aligns the purpose of records management with the strategic direction of the organization and contributes to the organization's information governance strategy, if one exists. It provides a framework for all records management activities. Typical contents of a records management strategy document include an introduction, scope, aims (goals), key elements (e.g., responsibility, accountability, management, security, access, audit, training), and implementation (reference to the records management policy and plan).

Records Management Policies and Procedures

The records management policy provides high-level direction in the form of goals for managing records across the organization throughout their lifecycle and assigns implementation responsibilities. In writing the policy document, keep the target audience in mind. The document must be clearly written, and consequences for noncompliance should

Figure 12.2. Essential elements of a records management program.



be specified. Although policies are often written in response to legal and regulatory requirements, their value to the organization lies in the guidance they provide to ensure that the work of the organization is carried out efficiently and effectively, while reducing risk and ensuring compliance.

The records management policy document may contain records management procedures in the form of guidance to units within the organization that are developing their own internal plans. These procedures can help the organization identify records by providing a definition of a record and help it organize records by specifying categories (e.g., administrative records, business unit records, fiscal records, and reference documents) and subcategories (e.g., current, inactive, temporary, permanent, confidential, vital, and archival) of records.

Additional topics found in a policy include high-level direction on records creation, maintenance and use, storage, disposition, disaster recovery, and training. The contents of the records management policy will depend upon the policy framework of the organization. Table 12.1 (p. 314) provides an outline of a records management policy (by omitting sections 7–12) or a records management policy and procedures document (by including sections 7–12).

Although some policy and procedures documents contain recommendations for the implementation of improvement plans, those recommendations are better included in the strategic plan. The strategic plan should include short-term and long-term goals that can be evaluated and updated as necessary.

Developing the Records and Information Management Strategic Plan

The strategic plan is used to develop a records management program that meets current and future needs. A needs assessment and business process analysis will provide the basis for formulating the strategic plan to improve recordkeeping practices. The plan typically covers a three- to five-year period and answers the following questions:

- What is the current state of the organization's records and information management program?
- What is the desired state?
- What steps should be taken to bridge the gap between the two?

The strategic plan provides a blueprint for constructing or improving a records and information management program, a plan to effectively manage the lifecycle of records and information, a roadmap for effectively preserving historical and archival records, and a tool for developing a system that ensures *delivery of the right information to the right person at the right time*.

Information governance is most closely associated with electronically stored information (ESI), but physical records still exist and must be managed. Records managers can assist the organization by conducting a needs assessment and strategic plan that can be used to improve recordkeeping practices for both physical and electronic records. A team should be formed to develop the plan. Support from upper-level management is needed, but members of the records management strategic planning group may include individuals from middle management as well as representatives from business units that best understand the records creation and management processes within their functional areas. An independent consultant or consulting firm may be employed to work with the team to conduct the needs assessment and prepare the resulting strategic plan. The program of work

Table 12.1. Example of outline for records management policy document.

Section/title	Description
1. Purpose	The *purpose* section provides the rationale for the records management policy and procedures (e.g., support the core functions, comply with legal and regulatory obligations, and contribute to management effectiveness).
2. Policy Statement	The *policy statement* explains the guiding principles on which the records management practices have been established (e.g., ARMA's Generally Accepted Recordkeeping Principles).
3. Relationship with Other Policies	This *other policies* section identifies related policies for which the records manager is responsible (e.g., electronic records management policy, e-mail policy, document-imaging policy, content management policy). This section also provides examples of related policies (e.g., information security policy managed by the security manager, Internet usage policy managed by the IT manager, social media policy managed by the corporate communications manager).
4. Scope and Intended Audience	The *scope and intended audience* section identifies the intended audience by providing a description of the work practices that are impacted by the policy (e.g., all employees involved in records creation and access).
5. Regulatory Framework	The *regulatory framework* section identifies regulations that must be complied with (e.g., U.S. 21 CFR Part 11 Electronic Records; Electronic Signatures)
6. Roles and Responsibilities	The *responsibility* section defines the title of the senior executive who has ultimate responsibility for the records management policy (e.g., registrar in a university). Responsibility of additional senior managers, the records manager, records liaisons, and all employees, including contractors and volunteers, will be explained.
7. Records Classification Systems and Related Storage Areas	Tip: Keep the policy short! Sections 7–12 can be included to create a policy and procedures document. However, the policy could, instead, refer the reader to a list of resources on these and related topics, perhaps available from the records manager, so that the policy is shorter and easier to update. The guidance could cover these areas: • Business classification (for filing schemes) • Records retention schedule • Records storage • Records destruction • Archival records selection and management • External codes of practice and relevant legislation
8. Disposal of Records	
9. Storage and Custody	
10. Access and Security	
11. Legal Admissibility and Evidential Weight (both paper and electronic)	
12. Training	
13. Monitor and Review	The policy should assign responsibility (specific person/role) to *monitor compliance* with the policy and prepare reports.
14. Definitions	Provide *definitions* of terms that have technical meaning within the policy.
15. References	Provide all *resources* referenced in the policy or that confirm the policy.
16. Authorization (name/date)	*Authorization* is provided in a statement, for example, "This policy was approved by (chief executive officer or head of governmental body) on (date)."

for the records management team, including consultants if any, includes the steps identified in Figure 12.3. Each of the steps required to develop a strategic records management plan merits further explanation.

Understanding the Corporate Culture

Corporate culture can determine the success or failure of any new initiative. It is important to understand the formal structure of the organization—an organizational chart can provide this information. But it is even more important to understand the factors not included on an organizational chart such as tolerance for risk, resistance to change, relationship between performance and rewards, and individual autonomy. Records management programs are successful when records management is integrated into the corporate culture by including representatives of business units in planning meetings, soliciting support of leaders to promote the program, and developing employee awareness and training programs that underscore the benefits of the proposed changes to individual employees as well as to the organization. Often the most progressive individuals (i.e., early adopters) will be easy to identify. They are the ones to include if conducting a pilot program before implementing massive changes organization-wide. Success stories will help promote the program beyond the individuals/units involved in the pilot programs.

Conducting a Needs Assessment

A needs assessment is "a systematic way of determining the current state of an organization before developing solutions or programming."[3] Upon completion of the needs assessment, the current state of the organization's records and information management program can

Figure 12.3. Developing a strategic records management plan.

be compared with the desired state in order to identify gaps that must be addressed. What is the desired state of affairs? Because a primary goal of records management is to mitigate risks to the organization, the desired state is one in which the organization experiences a low level of risk. It is also one in which information needed to support the core mission of the organization can be located and used in a timely and efficient manner.

Needs Assessment Goals and Methodology

A needs assessment can be completed by an internal team (e.g., records management staff) or an external consulting firm. Once the team is assembled, the following actions should be taken. The first task in performing the needs assessment is defining goals, including but not limited to the following:

- Gain a thorough understanding of the current records situation across the organization (or in specified departments).
- Provide information regarding serious risks related to the current records, including the existence and location of duplicate records.
- Provide recommendations for potential areas of improvement in the existing records management program.

The second task is determining how information will be gathered. An inventory of existing records and information assets is necessary and can be conducted by a member of the team, gathered though the use of a survey, or a combination of the two. The physical inventory and/or survey will provide statistical data related to records types and locations throughout the organization. If a survey is used, one employee from each department or functional area should complete the survey on behalf of the work unit. Someone from the records management team or consulting firm conducting the survey should be available to assist those completing it. In rare instances, it may be necessary for a team member to conduct the inventory with the department contact.

Keep in mind that employees may not provide accurate information due to their inability to accurately complete the survey or their unwillingness to highlight deficiencies in their approach to records storage. Therefore, the results of the survey should be verified by:

- physically reviewing and confirming record types, volumes, and conditions at each location;
- inspecting and reviewing the data and questioning those who completed the form about responses markedly different from the norm; and
- comparing the data across departments for consistency.

The survey of electronic assets can start with an existing *systems data map*, introduced in Chapter 4. The IT department should be able to provide this. A layer of data assets residing outside of the enterprise—including information residing in social media, mobile devices, and cloud storage—must be added if this has not already been done. If no data map exists, work with the IT department to develop "an accurate and complete understanding of the sources and types of electronic records generated, received, and used within the organization, as well as an overall assessment of the practices in place regarding the use, retention, storage, preservation and destruction of records generally."[4] The system data map can be used to minimize risk presented by pending litigation by creating a defensible and repeatable

discovery process for identifying potentially relevant ESI. The organization's legal department can use it to meet the minimum requirements specified in the *Federal Rules of Civil Procedure* (FRCP). In addition, it will be helpful in identifying custodians and locating relevant ESI for immediate preservation in the event of possible litigation.[5]

As an alternative or in addition to the data provided by the IT department, vendors can assist the organization in collecting data about specific file server environments. In its publication, *15-Minute Guide to Information Governance*, EMC[2] provides examples of questions that can be answered with the data collected, including the following:

- What percentage of our mailboxes are attachments?
- How many duplicate files are on the organization's servers?
- How many files haven't been touched in nine months?[6]

The third task is conducting on-site interviews with representatives from each department or functional area to assess the organization's records management processes, needs, and facilities. During this process:

- evidence will be gathered about current records management practices,
- key business functions that involve records will be documented,
- the overall condition of each department's or functional area's records management practices will be revealed, and
- risks related to the existing records management business processes will be identified.

The fourth task involves analyzing the information gathered to:

- identify the benefits of recommended improvements and prioritize the list of recommendations, and
- prepare a records management policy and an actionable strategic plan.

Documenting Strengths, Weaknesses, Opportunities, and Threats

A SWOT analysis is a tool that can be used to identify the organization's (or unit's) strengths and weaknesses (internal factors), as well as opportunities and threats (external factors). Developed in the 1960s from research conducted at the Stanford Research Institute (SRI),[7] it is still a useful tool that can help the records management team or consultant(s) determine what actions must be taken to mitigate weaknesses and risks and to take advantage of strengths and opportunities (see Figure 12.4, p. 318).

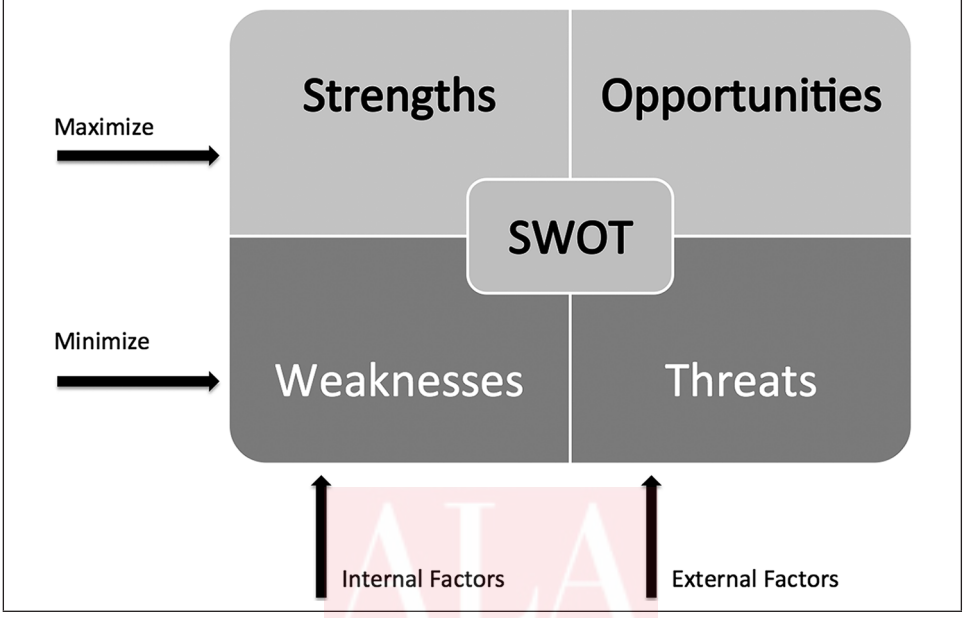
Information gathered from the analysis of the internal and external environment related to records and information management can reveal the types of strengths, weaknesses, opportunities, and threats shown in Table 12.2 (p. 318). Internally, the following types of factors should be analyzed:

- Recordkeeping systems
- Recordkeeping culture
- Recordkeeping accountability
- Recordkeeping processes

Externally, the following types of events should be monitored:

- Emerging technologies
- Proposed laws and regulations
- Court rulings related to records and information management

Figure 12.4. SWOT analysis tool based on research conducted at SRI International.



Not all of these factors will present the same level of risks for every organization. Refer to the risk assessment matrix in Chapter 9 for guidance in determining the level of risk presented to the organization by each factor identified.

Table 12.2. Factors that may be discovered as a result of a SWOT analysis.

Internal factors	External factors
Strengths • Well-educated and trained records management staff • Well-managed organization-run records center for paper records • Corporate interest in having a sound records management program to support business operations as well as to meet legal and regulatory obligations	Opportunities • Impetus of related legislation (e.g., FOIA, SOX, DP) driving awareness and standards for records management • Cloud computing options (e.g., Google Mail) relieving burden on in-house technical support • Information governance initiatives putting records management in the spotlight
Weaknesses • Resistance by operations staff to manage electronic records • Lack of integration between electronic and paper records management • Inadequate funding to implement electronic records solutions	Threats • Use of emerging technologies and mobile devices adding a layer of complexity to records creation and capture • Changes in terms of service agreements by social media providers making it more challenging to control records posted to external sites • Use of collaborative worksites creating silos of information that must be managed

Creating Records Management Vision and Mission Statements

Vision statements are common to all organizations, and entities below the top tier often develop their own vision statement as well. If so, it must fit under the overarching organizational vision statement, but its main purpose is to describe the entity's commitment to improved records management and the broad objective to be achieved. The vision statement will describe how the records management program will look. It can be used to provide direction for strategic and operational decision making. The vision statement of the Office of Records Management at the University of Idaho for example, reads:

> Records Management will provide or coordinate central efforts and services related to records and information management, and will provide expert records-related advice, guidance, and policy to organization units within the University of Idaho community.[8]

Mission statements identify the mission within the context of realistic goals. For example, the records management mission statement of the Finance Department of the University of California at Los Angeles (UCLA) is specific to the core mission of the department:

- To provide greater protection of University assets.
- To realize cost avoidance opportunities for the campus.
- To reduce UCLA's liability relative to litigation, privacy issues, and regulatory non-compliance.[9]

Developing Strategies, Goals, Objectives, and Action Plans

A *strategy* is designed to help you achieve your vision and mission. It is developed after the needs assessment, including SWOT analysis, has been completed. The strategic plan may have several strategies, all supporting the vision and mission of the records management program. The *goals* provide additional details about what must be accomplished in order to achieve the vision, mission, and strategy identified. The factors revealed by conducting the SWOT analysis can be the basis for developing *SMART* (specific, measurable, achievable, realistic, and timed) *objectives*.[10] The objectives should focus on the strategic and not the operational level. The strategies should aim to exploit strengths and opportunities, minimize or neutralize threats, and avoid or remove weaknesses. Once the strategic plan has been completed, develop an *operational* or *action plan* to identify the tasks that will help the organization achieve the goals specified in the strategic plan. Two types of action plans are needed:

- A high-level action plan to show how each goal will be achieved. You may include this as part of the *strategic plan*.
- Individual action plans for each service the program delivers (e.g., scanning, records center, electronic records management). The action plan on this level is often referred to as the individual unit's *operational plan*. It must designate the task, responsible party, expected results, and completion date.

Implementing, Evaluating, and Adjusting the Strategic Plan

Organizations that wish to establish a records management program where none exists should start with the appointment of a records manager charged with the authority and responsibility for establishing and maintaining the records management program. The

procedures for establishing the entire program involves conducting all of the activities covered in earlier chapters, including:

- developing policies and procedures,
- conducting a records inventory,
- creating a records retention and disposition schedule,
- preparing a records classification schedule, and
- developing an inactive records program.

Organizations that wish to improve an existing records management program can begin by relying on the expertise of a records manager and/or records consultant to conduct a needs assessment and develop a strategic plan. Depending on the scope of the goals and strategic initiatives and the culture of the organization, implementation may take place enterprise-wide at one time (e.g., moving all e-mail to a cloud e-mail provider) or within one or more functional areas, adding users as success is demonstrated on a smaller scale (e.g., SharePoint implementation). The SMART goals identified for the strategic plan can be used to evaluate progress by comparing them with the results of the tasks listed in the action plan.

When the terms *monitoring* and *evaluating* are used in this context, they refer to monitoring and evaluating the *planning activities* and the *implementation of the plan* and not the records and information management program. The purpose of monitoring and evaluating is to ensure that the plan is being followed or that deviations from the plan are based on sound rationale. The plan must be updated to reflect the new direction that results from deviations from the initial plan.

As you learned in Chapter 9, monitoring and evaluating is a matter of answering questions related to the plan being implemented. Questions might include the following:

- Are the goals and objectives being achieved? If not, are they still realistic?
- Are they being achieved on time? If not, should the schedule be changed?
- Are adequate resources (e.g., people, money, training, equipment) allocated to achieve the goals?

The strategic plan must identify the party responsible for implementation, as well as the parties responsible for each goal and objective. Someone must also be identified to monitor the status of the implementation, including progress toward each strategic goal. Status reports should include trends regarding the progress toward goals and objectives as well as answers to questions similar to those listed previously.

The reporting structure must be in place—from the bottom up. Those with the responsibility to carry out tasks within the action plan will report to those responsible for the high-level action plan, who in turn will report to those responsible for each of the strategic initiatives (goals and objectives assigned to them). These individuals might be expected to submit a report to the chief executive in charge of implementation.

As stated earlier, a records management program is "an overarching governance structure designed to manage information assets and records across the organization."[11] Based on this description, some believe that records management has always been involved in information governance. But others will argue that records management is one subset of information governance. Both statements are correct. Recordkeepers intimately familiar with developing

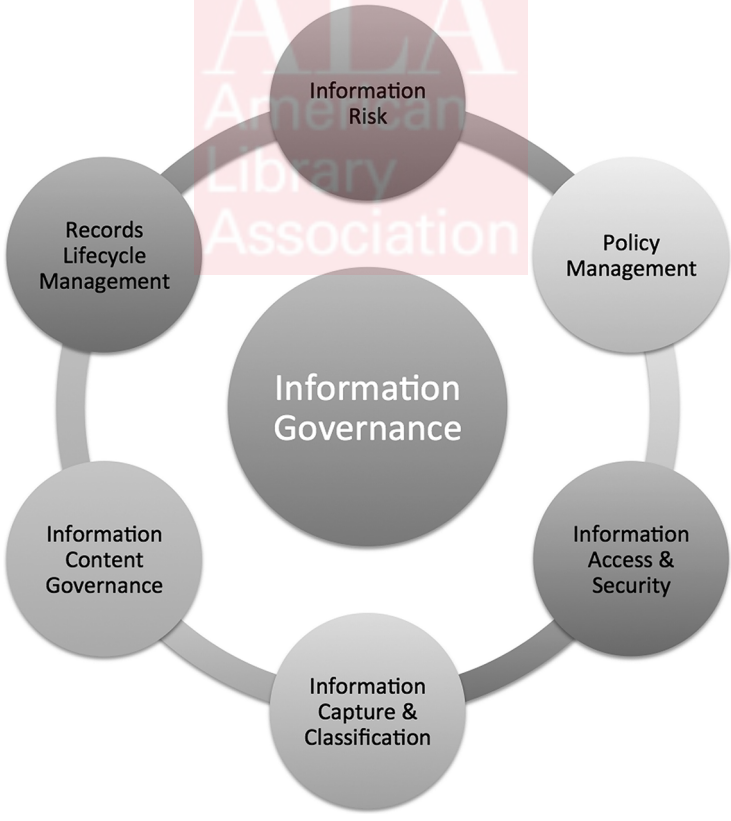
records management programs can play an important role in their organization's information governance initiatives.

The next section provides an overview of the steps to be taken to formulate an information governance strategy. As you review the material, identify with one or more of the stakeholders to understand how that role fits within the overarching information governance structure.

Implementing an Information Governance Strategy

Information governance is a high-level, strategic function that involves stakeholders from across the organization, each with their own expertise and responsibilities. The realization that an information governance strategy is necessary is often the result of the dramatic changes that have taken place due to the growth of electronic records, especially unstructured records; an increased emphasis on e-discovery; and the lack of sufficient controls over all electronically stored information (ESI). As shown in Figure 12.5, information governance

Figure 12.5. Information governance components based on the Information Governance Maturity Model by EMC².



must address a number of issues, only one of which is records lifecycle management. With the implementation of information governance, two main goals of a records management program—legal compliance and defensible disposal—become a shared responsibility with stakeholders from across the organization. Before an information governance strategy can be developed, it is necessary to understand how the responsibilities of the stakeholders are intertwined.

Information Governance Reference Model

To understand the dependencies of various stakeholders, we can look to the Information Governance Reference Model (IGRM) developed to provide a point of reference to promote cross-functional dialogue and collaboration.[12] The model shown in Figure 12.6 is different from other models we've studied so far in that it is a *responsibility model* and not a lifecycle model. The stakeholders identified in this model (i.e., *Business, IT, RIM,* and *Legal*) may not match those assuming key roles in your information governance strategy. For example, *Security and Privacy* may be a separate segment apart from *IT*, and *Compliance* and *Risk Management* may be additional segments apart from *Legal*.

A good place to start when using this model is with the information at the center, then branch out to see which stakeholders are involved. Each segment of Figure 12.5 (p. 321)—*Business*, *Information Technology, Records and Information Management*, and *Legal*—could be explained as follows:

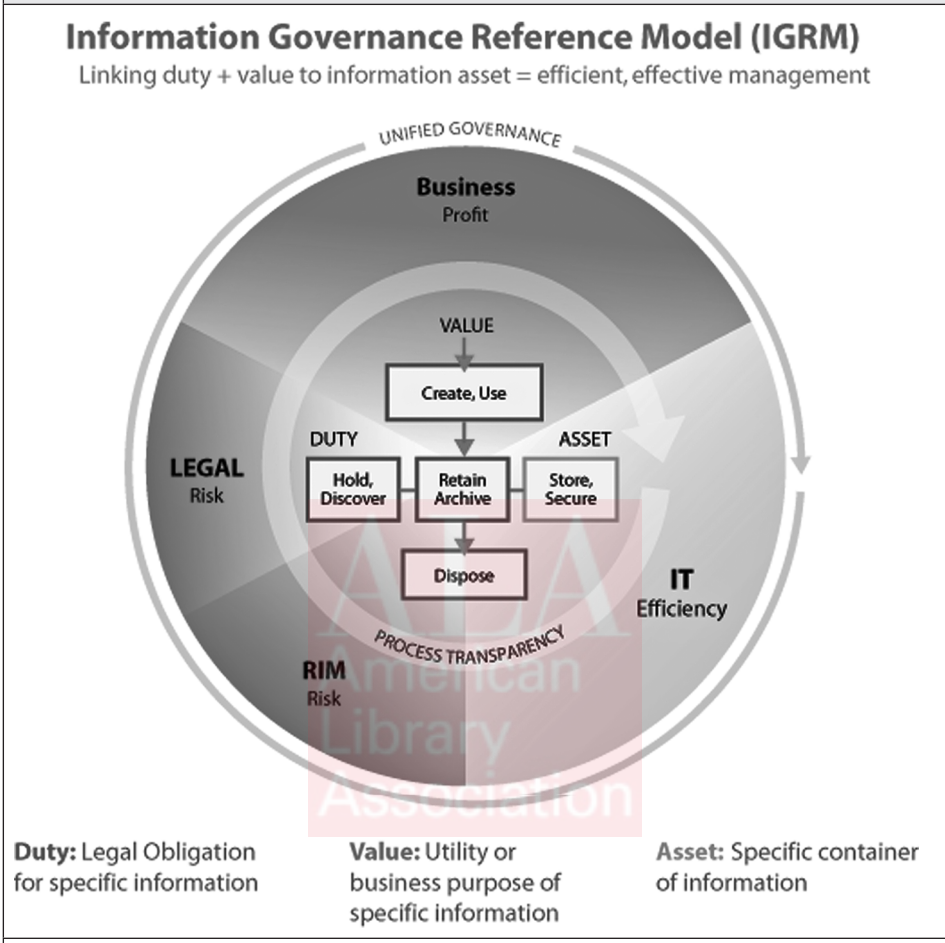
- Information has value to business units that, in the private sector, strive to make a profit. Information is created and used as part of normal business operations.
- Business units look to IT to help them manage their information assets. Efficiency is the goal of IT.
- Records and information management is responsible for ensuring that regulatory obligations for information are met. Records management can assist both Business Units and IT with guidance related to retention, disposition, and preservation requirements in order to reduce risk.
- Legal also plays a role in mitigating risk. Legal notifies both Records Management and IT in the event of a potential lawsuit, defines what to put on hold and collect for e-discovery, and informs records management and IT when a hold should be lifted.

This reference model illustrates a unified governance approach built on cooperation, collaboration, and transparency among the parties involved in creating and managing information. This reference model should be referred to when formulating the information governance strategy.

Information Governance Roles and Responsibilities

The Information Governance Reference Model helps us understand what can be called "functional stakeholders" and their information management responsibilities: IT, Business Units, Records Management, and Legal. But they are not the only individuals with information governance roles and responsibilities. The number of individuals involved in information governance and the roles and responsibilities they assume depends on the size and type of organization. The corporate governance structure, for example, differs from the government governance structure.

Figure 12.6. Information Governance Reference Model.



Source: EDRM (Electronic Discovery Reference Model), "Information Governance Reference Model (IGRM)," accessed December 21, 2012, http://edrm.net/.

Corporate Governance

Corporate governance is the responsibility of the firm's board of directors, which has a myriad of duties including hiring, supervising, and replacing the chief executive officer; approving major strategic decisions; making decisions about mergers and acquisitions; and overseeing financial reporting and audits. The members of the board of directors are elected by the shareholders and, as a consequence of the Sarbanes-Oxley Act of 2002, have a primary fiduciary duty to the shareholders and a secondary duty to the corporation.[13]

Government Governance

Governance in the public sector focuses on a budget that reflects policy decisions and proposals. Just as corporations are required to release financial reports, governments are

expected to provide an account of their actions to their primary stakeholders, the public. Accountability is vital and must be supported by adequate management, supervision, and control. This *government governance* premise is the basis for transparency and openness initiatives at all levels of government in order to promote accountability and an informed citizenry.

In reflecting on the descriptions of corporate and government governance, it is apparent that records and information are the assets that, when shared with stakeholders, demonstrate accountability. Members of the organization at all levels must carry out their responsibilities within the environment created at the top level of public or private organizations. Individuals holding positions at the top level of the management hierarchy are often referred to as C-level managers.

C-level Job Titles

CRO: chief records officer
CCO: chief compliance officer
CEO: chief executive officer
CIO: chief information officer
CFO: chief financial officer
CKO: chief knowledge officer
CSO: chief security officer

Governance and C-level Management

C-level is an adjective used to describe high-ranking executive titles within an organization. Within this context, *C* stands for *chief*. Records management departments and responsibilities may be placed under the purview of any one of several C-level managers (e.g., chief information officer, chief knowledge officer, or chief compliance officer). But the 2010 appointment of Paul M. Wester Jr. as the National Archives and Records Administration's first chief records officer brought attention to the growing trend of recognizing records management as a C-level function. This ensures that records management responsibilities are considered when making strategic decisions that involve all levels and functional areas of the organization.

Information Governance Steering Committee

Regardless of the number and variety of C-level positions, a board of directors will benefit from the formation of an information governance steering committee to develop a strategic information governance plan and to provide:

- advice on the organization's information management strategy with regard to quality and integrity, safety and security, and appropriate access and use of records and information assets; and
- assurance in relation to processes for creating, collecting, storing, disseminating, sharing, using, and disposing of information.

Assurance includes the practice of managing information-related risks known as *information assurance* (IA). IA strives to protect and defend information systems by ensuring confidentiality, integrity, authentication, availability, and nonrepudiation, whether the information is in storage, processing, or transit. The charge of some information governance steering committees also includes prioritizing the deployment of resources supporting information management. The information governance steering committee provides a vehicle to bring together representatives from legal, compliance, IT, information security, records management, business units, and other functional areas to create strategies, policies, and procedures related to the distribution of information both inside and outside of the organization.

An organization may appoint an information governance manager to perform such duties as developing and implementing information governance initiatives (legal and regulatory compliance, security, and data integrity and quality), producing the annual improvement

plan, providing operational support, and preparing routine performance reports. Committee members fill specific roles for which they are accountable. An example of possible roles and responsibilities is shown in Table 12.3.

Formulating an Information Governance Strategy

A review of a number of information governance strategy documents reveals a structure that includes at a minimum an introduction, scope statement, and conclusion; however, the sections shown in Table 12.4 (p. 326) are the most common. Notice that the purpose statement shown in Table 12.4 provides the context for the information governance plan, and the scope statement refers to the information governance policy, needs assessment, and annual action (improvement) plan.

Information Governance Plan

The IG plan is a required component of the IG strategy that should be brief but concise. It provides the actions to be taken and could be in the form of a list with dates each task is accomplished; such tasks include the following:

- Assign information governance roles and responsibilities and identify an information governance lead.
- Approve information governance policy or policies. Information governance policies can include not only the IG policy and strategy itself, but also a records management policy and strategy, information security policy, and confidentiality policy. It may also refer to additional governing policies, such as the e-mail and Internet policy, mobile computing procedures, and risk management strategy.
- Approve an information governance improvement plan. The plan may address new business processes that reflect policies, performance measurements, change management, lifecycle management, legal issues, physical records, and access control.

Information Governance Strategic Policy

The second important component of the information governance strategy is the information governance policy. The policy will provide further details than were included in the

Table 12.3. Partial example of information governance committee membership.

Role	Responsibility of	Responsibility for
Accountable officer	Chief executive officer	Information governance across the organization
Information governance lead	Information governance manager	Assessing, monitoring, and reporting compliance with information governance
Information security officer	Senior IT security specialist	Ensuring compliance with information security standards (*ISO/IEC 27001:2005*)
Data protection and freedom of information lead	Information governance manager	Assessing and monitoring compliance with data protection and freedom of information legislative requirements
Records management lead	Chief records officer	Providing advice on and monitoring compliance with laws, regulations, and best practices in records management

Table 12.4. Example of an information governance strategy outline.	
Section/title	**Description**
1. Introduction	An *introduction* asserts the value of information as a vital asset and the importance of ensuring that it is efficiently managed. Information governance is established in the introduction as the framework for information management.
2. Purpose Statement	A *purpose statement* provides the context for the information governance plan in relation to other organizational strategies, such as risk management service planning and business management.
3. Scope Statement	The *scope statement* clearly states the components of the strategy, such as an information governance policy and an annual action (improvement) plan derived from comparing the needs assessment against standards set for the information governance program.
4. Goals	A *goals* section explains the overarching goals of information governance and the goal of the strategic plan, which is to ensure effective information governance. Methods to achieve effective information governance would be provided, such as complying with all legislation and minimizing inappropriate use of personal data.
5. Strategic Objectives	*Strategic objectives* for a specific period of time (e.g., 2012–2014) are included in the goals section or immediately following it. The objectives would provide the requirements and plan of action, monitoring and assessment methods, and identification of lead (position within organization, not name) and target date for completion.
6. Key Strategic Areas	A *key strategic areas* section explains the role of the information governance steering committee and any subgroups, such as information governance project teams.
7. Responsibilities	A *responsibilities* section clarifies individual responsibilities, such as for the information governance manager, senior managers, line managers, and all employees.
8. Conclusion	A *conclusion* reinforces the importance of the information governance strategy, information governance policy, and information governance action plans to ensure that information is effectively managed and risk is reduced.

plan. The outline of the IG policy may resemble the one presented in Table 12.5. The IG policy includes sections that provide guidance for those implementing the IG plan, including foundational principles, governing legislation, and best practices.

Technology Strategy

To be effective, an information governance strategy must include a technology strategy. EMC Corporation suggests that enabling technologies include the following capabilities:[14]

- Information intelligence that facilitates classifying content, separating active versus inactive content, and taking action on content such as disposition of expired content
- Archiving technology that uses rules to enforce policies on content, including what is kept and how long
- Retention capabilities to help manage high volume content, allow storage outside of the production system, and impose event-based and time-based retention on content, including litigation holds
- Legal case management and e-discovery features that allow the creation of processes for responding to e-discovery and other legal searches across a number of repositories

Table 12.5. Example of an information governance strategic policy outline.

Section/component	Description
1. Introduction	The *introduction* provides the rationale for the policy, including the place of information governance within the overall governance structure, the information governance initiatives in place (e.g., confidentiality and data protection assurance, information governance management, corporate information assurance), and the benefits of information governance to the organization, its employees, and its clients.
2. Policy Statement	The *policy statement* outlines the objectives of the IG strategic policy (e.g., confidentiality, integrity, availability, and quality), and the aims (goals) of the policy.
3. Principles	The information governance policy is predicated on *foundational principles* that are then reflected in the information governance initiatives (e.g., openness, information security assurance, information management, confidentiality and data protection assurance, corporate information insurance). ARMA's Generally Accepted Recordkeeping Principles should be considered when identifying foundational principles.
4. Legislation	Organizations are required to comply with *governing legislation* within the countries and industries in which they operate. Examples of legislation from the United States are the *Federal Rules of Civil Procedure*, Freedom of Information Act, Sarbanes-Oxley Act, and Health Information Portability and Accountability Act. Examples from the United Kingdom are the Data Protection Act, The Copyright, Designs and Patents Act, the Health and Social Care Act, and the Freedom of Information Act.
5. Best Practices	*Best practices* for information governance can be identified by industry (e.g., healthcare), job function (e.g., records management), across industries (e.g., maturity assessments and business cases), and based on specific applications and software tools that facilitate information governance (e.g., SharePoint). Best practices are also found in published standards; for example, *ISO/IEC 27001* is considered an international best practice for an information security management system. Internal best practices can be identified by collecting and analyzing data across the enterprise and then establishing a baseline for performance (e.g., time to locate records in response to an e-discovery or FOIA request).
6. Improvement Plan and Assessment	The success of the information governance initiatives must be assessed in order to identify areas needing improvement. An *annual assessment* should be conducted and an *action plan* developed to address areas of concern during the upcoming year. This information is presented to the information governance steering committee, which then prepares a report for the information governance board.
7. Auditing and Monitoring Criteria	The policy would describe the *auditing and monitoring requirements* (e.g., compliance with the information governance policy), explain the method (e.g., annual assessments and action plan), and assign responsibility (e.g., IG steering committee).
8. Implementation and Dissemination	This section would state how the policy document is *disseminated*. *Implementation strategy* would be shared. For example, the policy could be posted to the Internet or Intranet or a collaborative workspace (e.g., SharePoint). The effective date for implementation would be specified.
9. Responsibility for Document	*Overall responsibility* for the document rests with the IG steering committee.
10. Attachments/ Appendices	A variety of *attachments and appendices* might be included; for example, a list of related policies and procedures, such as a data protection policy, e-mail policy, mobile computing policy, social media policy, and records retention policy.

Another component of the IG policy is an annual assessment to identify areas needing improvement and an improvement plan to make the necessary changes.

Assessment Tools and Services

Tools and services, both optional and mandatory, are available to help the information governance steering committee identify areas for improvement. These tools measure the level with which the organization complies with established norms for information governance.

Voluntary Assessments: An Example

An outside organization can be employed to conduct an assessment. For example, EMC Corporation can be invited to lead a structured discussion to assess the current state of information within an organization using the EMC Information Governance Maturity Model Matrix shown in Figure 12.7. During this discussion, the six categories associated with the organization's information management policies are assessed to determine their level of maturity, from *aware* to *optimized*.[15]

Mandated Assessments: An Example

Industry-related information governance assessment tools are also available and may be mandated. For example, the UK National Health Service (NHS) Department of Health issues an Information Governance (IG) Toolkit for NHS organizations that draws together the legal rules and central guidance required to effectively manage information as a set of governance requirements. Organizations conduct self-assessments by measuring their compliance against the rules and central guidance found in the IG Toolkit. Different sets of information guidance requirements exist for different organizational types (e.g., general practices, dental practices, adult social care). Each organization, however, must measure itself against requirements for:

- management structures and responsibilities (e.g., who will carry out the IG assessment or provide staff training),
- confidentiality and data protection, and
- information security.[16]

Figure 12.7. Information Governance Maturity Model Matrix.

	Information Risk	Policy Management	Information Access & Security	Information Capture & Classification	Information Content Governance	Records Lifecycle Management
Optimized						
Managed						
Proactive						
Reactive						
Aware						

Source: EMC Corporation, *EMC Information Governance Maturity Model Assessment*, 2010, 2, http://www.emc.com/collateral/services/consulting/h4905-info-gov-maturity-model-svo-pdf. Courtesy of EMC Corporation.

A new version of the UK Department of Health Information Governance Toolkit is released annually in June/July, and NHS organizations are required to submit the annual assessment by March 31 each year.

An increasing number of large enterprises and government agencies are investing in information governance programs. Smaller organizations may not have the capacity to develop a full-blown information governance program as outlined in this chapter. However, they must also take steps to manage their records and information in a way that supports the core mission of the business and complies with existing laws and regulations.

Certified Information Governance Professional

Continuous learning is expected of individuals involved in any profession, and the record-keeping profession is no exception. As illustrated in Figure 12.8, over the years records professionals have transitioned from managing only physical records to managing both physical and electronic records to serving as vital members of the team responsible for managing all the information of the organization.

Figure 12.8. The evolution from records management to information governance.

Recently, ARMA International introduced a new credential—the information governance professional (IGP) certification—that recognizes the efforts of professionals who possess the knowledge, skills, and abilities to perform competently as an IG professional. This certification was developed according to *ISO/IEC 17024:2012: Conformity Assessment—General Requirements for Bodies Operating Certification of Persons* and complements the CRM. Individuals who meet the eligibility requirements for education and experience must pass a 140-question, multiple-choice exam to earn the IGP certification. Check the ARMA International website for details.

Summary

In this chapter, you learned how the information covered in previous chapters could be used to design both a records management program and an information governance strategy.

According to *ISO 15489-1:2001: Information and Documentation—Records Management—Part 1: General*, records management is a field of management responsible for the efficient and systematic control of evidence of information about business activities and transactions regarded as records.[17] The emphasis is on control of information that is considered to be records. To records managers, records are media neutral, and records no longer of use to the organization must be disposed of.

Information management, according to AIIM, includes both physical and electronic information that must be managed throughout the information lifecycle for delivery through multiple channels. The focus of information management is "the ability of organizations to capture, manage, preserve, store and deliver the right information to the right

people at the right time."[18] The value comes from the *use* of information rather than the control of information. Employees are accountable to "capture, manage, store, share, preserve and deliver information."[19]

Information governance focuses on:

- reducing risk;
- improving e-discovery preparedness;
- increasing transparency, trust, and reputation; and
- reducing product and information cycle times as the result of improved information flows.

The emphasis is on actions to be taken to bring about a desired state. Information governance focuses on both *control and use* of information considered a valuable asset to the organization.

Information governance does not replace either records or information management but recognizes the value of both for the benefit of the organization. In 2009, ARMA International brought attention to the principles of recordkeeping that form the basis for effective records management programs by publishing eight Generally Accepted Recordkeeping Principles that identify the critical hallmarks of information governance.

Shortly afterward, the Information Governance Maturity Model was released by ARMA International to paint a more complete picture of what information governance looks like. For each of the eight principles, various characteristics were identified and used to rank the status of current recordkeeping programs.[20]

As with each of the previous chapters, a guest contributor has been invited to share her expertise. The guest contributor is Diane Carlisle, CRM, Deputy Executive Director of ARMA International, who provides her perspective on records and information management program development, including ARMA's Generally Accepted Recordkeeping Principles and the Information Governance Maturity Model.

PERSPECTIVE

Information Governance Program Development

Diane K. Carlisle, CRM, Deputy Executive Director, ARMA International

Introduction

Records and recordkeeping are the lifeblood of an organization's business activity. It is only through the information an organization records in the normal course of business that it can know what it has done and effectively plan what it will do in the future. Records must be created, organized, secured, maintained, and used in a way that effectively supports the activity of that organization, including the following:

- Facilitating and sustaining day-to-day operations
- Supporting predictive activities such as budgeting and planning
- Assisting in answering questions about past decisions and activities
- Demonstrating and documenting compliance with applicable laws, regulations, and standards

This makes information governance and records management of paramount importance to internal stakeholders.

At the same time, a plethora of *external* stakeholders have become interested in information governance and the role of good records management in all types of organizations:

- *Regulators* want to be assured that the records demonstrating compliance with regulations are created and accessible for inspection.
- *Legal counsel* want to be assured that the records required for successful litigation are identifiable and accessible.
- *Company shareholders* want to be assured that the company doesn't become the subject of an embarrassing public exposé if company records don't exist or have been maliciously (or unintentionally) destroyed.
- *Customers* want to trust that their financial or sensitive health information is properly protected against unauthorized access.

Challenges for Records Professionals

All of these assurances depend on an organization's adherence to its records and information management policies and procedures.

Establishing an Information Governance Program

Therefore, records professionals must create an information governance infrastructure of policies, procedures, and technology tools to address the concerns of both internal and external stakeholders. These policies and procedures cannot be too complex or time-consuming, or implementation will be sporadic, as employees tend to avoid procedures they feel take them away from their core responsibilities. This alone is a significant challenge.

Securing Executive Support and Funding

Securing staffing and financial resources in an environment where there are plenty of other initiatives competing for similar levels of support can be an even greater challenge. In spite of the fact that a significant body of standards, best practices, and generally accepted ways of managing records has developed over the years, records management professionals are sometimes unable to justify the importance of particular program components or to define the anticipated return on investment when requesting additional funds or staff to establish or improve their records management programs.

To meet this challenge, records professionals must be able to build a strong business case, using the answers to these questions:

- What does a good records management program look like?
- How do I know what elements my records management program *must* have in order to protect the company?
- How do I know that the resources I'm requesting are properly scaled for what we want to achieve?
- How can I measure the impact of my program's contribution to the organization?
- How can I ensure that my records management program is sustainable over time?

Opportunities for Records Professionals

In 2009, ARMA International released a comprehensive and authoritative resource records professionals can leverage to determine the answers to these questions and document for executive management the value of effective information governance, including the records and information management program: the Generally Accepted Recordkeeping Principles.

The Generally Accepted Recordkeeping Principles

The eight principles (see below) identify the critical hallmarks of effective information governance. They form the framework within which records professionals can design processes and roles, use existing standards and guidelines to ensure that processes are efficient, and create and monitor metrics to ensure the program is an effective contributor to organizational goals.

Generally Accepted Recordkeeping Principles:

- *Principle of Accountability:* An organization shall assign a senior executive who will oversee a recordkeeping program and delegate program responsibility to appropriate individuals, adopt policies and procedures to guide personnel, and ensure program auditability.
- *Principle of Integrity:* A recordkeeping program shall be constructed so the records and information generated or managed by or for the organization have a reasonable and suitable guarantee of authenticity and reliability.
- *Principle of Protection:* A recordkeeping program shall be constructed to ensure a reasonable level of protection to records and information that are private, confidential, privileged, secret, or essential to business continuity.
- *Principle of Compliance:* The recordkeeping program shall be constructed to comply with applicable laws and other binding authorities, as well as the organization's policies.
- *Principle of Availability:* An organization shall maintain records in a manner that ensures timely, efficient, and accurate retrieval of needed information.
- *Principle of Retention:* An organization shall maintain its records and information for an appropriate time, taking into account legal, regulatory, fiscal, operational, and historical requirements.
- *Principle of Disposition:* An organization shall provide secure and appropriate disposition for records that are no longer required to be maintained by applicable laws and the organization's policies.
- *Principle of Transparency:* The processes and activities of an organization's recordkeeping program shall be documented in an understandable manner and be available to all personnel and appropriate interested parties.

The annotated principles can be accessed at http://www.arma.org/garp.

These principles are comprehensive in scope, but general in nature. They apply to all sizes of organizations, in all types of industries, and in both the private and public sectors. Multinational organizations can use the principles to establish consistent practices across a variety of business units. The principles set forth the characteristics of an effective recordkeeping program, while allowing flexibility based upon the unique circumstances of an organization's size, sophistication, legal environment, or resources. Applying the principles should yield a responsive, effective, and legally compliant recordkeeping system. The complementary Information Governance Maturity Model (Maturity Model) provides metrics by which the effectiveness of and compliance with the records and information management program can be measured.

The Maturity Model

The Information Governance Maturity Model (Maturity Model) begins to paint a more complete picture of what effective information governance looks like. It goes beyond a mere statement of the Generally Accepted Recordkeeping Principles by beginning to define characteristics of various levels of recordkeeping program maturity. For each principle, the Maturity Model associates various characteristics that are typical for each of the five levels in the model:

- *Level 1 (Substandard):* This level describes an environment where recordkeeping concerns are either not addressed at all, or are addressed in a very ad hoc manner. Organizations that identify primarily with these descriptions should be concerned that their programs will not meet legal or regulatory scrutiny.
- *Level 2 (In Development):* This level describes an environment where there is a developing recognition that recordkeeping has an impact on the organization, and that the organization may benefit from a more defined information governance program. However, in Level 2, the organization is still vulnerable to legal or regulatory scrutiny because practices are ill-defined and still largely ad hoc in nature.
- *Level 3 (Essential):* This level describes the essential or minimum requirements that must be addressed in order to meet the organization's legal and regulatory requirements. Level 3 is characterized by defined policies and procedures, and more specific decisions taken to improve recordkeeping. However, organizations that identify primarily with Level 3 descriptions may still be missing significant opportunities for streamlining business and controlling costs.
- *Level 4 (Proactive):* This level describes an organization that is initiating information governance program improvements throughout its business operations. Information governance issues and considerations are integrated into business decisions on a routine basis, and the organization easily meets its legal and regulatory requirements. Organizations that identify primarily with these descriptions should begin to consider the business benefits of information availability in transforming their organizations globally.
- *Level 5 (Transformational):* This level describes an organization that has integrated information governance into its overall corporate infrastructure and business processes to such an extent that compliance with the program requirements is routine. These organizations have recognized that effective information governance plays a critical role in cost containment, competitive advantage, and client service.

The Information Governance Maturity Model associates various characteristics typical to each of the five levels of the model. Table 12.6 (p. 334) illustrates the model applied to the Accountability Principle.

A PDF version of the principles and the Maturity Model are available for free download from http://www.arma.org/garp/metrics.cfm. ARMA International also has a variety of resources and assessment tools available that will help organizations take the next steps in improving their information governance practices. These are available throughout the ARMA International website at http://www.arma.org/.

Conclusions

The Generally Accepted Recordkeeping Principles serve the interests of company management, legislators and regulators, and records management professionals. They, along with

Table 12.6. The Information Governance Maturity Model applied to the accountability principle.

GARP principle	Level 1 (Substandard)	Level 2 (In development)	Level 3 (Essential)	Level 4 (Proactive)	Level 5 (Transformational)
Accountability A senior executive (or person of comparable authority) oversees the recordkeeping program and delegates program responsibility to appropriate individuals. The organization adopts policies and procedures to guide personnel, and ensure the program can be audited.	No senior executive (or person of comparable authority) is responsible for the records management program. The records manager role is largely nonexistent or is an administrative and/or clerical role distributed among general staff.	No senior executive (or person of comparable authority) is involved in or responsible for the records management program. The records manager role is recognized, although he/she is responsible for tactical operation of the existing program. In many cases, the existing program covers paper records only. The information technology function or department is the de facto lead for storing electronic information, but this is not done in a systematic fashion. The records manager is not involved in discussions of electronic systems.	The records manager is an officer of the organization and is responsible for the tactical operation of the ongoing program on an organizationwide basis. The records manager is actively engaged in strategic information and record management initiatives with other officers of the organization. Senior management is aware of the program. The organization has defined specific goals related to accountability.	The records manager is a senior officer responsible for all tactical and strategic aspects of the program. A stakeholder committee representing all functional areas and chaired by the records manager meets on a periodic basis to review disposition policy and other records management-related issues. Records management activities are fully sponsored by a senior executive.	The organization's senior management and its governing board place great emphasis on the importance of the program. The records management program is directly responsible to an individual in the senior level of management (e.g., chief risk officer, chief compliance officer, chief information officer). OR, A chief records officer (or similar title) is directly responsible for the records management program and is a member of senior management for the organization. The organization's stated goals related to accountability have been met.

Source: ARMA International. Download the entire Maturity Model from http://www.arma.org/garp/metrics.cfm.

the Maturity Model and a variety of assessment tools available from ARMA International, will help records professionals establish the need for and develop programs that serve their organization's business, compliance, and operational needs.

These tools provide a variety of types of support—from diagnosing an organization's challenges and risk areas to prioritizing its improvement initiatives, gathering support and resources from various other interested internal stakeholders, and ensuring that routine measurements of programs contribute to the long-term sustainability of its information governance program.

Notes

1. Public Record Office of Victoria, State of Victoria, *Guideline: Records Management Strategy, Version Number 1.0*, July 19, 2010, 7, http://prov.vic.gov.au/wp-content/uploads/2011/05/1010g5.pdf.
2. Ibid.
3. Terry Musser, Tracy Hoover, and Marcos Fernandez, "Get the Horse before the Cart: Conducting Assessment of Advisor Development Needs," National Academic Advising Association (NACADA), 2008, http://www.nacada.ksu.edu/Resources/Clearinghouse/View-Articles/Needs-Assessment-for-Advisor-Development.aspx.
4. The Sedona Conference, *The Sedona Guidelines: Best Practice Guidelines and Commentary for Managing Information and Records in the Electronic Age*, The Sedona Conference Working Group on Best Practices for Electronic Document Retention and Production, September 2004 Public Comment Draft, Appendix C, 58, https://thesedonaconference.org/publication/Managing%20Information%20%2526%20Records.
5. eThemis, eDiscovery Systems Data Map, accessed December 21, 2012, http://www.ethemisinc.com/index.php/en/services/corporate/ediscovery-systems-data-map.
6. EMC Corporation, *15-Minute Guide to Information Governance*, 2011, http://www.emc.com/collateral/software/15-min-guide/h4912-15minguid-infogov.pdf.
7. Albert S. Humphrey, "SWOT Analysis for Management Consulting," *SRI Alumni Association Newsletter* (SRI International), December 2005, 7–8, http://www.sri.com/about/alumni/alumni-newletters.
8. University of Idaho, "Vision," Office of Records Management, accessed December 21, 2012, http://www.uidaho.edu/records-management.
9. University of California, Los Angeles (UCLA), "Records Management Mission," last modified July 22, 2011, http://www.finance.ucla.edu/Records/rrm_mission.htm.
10. G. T. Doran, "There's a S.M.A.R.T. Way to Write Management's Goals and Objectives," *Management Review* 70, no. 11 (AMA Forum), 35–36.
11. Kahn Consulting, Inc., "Records Management Program Development," accessed December 21, 2012, http://www.kahnconsultinginc.com/rim-services-records-information-management-program-development.php.
12. EDRM (Electronic Discovery Reference Model), *Information Governance Reference Model (IGRM) Guide*, accessed December 11, 2012, http://www.edrm.net/resources/guides/igrm.
13. Sarbanes-Oxley Act 2002, "A Guide to the Sarbanes-Oxley Act," accessed January 23, 2013, http://www.soxlaw.com/.
14. EMC Corporation, *15-Minute Guide to Enterprise Content Management*, accessed February 1, 2012, http://web.emc.com/15minguidetoecm?activity_id=66241.
15. EMC Corporation, *EMC Information Governance Maturity Model Assessment*, 2010, 2, http://www.emc.com/collateral/services/consulting/h4905-info-gov-maturity-model-svo.pdf.

16. National Health Service (NHS), "What Are the Information Governance Requirements?" About the IG Toolkit, accessed December 21, 2012, https://www.igt.connectingforhealth.nhs.uk/about.aspx.
17. International Organization for Standardization (ISO), *ISO 15489-1:2001: Information and Documentation—Records Management—Part 1: General* (Geneva: ISO, 2001).
18. AIIM, "What Is Information Management?," accessed December 21, 2012, http://www.aiim.org/what-is-information-management.
19. Ibid.
20. ARMA International, "ARMA International Maturity Model for Information Governance," Metrics, accessed December 21, 2012, http://www.arma.org/garp/metrics.cfm.

APPENDIX

A Sampling of Records Management Laws and Regulations outside of the United States

Australia

Freedom of Information Act of 1982

The regulation gives members of the public rights of access to official documents of the Government of the Commonwealth and of its agencies, including ministers, departments, and public authorities of the Commonwealth. Each of the states and territories has similar legislation. The Freedom of Information Amendment (Reform Bill 2010) seeks to establish a statutory framework for an information publication scheme for Commonwealth agencies. The amendment also mandates that documents held by specific service providers are subject to the act. It also limits access to specific intelligence agency information and documents of the Department of Defense (DoD).

Amended by Freedom of Information Amendment (Reform) Bill 2010, which impacts how records are made available in response to FOIA requests.

Archives Act of 1983

This act established the National Archives of Australia, the organization mandated with providing records management standards and advice for government agencies. Each of the states in the Commonwealth has records management regulations that define how records should be managed. Records administration is the responsibility of each of the states.

Corporate Law Economic Reform (CLER) 9/Corporations Act

This act amends the Corporations Act 2001 (Commonwealth), which governs corporate law in Australia. It was enacted in July 2004.

Canada

National Archives of Canada Act (R.S.C., 1985, c. 1 (3rd Supp.))

This act provides a definition of a record, assigns responsibilities for the preservation of records to the National Archives of Canada, establishes the governance structure for the National Archives, defines the scope of acquisition to acquire both public and private records, covers transfer of records to the archivist, and further defines the responsibilities of the archivist.

Personal Information Protection and Electronic Documents Act (2000)

This act supports and promotes electronic commerce by protecting personal information that is collected, used, or disclosed in certain circumstances; by providing for the use of electronic means to communicate or record information or transactions; and by amending the Canada Evidence Act, the Statutory Instruments Act, and the Statute Revision Act.

Access to Information Act (1985), Current to 2011

The purpose of this act is to extend the present laws of Canada to provide a right of access to information in records under the control of a government institution in accordance with the principles that government information should be available to the public, that necessary exceptions to the right of access should be limited and specific, and that decisions on the disclosure of government information should be reviewed independently of government.

Privacy Act (1985), Last Amended 2010

The purpose of this act is to extend the present laws of Canada that protect the privacy of individuals with respect to personal information about themselves held by a government institution and that provide individuals with a right of access to that information.

France

Ordinance 2004-178 (National Patrimony)

This legislation provides for official definition of records and archives as governed by French records management, data protection, and archival laws. According to French records and archival laws, records are the whole of documents—regardless of date, form, and physical support—created or received by any physical or juridical person and by every public or private agency or organization in the course of their activities.

French Data Protection Mandates

Law requires that data controllers provide information on their data-processing activities to their data subjects in a clear, specific, and easily accessible manner.

Délibération nº 2009-474

Issued on August 9, 2009, by the French Data Protection Authority (CNIL), this statute details the legal requirements for French/US data transfers in discovery activities related to litigation or for US investigations.

Freedom of Information Act (Loi nº 78-753)

The Directorate of the Archives of France is mandated with providing useful standards for electronic records, including long-term preservation. Title I addresses freedom of access to administrative documents and the reuse of public information. The act defines the right of everyone to information as defined and guaranteed by the provisions of Chapters I, III, and IV of this title regarding freedom of access to government documents, including records, reports, studies, statistics, directives, instructions, circulars, notes and ministerial responses, correspondence, opinions, forecasts, and decisions.

Germany

German Corporate Governance Code

The German Corporate Governance Code presents essential statutory regulations for the management and supervision of German-listed companies and contains internationally and nationally recognized standards for good and responsible governance.

DOMEA (German Ministry of Interior)

DOMEA stands for "Document Management and Electronic Archiving in Electronic Business" and is also known as the "Paperless Office Concept." This initiative of Germany's Department of Interior defines records management policies for government electronic records. DOMEA is intended to support the creation of a government-wide IT system that supports records management, the creation of electronic records, and cooperative business processes.

Federal Data Protection Act (Bundesdatenschutzgesetz, BDSG)

Personal data (i.e., data referring to an individual [natural person]) may only be stored or processed if either the person agrees in writing or the law allows the storage/processing.

Telecommunications Data Retention Law

On March 2, 2010, the German High Court rejected an EU mandate to retain telephone calls and e-mail traffic for six months for law enforcement purposes. This law overturns the 2008 directive requiring telecommunications service providers to retain mobile and fixed telephony and Internet service data for six months and demands that data stored so far be deleted immediately.

United Kingdom

UK Public Records Act of 1958 (and the National Archives 2002) (TNA 2002)

The Public Records Act of 1958 is an act of Parliament that forms the main legislation governing public records. It applies to the UK Central Government, including Executive Agencies and Non-Departmental Public Bodies.

TNA 2002 defines functional requirements for electronic documents and records management (taking into account the obligations defined by the Freedom of Information Act, *ISO 15489*, *MoReq*, e-government interoperability framework of the United Kingdom, and Data Protection Act of 1988).

Freedom of Information Act

This act does not impose any obligation on public authorities or their agents to retain documents for a certain period. However, it does make it a criminal offense to destroy documents after a request for information (a "subject access request") has been made, if the destruction was with the intention of preventing disclosure.

Electronic Communications Act

Regulations apply to communications data that is generated or processed in the United Kingdom by public communications providers in the process of supplying the communications services concerned.

UK Data Protection Act

This act regulates the use of "personal data" and applies to most personnel records (paper, microform, or computerized format). Computerized systems are covered by the law, as are certain manual systems: To be covered, manual systems must be organized into a "relevant filing system."

Glossary

access control: The process by which users are identified and granted certain privileges to information, systems, or resources; can allow or deny access to a physical environment or an electronic environment. (DISA, *Access Control in Support of Information Systems*)

accession: Process of transferring physical custody of documentary materials to an archival institution. *Note:* May also include transfer of legal custody. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

acquisition: Process of adding to the holdings of a records center or archives by transfer under an established and legally based procedure, by deposit, purchase, gift, or bequest; an addition so acquired. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

acquisition policy: An official statement issued by an archives or manuscript repository identifying the kinds of materials it accepts and the conditions or terms that affect their acquisition. It serves as a basic document for the guidance of archival staff and organizations and persons interested in donating their records or papers. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

action plan: A sequence of steps that must be taken, or activities that must be performed well, for a strategy to succeed. Also known as operational plan. (BusinessDictionary.com)

active preservation: An approach to digital preservation that seeks to ensure the continued accessibility of electronic records over time by actively intervening in how records are stored and managed (e.g., migration). (IRMT, *Training in Electronic Records Management*)

active record: Record needed to perform current operations, subject to frequent use, and usually located near the user. Also known as *current record*. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

administrative access controls: Access controls that result from administrative action that includes developing policies and procedures, providing education and training, and monitoring and evaluating use. (DISA, *Access Control in Support of Information Systems*)

administrative metadata: Data that is necessary to manage and use information resources and that is typically external to informational content of resources. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

administrative record: A record that is related to budget, personnel, supply, and similar administrative or facilitative operations common to all organizations. Also known as *operational record*. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

administrative risks: Risks related to the management of the records and information management program, including information governance, change management, and emergency management. (ARMA International, *Evaluating and Mitigating Records and Information Risks*)

agent: Individual, workgroup, or organization responsible for or involved in records creation, capture, and/or management processes. (ISO, *ISO 23081-1:2006*)

alphabetic filing system: A system in which files and documents are arranged in alphabetic order from A to Z. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

appraisal: Records analysis; the process of evaluating records based on their current operational, regulatory, legal, fiscal, and historical significance, their informational value, and their arrangement and relationship to other records. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

archival authority: Agency or program responsible for selecting and preserving archives, making them available, and approving destruction of other records. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

archival description: The process of analyzing, organizing, and recording details about the formal elements of a record or collection of records, such as creator, title, dates, extent, and contents, to facilitate the work's identification, management, and understanding; the product of such a process. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

archival system: Organized collection of hardware, software, policies, procedures and people that maintains, stores, manages, and makes available records over time. (ISO, *ISO 23081-2:2009*)

archives: Documents created or received and accumulated by a person or organization in the course of the conduct of affairs and preserved because of their continuing value; the building or part of a building in which archives are preserved and made available for consultation; and/or the agency or program responsible for selecting, acquiring, preserving, and making available archives. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

archives management: The general oversight of a program to appraise, acquire, arrange, describe, preserve, authenticate, and provide access to permanently valuable records. Also known as *archives administration*. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

archivist: A person professionally occupied in the administration of archives and/or management of archives. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

arrangement: Process of organizing materials with respect to their provenance and original order to protect their context and to achieve physical or intellectual control over the materials; the organization and sequence of items within a collection. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

attribute: Characteristic of an object or entity. (ISO, *ISO 23081-2:2009*)

audit: Independent review and examination of records and activities to test for compliance with established policies or standards, often with recommendations for changes in controls or procedures. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

audit plan: A description of the expected scope and conduct of the audit with sufficient detail to guide the development of the audit program; this includes a set of instructions and a means to control and record the proper execution of the work. (State Records of South Australia, *Records Management Audit Guideline*)

audit trail: Information in records that tracks a transaction from beginning to end, making it possible to review whether it was done according to relevant policies and standards. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

augmented reality (AR): A type of virtual reality that aims to duplicate the world's environment in a computer. An augmented reality system generates a composite view for the user that is the combination of the real scene viewed by the user and a virtual scene generated by the computer that augments the scene with additional information. (*Webopedia*)

authenticity: Sum of the qualities of a record that establishes the origin, reliability, trustworthiness, and correctness of its content. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

bar code: A predetermined pattern of vertical lines that, when read by an optical reader, can be converted to machine-readable language. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

big bucket schedule: A type of flexible records schedule that applies disposition instructions against a large body of records grouped at a level of aggregation greater than the traditional file series or electronic system and that can be along a specific program area, functional line, or business process. Also known as *large aggregation schedule*. (NARA, "NARA Bulletin 2008-04")

big data: Data so large that it is difficult to process with traditional database and software techniques. (*Webopedia*)

blog: An online journal with regular chronological entries written by one or more individuals that may provide readers with the ability to comment on postings. Derived from the phrase "web log." (ARMA International, *Implications of Web-Based, Collaborative Technologies in Records Management*)

Boolean logic search: Method of searching electronic information systems that uses specific terms and symbols to refine a search and improve the chances of obtaining successful search results. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

born digital: Information created in electronic format. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

business case: A type of decision-making tool used to determine the effects a particular decision will have on profitability. (BusinessDictionary.com)

business classification: A classification system related to business functions (activities) that provides a systematic framework for records management. (ISO, *ISO/TR 15489-2:2001*)

business continuity: An organization's ability to continue to operate in the event of a disaster or disruption. *See also* DISASTER RECOVERY PLAN. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

business continuity plan: Set of documents, instructions, and procedures that enable a business to respond to accidents, disasters, emergencies, and/or threats without any stoppage or hindrance in its key operations. (BusinessDictionary.com)

business process: Related activities, sequential or parallel, that have been systematically implemented to produce a specific service or product. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

business process analysis: The activity of reviewing and changing existing business practices in order to fit new and improved automated processes.

business process improvement (BPI): Improving quality, productivity, and response time of a business process, by removing non–value-adding activities and costs through incremental enhancements. Also known as *functional process improvement*. (BusinessDictionary.com)

business process mapping: Assigning variables to given work tasks and plotting how work moves from one department to the next and from one employee to the next. (Drive Your Success, "Understanding Business Process Mapping and Workflow Diagrams")

business process model (BPM): A sequential representation of all functions associated with a specific business activity. For example, a BPM diagram that depicts how an order is fulfilled will show the customer request, order entry, communication with shipping, inventory picking, ship scheduling, and delivery. (BusinessDictionary.com)

business resumption: Process of restoring the interrupted operations of a firm in the immediate aftermath of an accident, disaster, emergency, and/or threat. (BusinessDictionary.com)

business system: Organized collection of hardware, software, supplies, policies, procedures, and people that stores, processes, and provides access to an organization's business information. (ISO, *ISO 23081-2:2009*)

BYOD (bring your own device): A phrase that has become widely adopted to refer to employees who bring their own computing devices—such as smartphones, laptops and PDAs—to the workplace for use and connectivity on the corporate network. (*Webopedia*)

certified archivist (CA): An archivist who has successfully met all criteria for membership in the Academy of Certified Archivists (ACA). (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

certified information governance professional (IGP): The IGP will recognize the efforts of those professionals who are most accomplished with respect to the implementation of the Generally Accepted Recordkeeping Principles (GARP). (ARMA International, "Certified Information Governance Professional")

certified information privacy professional (CIPP): An individual who has achieved any one of the five IAPP (International Association of Privacy Professionals) credentials. All CIPPs have demonstrated knowledge of both broad global and specific regional or sectorial concepts of privacy and data protection law and practice. (IAPP)

certified information professional (CIP): An information professional who has taken and passed a 100-question examination to demonstrate competence in six domain areas across content and information management. (AIIM)

certified records manager (CRM): Professional records manager who has satisfactorily passed the certified records manager examination administered by the Institute of Certified Records Managers and who remains a member in good standing. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

chief records officer (CRO): A high-ranking executive within an organization who is responsible for the organization's records management program and who interacts with other C-level officers when strategic decisions are made that involve all levels and functional areas of the organization.

chronological filing system: A filing system set up by date and used to organize business records such as invoices, purchase orders, and bills of lading.

classification: The systematic identification and arrangement of business activities and/or records into categories according to logically structured conventions, methods, and procedural rules represented in a classification system. (ISO, *ISO 15489-1:2001*)

C-level management: C-level is an adjective used to describe high-ranking executive titles within an organization (e.g., CEO, chief executive officer; CFO, chief financial officer; and CRO, chief records officer).

cloud computing: Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. (Mell and Grance, *The NIST Definition of Cloud Computing*)

cloud digital preservation: A service providing digital preservation of information and data. (LTDP, "Cloud Digital Archive and Digital Preservation Service Requirements")

cloud storage: The storage of data online in the cloud wherein a company's data is stored in and accessible from multiple distributed and connected resources that comprise a cloud. (*Webopedia*)

cold site: An alternative facility that is void of any resources or equipment and that can be used as a backup site for disaster recovery. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

collaboration: The act of working jointly with others on a particular project or endeavor. In the context of this standard, the endeavor usually relates to some intellectual activity. (ARMA International, *Implications of Web-Based, Collaborative Technologies in Records Management*)

commercial records center: A records center that stores the records of other organizations and provides services on a for-profit fee basis. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

communication: An expression of ideas or information through speech, text, or symbolic behavior; the process of exchanging such ideas. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

compliance: Certification or confirmation that the doer of an action (such as the writer of an audit report) or the manufacturer or supplier of a product meets the requirements of accepted practices, legislation, prescribed rules and regulations, specified standards, or the terms of a contract. (BusinessDictionary.com)

compliance monitoring: Activities undertaken to establish whether a process or procedure is carried out in conformance with relevant external requirements, whether set through legislation, regulations, or directions. (NSW Government, "Monitoring Records Management")

computer: An electronic device that accepts data as input which is then analyzed or manipulated according to specific instructions, with the resulting data stored for future use, output in human-readable form, or used as input to another process or to control another device; one who counts or adds numbers. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

conceptual analysis: A term that can be applied to all examinations of message content; a category of content analysis.

conceptual model: Data model that represents an abstract view of the real world. (ISO, *ISO 23081-2:2009*)

content analysis: A research tool used to determine the presence of certain words or concepts within texts and sets of texts.

content management: Techniques to set policies and supervise the creation, organization, access, and use of large quantities of information, especially in different formats and applications throughout an organization. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

content standard: A set of formal rules that specify the content, order, and syntax of information to promote consistency. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

controlled language: *See* CONTROLLED VOCABULARY.

controlled vocabulary: A limited set of terms and phrases used as headings in indexes and as access points in catalogs. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

conversion: The process of changing records from one medium to another or from one format to another. *See also* MIGRATION. (ISO, *ISO 15489-1:2001*)

crowdsourcing: A slang term used to describe the practice of using both the skills and time of underpaid—or unpaid—amateurs to create content or solutions for established businesses. Basically,

crowdsourcing means to "use the talents of the crowd," and is a play on the word *outsourcing*. (*Webopedia*)

dark archives: A collection of materials preserved for future use but with no current access. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

data map: A comprehensive and defensible inventory of an organization's electronically stored information that includes all the relevant IT systems and media (online and offline) and the responsible business units, data stewards, and custodians. (ARMA International, *Implications of Web-Based, Collaborative Technologies in Records Management*)

data mart: A specific, subject-oriented repository of data gathered from operational data and other sources and designed to serve the needs of a particular community of knowledge workers. (Anupindi, "Inmon vs. Kimball")

data warehouse: a central aggregation of data (that can be distributed physically) that starts from an analysis of what data already exists and how it can be collected and later used. (Anupindi, "Inmon vs. Kimball")

de facto standard: A consistent manner of doing something that has been established by practice. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

de jure standard: A consistent manner of doing something established by a deliberate process. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

derivative dispersal: A term used to represent information and records intentionally (with or without malice) spread through the use of the Internet and Web 2.0 technologies.

description: The process of creating a finding aid or other access tools that allow individuals to browse a surrogate of the collection to facilitate access and that improve security by creating a record of the collection and by minimizing the amount of handling of the original materials. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

descriptive metadata: Information that refers to the intellectual content of material and aids discovery of such materials. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

designed dispersal: Regular distribution of records (especially vital records) to additional locations as a method of protection. Also known as *planned dispersal* or *built-in dispersal*. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

destruction: Process of eliminating or deleting records beyond any possible reconstruction. (ISO, *ISO 15489-1:2001*)

diffusion of innovation: Theory that every market has groups of customers who differ in their readiness and willingness to adopt a new product, and that an innovative product spreads (diffuses) through a market not in one straight course but in successive, overlapping waves. Most populations show the following pattern in the adoption of new consumer goods: innovators (2 percent of population), early adopters (14 percent), early majority (34 percent), late majority (34 percent), and laggards (16 percent). (BusinessDictionary.com)

digital archives: A specialized storage repository and service with supporting data and storage services used to secure, retain, and protect digital information and data usually for extended periods of time, but not including long term. (LTDP, "Cloud Digital Archive and Digital Preservation Service Requirements")

digital preservation: A digital object is preserved when information consumers can access, examine, reuse, and interpret digital information and verify it as authentic over any period of time

including long term. The goals of digital preservation are to keep any designated digital object accessible, interpretable, secure, reliable, and authentic over time. (LTDP, "Cloud Digital Archive and Digital Preservation Service Requirements")

digital rot: A colloquial computing term used to describe either a gradual decay of storage media or the degradation of a software program over time. Also known as bit rot, bit decay, data rot, or data decay. (StackExchange.com)

digitized: Converted (as data or an image) to digital form. (*Merriam-Webster Online*)

disaster preparedness and recovery plan: *See* DISASTER RECOVERY PLAN.

disaster recovery plan: A written and approved course of action to take after a disaster strikes that details how an organization will restore critical business functions and reclaim damaged or threatened records. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

discovery: Required disclosure of relevant items in the possession of one party to the opposing party during the course of legal action. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

dispersal: Transfer of duplicate copies of vital records to locations beyond those where the originals are housed. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

disposition: Range of processes associated with implementing records retention, destruction, or transfer decisions that are documented in disposition authorities or other instruments. (ISO, *ISO 15489-1:2001*)

disruptive innovation: The process of developing new products or services to replace existing technologies and gain a competitive advantage. For example, in a typical innovative high-technology business, disruptive innovation tends to shake up a market when it is introduced externally, and it typically requires a more creative internal attitude toward the product development and promotion process. (BusinessDictionary.com)

document: Recorded information or object that can be treated as a unit. (ISO, *ISO 15489-1:2001*)

document management: Techniques used to regulate the creation, use, and maintenance of documents according to established policies and procedures. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

document management system(s) (DMS): The use of a computer system and software to store, manage, and track electronic documents and electronic images of paper-based information captured through the use of a document scanner. (AIIM)

document type definition (DTD): A set of rules that specify the structure of a document and the tags used to define that structure and that can be used to validate whether a document is well formed. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

duplex numeric system: A coding system using numbers with two or more parts separated by a dash, space, or comma. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

dynamic website: A website that can use a single URL to generate a webpage with content that changes based on a number of factors. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

electronic discovery (e-discovery): The required production of information to an opposing party during the pretrial phase of litigation or a government investigation. (ARMA International, "What Is Electronic Discovery?")

electronic document management system(s) (EDMS): A system consisting of software, hardware, policies, and processes to automate the preparation, organization, tracking, and distribution of

electronic documents. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

electronic document records management system(s) (EDRMS): A system designed to manage electronic content, documents, and records and support four key functions: input (creation/capture); management (content, documents, records); collaboration/process management; and output/delivery. (JISC InfoNet, "infoKits")

electronic record: Data or information that has been captured and fixed for storage and manipulation in an automated system and that requires the use of the system to render it intelligible by a person. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

electronic records management (ERM): The application of records management principles to electronic records; the management of records using electronic systems to apply records management principles. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

electronic records management system(s) (ERMS): A system consisting of software, hardware, policies, and processes to automate the preparation, organization, tracking, and distribution of records regardless of media. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

electronic signature: An electronic symbol or process attached to or logically associated with an electronic record and executed or adopted with the intent to authenticate the record. Also known as *digital signature*. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

emulation: The use of one system to reproduce the functions and results of another system. (ARMA International, *The Digital Records Conversion Process*)

encoding scheme: Controlled list of all the acceptable values in natural language and/or as a syntax-encoded text string designed for machine processing. (ISO, *ISO 23081-1:2006*)

enterprise content management (ECM): The strategies, methods, and tools used to capture, manage, store, preserve, and deliver content and documents related to organizational processes. (AIIM)

enterprise content management system(s) (ECMS): This term encompasses the technologies, tools, and methods used to capture, manage, store, preserve, and deliver content across an enterprise. Content examples are contracts, files, e-mail, and so on. (AIIM)

enterprise information system(s) (EIS): An EIS integrates the key business processes into a single software system that enables information to flow seamlessly throughout the organization.

entity: Any concrete or abstract thing that exists, did exist, or might exist, including associations among these things (e.g., person, object, or event). (ISO, *ISO 23081-2:2009*)

ESI (electronically stored information): As referenced in the US *Federal Rules of Civil Procedure*, information that is stored electronically, regardless of the media or whether it is in the original format in which it was created, as opposed to stored in hard copy (i.e., on paper). (Sedona Conference, *The Sedona Conference Glossary*)

Ethernet: A computer network architecture consisting of various specified local area network protocols, devices, and connection methods; first-known use 1976. (*Merriam-Webster Online*)

evaluation: The process of assessing the value of records, especially regarding their destruction. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

Extensible Markup Language (XML): A universal format for structured documents and data on the web having the potential to alleviate many of the interoperability problems associated with the sharing of documents and data. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

faceted classification: A system for organizing materials into categories based on a systematic combination of mutually exclusive and collectively exhaustive characteristics of the materials (facets) and displaying the characteristics in a manner that shows their relationships. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

faceted search: A type of navigation model that leverages metadata fields and values to provide users with visible options for clarifying and refining queries. Also known as *guided navigation*.

field search: A search for a term or number within a particular data field of a document or database.

file format (examples: PDF, TXT, TIF, HTML, ASCII): A format for encoding information in a file. Each different type of file has a different file format. The file format specifies first whether the file is a binary or ASCII file, and second, how the information is organized. (*Webopedia*)

file plan: A classification scheme describing different types of files maintained in an office, how they are identified, where they should be stored, and how they should be indexed for retrieval, and a reference to the approved disposition for each file. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

flexible scheduling: A technique to apply disposition instructions to different types of information or categories of records. *See also* BIG BUCKET SCHEDULE. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

floppy disk: A circular sheet of polyester coated with magnetic oxide and housed in a thin, square plastic jacket that is used as a removable data storage medium. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

folksonomy: A collaborative effort by users to create and manage their own tags for the classification and categorization of online content. (ARMA International, *Implications of Web-Based, Collaborative Technologies in Records Management*)

full-text search: The ability of a system to provide search and retrieval of documents based on a search of the complete text within the documents, not just on keywords. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

functional classification system: A classification system related to business functions that provides a systematic framework for records management. (ISO, *ISO/TR 15489-2:2001*)

functions thesaurus: A classification tool built from the business classification scheme listing the terms in alphabetical order.

gap analysis: A technique for determining the steps to be taken in moving from a current state to a desired future state. Also known as *need-gap analysis*, *needs analysis*, and *needs assessment*. (BusinessDictionary.com)

Generally Accepted Recordkeeping Principles: Guiding statement on information governance based on eight recordkeeping principles published by ARMA International: accountability, integrity, protection, compliance, availability, retention, disposition, and transparency. (ARMA International, "Generally Accepted Recordkeeping Principles")

geographic filing system: The classification of records by geographic location usually arranged by numeric code or in alphabetic order. (Excerpted from *Glossary of Records and Information Management Terms,* 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

geographic information system(s) (GIS): A combination of hardware, software, and rules that supports complex analysis of geospatial and temporal information and that often uses static or dynamic maps for reports. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

glossary: An alphabetical list of terms in a particular domain of knowledge with definitions for those terms. Also known as *vocabulary*. (*Wikipedia*)

goal: An observable and measurable end result having one or more objectives to be achieved within a more or less fixed time frame. (BusinessDictionary.com)

governance: System, structures, tone, and behaviors by which the organization is directed and controlled and accountability clearly defined. (BSI, *BS 31100:2011*)

hard disks: A magnetic storage device designed to provide rapid access to large quantities of data. Also known as *hard drive*. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

hot site: An alternate facility that has the equipment and resources to immediately recover the business functions affected by the occurrence of a disaster. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

Hypertext Markup Language (HTML): The publishing language of the web used to provide structure that tells the web browser how to present the webpage.

inactive record: A record no longer needed to conduct current business but preserved until it meets the end of its retention period. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

index: An ordered list of controlled language terms that points to the location of information related to each term. (ARMA International, *Controlled Language in Records and Information Management*)

indexing: Process of establishing access points to facilitate retrieval of records and/or information. (ISO, *ISO 15489-1:2001*)

information: Data that has been given value through analysis, interpretation, or compilation in a meaningful form. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

information age: A period beginning about 1975 and characterized by the gathering and almost instantaneous transmission of vast amounts of information and by the rise of information-based industries. (Dictionary.com)

information governance: The specification of decision rights and an accountability framework to encourage desirable behavior in the valuation, creation, storage, use, archiving and deletion of information. It includes the processes, roles, standards, and metrics that ensure the effective and efficient use of information in enabling an organization to achieve its goals. (Gartner, *IT Glossary*)

information governance maturity model: The IG maturity model defines characteristics of five levels of recordkeeping programs based on the eight GARP principles as well as a foundation of standards, best practices, and legal/regulatory requirements. (ARMA International, "Information Governance Maturity Model, Metrics")

information management: Principles and techniques to process, store, retrieve, manipulate, and control access to information so that users can find information they need. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

information technology: The use of hardware and software, especially digital computers, to capture, process, store, and disseminate complex data in many forms, including audio, images, and text. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

information technology governance (IT governance): The process that ensures effective and efficient use of information in enabling an organization to achieve its goals. (Logan, "What Is Information Governance?")

infrastructure as a service (IaaS): Infrastructure as a service is the delivery of computer infrastructure, generally virtualized platform environments, as a service.

integrity (of a record): Quality of being whole and unaltered from loss, tampering, or corruption. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

keyword search: A type of search that looks for matching documents that contain one or more words specified by the user.

LAN: *See* LOCAL AREA NETWORK.

law: The whole of statutes, administrative regulations, judicial precedents, and legal principles that define socially accepted limits and obligations on human behavior; a statute. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

legal and regulatory risks: Risks related to compliance and arising from litigation. (ARMA International, *Evaluating and Mitigating Records and Information Risks*)

legal hold: A communication issued as a result of current or anticipated litigation, audit, government investigation, or other such matter that suspends the normal disposition or processing of records. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

local area network (LAN): A collection of computers, printers, storage devices, and other devices connected to allow resource sharing. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

logical access control: Logical access controls are found in databases, applications, servers, and even in transit. Access to critical data is determined by a person's role, and the need for access is reviewed regularly. (DISA, *Access Control in Support of Information Systems*)

long-term digital preservation: A series of managed activities necessary to ensure continued access to digital materials for as long as necessary. (DPC, "Introduction—Definitions and Concepts")

long-term record: Records that have enduring value to the organization. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

mashups: In the web environment, a combination of information, media, or tools from two or more sources that previously had no relation to each other, which results in new content or a new service. (ARMA International, *Implications of Web-Based, Collaborative Technologies in Records Management*)

M-DISC: A natural stone-like substance used as a "write once read forever" (WORF) medium on which files are laser-engraved and cannot be overwritten, erased, or corrupted by natural processes. (Millenniata, "M-DISC")

media vault: A vault designed and built to protect digital media from temperatures above 125°F and 80 percent relative humidity.

metadata: Data describing context, content, and structure of records and their management through time. (ISO, *ISO 15489-1:2001*)

Metadata Encoding and Transmission Standard (METS): An Extensible Markup Language (XML) schema used to package digital objects, along with descriptive, administrative, and structural metadata. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

metadata for managing records: Structured or semistructured information that enables creation, management, and use of records through time and within and across domains. (ISO, *ISO 23081-1:2006*)

metadata framework: A high-level set of instruments to establish and implement metadata specifications consistently across systems and organizations. (ISO, *ISO 23081-1:2006*)

metadata schema: A logical plan showing the relationships between all metadata elements identified; it incorporates a set of rules related to semantics and syntax. (ISO, *ISO 23081-2:2009*)

METS: *See* METADATA ENCODING AND TRANSMISSION STANDARD.

microblog: An Internet service that delivers and stores limited text messages. Unlike e-mail, which is generally a "push" service, these messages can be "pulled" through user subscription to a particular author or topic. The character length limitation makes it ideal for using with mobile devices, such

as smartphones. (ARMA International, *Implications of Web-Based, Collaborative Technologies in Records Management*)

microfilm: A high-resolution film in roll form containing microimages; to record microimages on film. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

migration: Act of moving records from one system to another while maintaining the record's authenticity, integrity, reliability, and usability. *See also* CONVERSION. (ISO, *ISO 15489-1:2001*)

mission statement: A written declaration of an organization's core purpose and focus that normally remains unchanged over time. Properly crafted mission statements (1) serve as filters to separate what is important from what is not, (2) clearly state which markets will be served and how, and (3) communicate a sense of intended direction to the entire organization. (BusinessDictionary .com)

monitoring: Supervising activities in progress to ensure they are on-course and on-schedule in meeting the objectives and performance targets. (BusinessDictionary.com)

needs assessment: *See* GAP ANALYSIS.

nuclear specialist (CRM/NS): Designation that indicates a certified records manager has passed an additional exam section related to nuclear information records management. (NIRMA)

numeric filing system: Any classification system designed to arrange records based on numbers that are assigned or taken directly from a record, such as a purchase order.

ontology: A working model of entities and interactions in some particular domain of knowledge or practice, such as transportation. (Gruber,"Ontology")

operational plan: *See* ACTION PLAN.

operational value: The usefulness or significance of records to support ancillary operations and management of an organization. *Principally Canadian:* The usefulness or significance of records related to the mandate, role, or mission of an organization by documenting the duties, responsibilities, functions, activities, and services performed. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

passive preservation: An approach to digital preservation that ensures continuing integrity of and controlled access to digital objects along with their associated metadata. The original digital objects are kept intact without changing the technologies used to store or process them (e.g., refreshing data, replication, and emulation.) (IRMT, *Training in Electronic Records Management*)

performance monitoring: Method to continually measure performance and provide ongoing feedback to employees and workgroups on their progress toward reaching their goals. Performance monitoring can also monitor the overall performance of programs, processes, and systems.

personal digital assistant (PDA): Powerful handheld computing device without a keyboard, but with a screen that reads the words written (drawn) on it with a pen-like stylus. (BusinessDictionary.com)

physical access controls: Physical access controls limit access to physical and electronic assets through the use of strategies (e.g., human screeners) and tools (e.g., ID cards, safes, vaults, and biometric systems based on fingerprints or the patterns visible within the iris of an eye). (DISA, *Access Control in Support of Information Systems*)

platform as a service (PaaS): A common reference to the layer of cloud technology architecture that contains all application infrastructure services, which are also known as *middleware* in other contexts. (Gartner, *IT Glossary*)

policy-based data preservation: A set of elements—purpose, properties, policies, procedures, state information, assessment criteria, and federation—that are integrated into the preservation system as actionable rules and executable computer procedures. (Moore et al., *NARA Transcontinental Persistent Archive Prototype*)

preservation: Process and operations involved in ensuring the technical and intellectual survival of authentic records through time. (ISO, *ISO 15489-1:2001*)

Preservation Metadata: Implementation Strategies (PREMIS): The name of an international working group sponsored by OCLC and RLG from 2003–2005. When referring to PREMIS, most people mean the PREMIS Data Dictionary, but occasionally they may be referring to the XML schema, the working group, or the entire effort, including the maintenance activity carried out by the Library of Congress. (Caplan, *Understanding PREMIS*)

primary value (of records): The value of records derived from the original use that caused them to be created. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

professional development: Process of improving and increasing capabilities of staff through access to education and training opportunities in the workplace, through outside organizations, or through watching others perform the job. (BusinessDictionary.com)

program audits: Systematic studies conducted to assess how well a program or operation is working.

project management professional (PMP): The PMP designation, certified by the Project Management Institute, provides evidence that the PMP has the experience, education, and competency to successfully lead and direct projects. (PMI)

provenance (n.; provenancial, adj.): The origin or source of something. Information regarding the origins, custody, and ownership of an item or collection.

radio frequency identification (RFID): Technology that uses radio frequencies to identify, track, locate, and manage items. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

really simple syndication (RSS): Form of web coding that allows information from a site to be displayed on a computer or other webpage as a continuous stream of information. Individuals are able to subscribe to particular feeds and are notified each time the content is updated or changed. Any content including text, music, and pictures files can be converted and transmitted in an RSS form. This type of service is beneficial to users who want to view in one place information from many various sources. (BusinessDictionary.com) Also known as *rich site summary* or *rich site syndication*.

record group (archives): A collection of records that share the same provenance and are of a convenient size for administration. Also known as *archive group*. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

records: Information created, received, and maintained as evidence and information by an organization or person, in pursuance of legal obligations or in the transaction of business. (ISO, *ISO 15489-1:2001*)

records and information management (RIM): Field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use, and disposition of records, including processes for capturing and maintaining evidence of and information about business activities and transactions in the form of records. Also known as *records management*. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

records appraisal: The process of evaluating records to determine their retention based on administrative, legal, and fiscal requirements and historical value. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

records capture: Ensuring that a record (e.g., a receipt, contract, or directive) becomes fixed so that it cannot be altered or deleted and that it is stored in a location where it can be retrieved, accessed, preserved, and managed.

records center: An area for lower-cost storage, maintenance, and reference use of semi-active records pending their ultimate disposition. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

records classification: The process followed to categorize or group records into retrieval units.

records classification scheme: A tool used to classify records and other business information based on the business activities that generate records. Also known as *file plan*.

records continuum: A model of archival science that emphasizes overlapping characteristics of recordkeeping, evidence, transaction, and the identity of the creator. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

records control risks: Risks related to records classification, records retention and disposition, and records storage. (ARMA International, *Evaluating and Mitigating Records and Information Risks*)

records disaster: A sudden and unexpected event, which results in the loss of records and information essential to an organization's continued operation.

records inventory: A detailed listing that includes the types, locations, dates, volumes, equipment, classification systems, and usage data of an organization's records in order to evaluate, appraise, and organize the information. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

records lifecycle: The span of time of a record from its creation or receipt, through its useful life, to its final disposition, whether that disposition is destruction or retention as a historical record. (ARMA International, *Requirements for Managing Electronic Messages as Records*)

records management (RM): Field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use, and disposition of records, including processes for capturing and maintaining evidence of and information about business activities and transactions in the form of records. (ISO, *ISO 15489-1:2001*)

records management application (RMA): Software that aids the management of records, especially electronic records, including the use of a file plan for classifying records and of a records schedule for identifying records that are due for disposition. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

records management policy: Mandated guidelines for managing records within an organization. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

records management procedures: Records management procedures are a set of steps, instructions, and/or other methodologies to follow in order to complete records management tasks in a predictable and orderly way.

records management strategic plan: A blueprint for constructing or improving a records and information management program, a plan to effectively manage the life cycle of records and information, a road map for effectively preserving historical and archival records, and a tool for developing a system that ensures delivery of the right information to the right person at the right time.

records manager: Individual within an organization who is responsible for systematically managing the recorded information generated and received by the organization. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

records retention and disposition schedule: *See* RECORDS RETENTION SCHEDULE.

records retention schedule: A comprehensive list of records series titles, indicating for each series the length of time it is to be maintained. Also known as *records retention and disposition schedule*. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

records series: A group of related records filed/used together as a unit and evaluated as a unit for retention purposes, for example, a personnel file consisting of an application, reference letters, benefit forms, and so forth. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

regulation: The process of controlling something through rule or procedure; a rule that is issued by an authorized government agency and that has the force of law. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

relational content analysis: A method of content analysis that goes beyond determining the presence of concepts to looking for meaningful (semantic) relationships between those concepts. Also known as *semantic analysis*. (Palmquist, Carley, and Dale, "Applications of Computer-Aided Text Analysis")

relational database: Information that has been organized, structured, and stored into tables of rows and columns (flat files) so that related data elements from different tables can be manipulated and extracted for various purposes. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

relational database management system(s) (RDBMS): A type of database management system (DBMS) that stores data in the form of related tables. (*Webopedia*)

reliability: Qualities of a record that demonstrate its trustworthiness over time. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

repository: A place where things can be stored and maintained; a storehouse. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

request for information (RFI): Request made typically during the project planning phase where a buyer cannot clearly identify product requirements, specifications, and purchase options. RFIs clearly indicate that award of a contract will not automatically follow. (BusinessDictionary.com)

request for proposal (RFP): Document used in sealed-bid procurement procedures through which a purchaser advises the potential suppliers of (1) statement and scope of work, (2) specifications, (3) schedules or timelines, (4) contract type, (5) data requirements, (6) terms and conditions, (7) description of goods and/or services to be procured, (8) general criteria used in evaluation procedure, (9) special contractual requirements, (10) technical goals, (11) instructions for preparation of technical, management, and/or cost proposals. RFPs are publicly advertised and suppliers respond with a detailed proposal, not just with a price quotation. (BusinessDictionary.com)

request for quotation (RFQ): Document used in soliciting price and delivery quotations that meet minimum quality specifications for a specific quantity of specific goods and/or services. (BusinessDictionary.com)

respect des fonds: This archival principle dictates that records of different origins (provenance) be kept separate to preserve their context. *See also* PROVENANCE.

reverse index search: The reverse index tells you what documents contain the word you are searching for.

rights management: A system that identifies intellectual property rights relevant to particular works and that can provide individuals with access to those works on the basis of permissions to the individuals. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

RIM: *See* RECORDS AND INFORMATION MANAGEMENT.

risk analysis: Process to comprehend the nature of risk and to determine the level of risk. (BSI, *BS 31100:2011*)

risk appetite: Amount and type of risk that an organization is willing to pursue or retain. (BSI, *BS 31100:2011*)

risk assessment: Overall process of risk identification, risk analysis, and risk evaluation. (BSI, *BS 31100:2011*)

risk capacity: The amount and type of risk an organization is able to support in pursuit of its business objectives. (Ernst and Young, "Risk Appetite")

risk level: Magnitude of a risk or combination of risks, expressed in terms of the combination of consequences and their likelihood. (BSI, *BS 31100:2011*)

risk management: Process that ensures that an organization does not assume an unacceptable level of risk; includes both records risk analysis and records risk assessment procedures. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

risk mitigation: A systematic reduction in the extent of exposure to a risk and/or the likelihood of its occurrence. Also called risk reduction. (BusinessDictionary.com)

risk tolerance: Organization's or stakeholder's readiness to bear the risk after treatment in order to achieve its objectives. (BSI, *BS 31100:2011*)

RMA: *See* RECORDS MANAGEMENT APPLICATION.

RSS: *See* REALLY SIMPLE SYNDICATION.

schema: Logical plan showing the relationships between metadata elements, normally through establishing rules for the use and management of metadata, specifically regarding the semantics, the syntax, and the optionality (obligation level) of values. (ISO, *ISO 23081-1:2006*)

secondary value (of records): The usefulness or significance of records based on purposes other than that for which they were originally created. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

semantic analysis: Semantic analysis goes beyond determining the presence of concepts to looking for meaningful (semantic) relationships between those concepts. Also known as *relational content analysis*. (Palmquist, Carley, and Dale, "Applications of Computer-Aided Text Analysis")

semantic search: A semantic search will search and discover the meaning of words and not just their occurrence.

semantic web: An extension of the current World Wide Web that catalogs information on a webpage and reprocesses it so that other machines including computers can understand the information. (BusinessDictionary.com)

semantics: Semantics refers to the meaning of words.

semi-structured data: Unstructured data that has been organized and/or has metadata attached that describes its content, for example, SharePoint lists and document libraries.

service level agreement (SLA): A contract between an application service provider (ASP) and the end user that stipulates and commits the ASP to a required level of service. An SLA should contain a specified level of service, support options, enforcement or penalty provisions for services not provided, a guaranteed level of system performance as relates to downtime or uptime, a specified level of customer support, and what software or hardware will be provided and for what fee. *See also* TERMS OF SERVICE (TOS) AGREEMENT. (*Webopedia*)

SMART objectives: A set of goals that are characterized by being specific, measurable, available at an acceptable cost, relevant, and time-bound. SMART objectives are typically used in a business context by project managers when initially evaluating and setting goals for a project. (Business Dictionary.com)

social bookmarking: A method for storing and managing bookmarks of webpages with individually chosen keywords; also the sharing of this data. (Dictionary.com)

social media: Tools and platforms, usually on the Internet, specifically designed for participatory interaction such as publishing, conversing, and sharing content, including multimedia. The tools include but are not limited to blogs, wikis, photo or video sharing, microblogging, and social networking sites. (ARMA International, *Implications of Web-Based, Collaborative Technologies in Records Management*)

social media policy: A social media policy (also called a social networking policy) is a corporate code of conduct that provides guidelines for employees who post content on the Internet either as part of their job or as a private person. (SearchCompliance, "Social Media Policy")

social media record: Social media content, regardless of physical form or characteristics, which meets the organization's criteria for a record. The term is used in this text to represent all records posted to, created through, or residing in social media technologies.

social networking: A special type of social media that uses web and Internet technology to enable interactions between people through the use of such features as personal profiles, blogs, content sharing, and messaging surrounded by an enabling framework of file storage, navigation, searching, and access controls. (ARMA International, *Implications of Web-Based, Collaborative Technologies in Records Management*)

social networking site: A website that provides a virtual community for people to share their daily activities with family and friends, or to share their interest in a particular topic, or to increase their circle of acquaintances. (PCMag.com, *Encyclopedia*)

software as a service (SaaS): Delivery of software over the Internet, eliminating the need to install the software on the organization's own computers.

static website: A website that uses Uniform Resource Locators (URLs) to point to fixed content. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

strategic plan: A broadly defined plan aimed at creating a desired future. (BusinessDictionary.com)

strategy: A method or plan chosen to bring about a desired future, such as achievement of a goal or solution to a problem; the art and science of planning and marshaling resources for their most efficient and effective use. (BusinessDictionary.com)

structural metadata: Information about the relationship between the parts that make up a compound object. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

structured data: Data organized in a way that makes it identifiable, such as a database structured in the form of columns and rows.

structured search: Structured search is a method of using the structure of a document to help users find the right documents in a large collection of documents. (McCreary, "Structured Search")

subject filing system: A filing system in which documents are organized into broad subject areas, such as departments and functional areas. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

SWOT analysis: Situation analysis in which internal strengths and weaknesses of an organization, and external opportunities and threats faced by it are closely examined to chart a strategy. (BusinessDictionary.com)

system of engagement: A type of system characterized by interactions, immediacy and accessibility, collaboration, and conversations. Examples are web conferences and microblogs. Also known as *social business systems*. (Moore, *A Sea Change in Enterprise IT*)

system of record: A type of system characterized by transactions, accuracy and completeness, authored content, and documents (text and graphics). Examples are systems to manage human resources, order processing, customer relationships, and supply chain management. (Moore, *A Sea Change in Enterprise IT*)

tagging: A specific piece of metadata—keyword term or phrase—that is assigned to a content object for use in browsing or searching. The process of tagging generally refers to the ability of users to collaboratively add their own descriptive tags to information. (ARMA International, *Implications of Web-Based, Collaborative Technologies in Records Management*)

taxonomy: A structure used for classifying materials into a hierarchy of categories and subcategories. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

technology risks: Risks associated with information security, electronic communications, and software applications. (ARMA International, *Evaluating and Mitigating Records and Information Risks*)

telecommuting: Substitution of telecommunications for transportation in a decentralized and flexible work arrangement that allows part-time or full-time employees to work at home via a computer attached to the employer's data network. (BusinessDictionary.com)

telework: European term for *telecommuting*. (BusinessDictionary.com)

terms of service (TOS) agreement: Rules one must agree to and abide by in order to use a service. Also known as *Terms of Use* or *Terms and Conditions*. *See also* SERVICE LEVEL AGREEMENT (SLA).

text content analysis tools: Tools that provide statistics about the text (written content)—such as word count, number of sentences, and reading ease—to help users improve their writing.

thesaurus: A controlled list of terms linked together by semantic, hierarchical, associative, or equivalence relationships; a tool used as a guide to allocating classification terms to individual records. (ISO, *ISO/TR 15489-2:2001*)

topic map: A set of topics and associations. The user can freely define any relationship, and it is possible to link subjects to a related information resource. (Topic Maps Lab)

Topic Maps: Topic Maps is an international industry standard (*ISO 13250*) for technology that enables information management and interchange. (Topic Maps Lab)

transfer (custody): Change of custody, ownership, and/or responsibility for records. (ISO, *ISO 15489-1:2001*)

transfer (movement): Moving records from one location to another. (ISO, *ISO 15489-1:2001*)

transient data: Data created within an application session that passes quickly into and out of existence producing results beyond itself; at the end of the session, it is discarded or reset back to its default and not stored in a database (PCMag.com, *Encyclopedia*)

transitory records: Records needed for a short time that can be acted upon and then destroyed. (Archives of Ontario, *Transitory Records*)

trend spotting: The process of systematically monitoring and assessing both the internal and external environments to identify changes taking place over the short or long term, analyzing their implications for the organization, and interpreting their impact on professional practice.

trusted digital repository: One whose mission is to provide reliable, long-term access to managed digital resources to its designated community, now and in the future. (RLG, *Trusted Digital Repositories*)

trustworthiness: The quality of being dependable and reliable; in the context of electronic records, trustworthiness often implies that the system is dependable and produces consistent results based on well-established procedures. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

unstructured data: A generic label for describing any corporate information that is not in a database. (SearchBusinessAnalytics, "What Is Unstructured Data?")

usability: Qualities of a record that allow it to be accessed, processed, and understood over time. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

vector search model: The vector search model considers a search query a vector in keyword space and then scores the items located based on the distance from your query, calculated by counting the number of times keywords appeared in each document, the size of the document, and the density of the keywords in the document. Also known as the *vector space search model*.

virtual office applications: Software applications that enable staff to access web-based tools (e.g., e-mail, calendar, word processing, spreadsheets, and web conferencing) remotely.

virtual world: A virtual world is an interactive simulated environment accessed by multiple users through an online interface. Also known as *digital world*, *simulated world*, or, in some cases, *immersive environment*. (VWR, "What Is a Virtual World?")

vision statement: An aspirational description of what an organization would like to achieve or accomplish in the mid-term or long-term future. It is intended to serve as a clear guide for choosing current and future courses of action. *See also* MISSION STATEMENT. (BusinessDictionary.com)

vital record: Records that are fundamental to the functioning of an organization and necessary to continue operations without delay under abnormal conditions. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

vital records manual: A communications tool used to document the vital records program either published separately or as part of a records management manual.

vital records program: Policies, plans, and procedures developed and implemented and the resources needed to identify, use, and protect the essential records needed to meet operational responsibilities under emergency or disaster conditions or to protect the organization's rights or those of its stakeholders. (Environmental Protection Agency, "Glossary of Terms")

vital records schedule: A listing of an organization's vital records along with an explanation of how each is to be protected from destruction in the event of a disaster. The information can be gathered from the records inventory.

vital statistics: Public records required by law that document significant life events, such as births, deaths, marriages, divorces, and public health events, and that are kept by city, county, state, or other governmental bodies. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

vocabulary: The set of terms used in an index or in the headings of a catalog. *Computing*: The set of labels used in an Extensible Markup Language (XML) document. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

Waferfiche: Silicon wafers, a "write once read many" (WORM) technology with a life expectancy of 500 years, used by one firm to provide long-term storage services. (NanoArk Corporation)

warm site: An alternative facility that has the equipment and resources available to recover business functions in the event of a disaster. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

Web 2.0: The name given to the second generation of the World Wide Web that utilizes social media and other collaborative services. (ARMA International, *Implications of Web-Based, Collaborative Technologies in Records Management*)

Web 3.0: A term also used interchangeably with the *semantic web* by some experts. Web 3.0, a phrase coined by John Markoff of the New York Times in 2006, refers to a supposed third generation of Internet-based services that collectively comprise what might be called "the intelligent web"—such as those using semantic web, microformats, natural language search, data-mining, machine learning, recommendation agents, and artificial intelligence technologies—and that emphasize machine-facilitated understanding of information in order to provide a more productive and intuitive user experience. (Spivack, "Timeline and Definition")

web archiving: Saving the pages from websites as they change over time for historical purposes. Using spiders similar to the ones search engines routinely deploy, there are services that archive the pages of a company's own website or pages from selected websites across the Internet. (PCMag.com, *Encyclopedia*)

web content management system(s) (WCMS): Allows a number of people to maintain a website using a simple web-browser-based interface (instead of manually authoring webpages). Most use a database to store and control a dynamic collection of web material.

web publishing: Creating a website and placing it on the web server. (PCMag.com, *Encyclopedia*)

web services: A standardized way of integrating web-based applications using the XML, SOAP, WSDL, and UDDI open standards over an Internet protocol backbone. (*Webopedia*)

wide area network (WAN): Data and voice communication network that extends beyond the geographical limitations of a local area network (LAN). (BusinessDictionary.com)

wiki: A webpage or series of webpages hosted on the Internet or an intranet that allow those with access and permissions to easily edit, contribute, and publish content. (ARMA International, *Using Social Media in Organizations*)

word processing: The process of creating, formatting, and editing documents with the assistance of computers. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

word processor: (1) A type of software that displays characters based on a user's input on an external or internal keyboard. The software allows the user to edit, modify, and format documents based on display preferences. The most common word processors are Microsoft Word and WordPerfect. (2) A machine similar to a typewriter that prints text as a user strokes keys on a keyboard. These machines have mostly been replaced with personal computers. (BusinessDictionary.com)

workflow: A series of tasks defined within an organization to produce a final outcome. (Excerpted from *Glossary of Records and Information Management Terms*, 4th ed., ©ARMA International, http://www.arma.org/, used with permission)

workflow diagram (WFD): Graphical depiction of steps taken, time spent, distance traveled, and other aspects of the way a particular piece of work is done. (BusinessDictionary.com)

World Wide Web (WWW): The massive collection of information and services accessible over the Internet through the hypertext transfer protocol (HTTP); the servers and network infrastructure used to store and deliver web-based information and services. (Pearce-Moses, *A Glossary of Archival and Records Terminology*, ©SAA, http://www2.archivists.org/glossary, used with permission)

"write once read forever" (WORF): A WORF medium cannot be overwritten, erased, or corrupted by natural processes. (Millenniata, "M-DISC") *See also* M-DISC.

XML: *See* Extensible Markup Language.

XML schema: Documents defining the legal building blocks of an XML document.

Bibliography

Academy of Certified Archivists. "Certification Maintenance—Option B: Recertification by Petition." Accessed November 26, 2012. http://www.certifiedarchivists.org/members-area/certification-maintenance.html#petition.

Adams Data Management. "Open Shelf Active File Management." Accessed November 26, 2012. http://www.adamsdatamanagement.com/open-shelf-active-file-mgmt-atlanta-ga.htm.

AIIM. Accessed December 21, 2012, http://www.aiim.org/.

———. "Expert Blogs." Accessed December 2, 2012. http://www.aiim.org/Community/Blogs/Expert.

———. "Index E—Community Topics." Accessed November 26, 2012. http://www.aiim.org/community/wiki/view/Index-E.

———. *Revised Framework for Integration of Electronic Document Management Systems and Electronic Records Management Systems*. ANSI/AIIM/ARMA Technical Report, 48-2006. Silver Spring, MD: AIIM International, 2006.

———. "Welcome to the AIIM Job Center." Accessed November 26, 2012. http://jobs.aiim.org/c/job.cfm?vnet=0&exclude=7934465&site_id=1633&jb=9141144.

———. "What Is Enterprise Content Management (ECM)?" Accessed November 26, 2012. http://www.aiim.org/What-is-ECM-Enterprise-Content-Management.

———. "What Is Information Management?" Accessed November 26, 2012. http://www.aiim.org/what-is-information-management.

Alaska Department of Commerce, Community, and Economic Development. "Sample Filing System for Small Communities." Accessed November 26, 2012. http://www.dced.state.ak.us/dca/logon/admin/pub/SampleFilingSystem.pdf.

Amazon Web Services. "Summary of the Amazon EC2 and Amazon RDS Service Disruption in the US East Region." April 29, 2011. http://aws.amazon.com/message/65648/.

American Council for Technology (ACT), and Industry Advisory Council (IAC). *Best Practices Study of Social Media Records Policies*. March 2011. http://www.actgov.org/knowledgebank/whitepapers/Documents/Shared%20Interest%20Groups/Collaboration%20and%20Transformation%20SIG/Best%20Practices%20of%20Social%20Media%20Records%20Policies%20-%20CT%20SIG%20-%2003-31-11%20(3).pdf.

AncientScripts.com. "Cuneiform." Accessed November 29, 2011. http://www.ancientscripts.com/cuneiform.html.

Anderson, K. "Education and Training for Records Professionals." *Record Management Journal* 17, no. 2 (2007): 94–106.

Anupindi, Nagesh V. "Inmon vs. Kimball—An Analysis." Nagesh.com. August 25, 2005. http://www.nagesh.com/publications/technology/173-inmon-vs-kimball-an-analysis.html.

Application Security, Inc. *An Examination of Database Breaches at Higher Education Institutions*. 2010. http://www.appsecinc.com/techdocs/whitepapers/Higher-Ed-Whitepaper-Edited.pdf.

Archive Storage Solutions. "Archive and Records Management Catalog." http://www.archivestorage solutions.com/.

Archives of Ontario, Government of Ontario, Canada. *Transitory Records*. Government of Ontario Common Records Series. December 8, 2008. http://www.archives.gov.on.ca/en/recordkeeping/documents/Transitory-Records-Common.pdf.

ARMA International. "ARMA International Maturity Model for Information Governance." Accessed November 28, 2012. http://www.arma.org/garp/metrics.cfm.

———. "Certified Information Governance Professional." Accessed February 14, 2013. http://www.arma.org/IGP/index.cfm.

———. "Cobalt Award—Application Pre-Screening, Question 8: Does Your Organization Provide All Employees with Formal Training on Their Roles and Responsibilities in Managing Records and Information?" Accessed November 28, 2012. http://www.arma.org/excellence/prescreen.cfm.

———. *Controlled Language in Records and Information Management*. Lenexa, KS: ARMA International, 2008.

———. *The Digital Records Conversion Process: Program Planning, Requirements, Procedures*. ANSI/ARMA 16-2007. Lenexa, KS: ARMA International, 2007.

———. *Establishing Alphabetic, Numeric, and Subject Filing Systems*. Lenexa, KS: ARMA International, 2005.

———. *Evaluating and Mitigating Records and Information Risks*. Overland Park, KS: ARMA International, 2009.

———. "Generally Accepted Recordkeeping Principles." Accessed February 14, 2013. http://www.arma.org/garp/.

———. *Glossary of Records and Information Management Terms*. 3rd ed. Accessed November 28, 2012. http://www.arma.org/standards/glossary/index.cfm?allTerms=true.

———. *Glossary of Records and Information Management Terms*. 4th ed. Overland Park, KS: ARMA International, 2012.

———. *Guideline for Evaluating Offsite Records Storage Facilities*. Lenexa, KS: ARMA International, 2007.

———. *Guideline for Outsourcing Electronic Records Storage and Disposition*. Lenexa, KS: ARMA International, 2008.

———. *Guideline for Outsourcing Records Storage to the Cloud*. Lenexa, KS: ARMA International, 2010.

———. *Implications of Web-Based, Collaborative Technologies in Records Management*. Lenexa, KS: ARMA International, 2011.

———. "Information Governance Maturity Model, Metrics." Accessed February 14, 2013. http://www.arma.org/garp/metrics.cfm.

———. *Records and Information Management Core Competencies*. Lenexa, KS: ARMA International, 2007.

———. *Requirements for Managing Electronic Messages as Records*. 2nd ed. Lenexa, KS: ARMA International, 2009.

———. *Retention Management for Records and Information*. Lenexa, KS: ARMA International, 2009. First published in 2005 by ARMA International.

———. *Using DoD 5015.02-STD outside the Federal Government Sector*. Lenexa, KS: ARMA International, 2009.

———. *Using Social Media in Organizations: A Technical Report*. ARMA TR-21-2012. Overland Park, KS: ARMA International, 2012.

———. *Vital Records Programs: Identifying, Managing, and Recovering Business-Critical Records*. ANSI/ARMA, 5-2010. Prairie Village, KS: ARMA International, 2010.

———. *Website Records Management: An ARMA International Guideline*. Overland Park, KS: ARMA International, 2009.

———. "What Is Electronic Discovery?" Accessed December 22, 2012. http://www.arma.org/rim/101/articles.cfm?key=rim101ediscovery.

———. "What Is Electronic Records Management?" Accessed January 27, 2013. http://www.arma.org/rim/101/index.cfm.

ARMA International and Society of American Archivists. *Sample Forms for Archival and Records Management Programs*. Lenexa, KS: ARMA International, 2002.

ARMA International Standards Development Program Workgroup. *Records Center Operations*. 3rd ed. ANSI/ARMA TR01-2011. Overland Park, KS: ARMA International, 2011.

Asaro, Tony. "Content Chaos." *Storage* 9, no. 3 (May 2010). http://searchstorage.techtarget.com/magazine-sections/2010/05.

ASIS International and British Standards Institution (BSI). *ASIS/BSI BCM.01-2010: Business Continuity Management Systems: Requirements with Guidance for Use* (an American National Standard). November 2, 2010. http://sac.acp-international.com/REV1921_BCMStandard.pdf.

Associated Press. "Hospital Workers Suspended for Allegedly Peeking at Clooney Medical Info." *FoxNews.com*, October 10, 2007. http://www.foxnews.com/story/0,2933,300648,00.html.

Atlanta Journal-Constitution. "Friends Requests Drive Bill Gates Off Facebook." *Atlanta Journal-Constitution*, July 25, 2009, Metro Atlanta edition. http://www.ajc.com/news/friends-requests-drive-bill-100760.html.

Atlassian. "Confluence." Accessed December 1, 2011. http://www.atlassian.com/software/confluence/overview#overview/tour/enterprise-wiki-software?&_suid=597.

Austin Community College District. "Specialist, Records Center." Accessed November 28, 2012. http://www5.austincc.edu/ehire/jobdesc/public_jobdesc.php?titleid=19403.

Avilés-Mendoza, Guillermo, Christina Hartman, Katie Kolor, and Megan Myers. *National Institutes of Health Vital Records Program White Paper.* October 2006. http://oma.od.nih.gov/ms/records/VRPWP.pdf.

Bailey, Steve. *Managing the Crowd: Rethinking Records Management for the Web 2.0 World*. London: Facet Publishing, 2008.

Beckett, Christine. "District Court Withdraws Metadata Opinion After Settlement." *Reporters Committee for Freedom of the Press*, June 23, 2011. http://www.rcfp.org/browse-media-law-resources/news/district-court-withdraws-metadata-opinion-after-settlement

Bell, Lindsay. "Dell's Social Media University." *Salesforce Marketing Cloud* (blog), May 26, 2011. http://www.radian6.com/blog/2011/05/social-media-university/.

Bellis, Mary. "History of Email and Ray Tomlinson." *About.com Guide*. Accessed January 27, 2013, http://inventors.about.com/od/estartinventions/a/email.htm.

Belsie, Laurent. "Wal-Mart: World's Largest Company." *The Christian Science Monitor*, February 19, 2002. http://www.csmonitor.com/2002/0219/p01s04-usec.html.

Benedon, William. "Outsourcing: The Right Decision?" *Information Management Journal* 34, no. 1 (January 1, 2000). http://www.freepatentsonline.com/article/Information-Management-Journal/77452277.html.

Berners-Lee, Tim, James Hendler, and Ora Lassila. "The Semantic Web." *Scientific American*, May 17, 2001. http://www.scientificamerican.com/article.cfm?id=the-semantic-web.

Bird, Lyndon. *Dictionary of Business Continuity Management Terms, Version 2*. The Business Continuity Institute. January 2012. http://www.thebci.org/glossary.pdf.

Bisconti, Ken. "Ken Bisconti Interview." Lotusphere 2011 Product Expo. YouTube video, 13:02. Posted by IBM ECM on February 24, 2011. http://www.youtube.com/watch?v=DoAdQ8wTTjQ.

Bolick, Cheryl Mason. "Digital Archives: Democratizing the Doing of History." *International Journal of Social Education* 21, no. 1 (Spring–Summer 2006): 122–134. http://eric.ed.gov/PDFS/EJ782136.pdf.

Boudreaux, Chris. "Policy Database." Social Media Governance: Empowerment with Accountability by Chris Boudreaux. Accessed November 28, 2012. http://socialmediagovernance.com/policies.php#axzz1iWXAyX1c.

Brandenberg, Denise. "Request for Information vs. Request for Proposal." eHow. Accessed November 28, 2012. http://www.ehow.com/about_6462623_request-information-vs_-request-proposal.html.

BSI (British Standards Institution). *BS 25999-1:2006: Business Continuity Management: Code of Practice*. London: British Standards Institution, 2006.

———. *BS 25999-1:2007: Business Continuity Management: Specification*. London: British Standards Institution, 2007.

———. *BS 31100:2011: Risk Management—Code of Practice and Guidance for the Implementation of BS ISO 31000*. London: British Standards Institution, 2011.

BusinessDictionary.com. Accessed December 21, 2012. http://www.businessdictionary.com/.

California Records and Information Management, Department of General Services. *Vital Records Protection and Disaster Recovery Handbook*. Accessed December 2, 2012. http://www.documents.dgs.ca.gov/osp/calrim/disasterhndbk12-03.pdf.

Canada, Government of. *Government of Canada Records Management Application Profile*. February 7, 2006. http://www.collectionscanada.gc.ca/obj/007002/f6/007002-5002-e.rtf.

———. *Government of Canada Records Management Metadata Standard, Version 1.0*. February 7, 2006. http://www.collectionscanada.gc.ca/007/002/007002-5001-e.html.

Caplan, Priscilla. *Understanding PREMIS*. Library of Congress Network Development and MARC Standards Office. February 1, 2009. http://www.loc.gov/standards/premis/understanding-premis.pdf.

Care Converge. "Care Converge Portal." Solutions. Last modified 2010. http://www.careconverge.com/healthcare/healthcareportal.htm.

Carmichael, David W. *Organizing Archival Records: A Practical Method of Arrangement and Description of Small Archives*. Walnut Creek, CA: AltaMira Press, 2004.

CBS News. "3 Emerging Technologies to Go Mainstream in 2011." CBS News video, 30 min. CBS MoneyWatch. January 10, 2011. http://www.cbsnews.com/video/watch/?id=10495949n?tag=bnet domain.

CheckFacebook. "CheckFacebook." Last modified December 2, 2012. http://www.checkfacebook.com/?ref=checkfacebook.

Chippewa Valley Technical College. "Records and Information Management Specialist." Accessed November 28, 2012. http://www.cvtc.edu/programs/certificate-catalog/Pages/Records-and-Info-Management-Specialist.aspx.

Choksy, Carol E. B. *Where Records Management Should Report: A Study and Comparison of Industry and Government*. ARMA International. 2008. http://www.arma.org/pdf/journal/rmreporting.pdf.

Cisco, Susan. "How to Win the Compliance Battle Using 'Big Buckets.'" *Information Management*, July–August 2008. http://content.arma.org/IMM/JulyAug2008/How_to_win_the_compliance_battle.aspx.

City of Mission, Texas. "Purchasing Department—Mission Statement." Accessed November 29, 2012. http://www.missiontexas.us/city-departments/purchasing-department.

Cobent. "Compliance Training—Streamline Compliance Training." Accessed November 29, 2012. http://www.cobent.com/Solutions/Regulatory-Compliance-Training.aspx.

Colorado State University. "Writing@CSU—An Introduction to Content Analysis." Accessed November 29, 2012. http://writing.colostate.edu/guides/page.cfm?pageid=1305.

Computermuseum.li. "Univac 1 (1951)—First Commercially Available Computer." Lexicon Services. Accessed December 3, 2012. http://www.computermuseum.li/Testpage/UNIVAC-1-FullView-A.htm.

Convery, N., and K. Ferguson-Boucher. "Storing Information in the Cloud." *Information and Records Management Society Bulletin*, May 2011: 162–164.

Corcentric. "Electronic Purchase Order Software and Purchase to Pay Solutions." Accessed November 29, 2012. http://www.corcentric.com/ap-automation/purchase-order-requisition.aspx.

Covington, Michael A. "IBM Selectric Typewriter Resource Page." Covington Innovations. Revised August 5, 2010. http://www.covingtoninnovations.com/selectric/index.html.

Cox, Richard J. *Closing an Era: Historical Perspectives on Modern Archives and Records Management*. Westport, CT: Greenwood Press, 2000.

Craig, Barbara L., and James M. O'Toole. "Looking at Archives in Art." *American Archivist* 63, no. 1 (Spring–Summer 2000): 97–125. http://archivists.metapress.com/content/11m20568371583v7/fulltext.pdf.

Craughwell, Thomas. "#3: The Watergate Scandal (Top 10 Mistakes by US Presidents." *Encyclopedia Britannica Blog*, January 1, 2009. http://www.britannica.com/blogs/2009/01/3-the-watergate-scandal-top-10-mistakes-by-us-presidents/.

Credant Technologies. "Research Shows More Than 17,000 USB Sticks Left at Dry Cleaners." *Information and Records Management Society Bulletin*, May 2011: 161.

Crylen, Katie, and Meghan Stedt. "Cave of Lascaux." Rich East High School. Accessed November 29, 2011. http://www.richeast.org/htwm/las/las.html.

Data.gov. "About Data.Gov." Accessed November 29, 2012. http://www.data.gov/about.

Department of Agriculture, Limpopo Provincial Government, Republic of South Africa. *Records Management Policy, Version 3*. June 2011. http://www.lda.gov.za/downloads/policies/LDA%20RECORDS%20MANAGEMENT%20POLICY%20version%203.pdf.

Department of Business and Employment, Northern Territory Government, Australia. *Records Management Advice No 10: Cloud Computing and Recordkeeping*. 2011. http://www.nt.gov.au/dbe/it/records/docs/recs_advice_no10_cloud_computing_and_recordkeeping.pdf.

Department of Defense, Chief Information Officer. *DoD 5015.02-STD: Electronic Records Management Software Applications Design Criteria Standard*. April 25, 2007. http://www.dtic.mil/whs/directives/corres/pdf/501502std.pdf .

Department of the Navy Chief Information Officer. *2012 Annual Records Management Refresher Training Guide*. US Department of the Navy. 2012. http://www.doncio.navy.mil/ContentView.aspx?ID=1885.

The Depository Trust and Clearing Corporation (DTCC). "No More Paper: The Problems with Paper—Overview: Paper vs. Electronic Securities." Accessed November 29, 2012. http://www.dtcc.com/leadership/issues/nomorepaper/investors/#b2.

Dictionary.com. Accessed December 22, 2012. http://dictionary.reference.com/.

Digital Curation Centre (DCC). "DCC Charter and Statement of Principles." Accessed November 29, 2012. http://www.dcc.ac.uk/about-us/dcc-charter.

———. "What Is Digital Curation?—The Digital Curation Lifecycle." Accessed December 2, 2012. http://www.dcc.ac.uk/digital-curation/what-digital-curation.

Dines, Rachel. "The State of Disaster Recovery Preparedness." *Disaster Recovery Journal,* 24, no. 1 (Winter 2011). http://www.drj.com/2011-articles/winter-2011-volume-24-issue-1/the-state-of-disaster-recovery-preparedness.html.

Dines, Rachel, and Chris Nicolini. "Data Centers: Outsource or Own?" Windstream Hosted Solutions. November 17, 2011. http://www.windstreambusiness.com/media/251805/datacenters-outsource_or_own-2011.pdf.

DISA (Defense Information Systems Agency). *Access Control in Support of Information Systems: Security Technical Implementation Guide, Version 2, Release 2*. December 26, 2008. http://www.sentekglobal.com/solutions/downloads/access_control_stig_v2r2_final_26_dec_2008.pdf.

DLM Forum Foundation. *MoReq2010: Modular Requirements for Records Systems*. 2010/2011. http://moreq2010.eu/pdf/MoReq2010-Core+Plugin(v1-0).pdf.

DPC (Digital Preservation Coalition). "Introduction—Definitions and Concepts." Accessed November 29, 2012. http://www.dpconline.org/advice/preservationhandbook/introduction/definitions-and-concepts.

Drive Your Success. "Understanding Business Process Mapping and Workflow Diagrams." Accessed November 29, 2012. http://www.driveyoursuccess.com/2011/08/understanding-business-process-mapping-workflow-diagrams.html.

Education-Portal.com. "Dewey Decimal System vs. Library of Congress: What's the Difference?" December 9, 2010. http://education-portal.com/articles/Dewey_Decimal_System_vs_Library_of_Congress_Whats_the_Difference.html.

Electronic Frontier Foundation. "Updates." Accessed December 2, 2012. https://www.eff.org/.

EMC. "New Study Forecasts Explosive Growth of the Digital Universe; Spotlights Worldwide Phenomenon of 'Digital Shadow.'" *Marketwire*, March 11, 2008. http://www.marketwire.com/press-release/New-Study-Forecasts-Explosive-Growth-Digital-Universe-Spotlights-Worldwide-Phenomenon-NYSE-EMC-831713.htm.

EMC^2. *15-Minute Guide to Enterprise Content Management*. Accessed February 1, 2012. http://web.emc.com/15minguidetoecm?activity_id=66241.

EMC Corporation. *EMC Information Governance Maturity Model Assessment*. Accessed November 29, 2012. http://www.emc.com/collateral/services/consulting/h4905-info-gov-maturity-model-svo.pdf.

Ennis, Sharon R., Merarys Ríos-Vargas, and Nora G. Albert. *The Hispanic Population: 2010*. 2010 Census Briefs. May 2011. http://www.census.gov/prod/cen2010/briefs/c2010br-04.pdf.

Environmental Protection Agency. "Glossary of Terms," in *Developing and Maintaining a Vital Records Program*. http://www.epa.gov/records/tools/toolkits/vital/b.htm.

———. "What Is a Records Series?" Last modified March 8, 2012. http://www.epa.gov/records/what/quest5.htm.

Environmental Protection Agency, Office of Environmental Information. *EPA Information Procedures: Vital Records Procedures*. June 8, 2009. http://www.epa.gov/irmpoli8/policies/CIO2155P010.pdf.

Ernst and Young. "Risk Appetite: The Strategic Balancing Act." Accessed December 22, 2012. http://www.ey.com/GL/en/Services/Advisory/Risk-appetite—the-strategic-balancing-act.

Erway, Ricky. *Defining "Born Digital."* OCLC Online Computer Library Center, Inc. November 2010. http://www.oclc.org/research/activities/hiddencollections/borndigital.pdf.

Etherington, Suzanne, and Ann Marie Przybyla. *Inventory and Planning: The First Steps in Records Management*. Archives Technical Information Series, 76 (2003). http://www.archives.nysed.gov/a/records/mr_pub76_accessible.html.

Europa. "Protection of Personal Data." Last modified January 2, 2011. http://europa.eu/legislation_summaries/information_society/data_protection/l14012_en.htm.

ExpertGlossary. "Electronic Record." Accessed December 1, 2012. http://www.expertglossary.com/definition/electronic-record#.

Facebook. Accessed December 2, 2012. http://www.facebook.com/.

———. "General Account Settings." Accessed December 2, 2012. https://www.facebook.com/download/?h=d6f4f48fca84d0657dc6d3e1243fb3e9.

———. "Newsroom." Accessed December 2, 2012. http://www.facebook.com/press/info.php?statistics.

———. "Statement of Rights and Responsibilities—Sharing Your Content and Information." Revised June 8, 2012. http://www.facebook.com/legal/terms.

Farber, Dan. "Twitter Hits 400 Million Tweets Per Day, Mostly Mobile." CNET News. June 6, 2012. Accessed January 27, 2013, http://news.cnet.com/8301-1023_3-57448388-93/twitter-hits-400-million-tweets-per-day-mostly-mobile/.

Federal Agencies Digitization Guidelines Initiative. "Digitization Guidelines." Last modified September 5, 2012. http://www.digitizationguidelines.gov/.

Federal Depository Library Program (FDLP). "FDL Handbook." Accessed November 29, 2012. http://www.fdlp.gov/administration/handbook.

Federal Trade Commission. *Electronic Signatures in Global and National Commerce Act: The Consumer Consent Provision in Section 101(c)(1)(C)(ii)*. June 2001. http://www.ftc.gov/os/2001/06/esign7.htm.

FileHold. "Records Management Software." Accessed December 7, 2011. http://www.filehold.com/features/standard/records-management.

Finance Industry Regulatory Authority (FINRA). "FINRA Rule 2210. Communications with the Public." Accessed November 29, 2012. http://finra.complinet.com/en/display/display.html?rbid=2403&element_id=3617.

———. "Social Media Web Sites: Guidance on Blogs and Social Networking Web Sites." Regulatory Notice 10-06. January 2010. http://www.finra.org/web/groups/industry/@ip/@reg/@notice/documents/notices/p120779.pdf.

FindLaw. "Time Limits for Filing Product Liability Cases: State-by-State." Accessed November 29, 2012. http://injury.findlaw.com/defective-dangerous-products/defective-dangerous-products-law/state-time-limits-for-filing-product-liability-cases.html.

Firelock. "Media Vault Tour." Accessed November 29, 2012. http://www.firelock.com/mediasecurity2.htm.

FOIA.gov. "Create a Basic Report." United States Department of Justice. Accessed December 2, 2012. http://www.foia.gov/data.html.

Forsyth, Paul. "Records Privatization Okayed: Region Opts to Hire Out Management of Inactive Files." *NiagaraThisWeek.com*, December 12, 2011. http://www.niagarathisweek.com/news/article/1261586—records-privatization-okayed.

———. "Records Storage Contract Eyed: Private Records Management Could Save Region $563,000 Over Five Years." *NiagaraThisWeek.com*, December 5, 2011. http://www.niagarathisweek.com/news/article/1256755—records-storage-contract-eyed.

Franks, Patricia C. "Understanding Web 2.0 and Challenges for the Records Manager." In *Information and Records Management Annual 2009 (IRMA)*, compiled by Margaret Pember and Roberta A. Cowan, 107–122. St. Helens, Australia: Records Management Association of Australasia, 2009. http://aussieleaks.info/Heiner.pdf.

Free Library. "Home Is Where the Business Is: Here's How You Can Live, Work and Make Money under One Roof." November 1, 1994. http://www.thefreelibrary.com/Home+is+where+the+business+is%3B+here%27s+how+you+can+live,+work+and+make...-a015891548.

Ganz, John F., David Reinsel, Christopher Chute, Wolfgang Schlichting, John McArthur, Stephen Minton, Irida Xheneti, Anna Toncheva, and Alex Manfrediz. *The Expanding Digital Universe: A Forecast of Worldwide Information Growth through 2010*. International Data Corporation (IDC). March 2007. http://www.emc.com/collateral/analyst-reports/expanding-digital-idc-white-paper.pdf.

Gartner. "Gartner Identifies Top Ten Disruptive Technologies for 2008 to 2012." May 28, 2008. http://www.gartner.com/it/page.jsp?id=681107.

———. *IT Glossary*. Accessed December 22, 2012. http://www.gartner.com/it-glossary/.

GeekPolice.net. "Digital Universe and Its Impact Bigger Than We Thought." March 14, 2008. http://www.geekpolice.net/t508-digital-universe-and-its-impact-bigger-than-we-thought.

Gellman, Robert. *Privacy in the Clouds: Risks to Privacy and Confidentiality from Cloud Computing*. World Privacy Forum. February 23, 2009. http://www.worldprivacyforum.org/pdf/WPF_Cloud_Privacy_Report.pdf.

Getty Research Institute. "Categories for the Description of Works of Art." Last modified June 9, 2009. http://www.getty.edu/research/publications/electronic_publications/cdwa/index.html.

Gibson Dunn. "2010 Year-End Electronic Discovery and Information Law Update." January 13, 2011. http://www.gibsondunn.com/publications/pages/2010YearEndE-Discovery-InformationLawUpdate.aspx.

Golliher, Sean. "SemTech 2011 Coverage: Paypal Discusses Social Commerce and the Semantic Web." Semanticweb.com. June 13, 2011. http://semanticweb.com/semtech-2011-coverage-paypal-discusses-social-commerce-and-the-semantic-web_b20536.

Google. "Google Announces Fourth Quarter and Fiscal Year Results." *Google Investor Relations*, January 19, 2012. http://investor.google.com/earnings/2011/Q4_google_earnings.html.

Gordon, C. H. *Forgotten Scripts: Their Ongoing Discovery and Decipherment*. New York: Basic Books, 1982.

Grand, P. M. *Prehistoric Art: Paleolithic Painting and Sculpture*. Greenwich: New York Graphic Society, 1967.

Gruber, Thomas R. "Ontology." In *Encyclopedia of Database Systems*, edited by Ling Liu and M. Tamer Ozsu. New York/London: Springer-Verlag, 2009. http://tomgruber.org/writing/ontology-definition-2007.htm.

———. *Toward Principles for the Design of Ontologies Used for Knowledge Sharing*. Technical Report KSL-93-04, Knowledge Systems Laboratory, Stanford University. Revised August 23, 1993. http://tomgruber.org/writing/onto-design.htm.

Haber, Stuart, and Pandurang Karnat. "A Content Integrity Service for Long-Term Digital Archives." Published in and presented at the IS&T Archiving 2006 Conference, Ottawa, Canada, May 23–26, 2006. http://www.hpl.hp.com/techreports/2006/HPL-2206-54.pdf.

Hill, Kashmir. "So, What Are These Privacy Audits That Google and Facebook Have to Do for the Next 20 Years?" *Forbes*, November 30, 2011. http://www.forbes.com/sites/kashmirhill/2011/11/30/so-what-are-these-privacy-audits-that-google-and-facebook-have-to-do-for-the-next-20-years/.

HIMSS Electronic Health Record Association. "HIMSS Katrina Phoenix Battles Ongoing Hurricane Effects with Health IT Donations." February 13, 2006. http://www.himssehra.org/ASP/pr_20060213b.asp.

HQ PaperMaker. "All about Paper—Paper Origins and History." Accessed November 29, 2011. http://www.hqpapermaker.com/paper-history/.

Hummel, Rob, and Jimmy Kemp. "Today's Digital Documents Are Tomorrow's Dinosaurs." *Washington Times*, December 22, 2011. http://www.washingtontimes.com/news/2011/dec/22/todays-digital-documents-are-tomorrows-dinosaurs/.

Humphries, Matthew. "Profile—Matthew Humphries." Geek.com. Accessed December 1, 2012. http://www.geek.com/users/Matthew/.

IAPP (International Association of Privacy Professionals). Accessed December 21, 2012. https://www.privacyassociation.org/.

IBM. "IBM Social Computing Guidelines." Accessed December 2, 2012. http://www.ibm.com/blogs/zz/en/guidelines.html.

IBM Institute for Business Value. *The Evolving Role of IT Managers and Chief Information Officers (CIOs): Findings from the 2010 IBM Global IT Risk Study*. IBM Corporation. 2010. ftp://ftp.boulder.ibm.com/software/uk/itsolutions/risk-study/The_2010_IBM_Global_IT_Risk_Study__UK_version.pdf.

"ICQ." The Media Briefing. Accessed January 27, 2013. http://www.themediabriefing.com/products/icq.

Inchware. "Pocket Synergy for BlackBerry." Accessed November 29, 2012. http://www.inchware.co.uk/products/synergy/blackberry.html.

Informatica. "Big Data." Accessed December 2, 2012. http://www.informatica.com/Documents/big_data/big_data_infographic_informatica1.jpg.

Information Enterprises Australia (IEA). *The Australian Record Retention Manual, 2010 Edition*. 11th ed. December 30, 2010. http://iea.highway1.com.au/getfile/482.

Institute for Business and Home Safety. *Open for Business: A Disaster Protection and Recovery Planning Toolkit for the Small to Mid-Sized Business*. 2007. http://www.disastersafety.org/content/data/file/OpenForBusiness_new.pdf.

Internal Revenue Service (IRS). "IRS Audit FAQS—How Far Back Can the IRS Go to Audit My Return?" Last modified August 3, 2012. http://www.irs.gov/Businesses/Small-Businesses-&-Self-Employed/IRS-Audit-FAQs.

International Council on Archives, Committee on Current Records in an Electronic Environment. *ICA Study 16: Electronic Records: A Workbook for Archivists*. April 2005. http://www.ica.org/10801/studies-and-case-studies/ica-study-n16-electronic-records-a-workbook-for-archivists.html.

International Digital Publishing Forum (IDPF). EPUB. Accessed November 30, 2012. http://idpf.org/epub.

Inter-University Consortium for Political and Social Research (ICPSR). "Defining Digital Curation." Last modified 2011. http://www.icpsr.umich.edu/icpsrweb/ICPSR/curation/index.jsp.

Iomart Hosting. *Rack Pack Blog*. Accessed January 14, 2013. http://rackpack.iomarthosting.com/?tag=cloud-hosting.

IRMT (International Records Management Trust). *Training in Electronic Records Management—Module 4: Preserving Electronic Records*, edited by Laura Millar. London: International Records Management Trust, 2009. http://irmt.org/documents/educ_training/term%20modules/IRMT%20TERM%20Module%204.pdf.

Iron Mountain. *Best Practices for Records Management (Iron Mountain Compliance Benchmark Report)*. 2010. Accessed December 8, 2011. http://ironmountain.com/forms/crm2010/2010_benchmark_report.pdf.

ISO (International Organization for Standardization). *ISO 10005:2005: Quality Management Systems—Guidelines for Quality Plans*. Geneva: ISO, 2005.

———. *ISO 15489-1:2001: Information and Documentation—Records Management—Part 1: General.* Geneva: ISO, 2001.

———. *ISO 15836:2009: Information and Documentation—The Dublin Core Metadata Element Set*. Geneva: ISO, 2009.

———. *ISO 16175-1:2010: Information and Documentation—Principles and Functional Requirements for Records in Electronic Office Environments—Part 1: Overview and Statement of Principles.* Geneva: ISO, 2010.

———. *ISO 16363:2012: Space Data and Information Transfer Systems—Audit and Certification of Trustworthy Digital Repositories*. Geneva: ISO, 2012.

———. *ISO 18934:2011: Imaging Materials—Multiple Media Archives—Storage Environment*. Geneva: ISO, 2011.

———. *ISO 19005-1:2005: Document Management—Electronic Document File Format for Long-Term Preservation—Part 1: Use of PDF 1.4 (PDF/A-1)*. Geneva: ISO, 2005.

———. *ISO 19005-2:2011: Document Management—Electronic Document File Format for Long-Term Preservation—Part 2: Use of ISO 32000-1 (PDF/A-2)*. Geneva: ISO, 2011.

———. *ISO 19005-3:2012: Document Management—Electronic Document File Format for Long-Term Preservation—Part 3: Use of ISO 32000-1 with Support for Embedded Files (PDF/A-3)*. Geneva: ISO, 2012.

———. *ISO 23081-1:2006: Information and Documentation—Records Management Processes—Metadata for Records—Part 1: Principles*. Geneva: ISO, 2006.

———. *ISO 23081-2:2009: Information and Documentation—Managing Metadata for Records—Part 2: Conceptual and Implementation Issues*. Geneva: ISO, 2009.

———. *ISO 31000:2009: Risk Management—Principles and Guidelines*. Geneva: ISO, 2009.

———. *ISO/DIS 16919: Space Data and Information Transfer Systems—Requirements for Bodies Providing Audit and Certification of Candidate Trustworthy Digital Repositories.* Geneva: ISO, under development, stage 40.99 (2011-11-23).

———. *ISO/IEC 17024:2012: Conformity Assessment—General Requirements for Bodies Operating Certification of Persons*. Geneva: ISO, 2012.

——. *ISO/IEC 27001:2005: Information Technology—Security Techniques—Information Security Management Systems—Requirements*. Geneva: ISO, 2005.

——. *ISO/TR 15489-2:2001: Information and Documentation—Records Management—Part 2: Guidelines.* Geneva: ISO, 2001.

——. *ISO/TR 23081-3:2011: Information and Documentation—Managing Metadata for Records—Part 3: Self-Assessment Method*. Geneva: ISO, 2011.

Jimerson, Randall. "Responding to the Call of Justice." *Tidsskriftet Arkiv*, April 28, 2010. http://www.tidsskriftetarkiv.no/index.php?option=com_content&task=view&id=15&Itemid=1.

JISC InfoNet. "infoKits." Northumbria University on behalf of JISC Advance. Accessed December 3, 2012. http://www.jiscinfonet.ac.uk/infokits/.

John Curtain Prime Ministerial Library. "Australian Contributions to Recordkeeping." Accessed December 7, 2011. http://john.curtin.edu.au/society/australia/.

Johnsen, L. "Topic Maps—From Information to Discourse Architecture." *Journal of Information Architecture* 2, no. 1 (2010). Available at http://journalofia.org/volume2/issue1/02-johnsen/.

Joint Interoperability Test Command (JITC). "Records Management Application." Accessed November 30, 2012. http://jitc.fhu.disa.mil/cgi/rma/.

——. "RMA Product Register." Accessed November 30, 2012. http://jitc.fhu.disa.mil/cgi/rma/reg.aspx.

Juniper Research. "Press Release: Mobile Instant Messaging Use to Triple in Five Years Exceeding 1.3 Billion Users by 2016 Says Juniper Research." June 21, 2011. http://juniperresearch.com/viewpressrelease.php?pr=248.

K&L Gates. "Supreme Court of Arizona Holds Metadata Is Subject to Public Records Requests." October 30, 2009. http://www.ediscoverylaw.com/2009/10/articles/case-summaries/supreme-court-of-arizona-holds-metadata-is-subject-to-public-records-requests/.

Kahn Consulting, Inc. "Records Management Program Development." Accessed November 30, 2012. http://www.kahnconsultinginc.com/rim-services-records-information-management-program-development.php.

Kan, Michael. "Baidu's Twitter-Like Service Gains 1 Million China Users." *PCWorld*, December 23, 2010. http://www.pcworld.com/article/214753/baidus_twitterlike_service_gains_1_million_china_users.html.

KEEP (Keeping Emulation Environments Portable). Accessed December 3, 2012. http://www.keep-project.eu/ezpub2/index.php.

Kennedy, Jay, and Cherryl Schauder. *Records Management: A Guide to Corporate Recordkeeping.* 2nd ed. Melbourne: Longmans, 1998.

Kirsner, Scott. "MIT Prof Who Invented Early E-mail System Donating His Records to Smithsonian Museum." Bostom.com. February 16, 2012. http://www.boston.com/business/technology/innoeco/2012/02/mit_prof_who_invented_early_e-.html.

Kolodny, Lora. "Can Technology Save the U.S. Postal Service?" Fast Company. Last modified September 15, 2011. http://www.fastcompany.com/1780716/can-technology-save-the-us-postal-service.

Lao, Levine. "Formal Archives Education Needed for Heritage Conservation." *Philippine Daily Inquirer*, December 11, 2011. http://lifestyle.inquirer.net/27069/formal-archives-education-needed-for-heritage-conservation.

Leahy, Emmett J. "Modern Records Management." *American Archivist* 12, no. 3 (July 1949): 231–242. http://archivists.metapress.com/content/52344260u1064020/fulltext.pdf.

Legal-Explanations.com. "Bill of Lading." Accessed November 30, 2012. http://www.legal-explanations.com/definitions/bill-of-lading.htm.

LexisNexis. "Terms and Connectors—Introduction to Traditional Boolean Searching." Last modified 2011. http://support.lexisnexis.com/lexiscom/record.asp?ArticleID=GS_Boolean&ALid=Lexiscom_basics.

Library of Congress. *Guidelines for Using PREMIS with METS for Exchange*. Revised September 17,

2008. http://www.loc.gov/standards/premis/guidelines-premismets.pdf.
———. "Library of Congress Classification Outline." Accessed December 1, 2012. http://www.loc.gov/catdir/cpso/lcco/.
———. "Library of Congress Online Catalog." Last modified November 12, 2012. http://catalog.loc.gov/.
———. "Library of Congress Subject Headings." Accessed December 1, 2012. http://www.loc.gov/cds/products/product.php?productID=44.
———. "Metadata Encoding and Transmission Standard (METS)." Last modified November 29, 2012. http://www.loc.gov/standards/mets/.
———. "Mission." Accessed December 1, 2012. http://www.loc.gov/about/mission.html.
———. "MIX: NISO Metadata for Images in XML Schema." Last modified May 13, 2008. http://www.loc.gov/standards/mix/.
———. "PREMIS Data Dictionary for Preservation Metadata, Version 2.1." Last modified December 13, 2011. http://www.loc.gov/standards/premis/index.html.
———. "PREMIS Schema, Version 2.1." Last modified September 27, 2012. http://www.loc.gov/standards/premis/schemas.html.
Lim, Daniel, and John Blumenschein. "Metadata and Load Files Required for Government FOIA Responses." Guidance Software. February 11, 2011. http://www.guidancesoftware.com/Media/NewsRoom/NewsRoomBlog.aspx?B=BlogContentDetails&Blog_S=NewsRoom Menu&newsroommenu_id=3503&image_id=1000000303&md_id=1000000296&id=1000002799&blogid=2523.
Linden Lab. *How Meeting in Second Life Transformed IBM's Technology Elite into Virtual World Believers*. Linden Research Inc. Accessed November 1, 2011. http://secondlifegrid.net.s3.amazonaws.com/docs/Second_Life_Case_IBM_EN.pdf.
LinkedIn. "About—LinkedIn and the Enterprise." Accessed December 6, 2011. http://press.linkedin.com/about.
———. "Michael Dell." Accessed December 5, 2011. http://www.linkedin.com/in/mdell.
Logan, Debra. "What Is Information Governance? And Why Is It So Hard?" Gartner, January 11, 2010. http://blogs.gartner.com/debra_logan/2010/01/11/what-is-information-governance-and-why-is-it-so-hard/.
LTDP (Long-Term Digital Preservation Reference Model). "Cloud Digital Archive and Digital Preservation Service Requirements." Accessed December 21, 2012. http://www.ltdprm.org/reference-model/preservation-in-the-cloud/cloud-archive-requirements.
Lucene/Apache Solr. "Welcome to Solr." Apache Solr. Last modified November 26, 2011. http://lucene.apache.org/solr/.
Ludascher, Bertram, Richard Marciano, and Reagan Moore. "Preservation of Digital Data with Self-Validating, Self-Instantiating Knowledge-Based Archives." *ACM SIGMOD Record* 30, no. 3 (September 2001): 54–63. doi:10.1145/603867.603876.
Lueders, Don. *SharePoint Records Management.com* (blog). Accessed January 14, 2013. http://sharepointrecordsmanagement.com/.
Mack, Mary. *A Process of Illumination: The Practical Guide to Electronic Discovery*. Fios. 2008. http://www.fiosinc.com/livefiles/1/586/Fios-eBook-A-Process-of-Illumination.pdf.
MacMillan Dictionary. "Professional Development." Accessed December 1, 2012. http://www.macmillandictionary.com/dictionary/british/professional-development.
Manning, Patricia. "Competency Statement E (e-Portfolio Prepared in Partial Fulfillment of MARA Degree)." Unpublished essay. 2011.
Massachusetts Records Conservation Board. "G Secretary of State." *Massachusetts Statewide Records Retention Schedule 01-11*. 2011 ed., 143–158. http://www.sec.state.ma.us/arc/arcpdf/0111.pdf.
Massachusetts Society of Certified Public Accountants, Inc. *The Record Retention Guide*. 2004. http://www.cpa.net/resources/retengde.pdf.

McCullagh, Declan. "White House Pressures Google Over Anti-Islamic Video." *CNET News*, September 14, 2012. http://news.cnet.com/8301-13578_3-57513264-38/white-house-pressures-google-over-anti-islam-video/.

McCreary, Dan. "Structured Search, Version 4." SlideShare. Accessed December 1, 2012. http://www.slideshare.net/dmccreary/structured-search.

McDonough, Jerome P. "METS: Standardized Encoding for Digital Library Objects." Illinois Digital Environment for Access to Learning and Scholarship (IDEALS). April 2006. https://www.ideals.illinois.edu/bitstream/handle/2142/177/METS.pdf?sequence=2.

McLean, Jennifer, and Matt Sussman. "State of the Blogosphere 2009." Technorati Social Media. October 19, 2009. http://technorati.com/blogging/article/state-of-the-blogosphere-2009 -introduction/.

Mell, Peter, and Timothy Grance. *The NIST Definition of Cloud Computing*. SP800-145. National Institute of Standards and Technology. September 2011. http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf.

Merriam-Webster Online. Accessed December 21, 2012. http://www.merriam-webster.com/.

Metaio. "The Big Picture of Augmented Reality." May 17, 2011. http://www.metaio.com/press/press-release/2011/ar-on-tablets/.

Microsoft Corporation. "Introduction to Records Management and Compliance (SharePoint 2010)." Accessed December 1, 2012. http://office.microsoft.com/en-us/sharepoint-server-help/identify-and-manage-records-anywhere-RZ101825173.aspx?section=2.

Microsoft Technet. "What Is Records Management?" Microsoft. Last modified February 26, 2009. http://technet.microsoft.com/en-us/library/cc261982(office.12).aspx.

Millenniata. "M-DISC." Accessed December 1, 2012. http://millenniata.com/m-disc/.

Miller, Eric. "WWW2002 W3C Track: The Semantic Web." W3C. May 8, 2002. http://www.w3.org/2002/Talks/www2002-w3ct-swintro-em/slide1-0.html.

Ministry of Education, Culture, and Sport. "History of the General Archive of Simancas." Accessed January 28, 2013. http://en.www.mcu.es/archivos/MC/AGS/Presentacion/Historia.html.

Minnesota State Archives. "Electronic Records Inventory Worksheet." Minnesota Historical Society. June 10, 2004. http://www.mnhs.org/preserve/records/recser.html.

——. "Minnesota Records Inventory." Minnesota Historical Society. Last modified March 27, 2012. http://www.mnhs.org/preserve/records/recser.html.

MIT Technology Review. "About Us." Accessed December 1, 2012. http://www.technologyreview.com/about/.

MobiThinking. "The MobiThinking Compendium of Mobile Statistics and Research." June 2012. http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats.

Model Requirements for the Management of Electronic Records (MoReq). Accessed January 24, 2013. http://www.moreq2.eu/moreq2.

Modeling Cross-Domain Task Force, "Appendix 16: Overview of the Records Continuum Concept" [electronic version], in I*nternational Research on Permanent Authentic Records in Electronic Systems (InterPARES) 2: Experiential, Interactive and Dynamic Records*, Luciana Duranti and Randy Preston, eds. Padova, Italy: Associazione Nazionale Archivistica Italiana, 2008. http://www.interpares.org/display_file.cfm?doc=ip2_book_appendix_16.pdf.

Montgomery College. "Records Management—Records Retention and Disposal." Accessed December 1, 2012. http://cms.montgomerycollege.edu/oit/aboutoit.aspx?id=58.

Moore, Geoffrey. *A Sea Change in Enterprise IT*. AIIM Whitepaper, 2011. http://www.aiim.org/~/media/Files/AIIM%20White%20Papers/Systems-of-Engagement.pdf.

Moore, Reagan W., Arcot Rajasekar, Antoine de Torcy, Mike Conway, Jewel Ward, Jon Crabtree, Mason Chua, Wayne Schroeder, Michael Wan, Sheau-Yen Chen. *NARA Transcontinental Persistent Archive Prototype*, Technical Report TR-10-04, RENCI, North Carolina, October 2010. http://www.renci.org/publications/techreports/TR-10-04.pdf.

Moreland, Nancy Graham. *Recommendations for Shelving for Inactive Records Storage*. New York State Archives. Revised July 2004. http://www.archives.nysed.gov/a/records/mr_pub65.pdf.

Morgan, Gareth. "Leading Vendors Collaborate for Records Management Scheme." Computing.co.uk. July 14, 2011. http://www.computing.co.uk/ctg/news/2094155/leading-vendors-collaborate-records-management-scheme.

Morgan Multimedia. "JPEG2000 Advantages Versus JPEG?" Last modified 2010. http://www.morgan-multimedia.com/morgan/php/news.php.

Mosher, Barb. "Top 10 Disruptive Technologies According to Gartner." *CMS Wire*, June 3, 2008. http://www.cmswire.com/cms/enterprise-20/top-10-disruptive-technologies-according-to-gartner-002726.php.

Motive, Ltd. *The Motive Web Design Glossary*. October 22, 2004. http://www.motive.co.nz/glossary/cms.php.

Murphy, Barry. *eDJ Contributor Barry Murphy (blog)*. eDiscovery Journal. Accessed December 2, 2012. http://ediscoveryjournal.com/author/barry/.

Murray, Athol L. "The Lord Clerk Register." *The Scottish Historical Review* 53, no. 156 (October 1974), 124–156.

Musser, Terry, Tracy Hoover, and Marcos Fernandez. "Get the Horse before the Cart: Conducting Assessment of Advisor Development Needs." National Academic Advising Association (NACADA). Accessed December 1, 2012. http://www.nacada.ksu.edu/clearinghouse/advisingissues/Needs-Assessment.htm.

NanoArk Corporation. Accessed December 22, 2012. http://www.nanoarkcorp.com/.

NARA (National Archives and Records Administration). "Context for Electronic Records Management (ERM)." Last modified March 27, 2000. http://www.archives.gov/records-mgmt/initiatives/context-for-erm.html.

———. "Does IM Content Qualify as a Federal Record?" Accessed December 1, 2012. http://www.archives.gov/records-mgmt/initiatives/im-faq.html#record.

———. "FAQs about NARA's Certificate of Federal Records Management Training Program." Last modified October 2011. http://www.archives.gov/records-mgmt/training/certification-faq.html.

———. "Frequently Asked Questions (FAQS) about Flexible Scheduling." May 3, 2010. http://www.archives.gov/records-mgmt/faqs/flexible-scheduling.html.

———. "General Records Schedule 23: Records Common to Most Offices within Agencies." April 2010. http://www.archives.gov/records-mgmt/grs/grs23.html.

———. "NARA Bulletin 2008-04—Guidance for Flexible Scheduling." April 30, 2008. http://www.archives.gov/records-mgmt/bulletins/2008/2008-04.html.

———. "NARA Bulletin 2010-03—Flexible Scheduling." May 3, 2010. http://www.archives.gov/records-mgmt/bulletins/2010/2010-03.html.

———. "NARA Bulletin 2011-02—Guidance on Managing Records in Web 2.0/Social Media Platforms." October 10, 2010. http://www.archives.gov/records-mgmt/bulletins/2011/2011-02.html.

———. "Records Management Frequently Requested." December 1, 2012. http://www.archives.gov/records-mgmt/.

———. *Records Management Self-Assessment 2009*. April 19, 2010. http://www.archives.gov/records-mgmt/resources/self-assessment.pdf.

———. *Records Management Self-Assessment 2010*. February 22, 2011. http://www.archives.gov/records-mgmt/pdf/rm-self-assessmemt.pdf.

———.*Records Management Self-Assessment 2011*. May 1, 2012. http://www.archives.gov/records-mgmt/resources/self-assessment-2011.pdf.

———. "Typical Records Management [RM] Functions and Typical RM Program Activities." Accessed December 7, 2011. http://www.archives.gov/records-mgmt/policy/prod6a.html.

——. "Web 2.0 and Social Media Project Proposal." February 4, 2011. http://www.archives.gov/social-media/policies/831-2-proposal-form.pdf.

NARA (National Archives and Records Administration), Northeast Region. "Vital Records Management: A Briefing for Federal Agencies." September 11, 2004. http://www.nctcog.org/ep/Special_Projects/COOP/Vital_Records_Management_Presentation.pdf.

National Archives. "Library New Editions January/February 2011." Accessed January 28, 2013. https://www.nationalarchives.gov.uk/documents/new-books-january-february-2011.pdf.

National Archives of Australia. "Digital Records." Accessed January 27, 2013. http://www.naa.gov.au/records-management/agency/digital/index.aspx.

——. "Records Management—Why Records Matter?" Accessed December 1, 2012. http://www.naa.gov.au/records-management/.

National Fire Protection Association (NFPA). *NFPA 232: Standard for the Protection of Records*. 2012 ed. Quincy, MA: NFPA, 2012.

——. *NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs*. Quincy, MA: NFPA, 2010.

——. *2009 Fall Revision Cycle Report on Proposals*. 2008. http://www.nfpa.org/Assets/Files/PDF/ROP/1600-F2009-ROP.pdf.

National Health Service. "About the IG Toolkit—What Are the Information Governance Requirements?" Accessed December 1, 2012. https://www.igt.connectingforhealth.nhs.uk/about.aspx.

National Information Standards Organization (NISO). *Understanding Metadata*. 2004. http://www.niso.org/publications/press/UnderstandingMetadata.pdf.

Natividad, Angela. "Microsoft Calls E-Discovery, Records Management Inseparable Halves." *CMS Wire*, April 30, 2007. http://www.cmswire.com/cms/records-management/microsoft-calls-ediscovery-records-management-inseparable-halves-001238.php.

New Jersey Chapter of the Special Libraries Association (NJSLA). "Records Manager." Special Libraries Association (SLA). December 15, 2011. http://sla-divisions.typepad.com/njslajobs/2011/12/records-manager.html.

New York State Archives. *Administration of Inactive Records*.1996. http://www.archives.nysed.gov/a/records/mr_pub49_accessible.html#introduction.

——. "Records Advisory: Preliminary Guidance on Social Media." May 24, 2010. http://www.archives.nysed.gov/a/records/mr_social_media.shtml.

New York State Historical Records Advisory Board. "2009—Lessons from a Theft: Bringing Security Tools and Knowledge to New York's Historical Records Community." New York State Archives. http://www.nyshrab.org/about/about_projects.shtml.

Ng, Yvonne, Nan Rubin, Kara Van Malssen, with Howard Besser, Karen Cariani, Irene Taylor, Winter Shanck, and Jeff Ubois. *Strategies for Sustainable Preservation of Born Digital Public Television.* Preserving Digital Public Television Project. February 2010. http://www.thirteen.org/ptvdigitalarchive/files/2009/10/PDPTV_SustainabilityStrategies.pdf.

NIRMA (Nuclear Information and Records Management Association). Accessed December 22, 2012. http://nirma.org/default.aspx.

——. "Application for Certification Nuclear Information and Records Specialist." Last modified May 2, 2011. http://nirma.org/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2fShared%20Documents%2fResource%20Information%2fLibrary&FolderCTID=0x012000B19C261FEEF39243A305B644A4FF4A4C&View=%7b9B6C8A7E%2dFD0A%2d4F45%2dACAA%2d8687E0A09E5C%7d.

NSW Government. "Monitoring Records Management." Accessed December 21, 2012. http://www.records.nsw.gov.au/recordkeeping/topics/monitoring-records-management#compliance-monitoring.

OASIS. "OASIS Content Management Interoperability Services (CMIS) Version 1.1 Approved and Published." November 12, 2012. https://www.oasis-open.org/news/announcements/content-management-interoperability-services-cmis-version-1-1-approved-and-publis.

Obama, Barack. "Freedom of Information Act." Memorandum for the Heads of the Executive Departments and Agencies. January 21, 2009. The White House, Office of the Press Secretary. http://www.whitehouse.gov/the_press_office/FreedomofInformationAct.

——. "Remarks by the President on the Economy." Speech, Industrial Support, Inc., Buffalo, New York, May 13, 2010. The White House. http://www.whitehouse.gov/the-press-office/remarks-president-economy.

Online Schools. "The State of the Internet 201" [infographic]. Accessed January 13, 2012. http://www.onlineschools.org/state-of-the-internet/soti.html.

O'Reilly, Tim, O'Reilly Media. *Web 2.0 Summit 09: Tim Berners-Lee and Tim O'Reilly, "A Conversation with Tim Berners-Lee"* [video interview]. October 24, 2009. http://www.youtube.com/watch?v=KY5skobffk0.

Palmquist, Michael E., Kathleen M. Carley, and Thomas A. Dale. "Applications of Computer-Aided Text Analysis: Analyzing Literary and Nonliterary Texts." In *Text Analysis for the Social Sciences: Methods for Drawing Statistical Inferences from Texts and Transcripts*, edited by Carl W. Roberts. XX. Mahwah, NJ: Lawrence Erlbaum Associates, 1997.

PCMag.com. *Encyclopedia*. Accessed December 5, 2011. http://www.pcmag.com/encyclopedia.

Pearce-Moses, Richard. *A Glossary of Archival and Records Terminology*. Society of American Archivists. Accessed December 2, 2012. http://www2.archivists.org/glossary.

Peter, Ian. "The History of Email." Net History. Accessed January 27, 2013. http://www.nethistory.info/History%20of%20the%20Internet/email.html.

Peters, Isabella. *Folksonomies: Indexing and Retrieval in Web 2.0*. Berlin: Walter de Gruyter GmbH, 2009.

PMI (Project Management Institute). Accessed December 22, 2012. http://www.pmi.org/.

Ponemon Institute, and Kingston Technology. "Ten USB Drive Security Best Practices." IT Business Edge. Accessed December 1, 2012. http://www.itbusinessedge.com/slideshows/show.aspx?c=92432.

PREMIS Editorial Committee. *Data Dictionary Section from PREMIS Data Dictionary for Preservation Metadata, Version 2.1*. PREMIS, January 2011. http://www.loc.gov/standards/premis/v2/premis-dd-2-1.pdf.

President's Council of Advisors on Science and Technology. *Report to the President and Congress: Designing a Digital Future: Federally Funded Research and Development in Networking and Information Technology*. The White House. December 2010. http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-nitrd-report-2010.pdf.

PRISM International. *Demand the Best*. 2002. http://dmashredding.com/demandthebest.pdf.

Promchertchoo, Pichayada. "Most Employees Would Pilfer Company Secrets." *TechWeekEurope UK*, November 24, 2010. http://www.techweekeurope.co.uk/news/most-employees-would-pilfer-company-secrets-14229.

Public Record Office Victoria. *Guideline: Records Management Strategy, Version Number 1.0*. State of Victoria. July 19, 2010. http://prov.vic.gov.au/wp-content/uploads/2011/05/1010g5.pdf.

Pugh, Harry. "Getting Rid of Data: Why It's So Hard." Information Management and SourceMedia, Inc. November 1, 2011. http://www.information-management.com/issues/21_6/getting-rid-of-data-why-its-so-hard-10021453-1.html?pg=1.

Pugh, Kate. "Unleashing Unstructured Data's Value: Mobilizing Us, Not Just Our Machines." Dashboard Insight. February 17, 2011. http://www.dashboardinsight.com/articles/new-concepts-in-business-intelligence/unleashing-unstructured-data-value.aspx.

RAND Gulf States Policy Institute. *The Workforce and Economic Recovery: Effects of Hurricane Katrina*. RAND Corporation. 2010. http://www.rand.org/pubs/research_briefs/2010/RAND_RB9531.pdf.

RecMan. "RecMan for Google Apps." Accessed December 1, 2012. http://recman.net/.

Right2INFO.org. "Constitutional Provisions, Laws and Regulations." Last modified October 24, 2011. http://right2info.org/laws/useful-resources-and-web-links.

RLG (Research Libraries Group). *Trusted Digital Repositories: Attributes and Responsibilities—An RLG-OCLC Report*. May 2002. http://www.oclc.org/programs/ourwork/past/trustedrep/repositories.pdf.

Robek, Mary F., Gerald F. Brown, and David O. Stephens. *Information and Records Management: Document-Based Information Systems*. New York: Glencoe/McGraw-Hill, 1996.

Robertson, Kathy. "Sutter Health Sued Over Patient Data Breach." *The Sacramento Business Journal*, November 23, 2011. http://www.bizjournals.com/sacramento/news/2011/11/23/sutter-health-sued-over-patient-data.html.

Robinson, Catherine. "Records Control and Disposal Using Functional Analysis." New South Wales Government: State Records. Originally presented at the 1997 ASA Conference, "Archives and Reform: Preparing for Tomorrow." Accessed December 2, 2012. http://www.records.nsw.gov.au/recordkeeping/keyword-products/records-control-and-disposal-using-functional.

Ryley Carlock and Applewhite Document Control Group. "E-Discovery—Misunderstanding of Vendor's Software Leads to Waiver of Privilege." Accessed December 1, 2012. http://www.rcalaw.com/E-Discovery/Document-Control-Blog/Misunderstanding-of-Vendor-Software-Leads-to-Waiver-of-Privilege.php.

Saffady, William. *Records and Information Management: A Benchmarking Study of Large U.S. Industrial Companies*. Lenexa, KS: ARMA International, 2002.

———. *Records and Information Management: Fundamentals of Professional Practice*. Lenexa, KS: ARMA International, 2004.

San Antonio College. "Records Management (Tech Prep Program) A.A.S." Accessed December 1, 2012. http://mysaccatalog.alamo.edu/preview_program.php?catoid=72&poid=3685&returnto=1997.

Schmandt-Besserat, Denise. "Reckoning before Writing." Escola Finaly. Last modified December 28, 2008. http://en.finaly.org/index.php/Reckoning_before_writing.

Science Daily. "How Much Does Email Cost a Business?" May 9, 2011. http://www.sciencedaily.com/releases/2011/05/110509100940.htm.

SearchBusinessAnalytics. "What Is Unstructured Data?" Last updated April 2010. http://searchbusinessanalytics.techtarget.com/definition/unstructured-data.

SearchCIO. "Sarbanes-Oxley Act (SOX)." Last modified September 2007. http://searchcio.techtarget.com/definition/Sarbanes-Oxley-Act.

———. "Workflow." Last modified April 2005. http://searchcio.techtarget.com/definition/workflow.

SearchCompliance. "Information Governance." Last modified March 2011. http://searchcompliance.techtarget.com/definition/information-governance.

———. "Social Media Policy." Accessed December 22, 2012. http://searchcompliance.techtarget.com/definition/social-media-policy.

SearchDataManagement. "Business Intelligence (BI)." Last modified November 2006. http://searchdatamanagement.techtarget.com/definition/business-intelligence.

SearchStorage. "Information Life Cycle Management (ILM)." Last modified September 2005. http://searchstorage.techtarget.com/definition/information-life-cycle-management.

SearchStorage.co.UK. "U.K. Data Protection Act 1998 (DPA 1998)." Last modified January 2008. http://searchstorage.techtarget.co.uk/definition/Data-Protection-Act-1998.

Sedona Conference. *The Sedona Guidelines: Best Practice Guidelines and Commentary for Managing Information and Records in the Electronic Age*. September 2004. http://www.flcourts.org/gen_public/cmplx_lit/bin/reference/Other%20States/SedonaBPMDigiRec200409.pdf.

———. *The Sedona Conference Glossary: E-Discovery and Digital Information Management*. 3rd ed. September 2010. https://thesedonaconference.org/publication/The%20Sedona%20Conference%C2%AE%20Glossary.

Shakespeare, William. *The Tempest*, in *The Complete Pelican Shakespeare*, edited by Alfred Harbage, 1369–1395. New York: Penguin Group, 1969.

Sharpe, Reginald R., ed. "Introduction," in *Calendar of Letter Books Preserved Among the Archives of the Corporation of the City of London*. London: John Edward Francis, BreaiM's Buildings, E.C., 1912, e-book: http://www.archive.org/details/cu31924103071134.

Shell, Adam. "Wall Street Traders Mine Tweets to Gain a Trading Edge." *USA Today*, May 4, 2011. http://www.usatoday.com/money/perfi/stocks/2011-05-03-wall-street-traders-mine-tweets_n.htm.

Shirky, Clay. *Here Comes Everybody: The Power of Organizing without Organizations*. New York: Penguin Group, 2009.

Shiva, V. A. "USPS and EMAIL: Email and Its Opportunities for USPS." V.A. Shiva: The Science of Connection. Accessed December 2, 2012. http://www.vashiva.com/innovation/email/vashiva-the-history-of-email-vs-usps-snail-mail.asp.

Smead. "Guides." The Smead Manufacturing Company, Inc. Accessed December 2, 2012. http://www.smead.com/Director.asp?NodeID=18.

Smithsonian Institution Archives. "Digitization Standards for Still Images." Accessed December 2, 2012. http://siarchives.si.edu/services/digitization.

Sobel, Jon. "State of the Blogosphere 2010." Technorati Social Media. November 3, 2010. http://technorati.com/blogging/article/state-of-the-blogosphere-2010-introduction/#ixzz1PM3DBQKw.

———. "State of the Blogosphere 2010 Introduction—Page 2," Technorati Social Media. November 3, 2010. http://technorati.com/social-media/article/state-of-the-blogosphere-2010-introduction/page-2/.

Socialware. "Social Media Industry Statistics." Socialware: Research. http://www.socialware.com/resources/research/social-media-industry-statistics/.

Society of American Archivists (SAA). "Types of Archives." Accessed December 2, 2012. http://www2.archivists.org/usingarchives/typesofarchives.

South Carolina Department of Archives and History. "Archivaria: An Assortment of Interesting Items from the South Carolina State Archives." Palmettohistory.org. Accessed December 2, 2012. http://www.palmettohistory.org/exhibits/archivaria/archivaria.htm.

Spencer, Ross. *Digital Records: Digitised Image Specification*. The National Archives, United Kingdom. April 4, 2011. http://www.nationalarchives.gov.uk/documents/information-management/digitisation-image-specification.pdf.

Spivack, Nova. "Timeline and Definition." Lifeboat Foundation. Accessed December 22, 2012. http://lifeboat.com/ex/web.3.0#timeline.

StackExchange.com. "English Language and Usage." Last modified November 8, 2011. http://english.stackexchange.com/questions/47676/who-first-used-the-term-bit-rot.

Stafford, Jan. "Lessons Learned from 9-11: Disaster Recover Dos and Don'ts." SearchWinIt. December 5, 2001. http://searchwinit.techtarget.com/news/784938/Lessons-learned-from-9-11-Disaster-recovery-dos-and-donts.

State of Delaware. "The Process of Vital Records Management—Records Classification." Accessed January 5, 2010. http://archives.delaware.gov/govsvcs/records_policies/vital%20records%20management.shtml.

State of New Jersey Department of the Treasury. "State Agency General Records Retention Schedule (GS100000-005)." May 19, 2011. http://www.nj.gov/treasury/revenue/rms/retention.shtml.

State Records Authority of New South Wales. "Guideline 19—Monitoring Recordkeeping Performance." Accessed December 2, 2012. http://www.records.nsw.gov.au/recordkeeping/government-recordkeeping-manual/guidance/guidelines/guideline-19.

State Records of South Australia, Government of South Australia. *Adequate Records Management Standard, Version 2.5*. July 2008. http://www.archives.sa.gov.au/files/management_standard_ARM.pdf.

——. *Records Management Audit Guideline, Version 2*. 2011. http://www.archives.sa.gov.au/files/management_guidelines_ARM_auditpolicy.pdf.

StateOfTheBlogosphere. "State of the Blogosphere 2011: Introduction and Methodology." Technorati Social Media. November 4, 2011. http://technorati.com/social-media/article/state-of-the-blogosphere-2011-introduction/.

Statistics Canada. "Classification of the Economic Territory of Canada 2011." Last modified June 8, 2011. http://www.statcan.gc.ca/subjects-sujets/standard-norme/sgc-cgt/et-te/et-te-eng.htm.

——. "Standard Geographical Classification (SGC), 2011—Volume I, The Classification." Last modified July 20, 2012. http://www.statcan.gc.ca/subjects-sujets/standard-norme/sgc-cgt/2011/index-indexe-eng.htm.

Steinfeld, Lauren, and Kathleen Sutherland Archuleta. "Privacy Protection and Compliance in Higher Education: The Role of the CPO." *EDUCAUSE Review Online*, January 1, 2006. http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume41/PrivacyProtectionandCompliance/158088.

Stevens, Gina Marie. *CRS Report for Congress—Hurricane Katrina: HIPAA Privacy and Electronic Health Records of Evacuees*. Congressional Research Service (CRS) Report, RS22310. January 23, 2007. http://library.ahima.org/xpedio/groups/public/documents/government/bok1_034961.pdf.

StorageNewsletter.com. "3,892,179,868,580,350,000,000." Miscellaneous. Accessed December 6, 2011. Last modified May 19, 2009. http://www.storagenewsletter.com/news/miscellaneous/idc-digital-information-created.

Symantec Corporation. "2012 State of Mobility Survey." 2012. http://www.symantec.com/en/uk/content/en/us/about/media/pdfs/b-state_of_mobility_survey_2012.en-us.pdf.

——. "Data Sheet: Messaging Security—Symantec IM Manager." 2009. http://eval.symantec.com/mktginfo/enterprise/fact_sheets/b-im_manager_DS_12688873.en-us.pdf.

——. "Symantec Survey Finds Emails Are No Longer the Most Commonly Specified Documents in eDiscovery Requests." September 19, 2011. http://www.symantec.com/about/news/release/article.jsp?prid=20110918_01&om_ext_cid=biz_socmed_twitter_facebook_marketwire_linkedin_2011Sep_eDiscoverysurvey.

Syracuse University. "Archives and Records Management." Accessed December 2, 2012. http://arm.syr.edu/.

Tapscott, Don. "Macrowikinomics: New Solutions for a Connected Planet." Accessed January 27, 2013. http://dontapscott.com/books/macrowikinomics/.

Tapscott, Don, and Anthony D. Williams. *Wikinomics: How Mass Collaboration Changes Everything*. New York: Penguin Group, 2006.

TechTerms.com. "Exabyte." Accessed December 6, 2011. http://www.techterms.com/definition/exabyte.

Tero, Vivian. "Global Records Compliance: What You Need to Know." IDC. June 2010. http://www.computerwoche.de/fileserver/idgwpcw/files/1811.pdf.

Themis. "eDiscovery Systems Data Map." Accessed December 2, 2012. http://www.ethemisinc.com/index.php/en/services/corporate/ediscovery-systems-data-map.

Thompson and Knight, LLP. "Client Alert: Litigation E-Discovery Readiness: Creating a Data Map." Last modified November 12, 2007. http://www.tklaw.com/publications.cfm.

Topic Maps Lab. Accessed December 22, 2012. http://www.topicmapslab.de/home.

Tripit. "The Smartest Way to Plan Travel for Your Office." Accessed December 2, 2011. http://www.tripit.com/business?us=ti&um=ip&un=fo.

University of California, Los Angeles (UCLA). "Records Management Mission." Last modified July 22, 2011. http://www.finance.ucla.edu/Records/rrm_mission.htm.

University of California, Office of the President. "Records Disposition Schedules Manual—Search." Accessed December 2, 2012. http://www.ucop.edu/recordsretention/search.html.

University of Idaho. "Office of Records Management—Vision." Accessed December 2, 2012. http://www.uidaho.edu/records-management.

University of Pennsylvania, University Archives and Records Center. "University of Pennsylvania Records Retention Schedule—Academic/Student Records." June 17, 2011. http://www.archives.upenn.edu/urc/recrdret/studtacad.html.

US Bureau of Labor Statistics. "Office and Administrative Support Occupations—Information and Record Clerks." US Department of Labor. Last modified March 11, 2010. http://www.bls.gov/soc/2010/soc430000.htm.

US Census Bureau. "Results from the 2007 Survey of Business Owners (SB) Are Now Available." Last modified November 16, 2012. http://www.census.gov/econ/sbo/.

US Department of Energy. *Your Records Management Responsibilities*. July 2010. http://energy.govsites/prod/files/cioprod/documents/Your_Records_Management_Responsiiblities__2_.pdf.

US Geological Survey, Geospatial Information Office. "U.S. Geological Survey—General Records Disposition Schedule." Last modified August 27, 2009. http://www.usgs.gov/usgs-manual/schedule/432-1-s1/infotouse1.html#infotouse1.

US Office of Personnel Management. *Position Classification Standard for Archivist Series, GS-1420*. Revised November 2005. http://www.opm.gov/fedclass/gs1420.pdf.

———. *Position Classification Standard for Support Services Administration Series, GS-0342*. May 1979. http://www.opm.gov/fedclass/gs0342.pdf.

van der Ven, Christian. *The Digital Archivist* (blog). Accessed January 22, 2013. http://www.digitalearchivaris.nl/.

Vednere, Ganesh. "The Quest for eDiscovery: Creating a Data Map." *Infonomics* 23, no. 6, (November–December 2009). 28-33. EBSCOhost Connection. http://connection.ebscohost.com/c/articles/47105850/quest-ediscovery-creating-data-map.

Venafi and Echelon One. *2011 IT Security Best Practices Assessment: Security and Compliance Best Practices and Rankings*. 2011. http://www.venafi.com/wp-content/uploads/2011/09/2011_IT_Security_Best_Practices_Assessment_Executive_Overview.pdf.

Versace, Michael. "Back to Records Management Basics." Wikibon. Last modified March 12, 2010. http://wikibon.org/wiki/v/Back_to_Records_Management_Basics.

VWR (Virtual Worlds Review). "What Is a Virtual World?" Accessed December 22, 2012. http://www.virtualworldsreview.com/info/whatis.shtml.

Wakim, Ziad. "Capture and Archive Your Email to Reduce Costs." Ever Team. Accessed December 2, 2012. http://www.ever-team.com/en/about-us/press-room/222-expert-opinion-capture-and-archive-your-emails-to-reduce-cost.html.

Washington Secretary of State. *From Our Corner* (blog). Accessed January 14, 2013. http://blogs.sos.wa.gov/FromOurCorner/.

Washington State Archives. "Digital Archives Background." Accessed December 2, 2012. http://www.digitalarchives.wa.gov/StaticContent/background.

Webopedia. Accessed December 2, 2012. http://www.webopedia.com/.

WhatIs.com. "Digitization." Last modified April 2007. http://whatis.techtarget.com/definition/0,,sid9_gci896692,00.html.

WhatIsRSS.com. "What Is RSS? RSS Explained." Accessed November 30, 2011. http://www.whatisrss.com/.

White House. *The White House Blog*. Accessed January 14, 2013. http://www.whitehouse.gov/blog.

White House, Office of the Press Secretary. "We Can't Wait: President Signs Memorandum to Modernize Management of Government Records." November 28, 2011. http://www.whitehouse.gov/the-press-office/2011/11/28/we-cant-wait-president-signs-memorandum-modernize-management-government-.

WhitePages. Accessed December 2, 2012. http://www.whitepages.com/.

Whitney, Lance. "Bieber Squeaks Past Gaga with Most Twitter Followers." *CNET News*, January 23, 2013. http://news.cnet.com/8301-1023_3-57565358-93/bieber-squeaks-past-gaga-with-most-twitter-followers/.

Wikia. *Wookieepedia, the Star Wars Wiki*. Accessed December 6, 2011. http://starwars.wikia.com/wiki/Main_Page.

Wikipedia. Accessed December 2, 2012. http://en.wikipedia.org/wiki/Main_Page.

Williams, April M. "Five Twitter Success Stories and How Small Businesses Can Learn from Them." CyberLife Tutors. February 3, 2011. http://www.cyberlifetutors.com/five-twitter-success-stories-and-how-small-businesses-can-learn-from-them/.

Williamson, Debra Aho. "US Social Network Usage: 2011 Demographic and Behavioral Trends." eMarketer. Accessed December 1, 2011. Last modified March 2011. http://www.emarketer.com/Welcome.aspx?code=emarketer_2000777&AspxAutoDetectCookieSupport=1.

Winn, Phillip. "State of the Blogosphere: Introduction—Page 2." Technorati Social Media. August 21, 2009. http://technorati.com/blogging/article/state-of-the-blogosphere-introduction/page-2/.

Woody Guthrie Foundation and Archives. *Woody Guthrie Archives Blog*. Accessed January 14, 2013. http://woodyguthrie.org/archives/newsletter/.

World Wide Web Consortium (W3C). "W3C Semantic Web Frequently Asked Questions." Last modified November 12, 2009. http://www.w3.org/RDF/FAQ.

——. "Web Ontology Language (OWL)." Last modified October 15, 2007. http://www.w3.org/2004/OWL/.

Worms, Phil. "Why Cloud Computing Must Be Included in Disaster Recovery Planning." *Cloud Computing Journal*, January 26, 2011. http://cloudcomputing.sys-con.com/node/1689928.

Yammer. "The First and Most Powerful Enterprise Social Network." Accessed December 2, 2012. https://www.yammer.com/about/product.

Yee, Ka-Ping, Kirsten Swearingen, Kevin Li, and Marti Hearst. "Faceted Metadata for Image Search and Browsing." Paper presented at annual conference of Computer-Human Interaction (CHI), Ft. Lauderdale, FL, April 5, 2003. http://kevinli.net/flamenco-chi03.pdf.

Young, John J., Jr. "DoD Installation Emergency Management (IEM) Program." US Department of Defense, January 13, 2009 (incorporating Change 1, November 19, 2010). http://www.dtic.mil/whs/directives/corres/pdf/605517p.pdf.

Yu, Eileen. "Oracle Looks to Clear Air on Big Data." ZDNet. October 4, 2012. http://www.zdnet.com/oracle-looks-to-clear-air-on-big-data-7000005211/.

Zoho. "Zoho Security Practices, Polices and Infrastructure." Accessed December 6, 2011. http://www.zoho.com/security.html.

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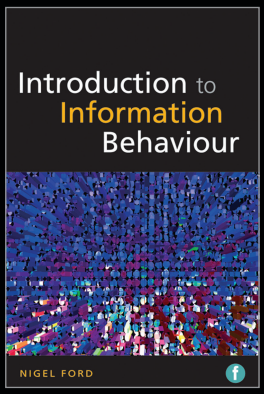

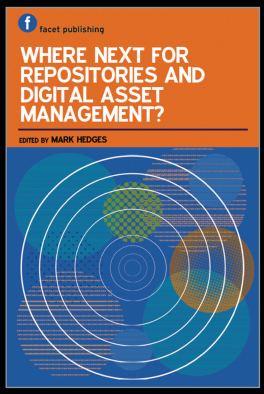

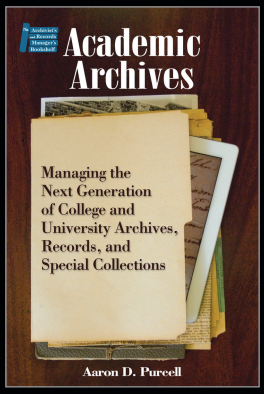

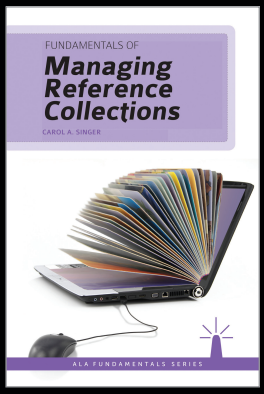

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