Challenges of Implementing an Electronic Document Management System in a Large Health Care Facility in Southern California

by

Maryam Katani

B.S., Islamic Azad University, 1996

A Thesis Submitted in Partial Fulfillment

of the Requirements for the Degree of

Master of Science

In the School of Health Information Science

University of Victoria

Supervisory Committee

Challenges of Implementing an Electronic Document Management System in a Large Health Care Facility in Southern California

By

Maryam Katani

B.S., Islamic Azad University, 1996

Supervisory Committee

Dr. Andre Kushniruk, School of Health Information Science
Supervisor

Dr. Elizabeth Borycki, School of Health Information Science
Departmental Member

Abstract

Supervisory Committee
Dr. Andre Kushniruk, School of Health Information Science
Supervisor
Dr. Elizabeth Borycki, School of Health Information Science
Departmental Member

The implementation of Electronic Document Management Systems (EDMSs) is a complex process. Scripps Health started a project to implement the web based McKesson Horizon Patient Folder (HPF) software system in early 2011 in order to digitally capture all the information in patient charts. This research used semi-structured interviews to assess the perceived benefits of using an EDMS and its effect on work-flow from the perspective of physicians and health information management (HIM) staff at two hospitals in San Diego, California. The study was designed to assess the new work-flow processes, work-flow challenges associated with EDMS implementation, and other key factors associated with successful implementation of such systems. The research found the opinion of physicians and HIM staff about the effect of an EDMS on their work-flow to be mostly positive. The data analysis further showed that perceived benefits of an EDMS included improved patient care quality and patient care efficiency due to capabilities such as immediate access to patient information by multiple users, reduced patient data error and improved communication between HIM staff and physicians. The analysis of study data also highlighted some shortcomings of EDMSs; these included the system not being user friendly, not having full EMR capabilities and benefits and the inability of EDMSs to interface with other

existing systems. The study proposes that despite some challenges post implementation, overall, an EDMS is favoured over paper based chart system.

Table of Contents

List of Tables

List of Figures

Acknowledgments

First and foremost I declare that completion of this thesis study was not possible without the help of God.

I am very thankful to my supervisor, Dr. Andre Kushnirukfor his support and guidance throughout the research process. He continuously encouraged and inspired me to extend my knowledge and improve my skills over the past few years.

I also want to offer my special thanks to Dr. Elizabeth Borycki for being a great mentor and offering me her advice.

I also want to thank all the members of the faculty of the School of Health Information Science who were involved in teaching and the delivery of this Master's program.

I extend my heartfelt thanks to the physicians and HIM staff in two facilities from Scripps Health who were at the heart of this research, for generously sharing their valuable time with me and for their recommendations and their valued experiences. I also want to thank all staff at the School of Health Information Science, University of Victoria, for their dedication and support.

Finally, I would like to thank my family members, especially my husband, for their patience and encouragement throughout the journey that has been completion of this thesis study.

Dedication

To my husband,

For unconditionally providing his

love, support, guidance, and encouragement.

Chapter 1: INTRODUCTION

1.1 Introduction:

Over the last two decades, both small and large healthcare providers have increasingly sought to store their information electronically. An Electronic Document Management System (EDMS) is a computer system which includes hardware and software technologies for capturing paper-based documents as scanned images. Metadata is then assigned to these captured images and taxonomies that are created for indexing them. EDMS functions include capture, storage, classification, indexing, versioning, maintenance, use, security, and retention of documents (Georgia Archives, 2008). An EDMS also includes technologies for receiving and storing digital documents such as computer output laser disk (COLD) documents, including lab results and transcribed reports for electrocardiograms (EKGs) generated by other computers. At times, healthcare professionals might confuse an EDMS with an imaging or scanning machine; but while the latter only allows for the retrieval of the digitally captured documents, EDMSs offer work-flow functionalities, sophisticated reporting, work queuing and the ability to manage documents based on a predetermined logical scheme. A Picture Archiving and Storage System (PACS), a computer system mainly used in radiology, is an example of a sophisticated image capture and retrieval machine which is at times also confused with an EDMS (AHIMA, 2003).

Documentum is a U.S. software company that develops Enterprise Document Management Systems (EDMS), which are used by large companies for various applications. In the mid 1990s, Documentum's products were chosen by Boeing Aircraft

for on-line authoring, managing and editing of some of the manuals for the Boeing 777 aircraft. These manuals, which could be as voluminous as thousands of pages, are used to train pilots and maintenance personnel in the safe and correct operation and maintenance of Boeing's airplanes. This information is frequently updated and revised throughout the life cycle of the airplane. Documentum's EDMS allowed Boeing's staff to produce accurate, up-to-date documents quickly and cost effectively. In many respects and for all practical purposes Enterprise Document Management Systems and Electronic Document Management Systems, perform the same tasks with the same end goal; easy and instant access to information at lowered costs (Business Wire, January 10, 1995).

Prompted partly by the use of EDMSs in other industries and the results of EHR (Electronic Health Record) implementation in other countries, U.S. politicians included a requirement for the modernization of the American Healthcare System in the American Recovery and Reinvestment Act (ARRA) of 2009. U.S. healthcare providers who implement an EHR will by 2012 qualify for significant subsidies from the government (Steinbrook, 2009). Additionally, providers who do not implement EHRs by a certain deadline are subject to penalties which are tied to payments for programs such as Medicare (Healthcare IT News website, 2004).

Even when a healthcare organization has a fully Electronic Medical Record (EMR) system, paper documents such as hand written notes, hard copy information and documents generated by third parties will still be generated and used by providers. Therefore, an EDMS is necessary to address the inclusion of this information within the EMR system. Completeness of records is a must for the healthcare industry, given certain legal and financial requirements. Paper documents constitute a large portion of legal

health records for at least the foreseeable future (Stratis Health, 2009). EDMSs can be helpful in different types of business environments, such as retail, construction, law, accounting and financial services, advertising, marketing, media, medical, healthcare, pharmaceutical, life sciences, software and technology. In the healthcare industry, an example of the use of an EDMS might involve a physician dictating a report about a patient's history and physical examination or a discharge summary whereby the digital documents automatically move from a transcription system to the EDMS system without creating paper. Additionally, this system has functionalities which allow for the capture, storage, indexing, versioning, maintenance, use, security and retention of documents; there are likewise functionalities that enable automated forms processing, bar coding, electronic signature, document annotation and editing, document capture, document indexing, character and form recognition and forms redesign, document retrieval, viewing and distribution and document management. If all of these functions work properly, this will lead to a complete EDMS.

Some of the most significant EDMS users include Health Care Organizations (HCOs). The healthcare industry has been discussing the Electronic Medical Record (EMR) for the last 20 years. All organizations in the healthcare industry recognize the need to improve their quality and efficiency. However, when an organization implements a new system, significant amounts of money and time are used in such areas as buying equipment, hiring experts, training current employees, etc. In addition, implementation of an EMR/EDMS results in some limitations in organizations whereadditional staffing then needs to be adapted; different types of expertise are needed in a paper based system versus an EDMS system. It is also always necessary to remember that when

implementing a new system in an organization, users adapt to and learn the new system at different speeds. These problems are generally short-term ones that are resolved quickly (AHIMA, 2003).

A number of issues have been encountered in moving from a paper to an EDMS, as will be described in the next section – the literature review. This thesis will explore the perceptions of both physicians and Health Information Management (HIM) staff of an EDMS deployed at two hospitals. Both the potential advantages as well as disadvantages of the implementation of this system will be explored in the research. A qualitative approach will be taken involving semi-structured interviews with both physicians and Health Information Management (HIM) staff who have moved to working with an EDMS at this major American healthcare organization.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In this chapter a review of the literature about EDMSs will be provided as motivation for the thesis study. In the first section of this chapter research about the advantages of using an EDMS will be discussed. This will be followed by a discussion of research that focused on identifying problems and challenges in implementing an EMRS.

2.2 Section A: Research About the Advantages of Using EDMSs

This section of the thesis discusses findings regarding the usefulness of EDMSs for health organizations. EDMS applications are data repositories designed to replace paper records with all the limitations and cost expenses associated with the retention and accessibility of paper records. An EDMS helps health professionals organize and utilize patient charts and other important documents. An EDMS has the capability to index forms in a variety of ways; forms need to be bar coded to be recognized with the EDMS application after scanning. The EDMS application reads the bar coded forms and puts them in an appropriate folder. Automation of this task results in significant time savings for users. Additionally, multiple bar coded forms can be scanned at once and can be automatically placed in different folders such as orders, face sheets, progress notes, etc. Although this feature results in significant time savings, bar coding the previous records is usually not feasible and is difficult to do for all forms at one time (Stratis Health, 2009).

An EDMS application is predominantly used by healthcare organizations and health professionals, including physicians and the staff of the health information management department. Research has investigated EDMS implementation challenges in different healthcare organizations. In this thesis there will be a specific focus on the implementation processes experienced at Scripps Health. According to previous research at Scripps, communication was enhanced through greater accessibility when using EDMS. Physicians can communicate with other providers and review patients' charts electronically instead of needing to be physically present bythe patient's bedside at hospitals or nursing homes. For example, a nurse and doctor can simultaneously view a patient's chart, but in different facilities, as long as they have access to a high-security Internet connection. Additionally, doctors can write a new order electronically based on the patient's chart review without being at the patient's bedside (Scripps, 2011). The American Health Information Management Association's (AHIMA) web site (www.ahima.org) is a great source of information about EDMSs and EHRs. Using this site, one can find useful information about various types of EHR and EDMS as well as information on how to organize to acquire and implement EDMSs (Stratis Health, 2009). Stratis Health took advantage of the AHIMA site and used it as a guide for a formal process of conducting work-flow and process mapping to develop their requirements analysis and request for proposal, and to carry out other aspects of product acquisition while addressing issues relative to implementing EDMS. Issues included the type of scanning process, retention of records, type of equipment, network capacity and chart preparation. Stratis Health's implementation of an EDMS can be used as a case study for improving the impact of physicians' work-flow. The EDMS application was

implemented at Stratis Health, a non-profit and independent organization in Minnesota (Stratis Health, 2009). The areas that needed focus included centralized operations, decentralized operations, and electronic signature. With an EDMS, document capture may be performed using either scanning or an electronic feed (computer output to laser disc [COLD]). Scanning the patient's paper chart is probably sufficient in many healthcare organizations or facilities. All authorized health professionals at Stratis can view the patient's report electronically at the same time even if they are in different places and there is no longer a need to have the patient's physical report.Stratis Health found that EDMS assists physicians in communicating faster among one another, and even between different facilities. Therefore, an EDMS saves time – physicians do not have to travel to different facilities and Stratis does not need to deliver the patient's chart to a physician's office. This increased the quality of patient care for Stratis Health (Stratis Health, 2009)**.** For example, at each visit; the physician has access to real time and up-to-date information such as medication list or history and physical reports.

A research study by Laerum et al(2003)conducted in six hospitals in Norway, surveyed physicians, nurses and medical secretaries at selected departments (Laerum, Karlsen, Faxvaag, 2003). For 24 tasks and 64 physicians, 68% of the physicians responded (Lium&Faxvaag, 2006). According to Lærum et al's (2003) paper, physicians reported that elimination of the paper chart in medical records and complete reliance on the EHR system involved more steps and took more time for some clinical tasks while completion of other tasks had become more efficient. Although some physicians reported slightly negative feedback on their specific department, most were pleased with the EHR system. Despite the few negative effects, the results seem to indicate that the EHR system has

better performance and quality than paper-based health record in clinical practice (Lium&Faxvaag, 2006). This study indicates that full EHR implementation is necessary but Norwegian hospitals need to consider both tools (i.e. EDMS and EHR) to work in parallel with each other at this time, because legal aspects of health documents arestrictly regulated by law and hospitals have to ensure safe keeping of those health records. For this reason, hospitals scan the paper health records which are available to clinicians via EHR.

The results of Norway's hospitals survey research included:

1) Some physicians reported reduced efficiency when comparing paper-based health records with a paperless health record system (Lium&Faxvaag, 2006).

2) There was generally a positive attitude towards using a paperless system such as an Electronic Document Management System. Although physicians have various levels of usage of paperless systems in different departments, the system still results in a high quality of work-flow. For example, the dermatology department at the Norway hospital had used this system less than other departments. The conclusion of this research was that the intention of achieving higher efficiency, quality, and new ways of delivering healthcare remains to be fulfilled. Lium's results lend support to the conclusion that removal of the paper-based health record is feasible. The results obtained from the university hospital departments are, however, worrying and warrant more thorough analyses (Lium, Faxvaag, 2006).

In two other studies (i.e. Borycki et al., 2009; Borycki& Lemieux-Charles, 2007), researchers found that nurses were able to develop better mental models of patients using

paper-based records rather that electronic records that were composed of both paper and electronic components. Lium and Faxvaag (2006) and Borycki et al. (2009) suggest that there are both positive and negative aspects to using charts that are composed of paper and electronic components.

According to another article, scanning handwritten documents is one of the data capture points in an EDMS and affects the quality of patient care by making all patient data available immediately. This method has inherent strengths and weaknesses that have an impact on data quality. One of the main advantages is that doctors and nurses can collect documents once and use as many documents as required electronically. Physicians and other health professionals do not need to ask for the patient paper charts anymore which may be not available at the time they are needed for many reasons, such as the medical record staff cannot find the paper chart, or another health provider needs to review it at the same time, etc.

As noted by Kallem, Crystal, and Gans in 2007, due to its nature EDMSs are viewed as a temporary tool and its use is often viewed as a transition between paper and full EHRs. Through the use of EDMSs many issues such as long term data preservation, critical for business or legal use, or misplacement of documents, which can cause delay of creation of supporting documents, are resolved. However, there some issues such as illegibility of records (which are illegible on paper to begin with), or situations where there are mismatched data elements, (error reports are generated), and where problem charts are sent to the error queue where the problem needs to be investigated and corrected manually (Kallem,Crystal, &Gans, 2007). As a result, health professionals such as physicians cannot view a report, because the report is in an error queue instead of a

production queue and the EDMS then delays access to the report. As a result, health professionals are not able to sign or edit incorrect documents.

Within the EMDS system at Scripps Health, programming does not allow for mass sign-offs. If a document is a dictated report, each page of the report must be viewed by the author or signer to, in essence, force the complete document to be reviewed for potential blanks or edits that need to be made before the "function" of e-signing. This function verifies that physicians agree with the content of the report information, which proves beneficial to the physician's work-flow.

An article by Clark and Devadas (2009) reported that three organizations implemented a document imaging system in 2009 which allowed for immediate and instantaneous access to a medical record post discharge, directly reducing the AR (Account Receivable) and bill hold days. Terrie Vilminot, RHIA, director of health information management at Allegiance Health in Jackson, explained that "electronically coding queries also contributed to the decrease, as coders were able to electronically send the physician a question and receive an answer directly, dramatically decreasing the response turnaround time". Barbara Gerringer, RHIT, director of HIM at Rochester General Health System in Henrietta, NY, also found the document imaging work-flow process had a positive effect on the revenue cycle: "The workflow process was built in, allowing us to send a copy of the medical record automatically to the business office with a worker's compensation claim, for example" (Clark, Devadas, 2009).

E-MDs' DocMan is another application that has similar functionality to an Electronic Document Management System. It is very affordable even for small medical offices, and

it helps physicians' work-flow. DocMan has proven to be secure and reliable. One of DocMan's customers in the healthcare industry extended the original design specifically for the medical industry. DocMan follows the most updated rules and regulations of the Insurance Portability and Accountability Act (HIPAA) for patient privacy (Berkshire Medical Technologies, 2010). This application has massive economic benefits by converting all patients' papers charts to electronic documents. Paper patient charts require storage and maintenance which costs $8 US per record per year. EDMS applications help to store the scanned patients' charts and decrease the cost to $1-$2 US. Electronic records also reduce expenses associated with storage space real estate space (Berkshire Medical Technologies, 2010). Scanned documents can be stored in less space than paper documents. Some companies such as Iron Mountain provide a service for storage for their customers to store files and paper charts. Electronic records also help to reduce real estate costs. Imaging of document management systems has reduced costs by 50-100% of physical medical document management, which involves pulling the patient's chart, filing charts, and other tasks.

The above research offers evidence of work-flow efficiency, and cost savings and benefits through the use of electronic documents instead of paper. Northwest Diagnostic, a medical practice located in the same location as e-MDs, eliminated paper charts by scanning all of them using DocMan. They used the equivalent of a full time staff member to maintain an excess of 12,000 records post scanning. Tens of thousands of records were digitized where they would have had to be kept in paper form in files. During the first year in which documents were being scanned, and due to a transition time for any such conversions, both paper and digital records needed to be kept which delays

savings recognition by one or one and a half years (Berkshire Medical Technologies, 2010).

Table 1 shows the cost calculation for the paper charts cost versus that of electronic data from medical offices. A paperless system is not only a financial benefit for physician but also increases the quality of their work-flow and cuts costs. Table 1 shows the paperless record cost versus paper record cost (Berkshire Medical Technologies, 2010). An EDMS allows physicians and other providers to not only increase the quality of patients' care but also reduce costs.

Table 1: Paperless Records vs Paper (Berkshire Medical Technologies, 2010).

Table 1*Paperless Records vs Paper*		
Estimated maintenance of paper charts	($8/chart/year)	$8
Estimated maintenance of an electronic Chart	($1-2/chart/year)	$2
Annual savings per chart	($8 - $2)	$6
Assumed active charts per physician		3,000
Total cost per doctor per year	(3,000 charts x $6)	$18,000

Another case study focused on St-Helens Hospital (St Helens &Knowsley Teaching Hospitals NHS Trust,2011), which uses an Electronic Document Management System

(EDMS), integrating with Kodak document scanners. This study illustrates an important factor in using EDMSs in HIM departments. Neil Darvill, (Director of Informatics, NHS Trust), stated that it is challenging to convert paper to electronic documents, but when an EDMS is implemented it helps to manage patient information more efficiently and effectively, and that"EDMSs are radically changing the way health records are distributed around its various outpatient facilities in Merseyside" (Darvill,2011, p. 1).

There are different medical companies on the market that develop EDMS applications with a similar functionality to each other. Alpha system is an EDMS that has been implemented by Virtua Health, a multi-hospital healthcare system headquartered in Marlton, New Jersey. Beth Juliano, Virtua Assistant Vice President for Health Information Management, stated that "Alpha's quality control processes and customer service model were instrumental in our decision versus a paper chart. After uploading the image through the Alpha system clinicians can view all images and facilitate patient care. This supports Virtua hospital's goals to provide outstanding patient care service and experience" (Berkshire Hathway, 2009).

To qualify for federal grants, the healthcare industry needs to comply with implementing an EDMS within a certain timeline. However, most hospitals are unable to spend a large amount of money on IT purchases. According to Forrester Research (Congdon, 2006), hospitals typically spent 2-3% of their annual revenue on IT procurement compared to the 5-7% spent by financial services companies. However, this trend is changing. The Health Insurance Portability and Accountability Act (HIPAA) and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), combined with a federal initiative to create EHR for every American by 2012 is forcing hospitals to increase the

use of technology as a way to comply with the regulations, improve patient care and customer service and ultimately cut costs. Between 2004 and 2006 hospitals spent an average of 5.7% of annual revenues on IT which are expected to increase annually for the next couple of years (Congdon, 2006).

The impact of the EDMS system in health information management (HIM) departments is very important. After the patient's paper chart is scanned, it is available immediately for coding and all authorized clinicians can access a patient's chart. As a result, there is no waiting time for health professionals to block their daily tasks. Consequently, an EDMS saves time and increases HIM department revenues. According to Cooley Dickinson's case study hospital (Congdon, 2006), an EDMS helps coders in a HIM department. Coders do not need to wait for patients' charts for a long time to collect bill payments. As soon as the papers are scanned and indexed through the system, they can be available for coders and analysts to complete their assignment at the same time. The system helps to increase the profits of the HIM department and eventually the hospital or organization. "The document imaging system has reduced the paper handling requirements for coders by nearly 90%, contributing to a 50% to 60% reduction in the time it takes to complete the entire coding process," says Bruch who is an administrator and Director of Health Information Management for Cooley Dickinson Hospital. This productivity improvement resulted in the purging of a coding backlog without the need to use additional resources (Congdon, 2006). As noted by Mauricio Pinto, EDMSs are an outstanding system for HIM departments even if a healthcare organization does not have an EMR. EDMSs can be implemented in an organization without EMRs. Some of the

healthcare organizations are still in the early stages of EMR implementation and have not completed it yet. EDMSs are seen by many as a way to transition to a full EMR.

EDMSs help HIM departments to save money and communicate with the other health departments in a secure path. EDMSs also has the benefit of other sub categories of a HIM department, such as speeding up the collecting of a billing department and reducing costs of maintaining health records and accelerating the release of information. The functionality of an EDMS is a solution for a significant number of business problems healthcare provider organizations see on a daily basis.

EDMSs also reduce the amount of missing patient information and decrease error rates and late information (Scripps Health, 2011). After scanning a paper chart, all authorized health professionals can communicate using the EDMS. For example, coders don't need to wait for a chart to be analyzed; as a result the EDMS helps billing departments and health organizations. If a patient's paper chart is missing some information or forms, (such as orders) there will still be a form in the EDMS application to inform the appropriate professionals of this. This type of system helps the HIM department to do follow up more easily and to communicate with other departments. EDMSs also help to decrease the amount of missing information, which in turn helps the HIM to communicate with physicians easily and decreases deficiency rates. In the paper world, physicians or other health professionals would have to physically come to HIM departments to sign their missing signature, to write their missing text, etc taking much more time, but EDMS gives them an ability to do their tasks through the web in a secure path and to complete their deficiency allocations; (i.e. when they are at home or travelling). Also, EDMS applications have a functionality that allows health professionals

to send a fax when physicians or other healthcare organizations make such requests. This application has a log section to make sure it is sent to the correct party. If we send scanned documents to the wrong party, we can recall the scanned document. When a HIM department faxes a paper record to the wrong party, there is no way to recall this information. An EDMS decreases the error rate in most areas of a HIM department (Scripps Health, 2011).

It is a huge decision for a health organization to consider moving to an EDMS. Implementation of an EDMS is an ongoing investment and requires an effort to promote adoption. An organization needs to consider many factors such as facility data (number of beds, number of inpatient and outpatient visits, etc,); storage (size of health information management department); and volume of charts requested on a daily or weekly basis (i.e., who needs charts external or internal facilities). Organizations may lose money if a technical failure occurs and a number of charts are missing. These are some other important factors to justify Release of Information (ROI) statics and provide some of the useful benchmarks that healthcare organizations we wish to achieve. One article (AHIMA, 2003) argues that ROI documentation has to be presented with a global objective that should tie in with an organization's mission, vision, and long-and short-range strategies. It can be useful to supply drilled-down statistics for key areas that will benefit from an EDMS, such as coding, release of information, chart completion/electronic signature, and finance (Acker et al., 2003). Figure 1 displays multiple sub categories of HIM departments and the benefits of implementation of an EDMS (Acker et al., 2003).

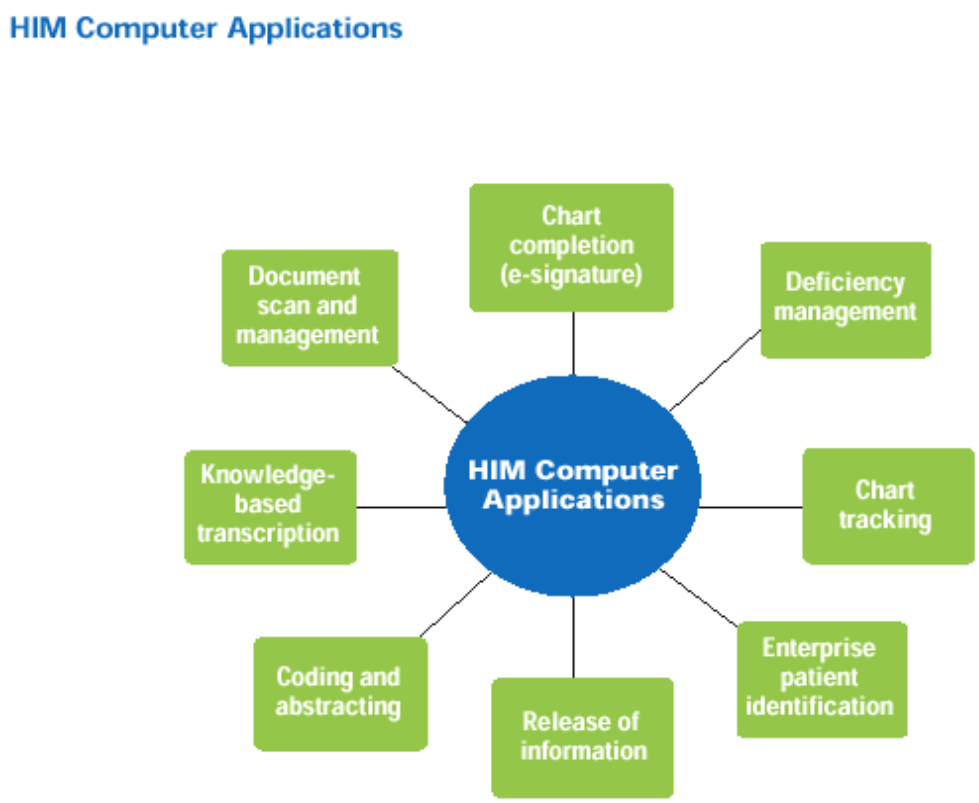


Figure 1: HIM Computer Applications (Acker et al.,2003)

The Jameson Health System, New Castle, Pennsylvania, is currently using 3MSolution software for EDMS and online forms management with its patented scanning and quality control process. The Jameson Health System serves New Castle and the surrounding Lawrence County, Pa., from the North and South campuses of Jameson Memorial Hospital. Additionally, satellite facilities include a personal care facility, a traditional nursing home, a physical rehabilitation center, three community health centers, a cancer center, and a cardiac care center, with more than 250 beds, at Jameson Memorial. There are some challenges in improving compliance with HIPAA regulations and legal record requirements, and replacing inefficient and costly paper-based processes. This hospital is

a full-service acute care facility offering a full continuum of health and human services (McDonough, 2012).

Figure 2 displays cost-savings for HIM departments while using an EDMS versus a paper based system (McDonough, 2012). Figure 2 shows the cost savings Jameson is projecting in revenue over the next four years as a result of reducing in-house release of information turnaround time (McDonough, 2012).

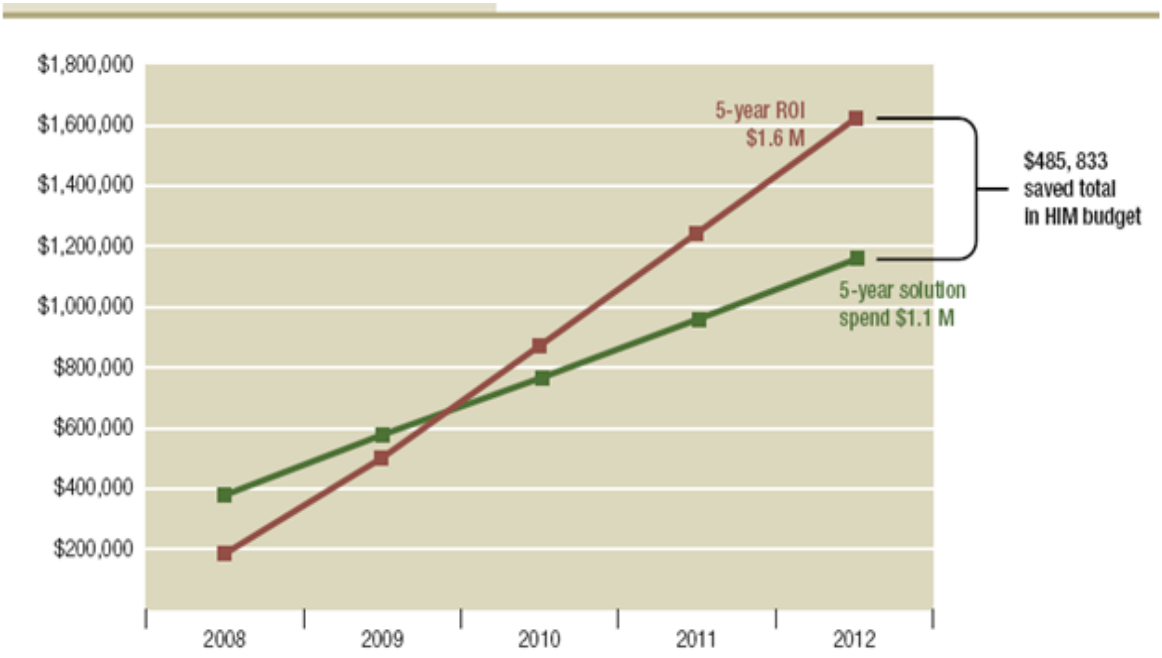


Figure 2: Cost Savings (McDonough, 2012)

Studies from four benchmark leaders including the Regenstrief Institute, Brigham and Women's Hospital/Partners Health Care, the Department of Veterans Affairs, and LDS Hospital/ Intermountain Health Care, show that the implementation of a multifunctional system can provide real benefits in terms of care delivery based on guidelines, especially in the preventative heath area as well as improved monitoring, reduced medication errors

and a decrease in medication errors and duplicate or inappropriate treatment. However, because these bench mark studies were developed over many years and were led by academic researchers, it is not likely these results will be generalized for non-academic institutions planning the implementation of health information technology (Chaudhry et al., 2006).As we know, EDMSs can be also considered under the EHR umbrella. As time passes, we will have access to many resources from health sectors and medical software companies to learn from their issues and how they approach and fix them when using the EDMS.

Implementation of EDMSs in healthcare organizations helps with privacy, security, and quality measure regulation. These factors will drastically affect how HIM professionals conduct business. Currently, most EDMSs are capable of handling workflow within a business. An EDMS goes beyond office automation and may include activation, tracking, status monitoring, messaging, queue handling, and routing of documents. "These capabilities allow us to monitor a business process and track the associated route of document flows" (Cho, 2007). The use of an EDMS results in reduced costs, improved profits, as well as enhanced customer service (Cho, 2007).

Like Stratis Health, Scripps Health launched a phased EDMS installation across five hospitals. The complete EDMS systems of Scripps Health includes the following: Documents Capture System /Quality Control Indexing ((DCS/QCI) and Horizon Patient Folder [HPF]), Centricity (CE), Copath, MacLab, Electrocardiograph (EKG) Strips, NAVICare/Watchild Fetal Monitor Strips, Centricity Perioperative Manager (ORMIS/CPM, Noviuslab, Stentor-PACS (picture archiving and communications system). However, only McKesson products and the Centricity application are currently

working and connected with each other. The rest of the EDMS is still under implementation at Scripps (Scripps Health, 2011). All precise dictation reports are accessible through the Horizon Patient Folder and Centricity. All of the patients' information, from admission to discharge, is stored in the CE application. After the patient is discharged, all of the information is available in the HPF system. The HPF application is a repository data system for all Scripps hospitals. All health professionals' dictation reports also are cold-fed from the CE to the HPF system.

The Scripps EDMS has been successfully interfaced with Scripps legacy system, using such products as the Centricity software application. For example, if a physician dictates a report for a patient, it will be cold-fed to the HPF application and all authorized health professionals willhave access to the patient's report. Scripps' McKesson system (HPF application) uses the encounter number (account number) as the main data element for accessing patient information and running queries. All reports, whether scanned documents or cold feed reports, will be in one electronic location for the duration of a patient's stay (DOS). As long as physicians have access to the Internet through the secure server, they will be able to view the reports and complete their individual chart completion deficiency allocations.

In order to view patient paper charts in HPF, steps must be taken, using the EDM system, for prepping the patient paper charts, scanning them through a high quality scanner and indexing each document with the proper label. After the indexing process, patients' documents are released to the HPF system and will become available to all authorized health professionals. Conveniently, physicians and other health professionals will be able

to discuss the patient's status with one another via phone or email without having the patient's actual paper physical documents in hand.

2.3 Challenges and Disadvantages of Using an EDMS

This section of the thesis looks at the reported challenges and disadvantages of EDMS application usage in health organizations. Although EDMS have many possible benefits for health organizations in terms of quality and efficiency, there are still some areas such as policy issues, whether company or governmental, which may not be addressed by even widely adopted commercial products. For example, when an application is developed by a commercial entity or in-house within specific hospitals, the new system may be designed to be used just for that specific organization; different hospitals or states have different policies to follow. Also, EDMSs do need to have more maintained support, technical support to implement, and /or annual application support, while the patient paper chart supports do not require these, causing increased costs for the healthcare organization in some areas. Start-up cost is one of the important issues in use and implementation of EDMSs in organizations (Gurley & Benjamin, 2004).

Another disadvantage of the starting up an EDMS is the education and training costs for clinicians and physicians. Organizations need to spend a considerable amount of money in supporting the training and learning curve of users. If the users have some technical knowledge, learning to use the EDMS will be less difficult. Some of the physicians and HIM staff are not as computer-savvy, therefore, trainers need to spend additional time with these users in order to educate them in the technology. Clinicians and physicians are the primary end users of the system. Training increases an organization's costs in the beginning years. Hiring new staff is limited to the period of transition from paper to

electronic documents, which means that an organization should consider who has more experience with computers when hiring new staff members. For example; new staff should have knowledge of computers, but in a paper world, people do not require any computer skills. EDMS designers have to consider the needs of the users. As much as this application is user friendly, training is still an issue even though it takes less time to instruct end users (American Academy of Medical Administrators, 2004).

Another potential disadvantage is related to the failure of software and hardware. For example, if multiple individuals access a medical record at the same time, there may software or hardware problems that lead to systems crashes. Crashes in software or hardware may cause loss of some patient information. Furthermore, security is another very important issue as well as to protecting patient privacy and confidentiality in the system (SEERI, 2008).

Start-up costs are a very important issue when an organization implements a new paperless system. Organizations need to scan high volumes of paper records and therefore need to spend money to update their computers and printer-scanners. This additional cost is a significant disadvantage for organizations in the short term. Also, hardware is usually changed or upgraded every 18 months while software upgrades are done every 2-3 years (Sarah, 2011).

Important issues to consider include the following: high start-up costs, a substantial learning curve, confidentiality and security issues, lack of a standardized terminology, system architecture, and indexing. These are the most important issues that need to be considered and worked around (BCTV, 2009).

Lack of experience by healthcare organizations (related to electronic medical records and EDMS applications) causes some unwanted or unexpected issues. The two parties (healthcare organizations and software companies) sometimes sign an agreement to implement the customized EDMS application, but things happen in the real life business environment that neither party has considered. As a result, the hospital or healthcare organization needs to pay more to fix issues and sometimes it costs more than they expect. As time passes, healthcare organizations and medical software companies will be able to reduce the costs related to the above issues. Other issues to consider are legal aspects of using EDMS. This is a new area for lawyers focusing on the healthcare sector. This area of work involves compensating damage done to a patient either by omission or commission of information. If the patient`s data are released to unauthorized persons through system failure, lawyers will be able to take action regarding this matter (AHIMA, 2010).

EMRs are becoming more accepted everywhere as more doctors become less apprehensive of their use. The rate of conversion from paper based medical records to paperless can be as high as 40% in some countries. Government mandates and incentives will soon make digital medical records the new norm (Artio, 2009).Therefore, there are challenges and risks involved when we implement a new system in a healthcare organization. Different health organizations have different systems that have already been running in-house. Sometimes medical software companies do not have the same experience prior to the software's implementation in different hospitals. It is a challenging step to determine how to integrate a legacy system with the new system. As a result, different health organizations and hospitals have reported different outcomes.

Some organizations are very successful while others need to work around their issues and problems. Some are small issues and fixable whilst some are not and they need to be studied. This may also involve significant financial investment to address them. Sometimes, project managers and business analysts do not consider some of the hidden issues when they are out of the scope of business requirements or proposals. This causes conflict between the software company and the healthcare organization. New systems need to be compatible with legacy systems, such as was the case at Kaiser Permanente (KP), which faced a big challenge while attempting to adapt software made by Epic (current system) with Citrix and ConnectHealth System (Rosencrance, 2006). Kaiser's e-health records management system had a huge issue after implementing the EHR. The rollout of the EHR management system at Kaiser Health Foundation's hospitals has been a good example of how an IT project can get out of control, according to sources at Kaiser and an internal report explaining the problems with the HealthConnect System (Rosencrance, 2006).

Different technical issues may come up in implementing a new and complex system in large facilities such as KP HealthConnect. KP HealthConnectwas faced with many issues after experiencing a power outage. According to one article, physicians and health professionals did not have access to patients' electronic health records for 55 hours and 7 minutes, which significantly affected healthcare and quality care (Rosencrance, 2006). This type of event leads to a very frustrating situation for healthcare providers and patients. According to Kaiser spokesman, Matthew Schiffgens, when organizations such as KP have major deployments of a new system, they come across different challenges in the phases of the project. An example was a problem in the Corona data center which

was identified and addressed by creating the necessary infrastructure in the same manner that any good business uses to resolve issues (Rosencrance, 2006). They discovered that the Epic system wasnot compatible with HealthConnect as they wished; therefore, they disconnected the Epic system, leading to a big push back in selecting Epic. One example of a document indexing issue occurs when users scan some of the forms without bar codes. The indexers need to index every single page manually in addition to the use of separator sheets because the system does not recognize what form is being scanned. Naturally, this process is very time consuming. At the beginning, most of the known documents such as progress notes, orders, etc are bar coded, but some other unknown documents need to be bar coded as the transitions are completed (Stratis Health, 2009).

According to one article (AHIMA, 2010), the weakness of paperless methods is that they are dependent on electrical power. Occasionally, there are power outages when nurses or physicians review a patient's chart electronically. As Kallem, Crystal, and David Gans, (2007) noted in an AHIMA journal publication, one more example of system functionality that could result in a possible problem, most likely legal in nature, is the "auto-authentication" or mass sign off. Typically, a physician's signature is indicative of review and approval. If multiple documents are stamped with the exact date and time by one health professional, it will be clear that the sign off the documents were not completed (Kallem&Gans, 2007).

When an EDMS or an image document generates an error, this document might not transfer to the right location, and physicians do not have access to the document until it is corrected manually. The above-mentioned issue is one of the disadvantages of an EDMS. Timing and timeliness of documents are other issues, especially when an EHR system is

set up to automatically queue the bill at the time of discharge. System generated date and time stamps make it very clear when services are provided. If documentation is incomplete at the time of discharge, it could be noted that necessity for medical treatment was not established because documentation was insufficient. Usually, complete documentation is needed to support the medical requirements of the services provided (Kallem&Gans, 2007).

In addition tothe advantages and benefits the use of an EDMS provides an organization, there are also a number of disadvantages. One article describes how usage of computers and EDMSs by health professionals, especially physicians, has some disadvantages (Koide &Peskin, 2005), including the following:

- If physicians cannot type fast enough, it takes more time for themto process their tasks (Koide &Peskin, 2005).
- Patients and physicians used to communicate with each other face to face but the transition from paper to electronic documents can result in situation where the doctor maybe typing as the patient speaks resulting in less eye contact and causing an uncomfortable and awkward situation (Koide &Peskin, 2005).
- Virus attacks on computer systems may cause data loss. This is a very important consideration for the confidentiality of patient data (Koide &Peskin, 2005).
- Fear that computerized data can be used by the legal system against doctors and hospitals might cause the interaction between the patient and doctor to seem less personal (Koide &Peskin, 2005).
- High level resource requirements and costs at start-up (Koide &Peskin, 2005).

The good news is that by knowing the disadvantages of the EDMS, each negative issue or weakness can be improved. When the patient's data was stored on paper, only certain people had access to it but storing such data in digital form gives more people access to the patient's data. A central repository data system has proven beneficial to organizations that fail to update data that has been stored in different structures; nevertheless, such a central repository system has raised concerns regarding data security and protection (Koide &Peskin, 2005). According AHIMA (2011), if birth confirmations are not scanned within 24 hours of the date of birth, an issue may arise in covering health insurance. It is therefore very important to monitor workflow on a regular basis. According to Denis Dunyak, "the technology allows clinicians to seamlessly open and view the documents stored in the document management system by logging in one time" (AHIMA, 2011).

2.4. Summary of the Literature

Published research indicates that a number of key factors including professional autonomy, training, computer self-efficacy and physician characteristics need to be considered when implementing EMRs or any other EMR subgroups, such as the EDMS. Some research points out that risks and challenges of implementation can be alleviated; for example, training has a significant positive impact on EMR self-efficacy (National Chung-Cheng University, 2011). Organizations should monitor and evaluate their EDMS workflows and make adjustments, especially when there is a change in how a document moves through the system. Overall, the literature indicates that EDMS helps to save time in a HIM department, but steps need to be taken to make sure patient documents are

scanned within 24 hours (Scripps, 2011). Furthermore, as described above there are a number of potential disadvantages and challenges in moving to EDMS.

CHAPTER 3: RESEARCH QUESTIONS

3.1 Introduction

In this chapter the research questions are presented along with their rationale. The research questions are focused around the overall effect of implementing an EDMS in a large multi-facility healthcare organization. In answering these questions two distinct groups of EDMS users (physicians and HIM staff) were interviewed.

The questions are listed below:

1) What is the impact of the implementation of an electronic document management system on physician workflow at organizations such as Scripps Health?

2) What are the perceived benefits of using this type of application versus paper at an organization such as Scripps Health?

3) What is the impact of this type of application on health information management at Scripps Health?

4) What impact does this type of application have on error rates in information, missing information and late information?

5) What factors are associated with the successful implementation of an electronic document management system at Scripps Health?

6) What impact does such a system have on availability or late availability of patient information within a large healthcare organization such as Scripps Health?

With time, organizations learn from their system failures and subsequently can improve future versions of the EDMS. In light of the above literature review, the following questions can be posed. What are users' perceptions of moving to an EDMS system? Do the benefits of the EDMS seem to outweigh the disadvantages organizations such as Scripps face in implementing the EDMS? Does using EDMS ensure that an organization can offer the highest level of service and efficiency regarding workflow?

3.2 Rationale for the Research Questions

The purpose of this thesis is to examine the implications of the implementation of an EDMS in a large hospital in a multi facility healthcare organization, Scripps Health, for two stakeholder groups: physicians and HIM staff. The literature review has shown that there are some gaps in knowledge regarding EDMSs in terms of the impact of implementation on work-flow, specifically processes, technologies, and new products. In addition, there are several factors such as cost-effectiveness that need to be considered. However, research has also shown EDMSs may be more beneficial than their counterpart (i.e. paper based records), because EDMSs serve to increase quality care and decrease error rates. The study in this thesis is designed to help discover some key stakeholder perceptions of implementation of an EDMS. For over a decade, many health information systems have been improved by including EDMSs. Obtaining feedback from users provides an opportunity to learn how users can consider applying EDMSs to their

business activities. In addition, such a study could give us an opportunity to understand the types of issues encountered by health professionals in the implementation of EDMSs, along with potential solutions to such concerns. Additionally, the outcome of the experience at Scripps Health can be used by other healthcare organizations which will have to make a decision regarding implementing an EDMS.

3.3 Study context

In this thesis, users' perceptions about the implementation of EDMS at Scripps Health were studied. Scripps Health, a premiere health provider organization in San Diego, California, started the implementation of an EDMS system in their facilities in the summer of 2010 with the goal of having the system in use in all of its facilities within a 6-12 months period. In other words, Scripps had a window of 6-12 months to complete EDMS implementation in all of its facilities. For Scripps, the decision to use an EDMS was two-fold: Initially, a decision was to be made as to whether to use EDMS, and, secondly, the decision of which EDMS to use. After five years of research, Scripps decided to use the Document Capture System (DCS)/ Horizon Patient Folder (HPF) by McKesson. This decision was the result of research conducted by corporate business executives from the Health Information Group, Information Technology Group and Physicians of Scripps. Scripps follows a natural evolution in its strategy to become an efficient service provider fully committed to its patients, and improving patient care by using technology-enabled clinical documentation to provide the highest quality of care. In 2011, Scripps completed the implementation of the DCS/HPF system in their facilities to transition from paper to electronic records for patient care. Research in this thesis examined user perceptions of implementing an EDMS and will benefit not only Scripps

Health but also health professionals who work for such organizations more generally. It is valuable to discover what advantages EDMS offers to physicians as well as to the overall workflow of the health management department. Interview research gives the researcher the opportunity to find out what challenges healthcare professionals encounter in using an EDMS. It also reveals the kind of learning curve involved in implementing the EDMS system, as well as the kind of challenges and difficulties experienced by different facilities. It is helpful to observe and learn the most common problems that arise in using EDMS. The research also gave us an opportunity to learn about the users' perceptions regarding the use of EDMS in meeting their daily business performance at the Scripps. The users' perceptions of an EDMS are important to Scripps Health, which would like to increase the quality and accuracy of its care by implementing an EDMS as well as by using Electronic Medical Records and managing documents electronically. This research is aimed at finding out if this transition from a paper chart to an EDMS made positive contributions to the total patient care experience. After two years of experience with an EDMS product physician and health information staff perceptions were evaluated.

CHAPTER 4: METHODS

4.1 Introduction

This chapter describes the methodology applied. This includes discussing the study setting, subjects, materials, interview prompts, the procedure and the analysis. The research proposal was reviewed and approved by the Human Research Ethics Board at the University of Victoria, British Columbia.

4.2 Setting

Scripps Health is a non-profit, community-based health care delivery network in San Diego, California. Scripps Health consists of four acute-care hospitals on five campuses, more than 2,600 affiliated physicians, an extensive outpatient care network at Scripps Clinic and Scripps Coastal Medical Center, home healthcare, and associated support services.

Scripps Health (SH) now has more than 14,000 employees and cares for patients at 20 outpatient facilities throughout San Diego, California. It has a long history in San Diego, dating back to 1924 when Ellen Browning Scripps founded the Scripps Memorial Hospital and Scripps Metabolic Clinic in La Jolla. Today, in addition to the aforementioned hospitals and clinics, SH also includes: (Scripps, 2011)

- 2 accredited trauma centers
- 12 Scripps Coastal Medical Center locations
- 5 hospital campuses
- 10 Scripps Clinic locations

SH conducts 100 new clinical trials annually, and trains 145 medical residents/fellows. Scripps also includes 236 acres and 4.1 million sq. feet of office space (one of the largest real estate holders in San Diego County), with 1,400 total licensed acute care beds, 2,600 affiliated physicians, 9,900 babies born annually, 14,000 employees, 55,500 cardiac procedures annually, 157,000 emergency department visits annually, 1,980,000 patient visits annually, $311 million community benefit services provided annually, and $1.8 billion in annual revenue (Scripps, 2011).

SH is a well-known entity in healthcare delivery and is ranked in the top five health systems for cardiac care in the U.S. In 2007, SH realized there was a need to implement an EHR system throughout its facilities, not only to keep up with other world-class healthcare delivery systems in the U.S. and elsewhere, but also to comply with the HITECH provision of the American Reinvestment and Recovery Act (ARRA) (Steinbrook, 2009). This Act provided incentives to doctors and hospitals which implemented EMRs and EHRs and made meaningful use of these respective tools, and warned healthcare professionals and organizations of severe financial penalties for not having EMRs/EHRs implemented by 2011.

Currently, McKesson applications at Scripps include the DCS/QCI application and HPF application. The HPF is connected to Centricity (CE) application whilst the CE application is a brand of 31 healthcare information technology software solutions from GE Healthcare. These are both part of the EDMS for Scripps Health. McKesson applications (DCS/QCI and HPF applications) were implemented through Scripps hospitals in 2011. It took 6 to8 months to complete the implementation of the McKesson products through five hospitals. There are high speed scanners attached to DCS/QCI

applications and all of the paper patient forms have barcodes. After the patient is discharged, HIM staffscans the patient's paper documents. The DCS/QCI system translates the type-based document form on the system barcode as it is programmed in the backend table. Some of the documents are lacking barcodes and need to be assigned the correct document type by indexers.

The high-speed scanner accepts a batch of up to 250 pages. After scanning, all images are stored in the DCS/QCI application. The indexers validate the patient's document to be in the correct file folder assignment given the document type. The DCS/QCI application has different functionalities such as zooming in/out, rescanning documents in color or black and white, renaming the document type, deleting the document file, and inserting and appending a new document. The DCS/QCI application is connected to the HPF (Horizon Patient Folder) application. The HPF application is a web application to which all authorized health professionals have access. The HPF application has a connection to some of the legacy systems, for example, the CE system. After indexing the patient's documents (charts), indexers release them to the HPF system. All authorized health professionals can have access to patients' charts through the HPF web application. All deficiencies will be communicated to HIM staff and physicians through the HPF system (for example, tasks involving the e-signature, missing text, dictation). Each facility has access to their patients' charts unless the patient either transfers to a different facility or some of the documents are in global view mode like Advanced Directive Power of Attorney. Global view mode means that certain documents can be available for all facilities even if a patient does not belong to certain facility. This system is a new electronic one for Scripps hospital facilities—it replaces the paper chart system; as an

electronic repository, the new system allows the medical record to remain after the patient`s discharge. Before implementing the McKesson applications, HIM departments at Scripps needed to keep the patients' paper charts in their department for at least six months. That is why they required sufficient space in which to store them. A combination chart folder was retained at the facilities (support storing, off-site and on-site). Physicians, nurses, and physician's assistants come to the HIM department to sign or remove deficiencies from their charts. The new system was convenient for healthcare staff. Different health professionals do not need to wait for one another to complete their daily tasks. EDMS speeds up their daily business tasks. All access to the DCS/QCI application and HPF application is determined by job title. All built-in tables prior to "go-live" addition/deletions are controlled by the onsite McKesson IS support team.

All of the HIM staff hasbeen authorized to work with HPF, but some of the HPF functionality is locked or grayed out just for some HIM staff; for example, the report running functionality is only for managers and directors, and the Index Correction Utility function is available for managers and some of the indexers. Scripps employees have different access to DCS/QCI applications based on their job titles. Coders and clerks in the HIM department have access to DCS/QCI application or scanning, and nurses have view access only to HPF. Physicians are able to view edited missing text to HPF but there is no access to the DCS/DCI application. Also, analyzers in the HIM department can view, assign and do allocation functionality. HIM management can view, move, rename, delete, and complete functionality of various queues, coders queue, and DCS/QCI applications, and indexers are able to access to most of the functionality of the

DCS/DCI and HPF applications. Some other health professionals only have view access to the HPF application.

4.3 Subjects

There were 29 subjects consisting of 10 physicians and 19 HIM staff. Of these, 5 physicians were from the Scripps' Green Hospital and the other 5 were from Scripps' Encinitas Hospital facility. Of the 19 HIM staff, 10 were from Green Hospital and the other 9were from the Encinitas facility. The HIM director arrived at the specific numbers of participants mainly based on availability and willingness of the subjects. The HIM director for both of the above hospitals communicated with all physician subjects and shared their contact information such as name and email with the researcher. The HIM director shared the contact information of the HIM staff with the researcher. The researcher communicated with all subjects to set up the interview date and time. HIM staff members had different educational backgrounds and were of various ages. Some physicians and some of the HIM staff were computer savvy while others were less so. Potential participants were sent an invitation email by the department secretary. If a participant was interested in being part of study he/she arranged an appointment for a face to face interview at his/her convenience. For my qualitative research method, purposive sampling was used.

In qualitative research studies attention should be paid to data saturation. Glaser and Strauss (1967) first defined data saturation as the point at which no additional data are being found whereby the researcher can develop properties of the category. In other words, saturation is reached when data from new or additional study participants does not add anything new to the usefulness of the data. Due to the high number of patients that

must be seen by each physician during his/her working hours at Scripps Health, the hospital has instituted strict policies governing physician's time. These policies, to a great extent, limit the number of available hours in a day or week during which a physician can allocate time for purposes other than direct or indirect patient care or specific and approved medical research. Each physician therefore has less than a couple of hours in a week for purposes other than those mentioned above. After consultation with the office of Chief Physician at Scripps Health, the director of HIM at Scripps Health authorized the researcher to conduct interviews with 10 physicians for no more than 30 minutes each. Due to the imposed limitations, the opportunity for analysis for data saturation analysis was not available. This would be a good point to consider for future research in this area (Bowen, 2008).

4.4Materials

The McKesson HPF EDMS which is the repository of all patient data for the entire hospital has three main features for physicians. These are e-Sign, missing text and missing dictation functions; absence of each would require communication between HIM and the physician. Figure 3 displays the interface of HPF application for physicians with signatures deficiency. Figure 4 displays the interface of the HPF application for assisting physicians with dictation deficiencies. Figure 3 and 4 are artificial screen shots from the vendor test protocol.

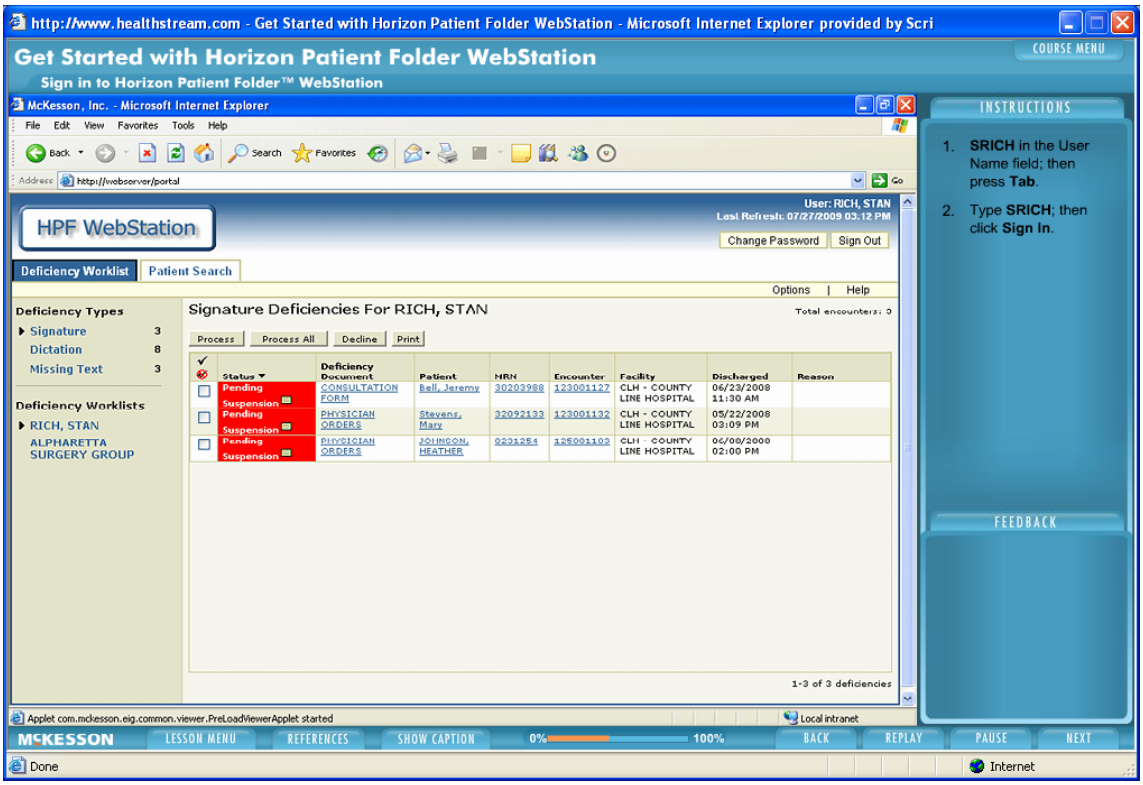


Figure 3: Signatures Deficiencies

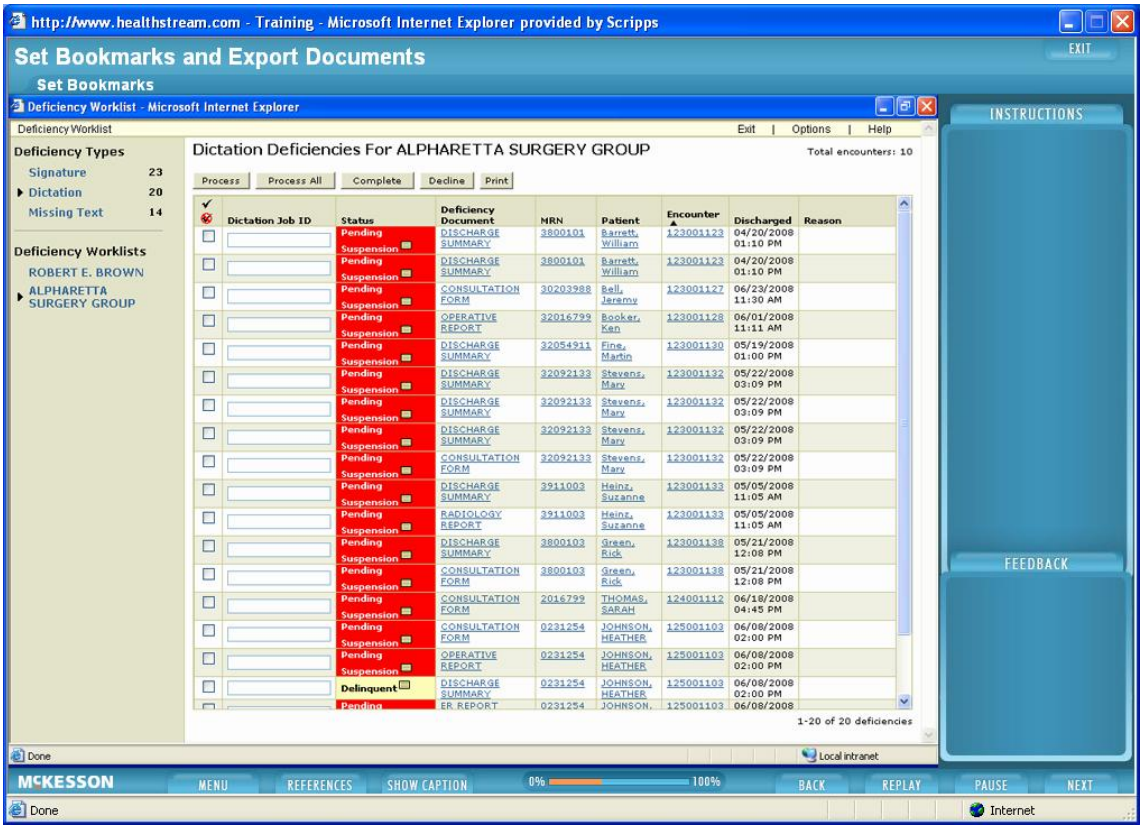


Figure 4: Dictation Deficiencies

4.5 Procedure

The experimenter booked appointments with physicians and HIM staff who agreed to participate from two different facilities. The researcher met with participants' in-person at a time and place that was convenient to them. The researcher obtained their written consent to participate in the study. Once the researcher obtained consent, the researcher would interview subjects with prepared questions. The researcher encouraged subjects to provide as much accurate and valuable information as possible. The experimenter audio

recorded the interview. When necessary, the experimenter also took notes. At the end of the interview, the experimenter thanked subjects and presented them with a small gift.

The interview prompts

The interview prompts for physicians and HIM staff are given below.

Interview Prompts for Physicians

1. What is your age?
2. What is your education and your professional background?
3. What division or department do you work in?
4. What is your work title and responsibilities?
5. What type of practice do you have?
6. Could you please tell me what your comfort level is in using computers?
7. Have you used an Electronic Document System before and, if so, which one and how often?
8. Can you give me an estimate of how many times you have forgotten your password? If you have, how did you resolve this issue?
9. How many years have you been with Scripps? If it is longer than one year, can you give me a general opinion about the McKesson products?
10. How long have you been using the EDMS (McKesson product)?
11. Did you undergo training on the product; if so, when was this and what training did you receive?
12. Has the EDMS (McKesson product) enabled you to complete your documentation more efficiently?

13. Does the EDMS (McKesson application) meet your needs? If not, please explain.
14. Do you believe the EDMS (McKesson product) has increased or decreased your efficiency? If increased, please provide an estimate of time saved. If decreased, please explain.
15. What issues and problems did you encounter as you transitioned to the EDMS (McKesson product)?
16. Has the EDMS (McKesson product) affected your work-flow? If yes, how , please explain
17. What do you like the most about the transition from a paper to electronic chart completion system?
18. What changes would you like to see that would improve your record-keeping and/or work-flow?
19. What features of McKesson HPF do you like the most and why?
20. What features of the McKesson product? Do you like the least and why?
21. Do you believe that, after implementing the HPF, you still have easy access to the HIM department and your group?
22. How often do you feel stressed when thinking about using McKesson HPF to complete your deficient records?
23. Do you believe it is challenging to use HPF? If so, please explain.

Interview Prompts for HIM Staff:

1. What is your age?
2. What is your education and your professional background?

3. What division or department do you work in?
4. What are your work title and responsibilities?
5. Could you please tell me what your comfort level is in using computers?
6. Have you used Electronic Document System before, if so which one and how often?
7. Can you give me an estimate of how many times you have forgotten your password? If you have, how did you resolve this issue?
8. How many years have you been with Scripps? If it is longer than one year, can you give me a general opinion about the EDMS (McKesson products)?
9. How long have you been using the EDMS (McKesson products)?
10. Did you undergo training on the product; if so when was this and what training did you receive?
11. Has the EDMS (McKesson product) enabled you to complete documentation more efficiently?
12. Does the EDMS (McKesson) application meet your needs? If not, please explain.
13. Do you believe the EDMS (McKesson) product has increased or decreased your efficiency to complete your assignments? If it has increased your efficiency, please provide an estimate of time saved. If it has decreased your efficiency, please explain.
14. What issues and problems did you encounter as you transitioned to an EDMS (McKesson product)?

15. Has the EDMS (McKesson product) affected your workflow? If yes, how, please explain
16. What do you like the most about the transition from paper to electronic chart completion?
17. What changes would you like in the product for the purpose of improving your recordkeeping and/or work-flow?
18. What features of the EDMS (McKesson HPF) do you like the most and why?
19. What features of the EDMS (McKesson) do you like the least and why?
20. How much time do you spend prepping a chart now, compared to prepping a paper chart before?
21. Can you access a patient's record faster or slower using a EDMS (McKesson HPF), as compared to accessing a paper record? If faster, what is the estimated time saved?
22. If you analyze the patient record using EDMS (McKesson HPF), please describe if the process is more or less efficient than analyzing a paper record.
23. Please describe if communication with physicians is more or less efficient with the use of EDMS (McKesson HPF).
24. Do you believe the HPF product has had an impact on your ability to process the record for billing? If so, please describe.
25. Do you believe the HPF product has had an effect on your work-flow efficiency? If so, please describe.

26. Please describe any benefits you believe EDMS (McKesson HPF) has brought to the HIM department.
27. What difficulties did you face post-implementation of EDMS (McKesson HPF)?
28. Did you have any support post-implementation of EDMS (McKesson HPF)? If yes, please describe.
29. How does the EDMS (McKesson HPF system) benefit you personally? How does it benefit the entire HIM team?
30. Do you believe it is important for Scripps to use the EDMS (McKesson HPF system)?

4.6 Analysis

4.6.1 Introduction

Qualitative analysis methods involve understanding the research from the point of view of the participants and users. Within a healthcare organization, qualitative research analysis is an excellent methodology and tool for evaluating certain characteristics of the organization, health care team and healthcare professionals. Qualitative research methods also enable systematic evaluation of the research data. This method emphasizes verbal descriptions and explanations of human behaviour. Qualitative research methods also point out social practices in an attempt to understand how the participants explain their own world experiences. Qualitative methods are best when the meaning and context of the studied phenomena are important, such as why or why not a user likes or dislikes a

system (Jackson &Verberg, 2007). Qualitative studies can help to identify existing and emergent findings which may have not been expected (Borycki&Kushniruk, 2005).

Qualitative research aims to gain an understanding of human behaviour and the reasons that govern such behaviour. Generally, the investigative nature of this methodology allows for smaller and more focused samples. Qualitative methods have a narrow focus and produce information about the phenomena of interest about particular cases that are being studied, and more general conclusions are only propositions (Hennie, 2010). In a qualitative research study interview responses can be analyzed using content analysis. In this approach, every piece of information in every line and paragraph is coded and similarities and differences compared to other pieces of information in the data (Jackson &Verberg, 2007).

For the purposes of this research study, after completion of the participant interviews, collected data was first transcribed verbatim. The researcher looked for emergent codes as the analysis was conducted (Gibbs, 2007). 'Emergent coding was used to code the interview responses (Borycki et al., 2009). Based on the collected data, the analysis focused on summarizing the findings related to Scripps Health, including analysis of demographic characteristics of the participants and EDMS application usage versus paper based processes. A table of codes from the data analysis section of this study is given in Appendix F.

4.6.2 Data Analysis

The verbatim transcription of interview responses was first done in an Excel spreadsheet by entering the interview questions and the recorded responses in two separate columns. Data from the Excel spreadsheet was extracted into a Microsoft Word file. After

transcription was complete, the researcher read through all the participants' responses to the questions asked. Within each response emergent themes were identified and a code was created for that theme. This involved reading sections of the transcripts and identifying key themes from the participants' responses in the transcripts. The researcher then sent the transcribed interview data with emergent themes coded to her professor to verify the coding. After confirmation the researcher continued with the process of emergent coding. Upon completion of coding for each question participant responses were compiled and compared to determine if data saturation had occurred and no new themes were identified. The researcher compared the responses of each subject to each question for all questions and all participants. Appendix G shows a print screen of the analysis that displays an example of how the coding was done for one of the participants. The transcripts were analyzed and coded by the investigator to identify themes in participant responses. Words and segments of sentences were the unit of analysis (Jackson &Verberg, 2007). The researcher's analysis considered the physicians' responses and the HIM staffs' responses separately. The researcher analyzed each group individually, as each has had different types of themes in the data. The researcher also compared the responses from the two groups with each other, regarding the use of the HPF/EDMS with respect to different work-flows and method/manner of communication between the two groups using the EDMS.

In this study, the analysis was conducted such that words, phrases and sentences were coded that represented a theme or category (Hsieh & Shannon, 2005). For this study, it was important to analyze the particular impacts of EDMS. The analysis of the interview transcripts generated a large amount of data, which included responses from 19 HIM staff

and 10 physicians. The researcher summarized the coded data to identify key themes. After coding was performed, the codes were grouped into larger categories (Priest et al., 2002).

CHAPTER 5: STUDY FINDINGS

5.1 Introduction

Based on an analysis of the collected data, this section provides an overview of the observations and study findings related to the implementation of an EDMS at two facilities at the Scripps Health organization in California, as experienced by two distinct groups of users: physicians and HIM staff. In this chapter the researcher begins with a discussion of the demographic characteristics of the participants.

5.2 Demographic Characteristic of Participants

A total of twenty-nine participants from two groups took part in the study. Group one consisted of ten physicians and group two consisted of nineteen members of the HIM department. Subjects in each group had both positive and negative perceptions of and experiences with the EDMS. The overall experience of the participant with EDMS depended on their educational background, age, prior experience with EDMS and level of computer use skill.

5.2.1 Demographic Characteristic of Group 1 – Physicians

A total of ten physicians participated in the study from two facilities (Green facility = facility 1 and Encinitas facility = facility 2). Of the ten physician participants three (30%) were females and seven (70%) were male. Five (50%) physicians were under the age of 40 and the other five (50%) were over 40 years of age. Seventy percent (70%) of participants were fairly comfortable with the use of computer systems. Thirty percent (30%) of the physicians were not comfortable with using computers.

The physicians who were not comfortable with using a computer were in the over 40 years old group and were all male.

5.2.2 Demographic Characteristic of Group 2 - HIM Staff

A total of 19 members of the HIM staff participated in the study from two facilities (Green facility = facility 1 and Encinitas facility = facility 2). Of the nineteen HIM staff participants, sixteen (84%) were female and three (16%) were male. Two (11%) of the HIM staff members were under the age of 40 and seventeen (89%) were over 40 years of age. Fourteen (74%) of the HIM staff member participants' were comfortable with the use of computer systems. Five (26%) of the HIM staff members were not comfortable with use of computers. The HIM staff members who were not comfortable with use of computers were all in the over 40 year old group and were all female. With regards to level of education, three (16%) had a high school diploma, and sixteen (84%) had RHIT certificate. Of the sixteen (84%) participants with RHIT certification, four (25%) had a minimum of a four year college degree. With regards to years of experience, six (31%) had between zero to ten, seven (37%) had between ten and twenty, and six (32%) had over twenty years of experience.

Table 2: tabulated summary of demographic characteristics of group 1 - physicians

Characteristic	Frequency (%)
Sex	
Female	3(30)
Age	
≤ 40	5(50)
>40	5(50)
Previous EDMS experience (*n*)	
Yes	7(70)
No	3(30)
Level of comfort using computers (*n*)	
Comfortable	7(70)
Not Comfortable	3(30)

Table 3: tabulated summary of demographic characteristics of group 2 - HIM staff

Characteristic	Frequency (%)
Sex	
Female	16(84)
Age(n)	
≤ 40	3(16)
> 40	16(84)
Years of HIM experience	
0-10	31
11-20	37
>20	32
Previous EDMS experience (*n*)	
Yes	5(26)
No	14(74)
Level of comfort using computers (*n*)	
Comfortable	7(70)
Not Comfortable	3(30)

5.3 Physicians

In this section, post implementation perceptions of physicians related to different areas of EDMS are discussed. In general, results of this research show that physicians have varied perceptions and expectations about the EDMS system. The majority of physicians were pleased with the E-Sign function. As for most other system features, there was not as

clear of a consensus. Some features were liked and some were disliked by percentages that were less than a clear majority. Below is an analysis of physicians' feedback on various areas of the system.

5.3.1 EDMS versus Paper

Post implementation of the EDMS, physicians seem to have had different experiences with the system at least initially. Based on the findings of this research study, this difference appears to be related to factors of age, level of expertise with computer use and prior EDMS experience. Results of the researcher's interviews with the ten physicians at two different facilities included positive and negative comments as indicated in qualitative analysis in the following sections.

5.3.1.1 Positive Feedback

Most of the physicians (70%) provided positive feedback about the E-Sign function of the EDMS application, with some stating that it allows them to sign a patient chart without the need to physically go to the HIM department (which in this case could take more than 10 minutes of their time). Physical presence at the HIM department at the time of signing is a must for paper charts. One subject stated, "I don't have to go down to the HIM Department to sign the chart and it saves me time and I can sign the chart from anywhere I am" (Subject 1, Facility 1, Question 17). Another subject stated "I think that it isconvenient. I can sign my charts from any place. I don't need to go to the HIM department" (Subject 3, Facility 1, Question 17).

Three out of the ten physicians (30%) specifically mentioned that the EDMS speeds up their daily tasks because the use of E-sign eliminates hand written signatures. The following example was provided by a physician in the quote below: "Speed and lack of

hand writing, I think it would be so much more easy to view the chart because the progress note is scanned it has been very helpful to review the chart" (Subject 7, Facility 2, Question 17).

In addition, physicians mentioned that the EDMS helps them to save time because they do not need to go to the HIM department or hospital to sign patient charts. Physicians can sign the patient chart from anywhere as long as they have access to a secure network and complete their signature deficiencies. For example, one physician stated "Pretty good, because I am able to see documents in my office/home" (Subject 10, Facility 2, Question17).

5.3.1.2 Negative Feedback

The majority (80%) of physicians complained about the need to sign in using a password in order to gain access to the EDMS application and subsequent access to patient charts, which is clearly not a requirement for paper charts. Some of the physicians are not good at remembering passwords, especially if they have to do that for multiple systems. For example, one physician stated "Forgot my password and sometimes document takes longer time to display on McKesson application and I don't have access to it (who ever scans the docs to the system does not do it in time)" (Subject 4, Facility 1, Question 15).

A smaller number of physicians (20%) complained about the system user interface. These physicians expected the EDMS to have a friendlier user interface. For example, one physician stated the EDMS is"Not user friendly and it is very hard to understand their modules" (Subject 9, Facility 2, Question 15).

5.3.2 EDMS Features

Results of the researcher's interviews with ten physicians at two different facilities (facility 1, facility 2) included both positive and negative comments as outlined below.

5.3.2.1 Positive Feedback

With regards to the features of the EDMS, physicians had different positive experiences with the HPF application. The majority of physicians had positive feedback with regards to the e-sign function which allows for signing without the need to physically go to the HIM department. For example, one subject stated that "I like the EDMS system because of e-signing because I don't need to go HIM department" (Subject 1, Facility 1, Question 19).

Some other physicians were pleased with the EDMS because of the capability to sign the patient chart electronically from anywhere and at any time, which saves them time. One of the physicians indicated this in the following quote "Some I like EDMS system because of remote access to application and do my tasks or complete some of my job it is very helpful for me" (Subject 10, Facility 2, Question 19)

Quick access to patient data is very important because it increases the quality of care. One of the physicians indicated this in the below quote:

"I would say the speed thing, loads quickly – with some other software, when you retrieving the records you get an hour last and you are waiting for the document view. I found it, McKesson is very fast you can go to document as long as you click the mouse the document displays and is available for you. And the way it serves you to find the

document and retrieve the document and signature is very fast and I couldn't find another software to be this much faster" (Subject 7, Facility 2, Question 19).

5.3.2.2 Negative Feedback

The features and functions of available EDMS applications from different vendors can vary. With regards to HPF, some of the physicians like to have copy and paste functionality, which is not offered in HPF. Also, 40 % of the physicians indicated that with regards to correction of deficiencies, the control of the numbers of inserted characters should be with physicians. In the absence of that control, the maximum number of inserted characters allowed by HIM staff for insertion of missing text by physician is sometimes insufficient. This was indicated by two of the physicians in the following quotes:

"It is not user friendly. Copy and paste that I don't like it. It is cumbersome if you want to find some information. When I want to decline something there is not that much room or space to do it and I want to explain what is the problem is. I want to say something else I forgot, the thing I really hate about McKesson when I sign into McKesson to remove my deficiencies from my charts on Monday, displays I have pending suspension which this did not display on Saturday, I signed in and I am in trouble because I didn't click quick enough or so. I really didn't like that. I don't want to have paper charts as well, the better thing will be just EMR and with a one system. Like Denmark and Norway and they can access all patients information and it would be awesome." (Subject 6, Facility 2, Question 20)

"Well, I think inability to (type) make modifications to record, inability to complete written forms online. The HIM department tries to use yellow boxes, but this is a pretty poor band aid for such an expensive system. I think they need to come up with better idea and solutions about it." (Subject 10, Facility 2, Question 20)

5.3.3 EDMS versus Paper

At the heart of an EDMS is document scanning. Scanned, digitally captured patient charts are kept in long term storage, as preservation of patient data for a minimum period of time is required by law in the U.S. The volume of data captured digitally is considerably less than that of paper charts. Scanned documents are passive. That is, the data is not fully digitized and searchable. However, this is a known fact for large healthcare providers such as hospitals which use EDMS as part of a pathway to a complete EMR system. A part of this study documents the opinion of several physicians about EDMS and its advantages and disadvantages versus paper based systems, as related to their work-flow.

5.3.3.1 Positive Feedback

EDMS is argued to be a more convenient application as compared to paper patient charts. One of the results of EDMS usage is that physicians do not need to go to the HIM department to sign the patient chart manually. Physicians can sign patient charts from anywhere as long as they have access to a secure internet connection. This is reflected in one of the physician's quotes:

"I don't have to go down HIM Department to sign the chart and it saves my time and I can sign the chart from anywhere I am." (Subject 1, Facility 1, Question 17)

5.3.3.2 Negative Feedback

Once all deficiency allocations are removed from a physician's inbox through the system, it is very difficult for the physician to find specific information in the various document modules (such as progress notes or physician orders). In such cases, the physician must go through every single page of the document module to find the necessarydata, as one of the physicians indicated the following quote:

"I prepped the chart ahead of time I spend hours at home to prep it because of having EMR system now and I didn't do it before at all. That's partially because I need to populate the chart and clean them up and there is lots of garbage on it and I don't need them but I need to read all of them. I would say it takes more time but on other hand I should say it is easier to find the information and it is much more accurate information about patient care. McKesson is very difficult to use and I don't like to use it at all. It isnot as user friendly for me as for physicians." (Subject 6, Facility 1, Question14)

Table 4 displays the frequency of types of system problems or issues encountered by the physicians (from their quotes), in terms of: problems in transitioning from paper to EDMS, problems with EDMS features, problems as compared to paper, and problems related to communication between HIM staff and physicians.

Table 4: physicians' frequency of system problem or issues

Physicians	**Frequency**
Transition from paper to EDMS	4(40%)
EDMS features	4(40%)
EDMS versus paper	4(40%)
Communication between HIM and physicians	2(80%)

Subjects n= 10

5.3.4 Summary - Physician Interviews

Sixty (60%) percent of the physicians who participated in this study were satisfied with EDMS and its effect on improving the efficiency of their work-flow. The same percentage of physician participants also believed EDMS improved patient care quality. The main factor shaping a positive overall opinion of physicians about EDMS was immediate access to patient data.

5.4 HIM Participants

In this section, the post implementation perceptions of HIM staff related to different aspects of EDMS is discussed. In general, results of this research show that HIM staff members have different perceptions and expectations of the EDMS system. The majority

of HIM staff were pleased with the EDMS functions compared withpaper charts. Below is an analysis of HIM staff feedback about various aspects of the system.

5.4.1 EDMS Efficiency as related to HIM Workflow

At Scripps' hospitals, the conversion of paper charts into electronic patient charts is done by the HIM department. The steps for this conversion are the following: 1) prepping (process of sorting and organizing the chart), 2) scanning, 3) indexing and releasing. Once the electronic chart is released, it is available for all who are authorized to access patient data. Whether or not the HIM staff thought positively or negatively about the EMDS appeared to be related to several factors, such as job function within the HIM department, prior experience with EDMS and level of computer use skill. five (26%) of the nineteen participants did not feel that HPF met their expectations related to efficiency of their work flow in at least one area. For example, the efficiency in indexing area met their expectations, whereas efficiency in prepping records did not.

The key concepts related to efficiency were permanent and centralized patient chart location, access by multiple people (coders and analyzers in the HIM department and physicians) at the same time and overall time savings. Positive and negative inputs related to the above mentioned key concepts are described in the following sections.

5.4.1.1 Positive

The majority of HIM staff believed that the EDMS application provided faster access to patient data as compared with paper charts. Also, because of simultaneous access ability, there is no waiting time to access a chart in cases where it was being worked on by someone else in the HIM group or a physician. Additionally, HIM staff stated that

deficiency removal is easier and more efficient with the EDMS. With paper charts, during a physician visit to the HIM for removal of deficiencies, a physician might miss removing a deficiency which would require another trip to the HIM department. With the EDMS, a deficiency is not removed unless proper action is taken by the physician. HIM staff indicated they would rather use EDMS as indicated by the following two quotes: "It is very positive. We now can immediately have access to patient information, and multiple end users have access to it. Papers can be set to one place and one end user can use it and sometimes it's hard to find the patient chart because it misplaces the chart. Now the same end user can view the patient chart at the same time. This improves patient care it is very efficient for the hospital. In the paper world we have some delays, but not now with the EDMS system. If the patient goes home and comes back again, all patient information (e.g., laboratory reports etc.)are available to all health providers. The workflow processes are more easily analyzed and it is easier to ask doctors to complete the charts and sign the orders. For example, it may be that different orders have different doctors and they can sign at the same time when we have the EDMS it is opposite of paper system"(Subject 2, Question11, Facility 1).

"More efficient; No need to turn the page to go to the right spot to sign out just click on the flag and system takes you to the right spot to sign the deficiency. Also doctors need to come to him and if the flag removes accidently it is too hard to find the missing text or signatures. The system is more efficient because you put in information electronically and right quickly go to the physicians. In the paper we need to handwrite where the deficiencies are and tab them and put this information in a system recorder, physicians need to come to the HIM department and pull the chart and complete their deficiency,

and analyzers need to go back to make sure they did a good job, either they did it right or not. In the electronic world they would have done their task and left and we would not need to review it again, for most of them, signatures and missing text. (Subject 2, Question 22, Facility 2)

5.4.1.2Negative

Five out of 19 (26%) HIM department staff did not think that the EDMS was more efficient than paper because the system took a long time to load the patient data but with paper charts there is no waiting for uploading of the data as long as the patient chart is available. This issue came up after the upgrading of the EDMS application. When the system is slow it affects HIM work-flow. This issue was highlighted by some of the HIM staff as described in following quote:

> "We had an upgrade in August 2012 and ever since then the system has not functioned correctly." (Subject 16, Facility 2, Question 11)

In addition, another subject stated "When the system has a "blockage" and makes my program slow it becomes an issue." (Subject 15, Facility 2, Question 15)

5.4.2 Meeting End Users Needs

Implementation of an EMR for large U.S. healthcare provider such as Scripps Health is necessitated by law. To get to a full EMR implementation, many healthcare providers have chosen EDMS as an intermediate step. The EDMS chosen by Scripps Health is a product called Horizon Patient Folder (HPF) marketed by McKesson Corp. There are two classes of end users with respect to the HIM department. One is the senior management team who are mainly concerned with productivity and financial

performance of the department and the other are the people who actually use the product (e.g. physicians, nurses, etc.). According to one subject (Subject 2, Facility 1, Question 13), using the same full time equivalent (FTE) resources, post implementation of EDMS the department has processed more patient data - these were patient data from physical therapy and interventional radiology departments. This was a significant part of the goals of the HIM senior management with respect to selection of HPF. Additionally, the revenue cycle for the HIM department was reduced post EDMS implementation.

As part of this research study, the HIM staff participants provided their opinion on whether or not HPF met their overall needs. Five (26%) of the nineteen participants did not feel that HPF met their overall needs. The quotes in the next sections describe the positive and negative perceptions of the HIM staff.

5.4.2.1 Positive Feedback

Most of the HIM staff indicated that the EDMS application facilitates their desire to finish their daily tasks faster than using paper patient charts. However, a few of staff members indicated that there are some application issues including the following:

"Overall it needs my needs." (Subject 2, Facility 1, Question 12)

"It meets my needs however, the recent updates have done nothing but set us

behind." (Subject 16, Facility 2, Question 12)

"Yes, but after updating we had some issues about this system." (Subject 4, Facility 2, Question 12)

5.4.2.2 Negative Feedback

Only a few HIM staff members indicated that the EDMS application cannot be cold fed with all other applications and therefore this results in not being able to find all patient data in one system. One of the HIM staff describes this issue in the following quote:

"Not all of the information that is needed interfaces into the system which is frustrating, sometimes that's a problem with the system that we can't view or access to other information through this system." (Subject 15, Facility 1, Question 12)

5.4.3 Paper versus EDMS

As mentioned earlier in the review of the literature, scanning handwritten documents is one of the data capture points in using an EDMS. Once these documents are digitally captured they can be accessed immediately. This immediate access affects the quality of patient care. In addition to the immediate access aspect, digitally captured documents offer other advantages to the user, such as the ability to zoom in on difficult to read words, and documents not getting faded and difficult to read overtime. HIM staff wereasked about the accessibility and completeness of patient information with the recording system utilized in their health facility. Most HIM staff indicated that the documentation is comprehensive, accurate, and available immediately, as indicated by responses from three HIM participants in the following quotes:

"Much faster time savings, it is hard to put a number on. With paper charts, everybody tries find to chart and it is sometimes misplaced. For the McKesson, if you have the right information with demographics, or MR# or ACCT# it takes a matter of minutes." (Subject2, Facility 1, Question 21)

“Less paper work, no loose filing that's the biggest thing.” (Subject 1, Facility 1, Question 16)

“The immediate access to information, we don't have to wait, there is no delay for it and if something happened we can just pull up the patient information by having the ACCT# or MR#.” (Subject 6, Facility 2, Question 16)

As a consequence of the above perceptions, 18 out of the 19 (94.73%) of the HIM staff would rather use an EDMS than a paper system.

5.4.4 Communication Between HIM and Physicians in post EDMS Implementation

One of the argued for outcomes of EDMS implementation is improved communication between the HIM staff and physicians when compared to the paper-based system. At Scripps, prior to EDMS implementation, physicians needed to go to the HIM department to sign for deficiencies in patient charts with face to face interaction. Subsequent to EDMS implementation, there is no face to face interaction and most communication is either through email or the system to remove physician’s chart deficiencies such as missing signatures or text. Most of the HIM staff indicated that communication is more efficient and accurate, with the exception of 2 (11%) out of the 19 who indicated the following:

“Less, since we’re not there when they review the queries, we can’t explain it to them, like we could with the paper record.” (Subject 14, Facility 1, Question 23)

“I think it is not efficient when we need to describe an issue in detail.” (Subject 15, Facility 1, Question 23)

5.4.5 Transition from Paper to EDMS

In 2011, Scripps completed the implementation of the DSC/HPF system in their facilities to transition from paper to electronic records for patient care. Generally, with a new system's implementation in an organization, there are possible issues with the system itself or the end users who utilize the system. There was mixed opinion about the transition from paper to EDMS in the participant responses during the interview process. Some HIM staff members provided examples of a number of issues whereas others either did not encounter or remembered to share these issues.

Nine (48%) HIM staff out of 19 participants indicated that there were some issues in the transition. Some of the important issues mentioned are listed in the following quotes:

> "First steps, the staff didn't like to change,were not happy they need to have immediate resolve and they got behind and they have some issues with the system and it made them to get frustrated and it took almost 6 months to get used to this system. The system didn't work at the beginning the way it was supposed to work and there are lots of redo works involved such as the need to rescan all charts. And work flow changed. And we didn't know till it was to go live and we needed to change many areas of the work flow. And we kept changing the workflow. This is not working and need to change ... lots of consequences anticipated until they work it out." (Subject 6, Facility 2, Question 14)

> "Navigation, pressing the wrong buttons, there are short cut keys we use." (Subject 7, Facility 2, Question 14)

"I think uhm you know there are issues where the system crashes and or we have to constantly reboot or log out of the system." (Subject 15, Facility 1, Question 14)

"Training and familiarity with the product was very challenging and it took a while for the people to really know and get on the top of that. I also don't know the product that much and I need to learn that some of that some of it is challenging." (Subject5, Facility 1, Question 14)

Overall, for the HIM staff at Scripps Health, a majority of 52% made the transition from paper to EDMS without major issues. The issues that the other 48% reported were resolved quickly to the point that they started utilizing the system without major disruptions to or significant reductions in the department's output.

5.4.6 Benefits of EDMS for the HIM Department

During the interview process, participants elaborated on various advantages of EDMS as used in the HIM department. Generally, participants expected that any new system would have bugs (i.e. software errors) that need to be worked out because there are no new systems that work from their initial implementation without any bugs. In general, small issues/bugs did not detract from participants' opinions about EDMS. Participants indicated the following key elements as benefits of EDMS versus paper based systems:

1) Faster access to patient data
2) Time saving
3) Faster billing process (shorter revenue cycle)

4) Patient safety and quality of care
5) Less missing patient data
6) Increase in HIM staff productivity

Some of participants' quotes related to benefits of EDMS for the HIM department are listed below:

> "For the team everybody is more efficient and you can get the answers much faster. Because it is matter of login and pull up the record - patients can call or insurance people call and we can provide them information fast instead of pull up the charts and call back. For me personally the department runs better and they can provide the information quicker and that's better." (Subject 6, Facility 2, Question 29)

> "Records are in the queues, multiple people can work on the same record at the same time." (Subject 13, Facility 2, Question 29)

> Also one of the HIM participants indicated that the EDMS system caused the billing process to be faster and helped to make their workflow more efficient, as the quote below indicates:

> "Yes, you don't have to scroll through the paper chart. And yes, we are able to code more accurately." (Subject 9, Facility 1, Question 24)

In summary, regarding the benefits of the EDMS versus paper from a HIM staff perspective several key benefits were identified such as easier access to patient data, increase in productivity and faster billing cycles. In addition, participants were willing to

learn to adapt to the new system and use it despite a few minor system and or software issues.

5.4.7 Liked and Disliked EDMS Features

The participants liked a number of EDMS features. The main EDMS features that were liked by participants included the following: (a) substantial reduction of paper in patient charts, (b) immediately searchable patient data using Medical Record number or Account Number or demographic information, and (c) simultaneous multi-user data access. There were other features that some users found useful whereas others did not. Functions for missing text, dictation, and signatures are the main functions of a typical EDMS associated with HIM tasks. HIM staff could complete their daily tasks electronically. When HIM staff members submitted their assignments for different physicians attending to one patient, multiple physicians could complete their tasks related to the same patient simultaneously, therefore eliminating the need to wait for a serial process (i.e. that of waiting until one physician signed off the chart before the paper chart could be passed to the next physician) as is the case when working on paper charts. Some of the features of the HPF EDMS were poorly designed, according to some of the HIM interview participants. One such poorly designed feature was the search function. Here, participants stated that in the search field input area the HIM staff needed to type the complete physician name to find that physician in the system. Otherwise the search button did not recognize the name when partially spelled. Also, Scripps' HPF EDMS system did not interface with other Scripps applications making it hard to consider the HPF system as a centralized application for the entire Scripps organization. As participants were interviewed, they shared different opinion about EDMS features. The

examples below include both positive and negative comments about the EDMS features used by the HIM staff:

5.4.7.1 Positive

The majority of HIM staff indicated that several users can have access to the same patient data at the same time. This is the most important benefit of using an EDMS application. This feature of the EDMS application provided for easier and faster completion of HIM staff daily tasks. Two related quotes are given below:

> "The fact that several users can view the reports at the same time and one is not dependent on other users do coding, ROI, analyze and deficiency and we cannot wait for each other." (Subject2, Facility 1, Question18)

> "I have to say the electronic well, the sign the chart electronically by physicians trying sitting in their office and it makes easier to our staff and them as well. It is made of potentially that would be faster." (Subject5, Facility 2, Question18)

Implementation of EDMS which provides for simultaneous access by multiple users in various departments results in time savings and faster access to data. Overall benefits of these features included improved productivity for the HIM department.

5.4.7.2 Negative

A few of the HIM staff indicated that some areas of the HPF application needed improvement in order to allow for tasks to be done more efficiently. These staff members were not pleased with the search field for finding physician names because they were required to type the physician's entire name without spelling errors. Many current

software applications show a list of names starting with a few letters of the name so the desired name could be quickly selected from those showing. One of the HIM staff indicated this in the following quote:

> "Major, physician name not able to find with 3 or more letters, and ICU section doesn't work properly." (Subject2, Facility 1, Question19)

In addition, one of the HIM staff mentioned in the following quote that the reporting of historical patient data is not working as the HIM staff desired and the system didn't display detailed information:

> "I have to say the reporting capability it is not robust enough, it doesn't give enough information, specifically about keeping historical data, reporting about the delinquent and deficiencies of physicians' signatures - need more detailed information in report." (Subject5, Facility 2,Question19)

A few HIM staff also discussed the speed of EDMS, which caused slowdowns in their work-flow. The following quote reflected this:

> "The slowness of pages loading really puts a dent in my workflow." (Subject5, Facility 2,Question19)

Currently, the EDMS application cannot communicate with other applications at Scripps Health. HIM staff mentioned that it would be helpful to either use systems which can communicate with other systems or just have one system for an entire organization. To find different patient data, HIM staff members need to open multiple different

applications such as radiology. One of the HIM staff described the issue of systems not communicating in the following quote:

> "EDMS (HPF) is unable to communicate with other systems properly and vice versa." (Subject19, Facility 2, Question19)

The main dislikes about the EDMS system had to do with problems that were relatively easy to address and fix by the system vendor (which will eventually be done). These included no auto word completion feature which required users to correctly spell complete physician names, system slow down at times and inability to accept uploads from EKG or PAC systems.

5.4.8 Post Implementation System Support

When any new system is implemented in a large organization, it will have some unexpected issues that neither the system developer nor the user could have anticipated. Some of the issues are fixable and some of them are not. When Scripps' EDMS "went live", that is, when it was installed for official use, some issues showed up and the Scripps' Information System (IS) team started working on resolving them. Some of these issues were critical, such as the following: (a) the system not reading the bar code of some forms, (b) the system causing increased work, and (c) consumption of more of the HIM staff's time. Some other issues were minor enough that HIM staff could work around them. For example, some short cut or "hot" keys did not work as designed. Additionally, there was a learning curve as is the case with any new system. Overall, Scripps' information systems team and McKesson representatives worked together to go through the list of prioritized issues and fix each one based on criticality. Seven (36.84%)

out of 19 HIM staff indicated that there were no issues with system support. One HIM staff commented about system support in the following quote:

> "Yes, they are very organized and had a game plan in implementation so direct go live we have the IS team and we have representatives from McKesson and they set up a command center to fill the early questions that's sort of things. They were here for the first couple of weeks and we have support for our site as well, and a designated expert of the IS department is trained as super user of each department. Then they are kind of left to perform the job and McKesson people came again 60-90 days after implementation, to see how we did the job and maybe look at us in real the world not in test or training world." (Subject 2, Facility 1, Question 29)

Other HIM staff indicated the following post implementation issues:

> "Some of the bar codes didn't read and we still sometimes have this issue." (Subject 12, Facility 2, Question 28)

> "At the beginning it is hard time to print the patient's labels." (Subject 3, Facility 1, Question 28)

> "Well, it is really problems or questions came up and we don't know how to answer, so you know try to find the answer for them some of them it is easy and some others it is difficult. We are not expert in the system so it was a little challenging to for us make sure to be comfortable with the answer we want to give. That was a little problem and the system doesn't usually work the way it is supposed to work 100%when you put in the new system. Sometimes you don't

know whether it is the problem or not so it might be a problem but you don't know it yet to report it. You think that may be something that you don't know about it and spend lots of time and trying look things up and ask questions. And then the other challenge was that we implemented the system wide and I made a decision one way and another candidate partner in another entity got a different decision and we don't have standardization across the system for the little tiny things." (Subject 5, Facility 1, Question 28)

"Initially, we are the first site, the system went to live batches disappeared and we scanned the chart and images disappeared and we needed to rescan them and it was lots of work. For the coder, it was fine they need to correct queue and track it manually and electronically. For ERs that is still a problem and they continue to repopulated, it could be the record re-populate if it is been for 6 months ago that payment has been made, is the trigger that ACCT came across again and we need to clean that every day and that's inefficient and it was an interface issue and it is an issue about ER departments." (Subject6, Facility 2, Question 28)

Table 5 summarizes the frequency of negative responses by the HIM staff:

Table 5: summarized the frequency of negative responses by the HIM staff

HIM Staff	**Frequency**
EDMS efficiency as related to HIM workflow	5 (26%)
Meeting end user needs	5 (26%)
Paper versus EDMS	1(5.27%)
Communication between HIM and Physicians in post EDMS implementation	2 (11%)
Transition from paper to EDMS	9 (48%)
Support Post implementation system	7 (36%)

Participants: n= 19

From participant responses, it appeared that although there were issues with the system most of the major issues where addressed by either the vendor or Scripps' own support staff.

5.5 Advantages of the EDMS System in the Scripps Organization

The healthcare organizations' management decided that it was important for Scripps to implement the EDMS (McKesson HPF) before they implement a full EMR system because healthcare providers in the U.S. must implement substantial portions of steps in

order to get to full EMR status. Scripps implemented the EDMS in their five facilities to improve the quality of patient care, meet the requirements of new healthcare laws and avoid penalties that result for no or delayed implementation. During this study, participants responded to a list of prepared questions. One of the key concerns raised by some participants was that the HPF system cannot interface with other existing applications at Scripps Health. Clinicians need to work with different systems in order to get different patient data and were concerned that HPF lacks a complete centralized system. The HPF system had and continues to have some bugs related to and affecting the workflow of the HIM department. Some other participants stated that the EDMS is a good product and at this time it has increased quality of patient care as compared to paper chart system. Some of the participants' quotes along these lines are indicated below:

> "I think it's about time we went electronic, it has its bugs but it is still a good system, and it has made us more efficient as a whole." (Subject 1, Facility 1, Question 30)

> "If it only talks to all systems it would be a good system… I wish to have one central system and it can talk with different systems." (Subject 4, Facility 2, Question 30)

Although all participants agreed that it is time to implement an EDMS system at Scripps health, three (16%) out of the 19 participants believed that it would be better to find a system that is capable of interfacing with other existing systems and one without as many issues.

CHAPTER 6: DISCUSSION

6.1 Introduction

An EDMS was implemented at Scripps Health located in San Diego County in the Southern California region of the U.S. to meet the requirements of new healthcare laws and to improve the quality of patient care, as discussed in the literature review section of this thesis. This implementation was done prior to full EMR implementation so that health professionals generating or working with patient charts become familiarized with non-paper based systems. There are some studies on and formal evaluations of the challenges of EDMS implementation in healthcare organizations. EDMS implementation is a challenging process for any healthcare organization. As much as learning about the experiences of different healthcare organizations would be helpful and used as reference, there is no universal standalone EDMS software system that could fully meet the requirements of all healthcare organizations. As well, no software system fully meets a healthcare organization's regulation and policy needs fully. Therefore, a healthcare organization would need differing EDMS solutions based on its requirements, policy and regulation needs. Additionally, each state in the U.S. has its own regulations and policies. To meet the varied requirements of health organizations, customization of available platforms is done.

The findings of this study indicate that implementation of an EDMS at Scripps Health's two hospitals was beneficial. The majority of participants in the physician and the HIM staff groups felt that implementation of EDMS was beneficial to them. Due to dissimilar work requirements, the perceived negative aspects of using an EMDS were different for the two groups.

6.2 Perceived Benefits of Using EDMS versus Paper Charts on Physicians Work-flow

6.2.1 Immediate Access to Patient Data

This study's findings with respect to immediate access to the EDMS were similar to what was reported by Stratis Health (2009). According to physicians at Scripps, immediate access to patient charts was one of the key advantages of the EDMS implementation that they preferred. As reported by Stratis Health, immediate access increased the quality of patient care because the physician has access to patient data in real time and up to date information such as medication lists, patient history and physical reports. Compared to a paper based system, there is a multi-step process that needs to be followed to obtain a chart. These steps include: a) informing the HIM department of the chart needed, and b) waiting for the chart delivery from HIM (in-house or outsourced data storage). This immediate access is extended to all hospitals in Scripps Health, where in contrast, paper charts were only kept as single copies in one facility only. Obtaining a paper chart from a different facility could be a very time consuming process.

6.1.2 Simultaneous Access to Patient Data

This feature allows several physicians to access data simultaneously and provides an opportunity for consultation among physicians while each is looking at the same data, at the same time, while in the same or at different locations (Stratis Health, 2009). The EDMS at Scripps Health provides its physicians this capability as well as the ability to access patient data through the web via a secure path using a Virtual Private Network (VPN) in case they are at home, on vacation or at a conference etc.Results from this

research study indicated that sixty (60%) percent of physicians felt that an EDMS made a positive impact on their workflow in this regard.

The results of the study of the six hospitals in Norway (Laerum et al, 2003) indicated a sixty eight percent (68%) positive response with respect to the capability to access data more flexibly. This was in light of the fact that system usage levels were different in various departments. Overall, an EDMS was perceived as producing a higher quality of workflow.

6.2 Impact of Implementation of EDMS on Physician Workflow

6.2.1 Deficiency Allocation

Deficiencies in patient charts must be removed by physicians for a chart to be considered complete from a legal perspective. There is also a time frame for removal of these deficiencies. With paper charts, physicians need to go the HIM department to complete fixing of deficiencies. This activity takes a significant amount of time even if all the needed charts are readily available. An EDMS allows for deficiency allocation to be done from the physician's computer eliminating the need for visiting the HIM department. This feature saves time as reported by Stratis Health (Stratis Health, 2009).

6.2.2 Using Computer Application versus Paper

Some physicians with limited computer use skills had difficulty with use of the EDMS. Some of the issues included the learning curve associated with learning features of software, use of computer applications and poor typing skills. These issues were mainly brought up by physicians that were older than forty years of age. Poor typing skills caused a longer period of time needed for chart completion. The same group of

physicians also needed more training time. From the literature, a study by Koide and Peskin(2005) found the same issue with physicians who did not type fast.

6.3 Impact of EDMS Implementation on HIM

6.3.1 Simultaneous Access to Patient Chart

Once a patient chart is scanned, indexed and released through the EDMS system, the patient data will be available for all of the HIM staff. Each member of the HIM staff can work on their specific section of the chart at the same time. For example, coders and analysts do their tasks simultaneously. Working with paper charts, coders and analysts would have to wait for each other to complete tasks because there is only one chart available. This eliminates the typical backlog associated with paper charts which in turn requires blocking of daily tasks by the HIM staff. This was also reported in a study of Cooley Dickinson Hospital as reported by Congdon (2006) who stated a 90% reduction in paper handling by coders, which in turn resulted in a 50-60% reduction in coding process time.

6.3.2 Cost savings

Safe storage of data is a significant portion of the HIM department's budget. Berkshire Medical Technologies (2010) reported a cost of $8 per chart per year for storing paper charts and a cost of $1-$2 per chart for electronically stored records. Participants believed that there were costs savings associated with using an EDMS. According to two of the study's participants, Scripps' cost savings per electronic record is within the above range. One of the key factors in justification of an EDMS is cost savings. Data storage provided clear measureable metrics towards this goal.

Another source of cost savings at Scripps was the fact that an increased workload caused by addition of data from physical therapy and radiology departments is being handled with the same number of staff. The full time equivalent (FTE) factor of the HIM department has remained the same while its output has increased. This is also a clear and measureable metric.

6.3.3 Reduction of Accounts Receivables and Bill Holding Days

Daily billing volumes in a large hospital, especially in the U.S. are very significant. It is important that these hospitals get paid for their services on time and as quickly as possible so they can continue their operations. According to an article by Clark and Devadas (2009) three organizations which implemented EDMS in 2009, allowed for immediate and instantaneous access to the medical record post discharge, which directly reduced their Account Receivable (AR) and bill hold days. A couple of the participants in this study indicated that average time from bill submission to payment was reduced significantly. A major contributor to this effect was from the ability of coders to complete tasks related to each patient quickly without waiting for other HIM tasks, such as analysis, to be completed and send the medical records to the business office automatically through the EDMS system.

6.3.4 Reduction of Error Rates and Less Missing Data

Missing patient data in paper based systems is a problematic matter both in terms of providing high quality patient care and from a legal stand point. Implementing an EDMS reduces missing patient data by eliminating the chance for many things that can happen with paper charts; including accidental loss of loose papers and forms, fading, and misfiling. Studies from four benchmark leaders, results of which were published in the

information technology literature, show that the implementation of EDMS can provide real benefits in terms of care delivery based on guidelines, especially in the reduced medication errors and duplicate or inappropriate treatment (Chaudhry et al., 2006). Findings of the research study in this thesis also suggest that EDMS implementation reduces missing patient data as reported by HIM participants.

It should be noted that when an EDMS is subjected to power outage or other significant hardware or software issues, patient data that is scanned and is in queue for indexing is lost for aforementioned reasons. Therefore, even an EDMS can have episodes of missing patient data until electrical power returns or hardware/software issue is resolved. This type of missing patient data is recoverable by rescanning and continuing with the normal process. Also, the episodes of missing patient data in an EDMS concerns a known batch of patient data (identified with a unique batch ID) whereas missing data in paper based systems is random.

CHAPTER 7: CONCLUSION

This research study has achieved the objective of identifying the challenges of implementing an EDMS at hospitals of Scripps Health in Southern California, with a focus on challenges experienced by two specific EDMS user groups: physicians and HIM department staff. This study has answered the six posed research questions. Participants provided their insight, both positive and negative about an EDMS overall and as compared with paper based chart system. From the interviews, positive aspects about the use of EDMS included benefits such as immediate access to patient information, simultaneous multiple user access to patient data, remote access, reduced error rates, no delay or missing information, improved productivity and reduced costs associated with storage of patient data. Negative aspects included learning curve issues, no option of copy/paste to the notes section, unexpected issues associated with system upgrades, and slow speed of loading patient charts.

The researcher has also identified the system functions that users in each of the two user groups stated as the key factor making the EDMS the preferred system versus paper based charts at Scripps Health. The literature reviewed for this research study is mainly about implementation of EDMS in one type of facility at various health organizations. This research is focused only on hospitals of Scripps Health (two hospitals). Scripps Health has clinics as well as hospitals and these two entities have different patient data repository systems. Scripps' EDMS (HPF) is for hospitals and the clinics have different systems although both types of facilities belong to same healthcare organization. This may be a significant difference between Scripps Health and other health organizations.

Through the information collected during the research, some of the participants discussed the desired features and functions they would like to see improved or added as part of Scripps' EDMS. A key desired feature was an improved user interface that is more user-friendly. The research study also identified that the perceived strength of EDMS (such as immediate access to patient data, simultaneous multiple user access, and remote access) and weaknesses (such as not having a user friendly interface, low loading speed of patient data , training intensiveness etc.) depended on the age of the user as well as level of computer use knowledge.

It is hoped that through the analysis of the responses to questions posed in this thesis, the management of the health information department, IT department and physicians involved in decision making process related to patient data repositories will gain a better understanding on the impact of EDMS (HPF) post implementation. Understanding and discussing these positive and negative impacts is important for health organizations, as many are increasingly looking to make improvements in systems and processes in order to provide the best possible solutions for the various end users.

7.1 Implications of the Research Study

This research has some important implications for management, physicians and HIM staff at Scripps as well as other hospitals which are contemplating implementation of EDMS (HPF) in their organization. These implications are described below.

7.1.1 Implications for Physicians

This research has implications for physicians who are employed or have practice privileges at hospitals or both clinics and hospitals. The research study provides

feedback about the perception of physicians and HIM staff. These two groups have different points of view and expectations about EDMS implementations. The research provides insight into other healthcare organizations' experiences with EDMS post-implementation including positive and negative outcomes and impacts as well as particular EDMS functions that were considered important regarding the implementation a success. The research study can also be used as a good starting point for when organizations such as Scripps Health consider moving to full EMR implementation.

7.1.2. Implications for Health Information Staff

The research study has implications for health information staff members and for people who actually use the system to complete their daily tasks to department managers. Results of this research may provide new insights on perceived post-implementation results by the HIM management. The results of this study may help HIM department managers and leaders better understand all the key challenges post-implementation of an EDMS, which would allow them to prepare a more comprehensive set of upgrade requirements for the vendor of the application. Additionally, results of this study affirm the decision to implement EDMS, because overall it is considered by the participants to be a better alternative to a paper-based chart system.

Furthermore, this study identifies some of the differences between the expectations of the HIM staff and physicians with regards to EDMS functionality. It also identifies some differences between the literatures, which highlights that implementation of EDMS has been found to be successful and the interview data, which found post-implementation of EDMS to be more successful before upgrading the system. It may be that implementation

of EDMS at Scripps is different than in other healthcare organization that were included in the literature review section where systems may have failed. This is a qualitative study and therefore the research cannot be certain of the differences and outcomes. However, knowledge of these differences can be helpful for Scripps Health for future EMR implementations. In addition to this, HIM leaders can use feedback from this study as a basis for planning a future full EMR implementation.

7.2 Limitations and Future Research

EDMS implementation was the first attempt at a digital data repository at the hospitals of Scripps Health. As a result, there are a number of opportunities for further research in this area.Since this research was limited to a small number of participants, especially physicians, one area for future research could be increasing the number of participants in each group to allow for sub-grouping based on disciplinary specialty (e.g. surgeons versus internal medicine physicians). An increase in the sample size of participants leading to sub-grouping by specialty may provide a better understanding of how EDMS is viewed depending on specialty. Another area of focus could be to make the study more inclusive. That is, a large group of users such as nurses could also be included as participants to obtain this group's perspective. Yet another area for future research could be on the EMR pre-implementation and implementation phases; in particular how the EDMS can be integrated with a full EMR system as a key consideration for selection of the right product. Finally, a study of the perceptions of physicians and staff regarding EDMS implementation could also be complemented by quantitative data from studies of chart audits and tracking of record creation and usage. A match between the qualitative and quantitative studies will confirm validity of the former.

REFERENCES

Acker et.al.(2003). Electronic Document Management as a Component of the Electronic Health Record.

AHIMA (2003).Disaster Planning for Health Information.Available at : http://library.ahima.org/xpedio/groups/public/documents/ahima/bok3_004994.pdf Accessed: August, 2003.

AHIMA (2010).Disaster Planning for Health Information. Available at: http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_048638.hcsp?dDocName=bok1_048638. Accessed: December, 2010.

Artio,C. (2009). Advantages of Electronic Health Record System.EzineArticles. Available at: http://ezinearticles.com/?Disadvantages-of-Electronic-Health-Records-System&id=2720650 .Accessed : August 06,2009

BCTV (2009). Available at: http://www.bctv.org/special_reports/health/advantagesdisadvantages-of-electronic-medical-records/article_3cc6ae5e-d46d-11de-b132-001cc4c03286.html.Accessed: NOV 18, 2009.

Berkshire Medical Technologies.e-MDsDocMandir: Electronic Document Management System for Eliminating Paper Charts at: http://www.bmedtech.com/index.php?option=com_content&view=article&id=11:e-mds-docman&catid=2.Accessed at July 7, 2011.

Boeije, H. R. (2010). Analysis in Qualitative Research. Thousand Oaks, CA: Sagepub.

Borycki, E. M., Lemieux-Charles, L., Nagle, L., &Eysenbach, G. (2009).Evaluating the impact of hybrid electronic-paper environments upon novice nurse information seeking.Methods of information in medicine, 48(2), 137-143.

Borycki, E. M., & Lemieux-Charles, L. (2007). Does a hybrid electronic-paper environment impact on health professional information seeking?.Studies in health technology and informatics, 136, 505-510.

Business Wire,Berkshire Hathaway.(2009). Available at: http://www.businesswire.com/news/home/20091013006268/en/Alpha-Systems-Provide-Electronic-Document-Management-Virtua.Accessed : October 13, 2009

Business Wire. (1995). Available at:

http://www.thefreelibrary.com/Documentum+announces+selection+by+the+Boeing+Company+as+document...-a016013495.Accessed : January 10, 1995

Chaudhry, B., Wang, J., Wu, S., Maglione, M., Mojica,W., Roth, E., Morton, SC., &Shekelle, PG.(2006). SystematicReview:Impact of Health Information Technology on Quality, Efficiency, and CostsofMedicalCare.*Annals of Internal Medicine* 144, 10,742-752.

Cho,V.(2007). A Study of the Impact of Organizational Learning On Information System Effectiveness. Department of Management and Marketing HongKong Polytechnic University. International Journal of Business and Information.2,1.127-153

Clark, J. (2009).Using Document Imaging to Strengthen Revenue Cycle.*Journal of American Health Information Management Association. 80, 4, 54-55*

Clark,J. (2009). Using Document Imaging to Strengthen Revenue Cycle.*Journal of American Health Information Management Association,* 80, 38.

.

Corbin, J., & Strauss, A. (1990). Basics of qualitative research: Techniques and proceduresfor developing grounded theory (3rd ed.). Thousand Oaks: Sage Publications, Inc.

Congdon,K.(2006).Document Imaging Streamlines Hospital Billing. BizTechsolutionsInc.IntegratedSolutions. Available at: http://www.forbiztechhealth.com/CooleyDickinson-TSI_IntegratedSolutions.pdf. Accessed at: February 21,2006.

Darvill, N.(2011). St Helens &Knowsley Teaching Hospitals NHS Trust. Available at: http://graphics.kodak.com/docimaging/uploadedFiles/St-Helens_Knowsley_Hospitals.pdf. Accessed July 7, 2011.

Darvill, N.(2011). St Helens &Knowsley Teaching Hospitals NHS Trust. Available at:http://graphics.kodak.com/docimaging/HK/en/Industry_Solutions/Healthcare/Healthcare/St_Helens_and_Knowsley_Hospitals/index.htm. Accessed July 7, 2011.

Dooling, J. (2011). Managing records between the EDMS and EHR.*Journal of American Health Information Management Association*, 82, 38-39

Georgia Archives (2008).Electronic Document Management System Technologies. Availableat:http://www.sos.ga.gov/archives/pdf/records_and_information_management_services/edms.pdf.Accessed at April 4, 2008.

Gibbs, G. T. (2007). *Analyzing Qualitative Data*. Thousand Oaks California, CA: SAGE Publications Ltd.

Gurley,L., Benjamin, R., (2004). Advantages and Disadvantages of the Electronic

Medical Record.*American Academy of Medical Administrator*.

Healthcare IT News. (2004). Available at: http://www.healthcareitnews.com/news/president-bush-continues-ehr-push-sets-national-goals.Accessed : April 24, 2004

Hsieh H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis.Qualitative Health Research, 15(9), 1277-1288

Huang,W.M., Shih,C.T. (2011). An Empirical Study on the Intentions of Physicians in Adopting Electronic Medical Records with Modified Technology Acceptance Models in Rural Areas of Taiwan. National Chung-Cheng University, Chiayi, Taiwan.

Jackson, W., &Verberg, N. (2007). Methods: Doing social research. 4th edition. Toronto: Pearson.

Kallem,C., &Gans,D. (2007).Aligning the Demands for Performance Data. *Journal of American Health Information Management Association.*78 (10), 56–60.

Koide,D. &Peskin, E. (2005). New uses for computer in medical education, clinical practice, and patient safety in the US and Japan.

Laerum,H., Karlsen, T., Faxvaag, A., (2003). Effects of scanning and eliminating paper-basedmedical records on hospital physicians clinical workpractice.Journal of the American Medical Informatics Association.10 (6).588.

Leong,J., Damallie,S.(2008). Security of Computerized Patient Record, *Software Engineering Ethnics Researches Institutes* [SEERI]. Available at: http://seeri.etsu.edu/SECodeCases/ethicsC/Computerized%20Patient%20Records.htm. Access: August, 2008.

Lium, J.T., Faxvaag, A. (2006). Removal of paper-based health records from Norwegian hospitals: Effects on clinical workflow. Research Centre for Electronic Patient Records. Faculty of medicine, Norwegian university of science and technology, Trondheim, Norway.

McKesson (2011). Available at: http://www.mckesson.com/en_us/McKesson.com/For%2BHealthcare%2BProviders/Hospitals/Community%2BHospital%2BSolutions/Horizon%2BPatient%2BFolder/Horizon%2BPatient%2BFolder.html.Access: August 11, 2011.

Nixon, A., Wild, D. (2010).Methodologies for assessing and demonstrating data saturation in Qualitative inquiry supporting patient-reported outcomes research. Oxford Outcomes.

Priest, H., Roberts, P., & Woods, L. (2002). An overview of three different approaches to the interpretation of qualitative data. Part I: Theoretical issues. NurseResearcher,10(1): 30-42.

Rosencrance,L., (2006). Problems abound for Kaiser e-health records management system. An internal report details hundreds of technical issues and outages. Kaiser permanente.

Sage Pub(2012) Available at : www.sagepub.com/upmdata/28284_01_Boeije_Ch_01.pdf.Access: August 11, 2012.

Sarah, S. (2011). The Disadvantages of Records Management. Available at: http://www.ehow.com/list_7865748_disadvantages-records-management.html. Access: August 11, 2011.

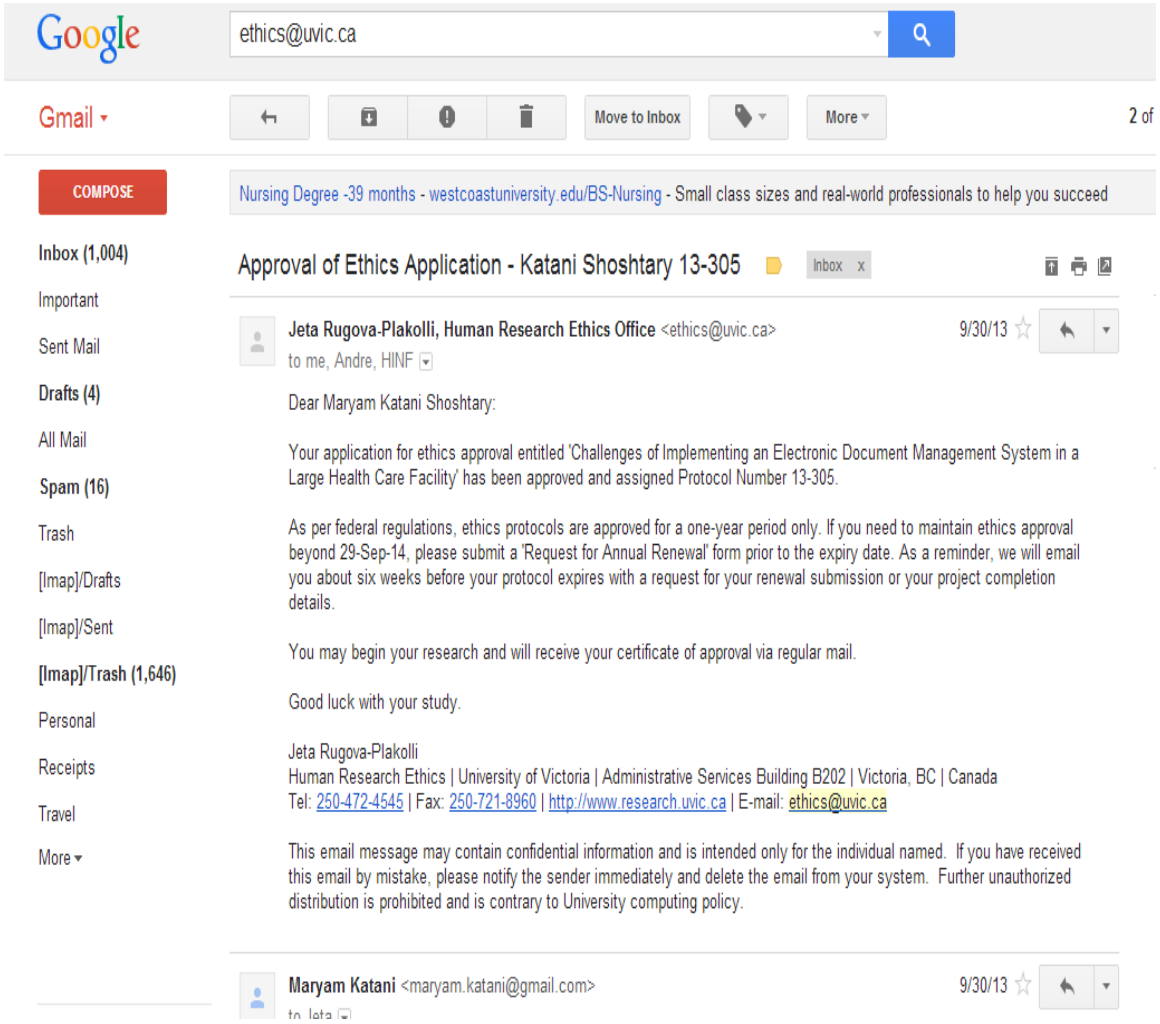
Scripps Health (2011). Available at: http://www.scripps.org. Accessed: January 11, 2011.

Steinbrook,R. (2009). Health Care and the American Recovery and Reinvestment Act. The NewEngland Journal of Medicine, 360, 1057-1060.

Stratis Health (2009). Implementation Strategies for Electronic Document Management Systems (EDMS) and Hybrid Record Risk.1-6

List of Appendices

Appendix A: Ethics Approval (University of Victoria)



Google ethics@uvic.ca

Gmail ▾ Move to Inbox More ▾ 2 of

COMPOSE

Inbox (1,004)
Important
Sent Mail
Drafts (4)
All Mail
Spam (16)
Trash
[Imap]/Drafts
[Imap]/Sent
[Imap]/Trash (1,646)
Personal
Receipts
Travel
More ▾

Nursing Degree -39 months - westcoastuniversity.edu/BS-Nursing - Small class sizes and real-world professionals to help you succeed

Approval of Ethics Application - Katani Shoshtary 13-305 Inbox x

Jeta Rugova-Plakolli, Human Research Ethics Office <ethics@uvic.ca> 9/30/13
to me, Andre, HINF

Dear Maryam Katani Shoshtary:

Your application for ethics approval entitled 'Challenges of Implementing an Electronic Document Management System in a Large Health Care Facility' has been approved and assigned Protocol Number 13-305.

As per federal regulations, ethics protocols are approved for a one-year period only. If you need to maintain ethics approval beyond 29-Sep-14, please submit a 'Request for Annual Renewal' form prior to the expiry date. As a reminder, we will email you about six weeks before your protocol expires with a request for your renewal submission or your project completion details.

You may begin your research and will receive your certificate of approval via regular mail.

Good luck with your study.

Jeta Rugova-Plakolli
Human Research Ethics | University of Victoria | Administrative Services Building B202 | Victoria, BC | Canada
Tel: 250-472-4545 | Fax: 250-721-8960 | http://www.research.uvic.ca | E-mail: ethics@uvic.ca

This email message may contain confidential information and is intended only for the individual named. If you have received this email by mistake, please notify the sender immediately and delete the email from your system. Further unauthorized distribution is prohibited and is contrary to University computing policy.

Maryam Katani <maryam.katani@gmail.com> 9/30/13
to Jeta

Appendix B: Scripps Approval (Supervisor letter Approval)

Scripps

To whom it may concern:

Please be advised that Maryam Katani, currently an employee of Scripps Green as a Quality Control Indexer, has been given approval to conduct interviews with physicians and other health care professionals that have been involved with the use and /or implementation of Scripps EHR. Maryam has met with Jean Fuller, Assistant vice President of Health Information Management Services to discuss requirements for completion of her thesis on "Challenges of Implementing an Electronic Document Management System in a Large Health Care Facility".

Diane Muir, RHIT, CCA

Health Information Supervisor

Scripps Green Health

Appendix C: Participants Consent Form

Health Information Science

Implied Consent Form

Challenges of implementing an Electronic Document Management System in 2 large facilities; Scripps Hospitals in La Jolla and Encinitas California, USA

You are invited to participate in a study entitled Challenges of implementing an Electronic Document Management System in 2 large facilities; Scripps Hospitals in La Jolla and Encinitas California, USA that is being conducted by Maryam Katani.

Maryam Katani is a graduate student in the department of Health Information Science at the University of Victoria in British Columbia and you may contact her if you have further questions, by phone (760-809-9205) or by email (maryam.katani@gmail.com).

As a graduate student, I am required to conduct research as part of the requirements for a Masters of Science degree in Health Information Science. It is being conducted under the supervision of Dr. Andre.W. Kushniruk (Department of Health Information Science, University of Victoria). You may contact Dr. Kushniruk by phone (250-472-5132).

Purpose and Objectives

The purpose of this research project is to explore the challenges encountered while transitioning from a paper chart world to a paperless world in patient care using an

EDMS at two hospitals of Scripps Health Organization. Our investigation will search for answers to the following core questions**:**

1) What is the impact of implementation of an electronic document management system on physician workflow?

2) What are the perceived benefits of using this type of application versus paper?

3) What is the impact of this type of application on health information management?

4) What impact does this type of application have on error rates in information, missing information and late information?

5) What factors are associated with the successful implementation of such systems?

6) What impact does such a system have on availability or late availability of patient information within a large healthcare organization?

Importance of this Research

Implementation of an EDMS project in multiple facilities of a large healthcare organization requires a substantial investment. After completion of the project, it will be useful for the management of the healthcare organization to find out about the challenges faced during the implementing of the EDMS as well as the effects of the application on physicians and health information management staff work-flow. This research will also discover the challenges faced and weaknesses discovered post EDMS implementation.

Participants Selection

You are being asked to participate in this study because of your hands-on experience with this EDMS application. Your professional perspective on the use of this EDMS application, as a participant in this research study will be a valuable asset.

Your participation involves an in-person interview with me, which will take approximately one to two hours. The interview will consist of a series of open-ended questions; the interview will focus on challenges of implementing the EDMS application at Scripps' La Jolla and Encinitas facilities. Participants of this study are 10 physicians and selected members of the HIM staff.

What is involved:

If you decide to participate you will remain anonymous, your information will be treated as such and your name will not appear in my thesis. Tapes and written material (notes) used during interviews will be stored in my personal USB drive, transcribed and later destroyed upon completion of this study.

All aspects of your participation in this study are voluntary. You may refuse to answer any question at any time. You may terminate the interview altogether at any time. At any time before the end of the interview, you may request that I erase all or part of your previously recorded answers and or comments. I am very flexible about the interview times and date and will do my best to accommodate your busy schedule.

Inconvenience

Participation in this study may cause some inconvenience for you, such as fitting my interview in your busy schedule.

Risks

There are no known or anticipated risks to you by participating in this research.

Benefits

Your participation will help Scripps Health learn about challenges of implementing a large enterprise-scale software, in this case the Horizon Patient folder EDMS. Knowledge obtained from this study can help with future implementation of similar or next generation EDMS software.

Compensation

N/A

Voluntary Participation

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data in audio tape of digital form will be deleted immediately.

Researcher's Relationship with Participants

The researcher has no relationship to any of the potential participants.

On-going Consent

N/A

Anonymity

Other than your name on the consent form, your name is not recorded on any other forms and is not disseminated in any form for any purpose.

Confidentiality

Your information will be treated as confidential and your name will not appear in my thesis. There is no personal data involved in this research.

Dissemination of Results

It is anticipated that the results of this study will be shared with others in the following ways:

1) Thesis paper

2) Supervisor and project committee

3) HIM Directors and supervisor

Commercial Use of Results

This research will not lead to a commercial product or service.

Disposal of Data

Data from this study will be destroyed from my HDD and USB drives immediately post approval and defense of my thesis.

Contacts

Individuals that may be contacted regarding this study include: Supervisor and researcher. Their contact information is stated above.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Your signature below indicates that you understand the above conditions of participation in this study, that you have had the opportunity to have your questions answered by the researchers, and that you consent to participate in this research project.

Name of Participant	*Signature*	*Date*

Visually Recorded Images/Data

N/A

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Appendix D: Email Invitation to Participate

Re: Research project: Challenges of Implementing an Electronic Document Management System in a Large Health Care Facility: A Qualitative analysis

Dear Sir/Madam

As a graduate student, I am conducting research as part of the requirements for a Masters of Science degree in Health Information Science at the University of Victoria. It is being conducted under the supervision of Dr. Andre W. KushnirukandDepartmental Committee Member: Dr. Elizabeth Borycki.

I would like to invite you to participate in a study exploring the Implementation ofan Electronic Document Management System at Scripps Green and Encinitas hospitals.If you know of a Physicianor HIM staff who might be interested in participating in this study, forwarding this invitation would be greatly appreciated.

Purpose of the Study:

The overall purpose of this research project is to explore the challenges encountered while transitioning from a paper chart world to a paperless world in patient care using an EDMS at two hospitals of Scripps Health Organization. Specifically, this study will focus on effects of implementation and usage of EDMS on workflow of physicians and HIM staff.

Setting of the Study:

The study will be conducted as face to face interview at a time that is convenient for you.

Participants:

Physicians and HIM staff who are working at the Scripps Green and Encinitas hospitals.

Participation:

If you agree to voluntarily participate in this research, your participation will include a short demographic questionnaire as well as twenty-three interview questions for physicians and thirty for HIM staff. The interview should take approximately 30 minutes of your time. The interviews

will be audio-recorded, with your consent. Your participation in this research is completely voluntary.

Risks and Benefits:

No known risks are anticipated to occur during this research; however, you may withdraw at any point. Similarly, you may answer all, some, or none of the demographic and interview questions. Your participation will help Scripps Health learn about challenges of implementing a large enterprise-scale software, in this case the Horizon Patient folder EDMS. Knowledge obtained from this study can help with future implementation of similar or next generation EDMS software.

If you have any questions, or are interested in participating in this study, please contact me by email at maryam.katani@gmail.com. Thank you for your consideration.

Sincerely,

Maryam Katani

Appendix E: Demographic form

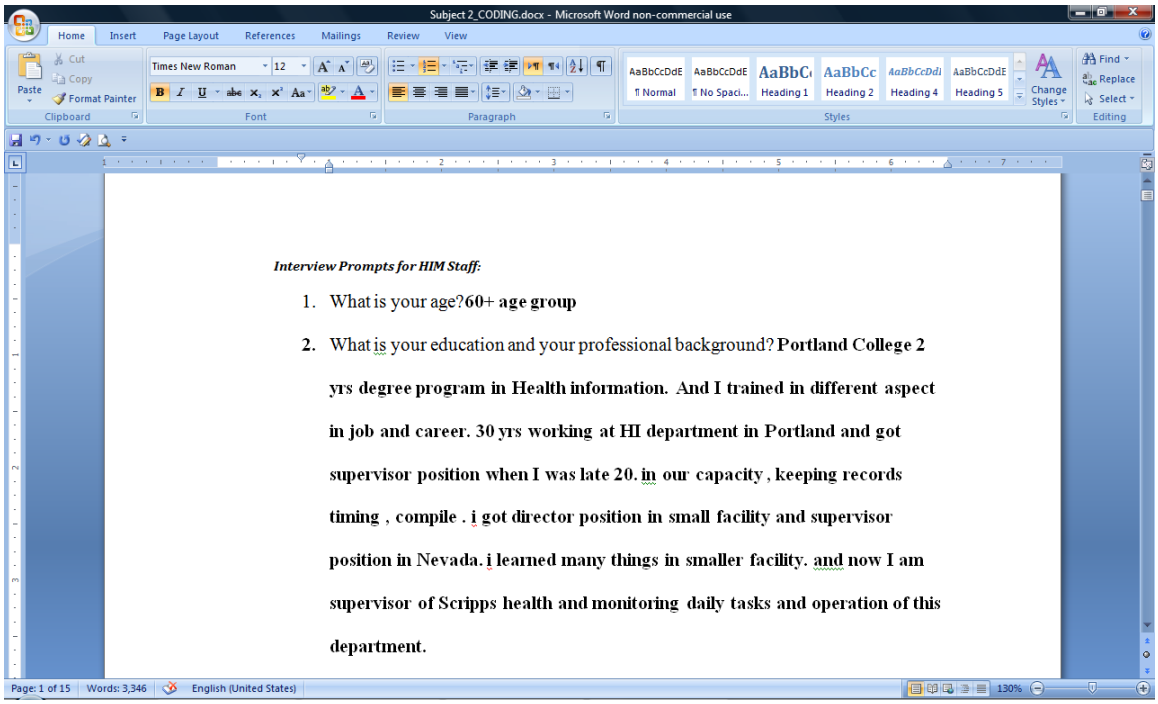
	Number	**%**
Sex		
Male		
Female		
Age		
26-30		
31-35		
36-40		
41-45		
46 and over		
Computer knowledge		
Beginner		
Intermediate		
Advance		
Expert		

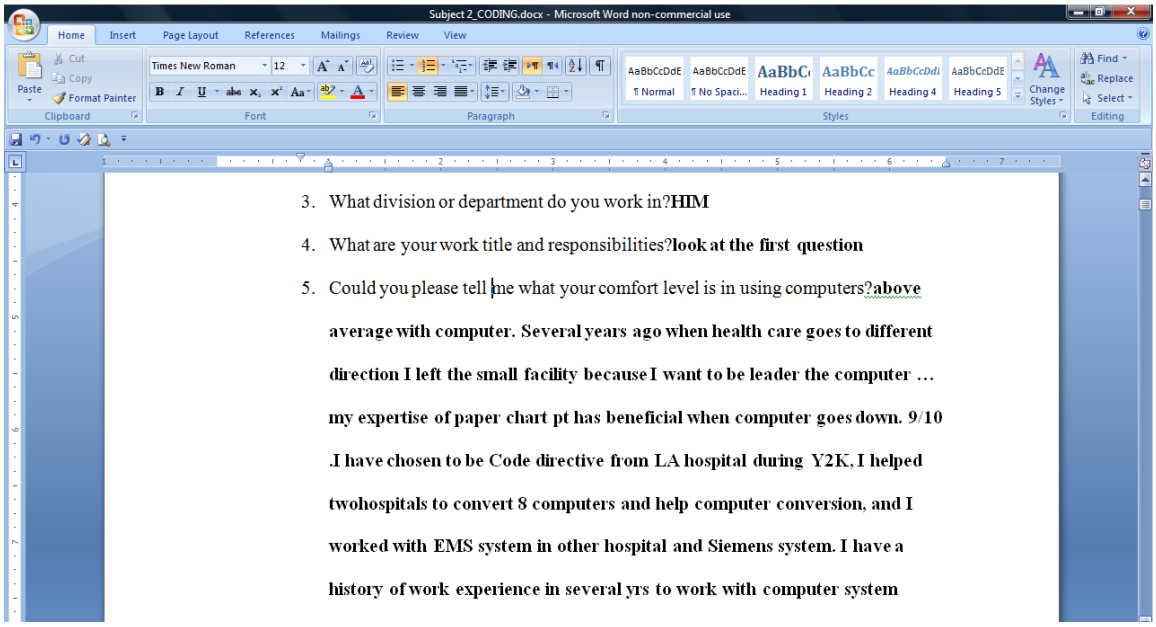
EMR knowledge		
Beginner		
Intermediate		
Advance		
Expert		
Professional background		
EDMS knowledge		
Beginner		
Intermediate		
Advance		
Expert		

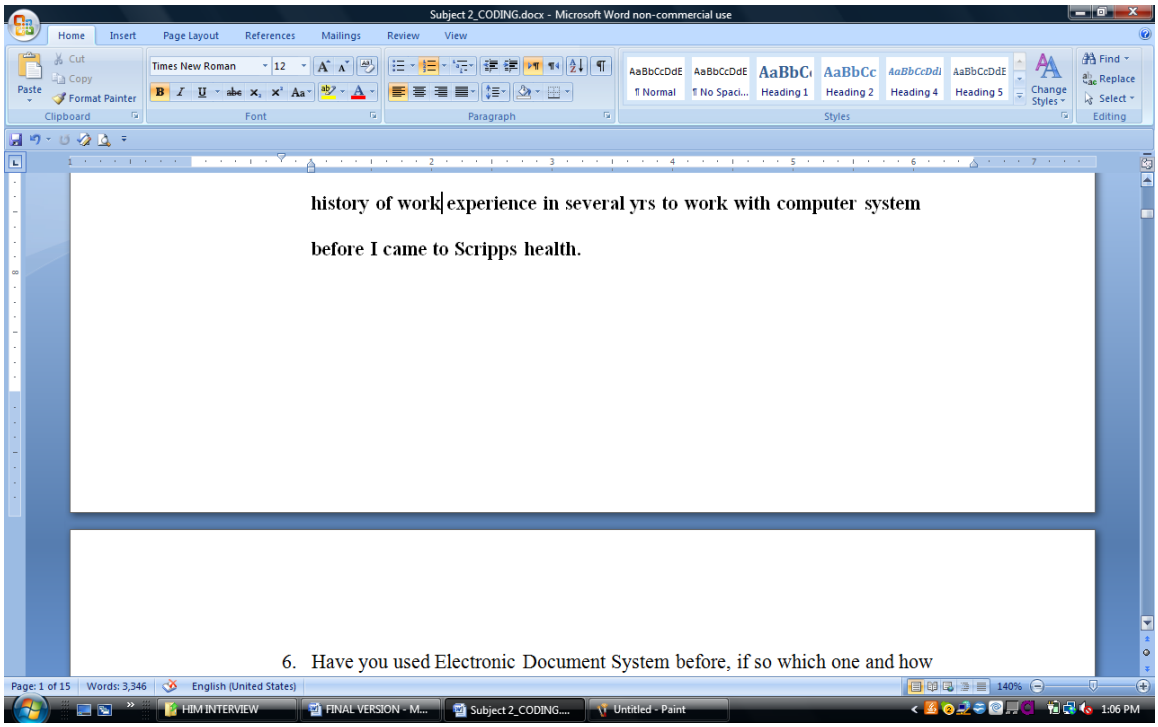
Appendix F:Positive and negative codes identified from participant transcripts

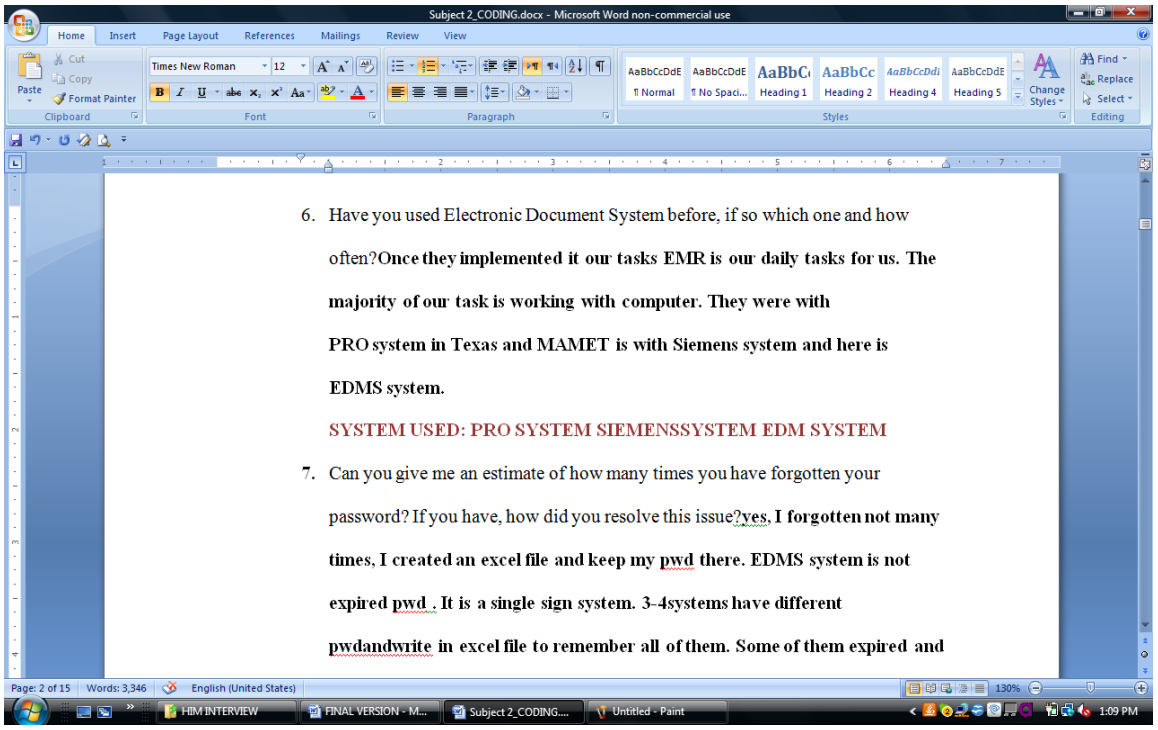
POSITIVE CODES	**NEGATIVE CODES**
PREVIOUS EXPOSURE TO EDMS	LACK OF INTEROPERABILITY
HAVING COMPUTER SKILL	NEED TO REMEMBER PASSWORD
SYSTEM TRAINING	LACK OF COPY AND PASTE FUCNTIONILITY
ADAPTING WITH NEW WORK-FLOW	NOT ABLE TO READ THE BAR-CODE
IMPROVED ACCESSIBILITY	MISSING PATIENT BATCH
IMPROVED EFFICIENCY	SYSTEM SPEED ISSUE
IMPROVED VPN ACCESS	EXISTING LACK OF FUNCTIONALITY
SAVED TIME	SYSTEM ISSUE
INCREASED PRODUCTIVITY	
WELL ORGANIZED TRAINING	
HAVING COMPUTER KNOWLEDGE	
HAVING PREVIOUS EDMS EXPERIENCE	
IMPROVED BILLING PROCESSING	
IMPROVED PRODUCTIVITY	
IMPROVED COMMUNICATION	
ADAPTED TO NEW WORK-FLOW	

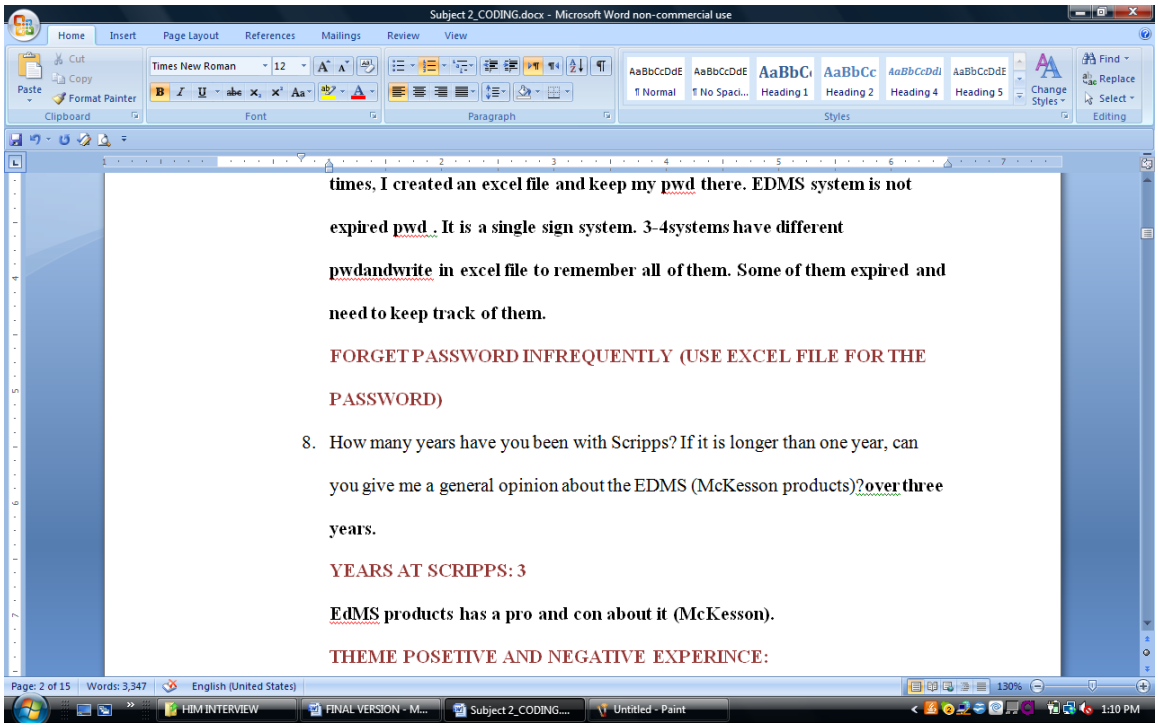
Appendix G: Example of one participant coding

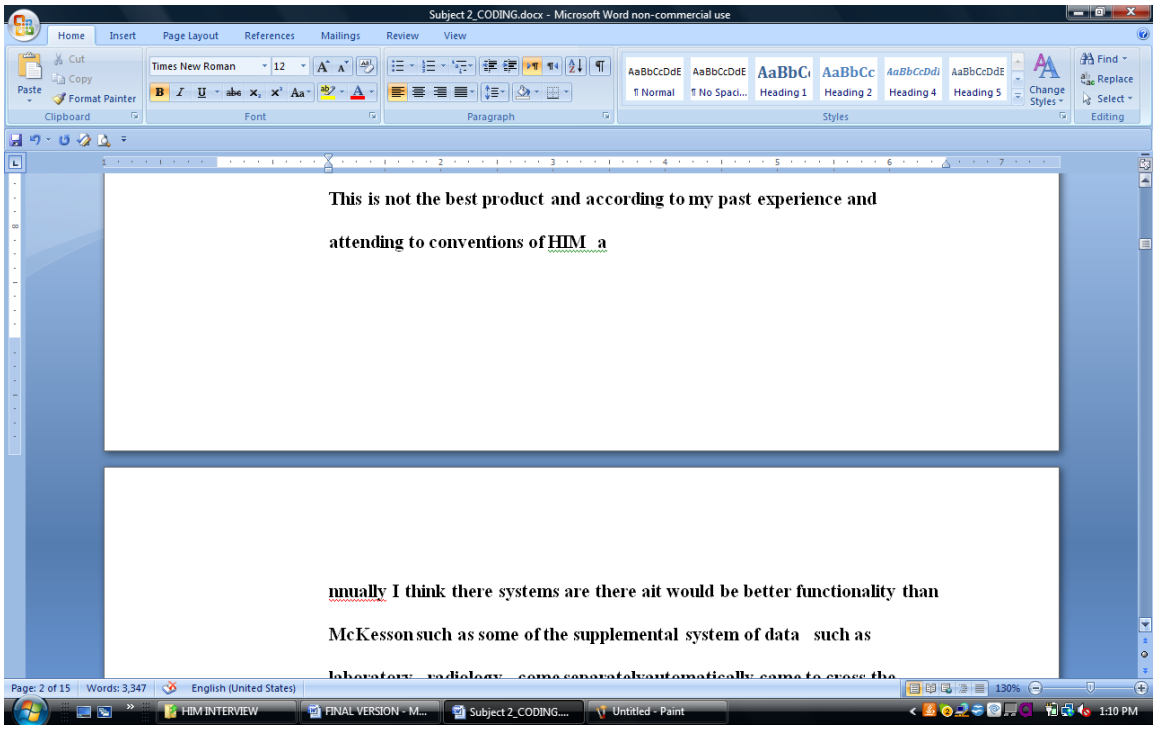


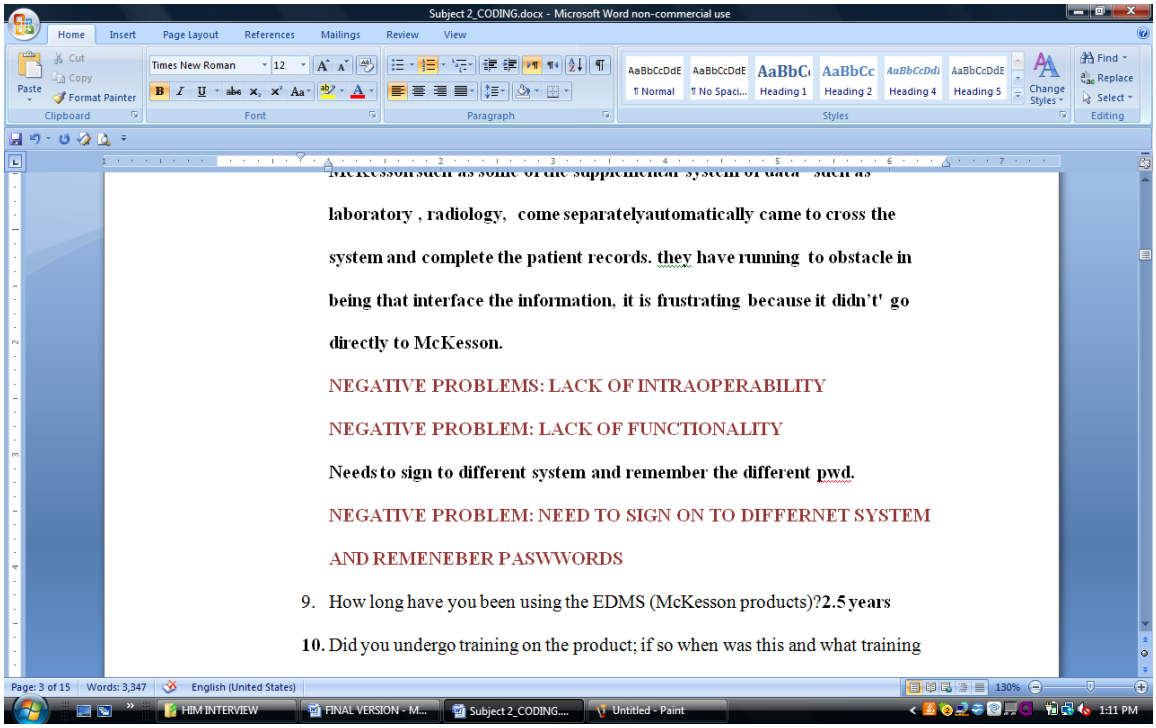


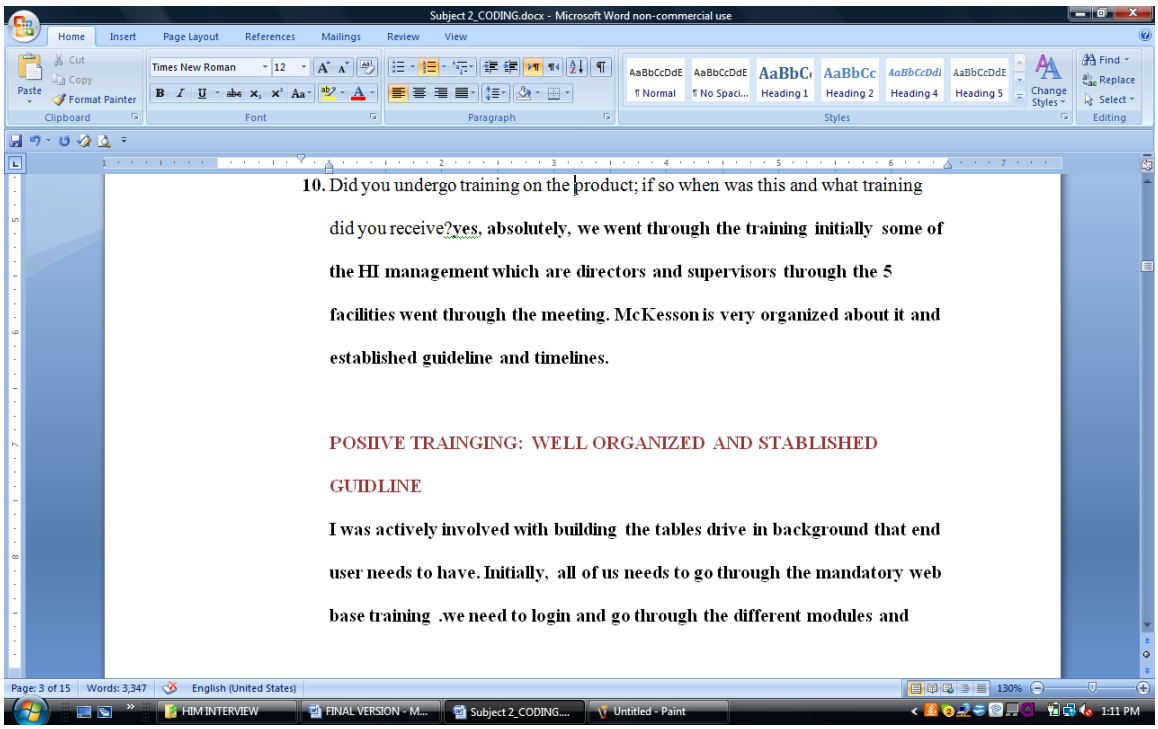

Subject 2_CODING.docx - Microsoft Word non-commercial use
history of work experience in several yrs to work with computer system
before I came to Scripps health.
6. Have you used Electronic Document System before, if so which one and how
Page: 1 of 15
Words: 3,346
English (United States)
140%
1:06 PM

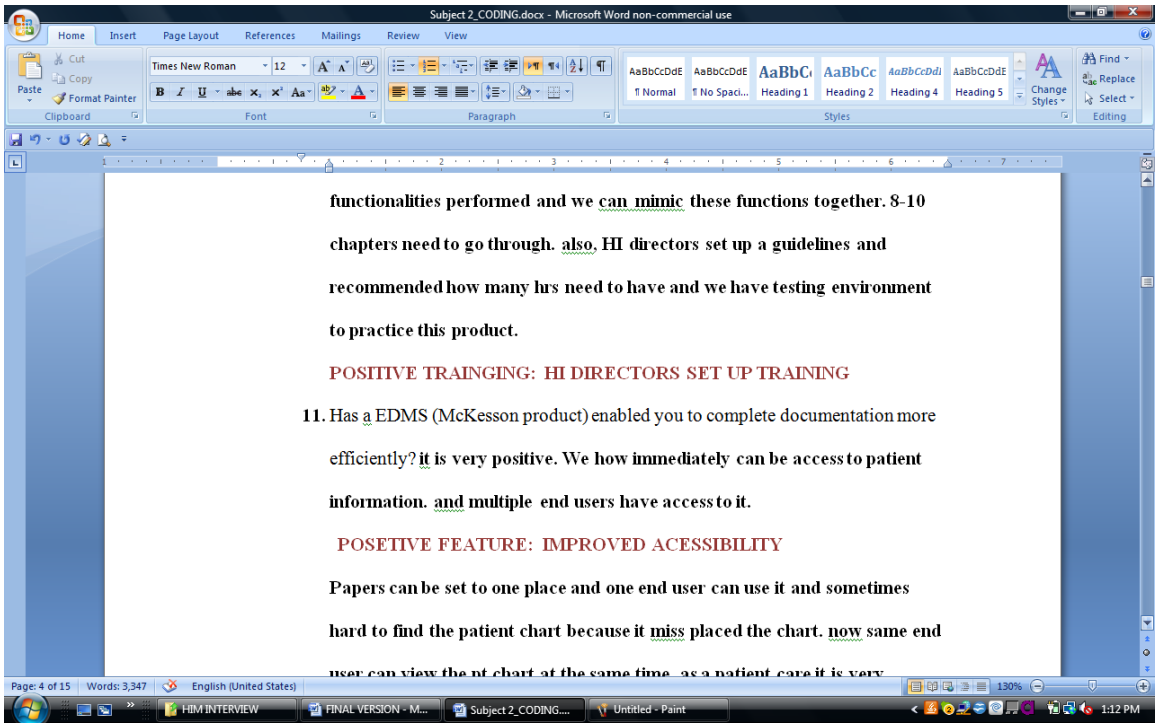

Subject 2_CODING.docx - Microsoft Word non-commercial use
6. Have you used Electronic Document System before, if so which one and how
often?Once they implemented it our tasks EMR is our daily tasks for us. The
majority of our task is working with computer. They were with
PRO system in Texas and MAMET is with Siemens system and here is
EDMS system.
SYSTEM USED: PRO SYSTEM SIEMENSSYSTEM EDM SYSTEM
7. Can you give me an estimate of how many times you have forgotten your
password? If you have, how did you resolve this issue?yes, I forgotten not many
times, I created an excel file and keep my pwd there. EDMS system is not
expired pwd . It is a single sign system. 3-4systems have different
pwdandwrite in excel file to remember all of them. Some of them expired and
Page: 2 of 15
Words: 3,346
English (United States)
130%
1:09 PM

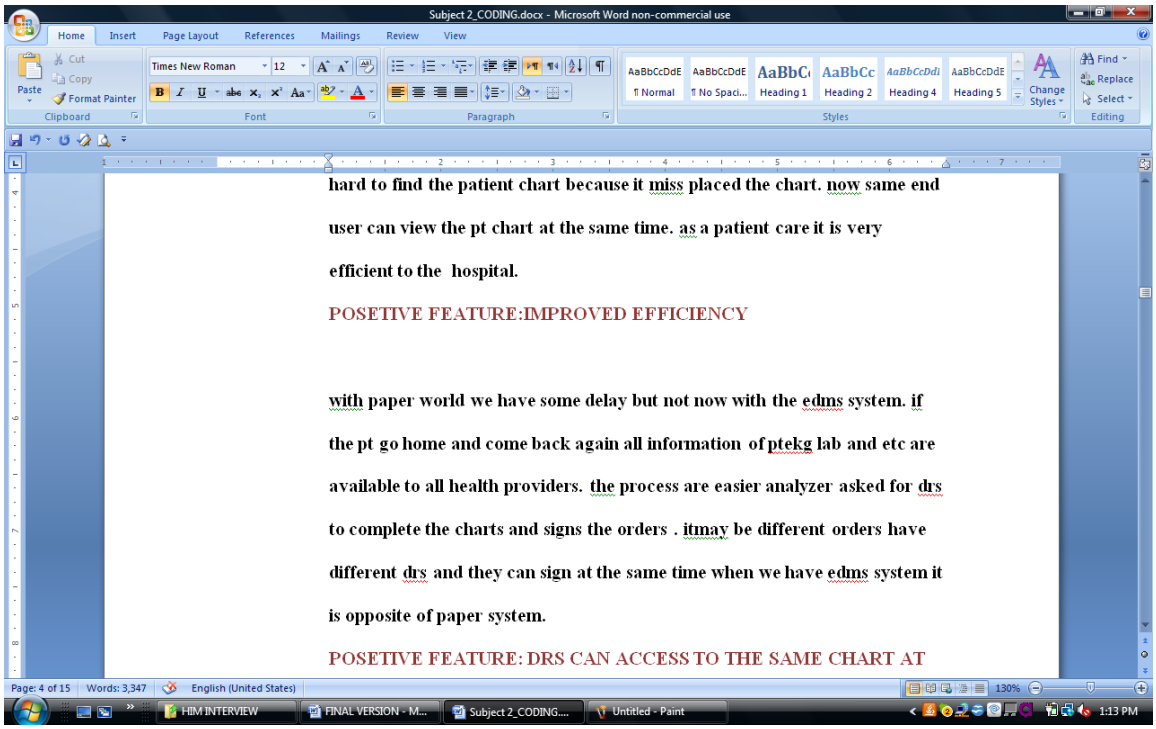

Subject 2_CODING.docx - Microsoft Word non-commercial use
times, I created an excel file and keep my pwd there. EDMS system is not
expired pwd . It is a single sign system. 3-4systems have different
pwdandwrite in excel file to remember all of them. Some of them expired and
need to keep track of them.
FORGET PASSWORD INFREQUENTLY (USE EXCEL FILE FOR THE
PASSWORD)
8. How many years have you been with Scripps? If it is longer than one year, can
you give me a general opinion about the EDMS (McKesson products)?over three
years.
YEARS AT SCRIPPS: 3
EdMS products has a pro and con about it (McKesson).
THEME POSETIVE AND NEGATIVE EXPERINCE:
Page: 2 of 15
Words: 3,347
English (United States)
1:10 PM

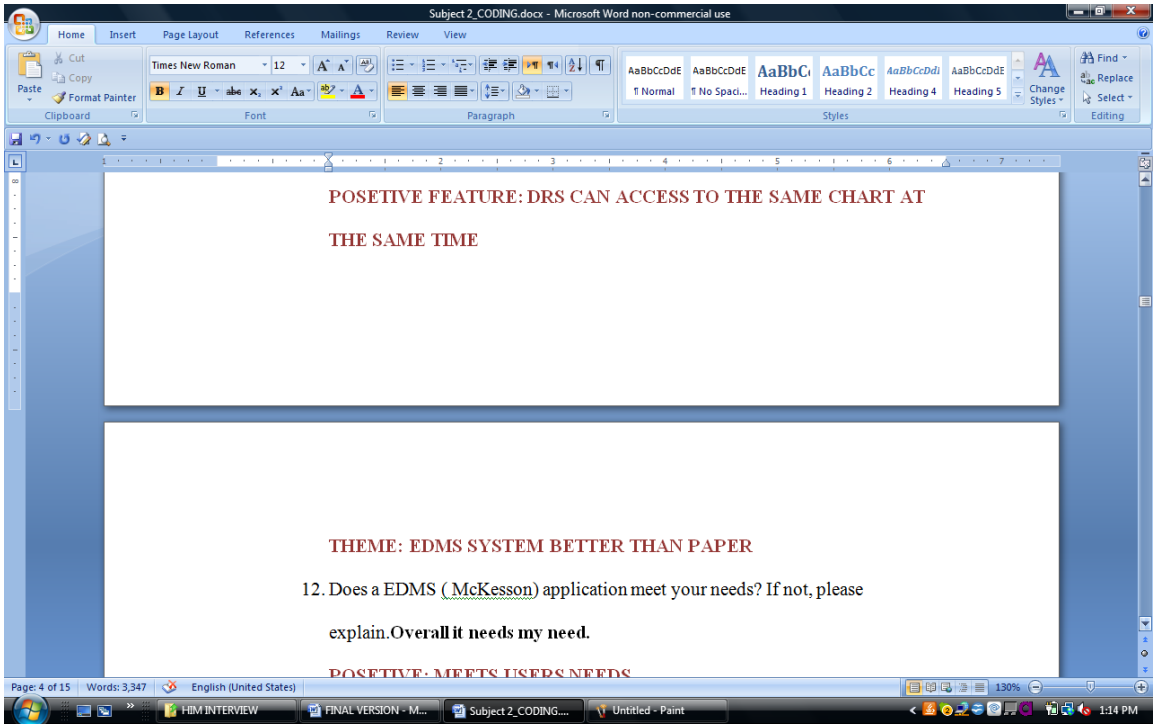

Subject 2_CODING.docx - Microsoft Word non-commercial use
This is not the best product and according to my past experience and
attending to conventions of HIM a
nnually I think there systems are there ait would be better functionality than
McKesson such as some of the supplemental system of data such as
Page: 2 of 15
Words: 3,347
English (United States)
1:10 PM


Subject 2_CODING.docx - Microsoft Word non-commercial use
laboratory , radiology, come separatelyautomatically came to cross the system and complete the patient records. they have running to obstacle in being that interface the information, it is frustrating because it didn't' go directly to McKesson.
NEGATIVE PROBLEMS: LACK OF INTRAOPERABILITY
NEGATIVE PROBLEM: LACK OF FUNCTIONALITY
Needs to sign to different system and remember the different pwd.
NEGATIVE PROBLEM: NEED TO SIGN ON TO DIFFERNET SYSTEM AND REMENEBER PASWWORDS
9. How long have you been using the EDMS (McKesson products)?2.5 years
10. Did you undergo training on the product; if so when was this and what training


Subject 2_CODING.docx - Microsoft Word non-commercial use
10. Did you undergo training on the product; if so when was this and what training did you receive?yes, absolutely, we went through the training initially some of the HI management which are directors and supervisors through the 5 facilities went through the meeting. McKesson is very organized about it and established guideline and timelines.
POSIIVE TRAINGING: WELL ORGANIZED AND STABLISHED GUIDLINE
I was actively involved with building the tables drive in background that end user needs to have. Initially, all of us needs to go through the mandatory web base training .we need to login and go through the different modules and


Subject 2_CODING.docx - Microsoft Word non-commercial use
Home
Insert
Page Layout
References
Mailings
Review
View
Times New Roman
12
Paste
Cut
Copy
Format Painter
Clipboard
Font
Paragraph
Styles
Change Styles
Find
Replace
Select
Editing
functionalities performed and we can mimic these functions together. 8-10 chapters need to go through. also, HI directors set up a guidelines and recommended how many hrs need to have and we have testing environment to practice this product.
POSITIVE TRAINGING: HI DIRECTORS SET UP TRAINING
11. Has a EDMS (McKesson product) enabled you to complete documentation more efficiently? it is very positive. We how immediately can be access to patient information. and multiple end users have access to it.
POSETIVE FEATURE: IMPROVED ACESSIBILITY
Papers can be set to one place and one end user can use it and sometimes hard to find the patient chart because it miss placed the chart. now same end
Page: 4 of 15
Words: 3,347
English (United States)
130%
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:12 PM


Subject 2_CODING.docx - Microsoft Word non-commercial use
hard to find the patient chart because it miss placed the chart. now same end user can view the pt chart at the same time. as a patient care it is very efficient to the hospital.
POSETIVE FEATURE:IMPROVED EFFICIENCY
with paper world we have some delay but not now with the edms system. if the pt go home and come back again all information of ptekg lab and etc are available to all health providers. the process are easier analyzer asked for drs to complete the charts and signs the orders . itmay be different orders have different drs and they can sign at the same time when we have edms system it is opposite of paper system.
POSETIVE FEATURE: DRS CAN ACCESS TO THE SAME CHART AT
Page: 4 of 15
Words: 3,347
English (United States)
130%
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:13 PM

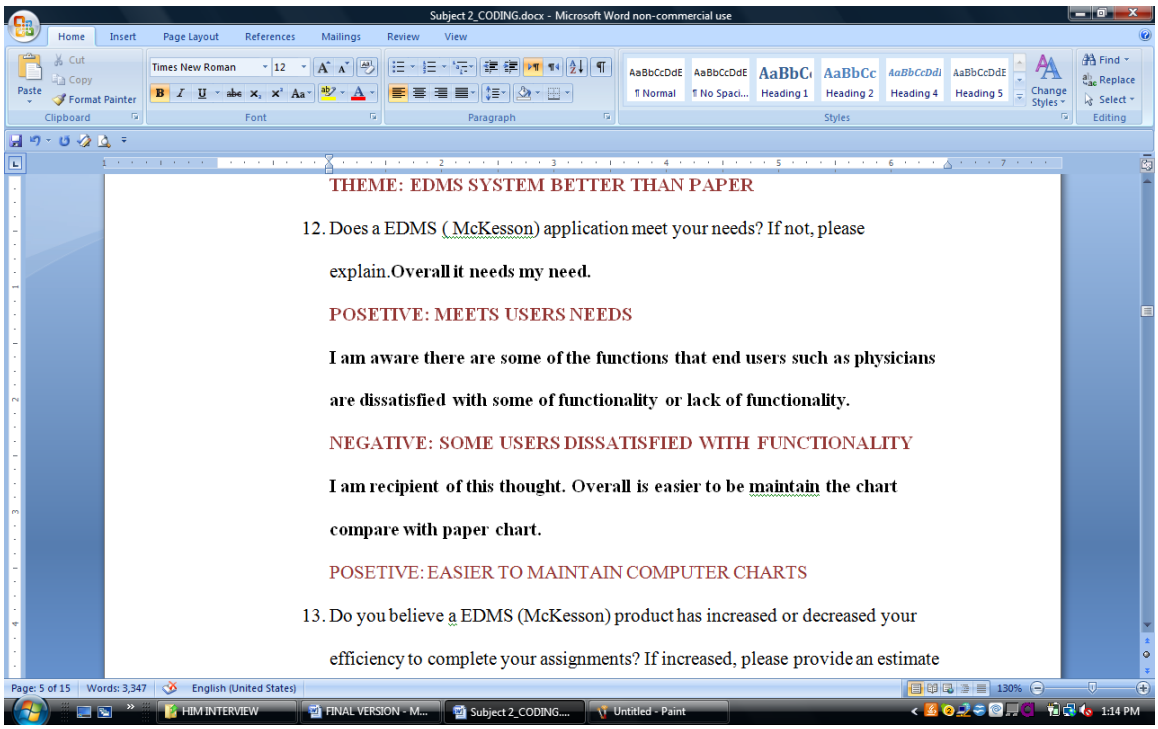


POSETIVE FEATURE: DRS CAN ACCESS TO THE SAME CHART AT THE SAME TIME

THEME: EDMS SYSTEM BETTER THAN PAPER

12. Does a EDMS (McKesson) application meet your needs? If not, please explain.**Overall it needs my need.**

POSETIVE: MEETS USERS NEEDS



THEME: EDMS SYSTEM BETTER THAN PAPER

12. Does a EDMS (McKesson) application meet your needs? If not, please explain.**Overall it needs my need.**

POSETIVE: MEETS USERS NEEDS

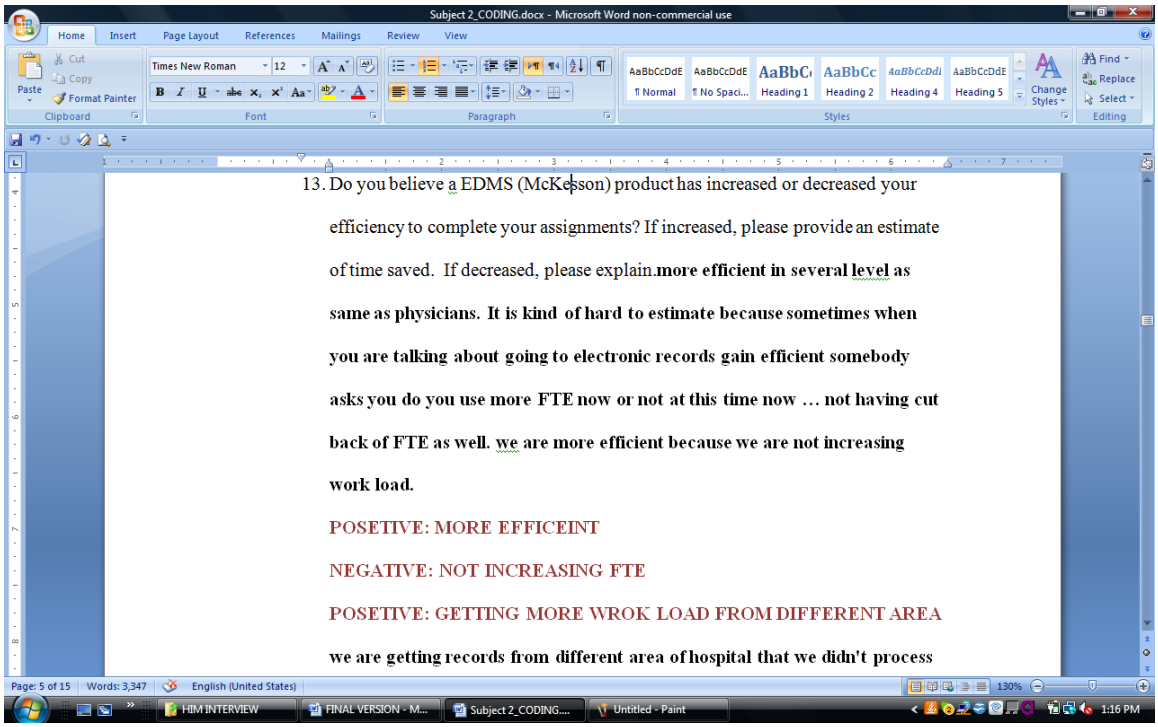
I am aware there are some of the functions that end users such as physicians are dissatisfied with some of functionality or lack of functionality.

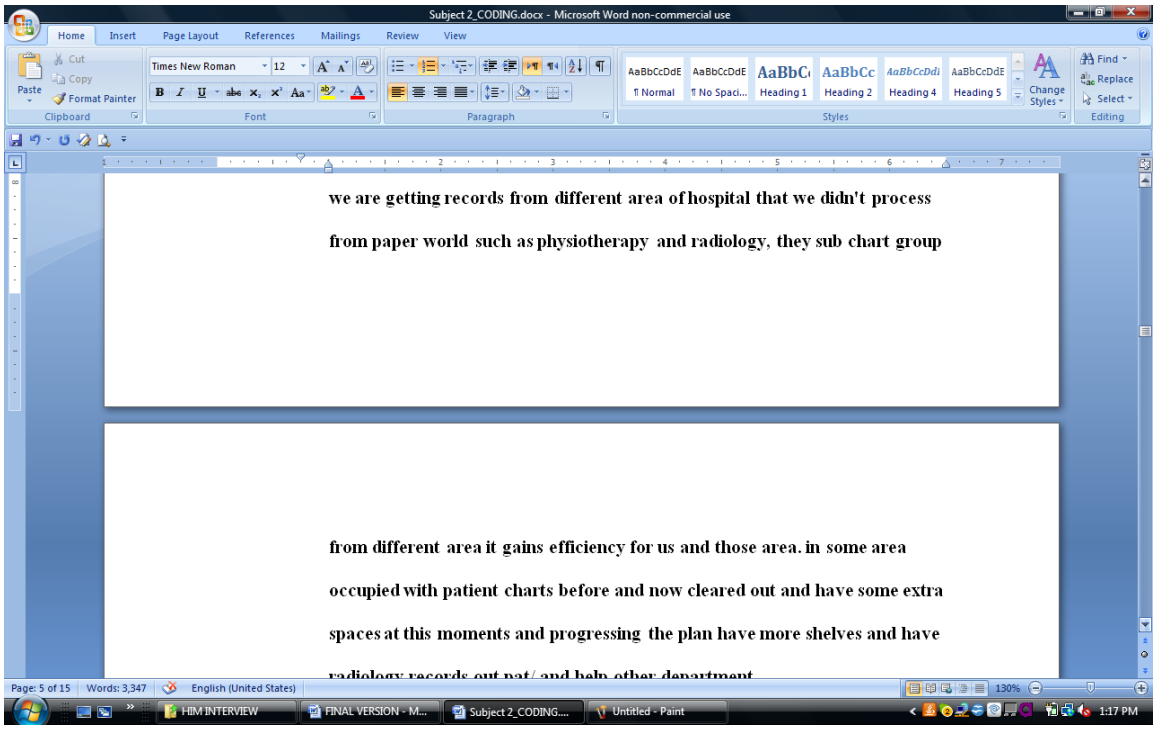
NEGATIVE: SOME USERS DISSATISFIED WITH FUNCTIONALITY

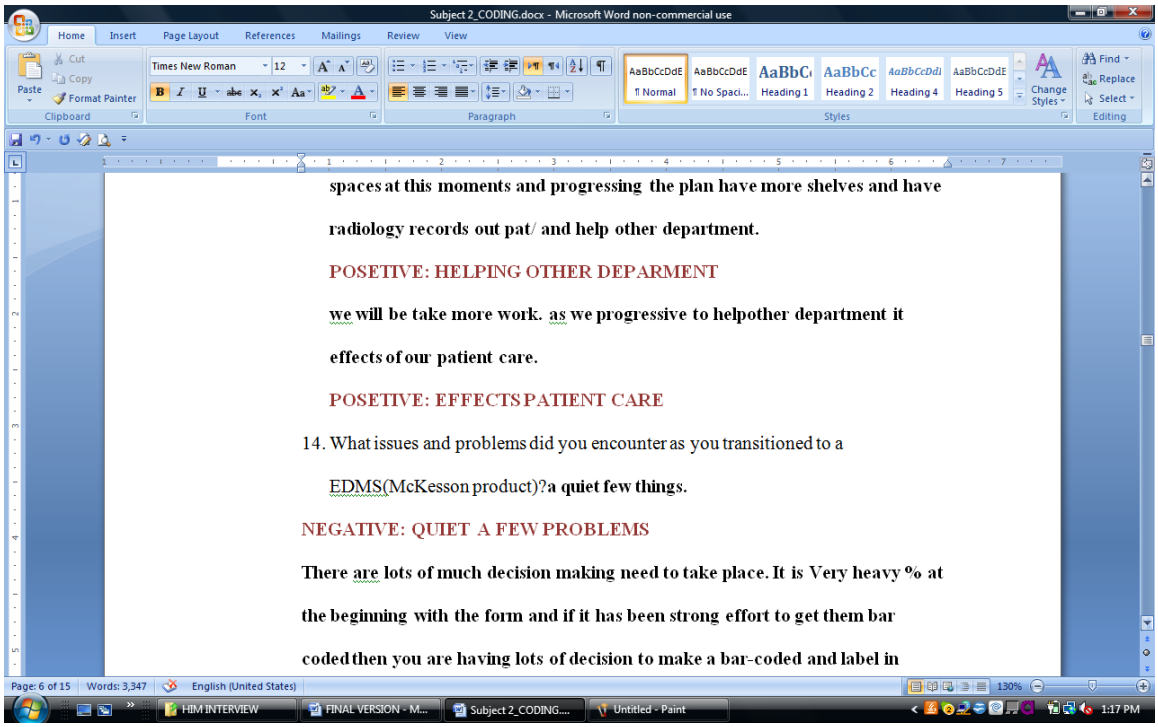
I am recipient of this thought. Overall is easier to be maintain the chart compare with paper chart.

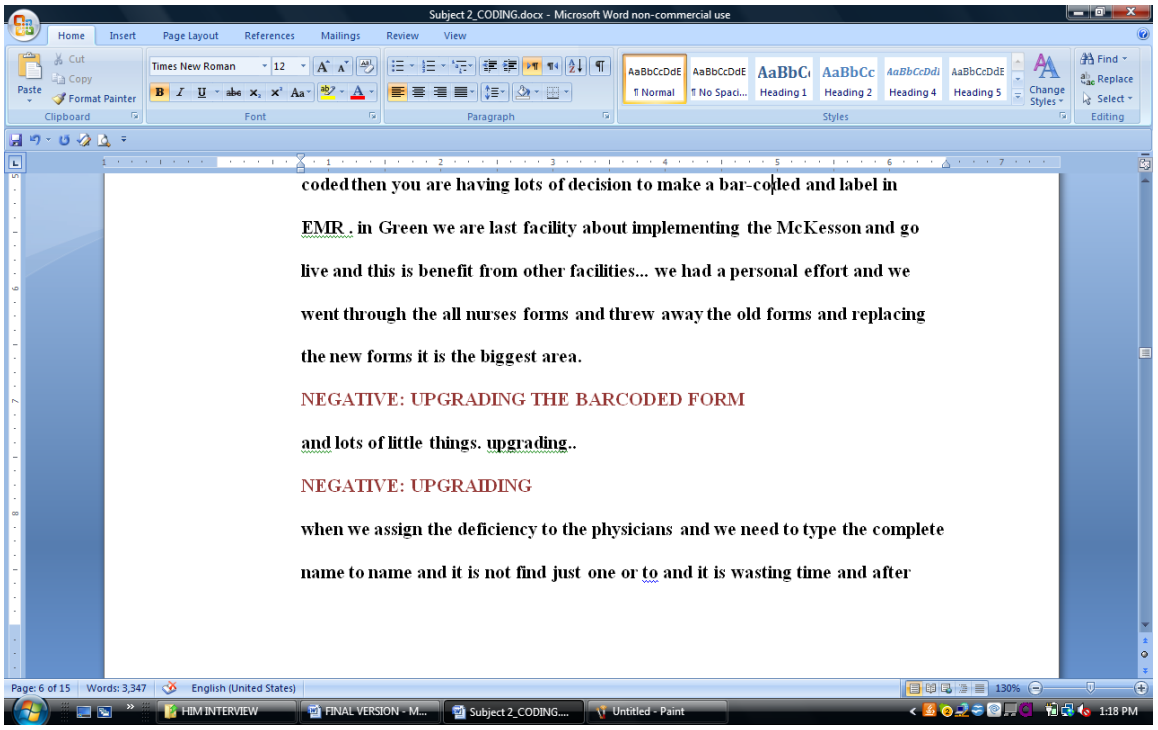
POSETIVE: EASIER TO MAINTAIN COMPUTER CHARTS

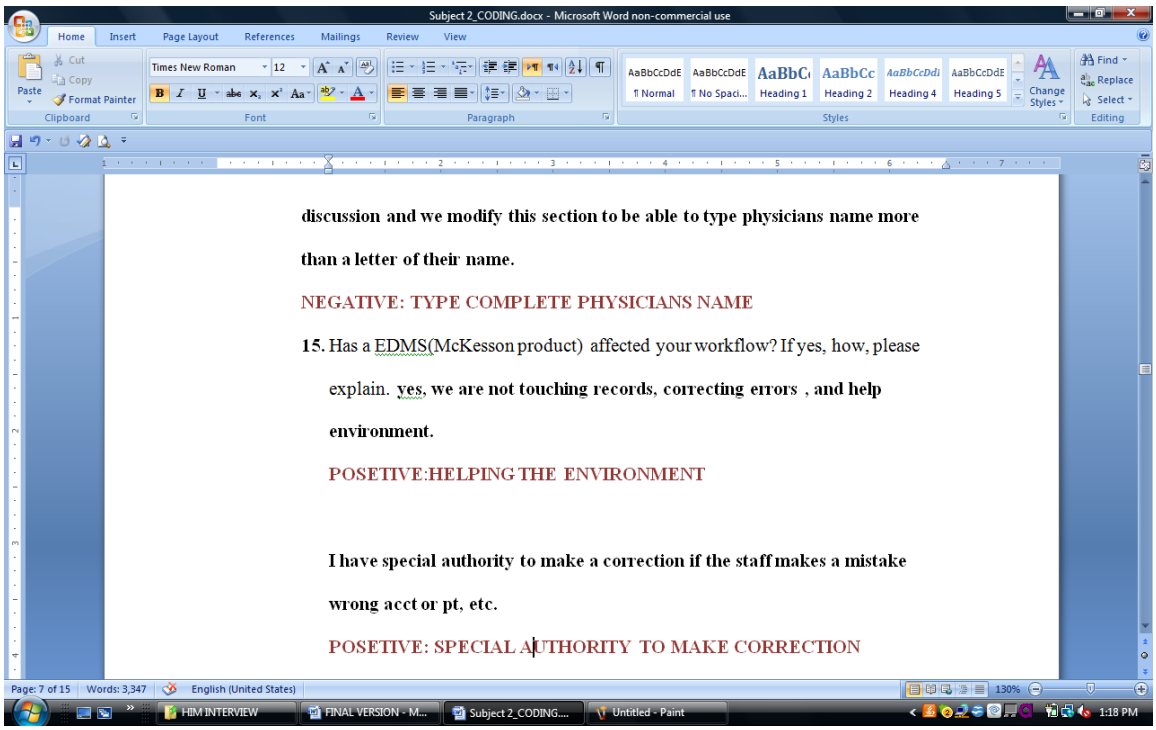
13. Do you believe a EDMS (McKesson) product has increased or decreased your efficiency to complete your assignments? If increased, please provide an estimate

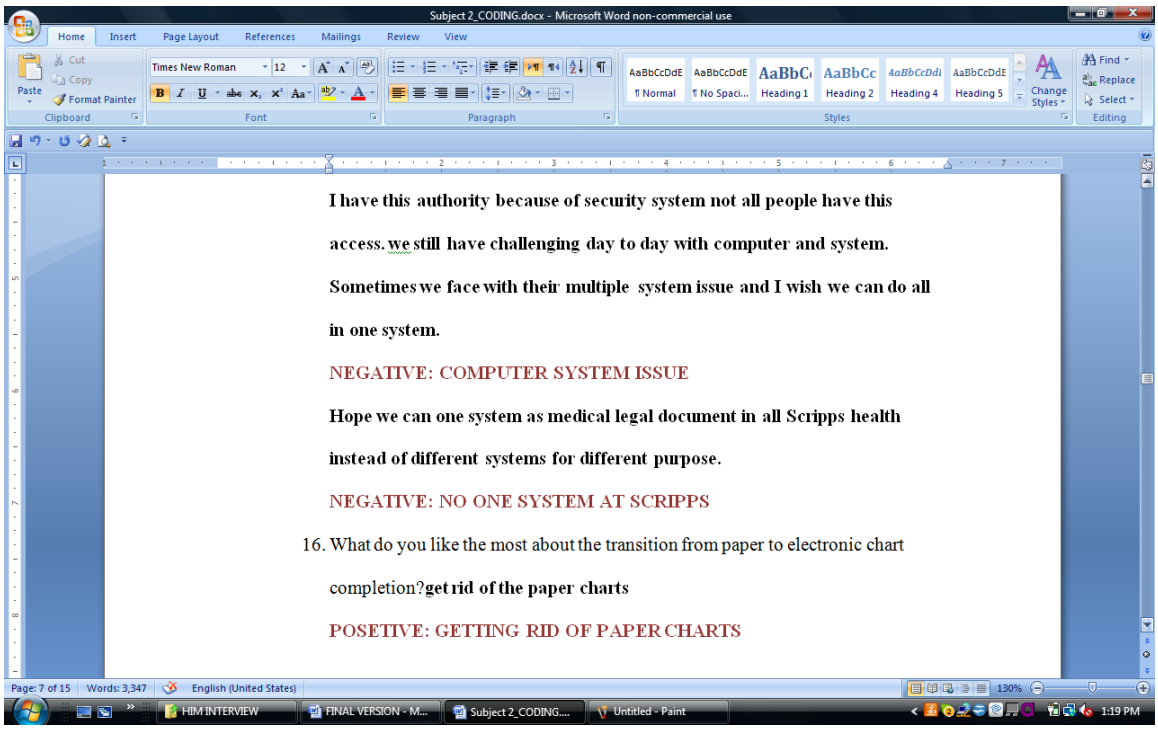

Subject 2_CODING.docx - Microsoft Word non-commercial use
13. Do you believe a EDMS (McKesson) product has increased or decreased your efficiency to complete your assignments? If increased, please provide an estimate of time saved. If decreased, please explain.more efficient in several level as same as physicians. It is kind of hard to estimate because sometimes when you are talking about going to electronic records gain efficient somebody asks you do you use more FTE now or not at this time now … not having cut back of FTE as well. we are more efficient because we are not increasing work load.
POSETIVE: MORE EFFICEINT
NEGATIVE: NOT INCREASING FTE
POSETIVE: GETTING MORE WROK LOAD FROM DIFFERENT AREA
we are getting records from different area of hospital that we didn't process
Page: 5 of 15
Words: 3,347
English (United States)
130%
1:16 PM

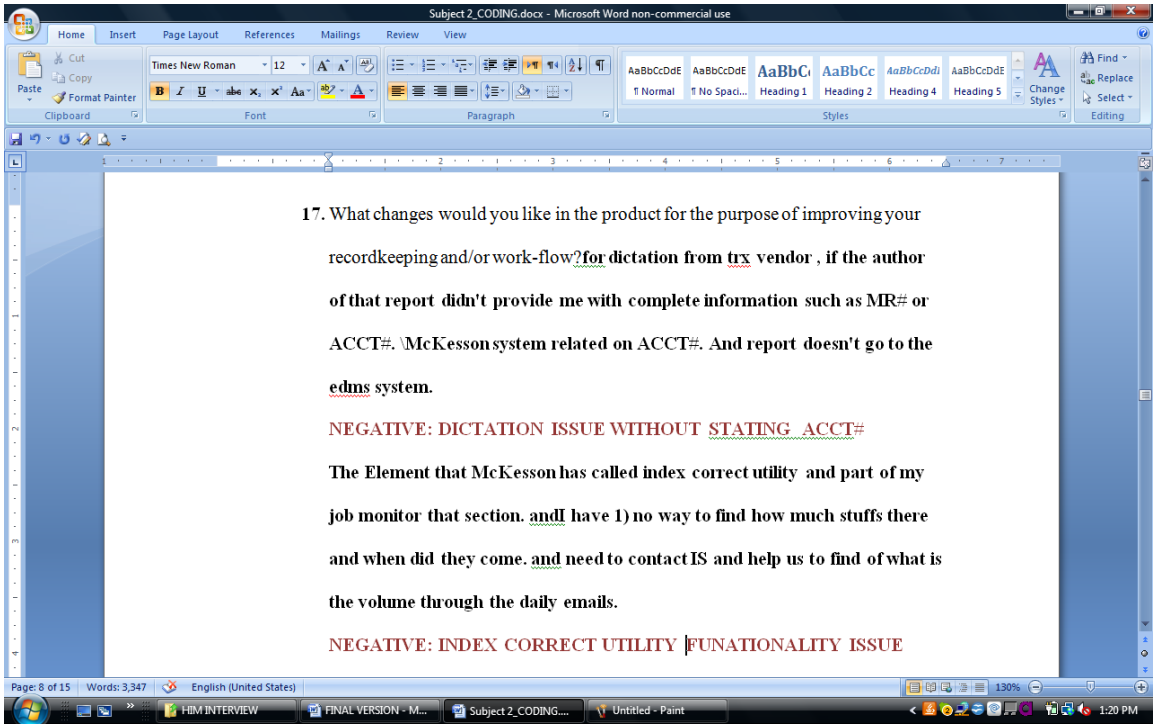

Subject 2_CODING.docx - Microsoft Word non-commercial use
we are getting records from different area of hospital that we didn't process from paper world such as physiotherapy and radiology, they sub chart group
from different area it gains efficiency for us and those area. in some area occupied with patient charts before and now cleared out and have some extra spaces at this moments and progressing the plan have more shelves and have
Page: 5 of 15
Words: 3,347
English (United States)
130%
1:17 PM

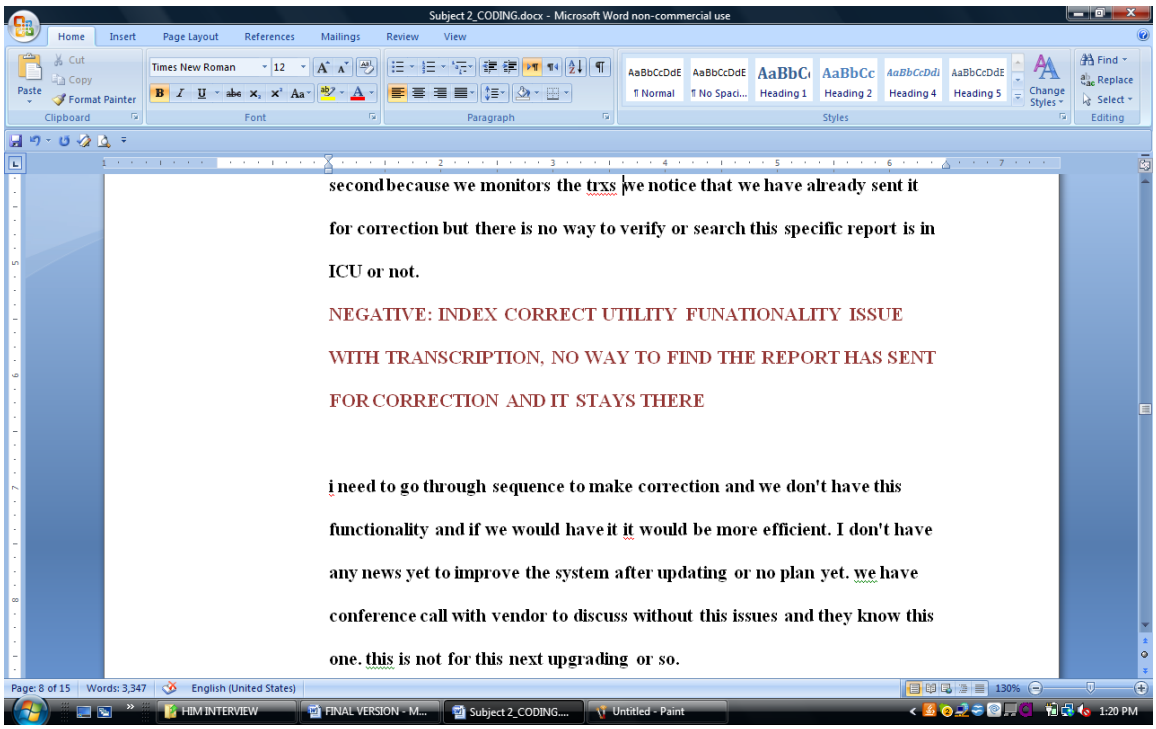

Subject 2_CODING.docx - Microsoft Word non-commercial use
spaces at this moments and progressing the plan have more shelves and have
radiology records out pat/ and help other department.
POSETIVE: HELPING OTHER DEPARMENT
we will be take more work. as we progressive to helpother department it
effects of our patient care.
POSETIVE: EFFECTS PATIENT CARE
14. What issues and problems did you encounter as you transitioned to a
EDMS(McKesson product)?a quiet few things.
NEGATIVE: QUIET A FEW PROBLEMS
There are lots of much decision making need to take place. It is Very heavy % at
the beginning with the form and if it has been strong effort to get them bar
coded then you are having lots of decision to make a bar-coded and label in
Page: 6 of 15
Words: 3,347
English (United States)
130%
1:17 PM

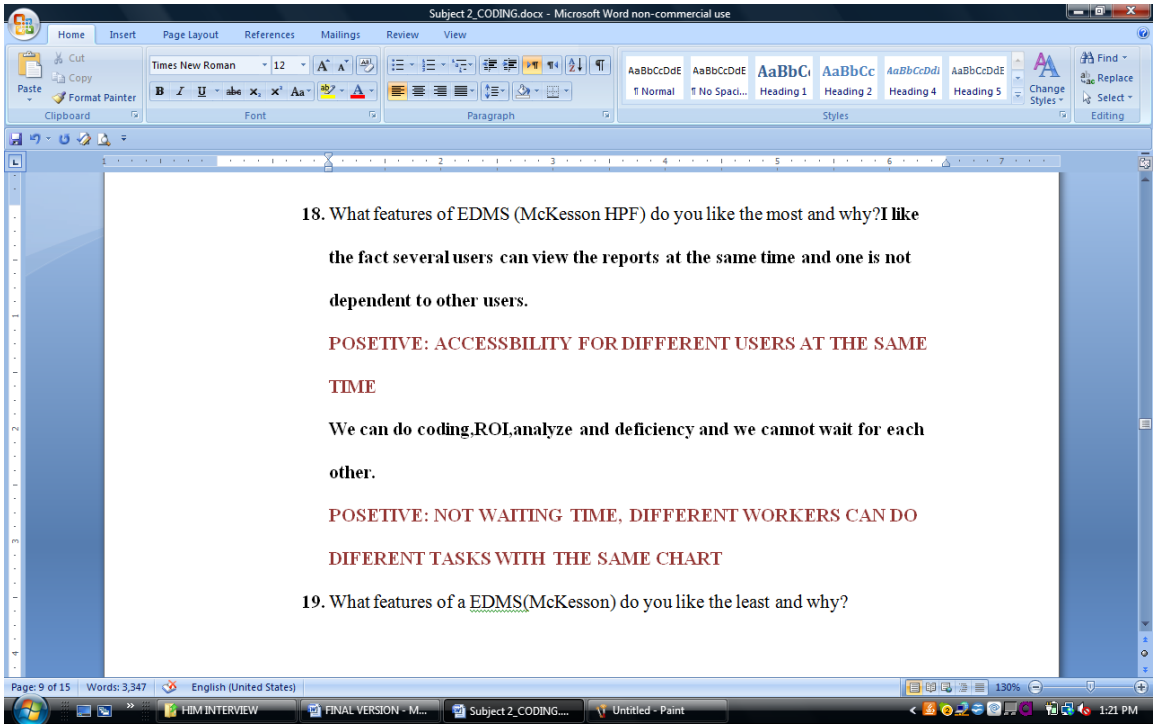

Subject 2_CODING.docx - Microsoft Word non-commercial use
coded then you are having lots of decision to make a bar-coded and label in
EMR . in Green we are last facility about implementing the McKesson and go
live and this is benefit from other facilities... we had a personal effort and we
went through the all nurses forms and threw away the old forms and replacing
the new forms it is the biggest area.
NEGATIVE: UPGRADING THE BARCODED FORM
and lots of little things. upgrading..
NEGATIVE: UPGRAIDING
when we assign the deficiency to the physicians and we need to type the complete
name to name and it is not find just one or to and it is wasting time and after
Page: 6 of 15
Words: 3,347
English (United States)
130%
1:18 PM


Subject 2_CODING.docx - Microsoft Word non-commercial use
Home
Insert
Page Layout
References
Mailings
Review
View
Times New Roman
12
Paste
Cut
Copy
Format Painter
Clipboard
Font
Paragraph
Styles
Change Styles
Find
Replace
Select
Editing
discussion and we modify this section to be able to type physicians name more than a letter of their name.
NEGATIVE: TYPE COMPLETE PHYSICIANS NAME
15. Has a EDMS(McKesson product) affected your workflow? If yes, how, please explain. yes, we are not touching records, correcting errors , and help environment.
POSETIVE:HELPING THE ENVIRONMENT
I have special authority to make a correction if the staff makes a mistake wrong acct or pt, etc.
POSETIVE: SPECIAL AUTHORITY TO MAKE CORRECTION
Page: 7 of 15
Words: 3,347
English (United States)
130%
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:18 PM


Subject 2_CODING.docx - Microsoft Word non-commercial use
I have this authority because of security system not all people have this access. we still have challenging day to day with computer and system. Sometimes we face with their multiple system issue and I wish we can do all in one system.
NEGATIVE: COMPUTER SYSTEM ISSUE
Hope we can one system as medical legal document in all Scripps health instead of different systems for different purpose.
NEGATIVE: NO ONE SYSTEM AT SCRIPPS
16. What do you like the most about the transition from paper to electronic chart completion?get rid of the paper charts
POSETIVE: GETTING RID OF PAPER CHARTS
Page: 7 of 15
Words: 3,347
English (United States)
130%
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:19 PM


Subject 2_CODING.docx - Microsoft Word non-commercial use
Home
Insert
Page Layout
References
Mailings
Review
View
Times New Roman
12
Paste
Cut
Copy
Format Painter
Clipboard
Font
Paragraph
Styles
Change Styles
Find
Replace
Select
Editing
17. What changes would you like in the product for the purpose of improving your recordkeeping and/or work-flow?for dictation from trx vendor , if the author of that report didn't provide me with complete information such as MR# or ACCT#. \McKesson system related on ACCT#. And report doesn't go to the edms system.
NEGATIVE: DICTATION ISSUE WITHOUT STATING ACCT#
The Element that McKesson has called index correct utility and part of my job monitor that section. andI have 1) no way to find how much stuffs there and when did they come. and need to contact IS and help us to find of what is the volume through the daily emails.
NEGATIVE: INDEX CORRECT UTILITY FUNATIONALITY ISSUE
Page: 8 of 15
Words: 3,347
English (United States)
130%
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:20 PM


Subject 2_CODING.docx - Microsoft Word non-commercial use
Home
Insert
Page Layout
References
Mailings
Review
View
Times New Roman
12
Paste
Cut
Copy
Format Painter
Clipboard
Font
Paragraph
Styles
Change Styles
Find
Replace
Select
Editing
second because we monitors the trxs we notice that we have already sent it for correction but there is no way to verify or search this specific report is in ICU or not.
NEGATIVE: INDEX CORRECT UTILITY FUNATIONALITY ISSUE WITH TRANSCRIPTION, NO WAY TO FIND THE REPORT HAS SENT FOR CORRECTION AND IT STAYS THERE
i need to go through sequence to make correction and we don't have this functionality and if we would have it it would be more efficient. I don't have any news yet to improve the system after updating or no plan yet. we have conference call with vendor to discuss without this issues and they know this one. this is not for this next upgrading or so.
Page: 8 of 15
Words: 3,347
English (United States)
130%
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:20 PM



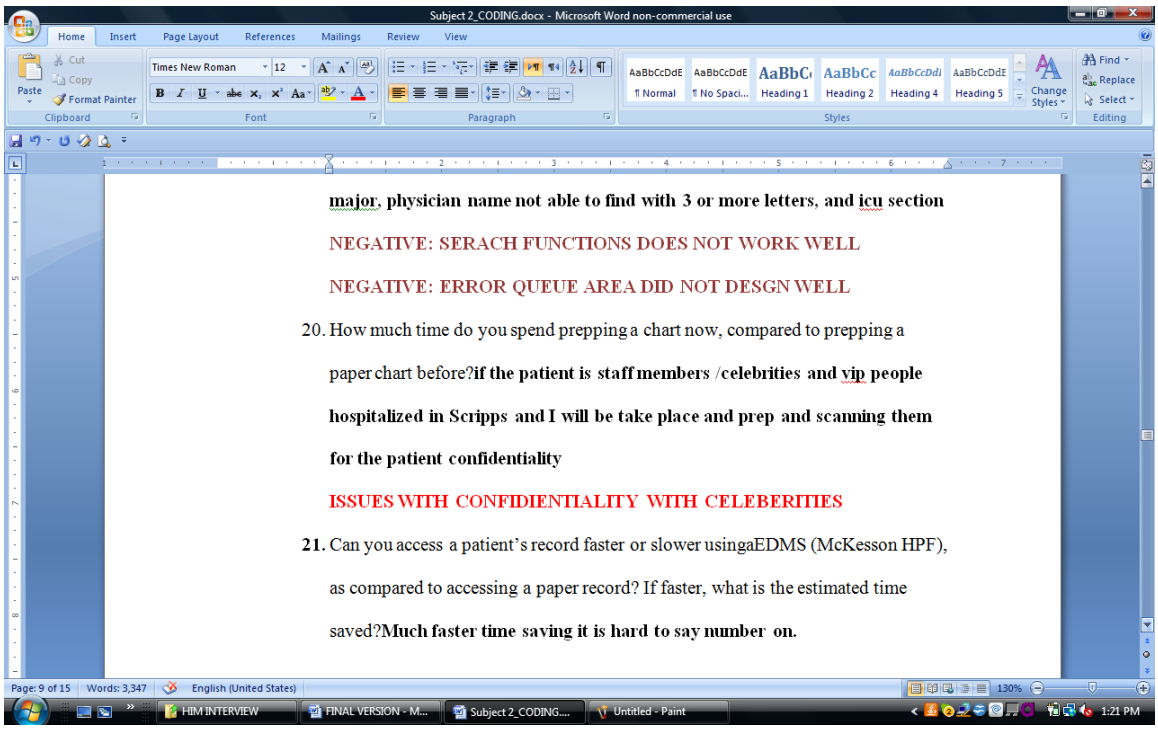
18. What features of EDMS (McKesson HPF) do you like the most and why?**I like the fact several users can view the reports at the same time and one is not dependent to other users.**

POSETIVE: ACCESSBILITY FOR DIFFERENT USERS AT THE SAME TIME

We can do coding,ROI,analyze and deficiency and we cannot wait for each other.

POSETIVE: NOT WAITING TIME, DIFFERENT WORKERS CAN DO DIFERENT TASKS WITH THE SAME CHART

19. What features of a EDMS(McKesson) do you like the least and why?



major, physician name not able to find with 3 or more letters, and icu section

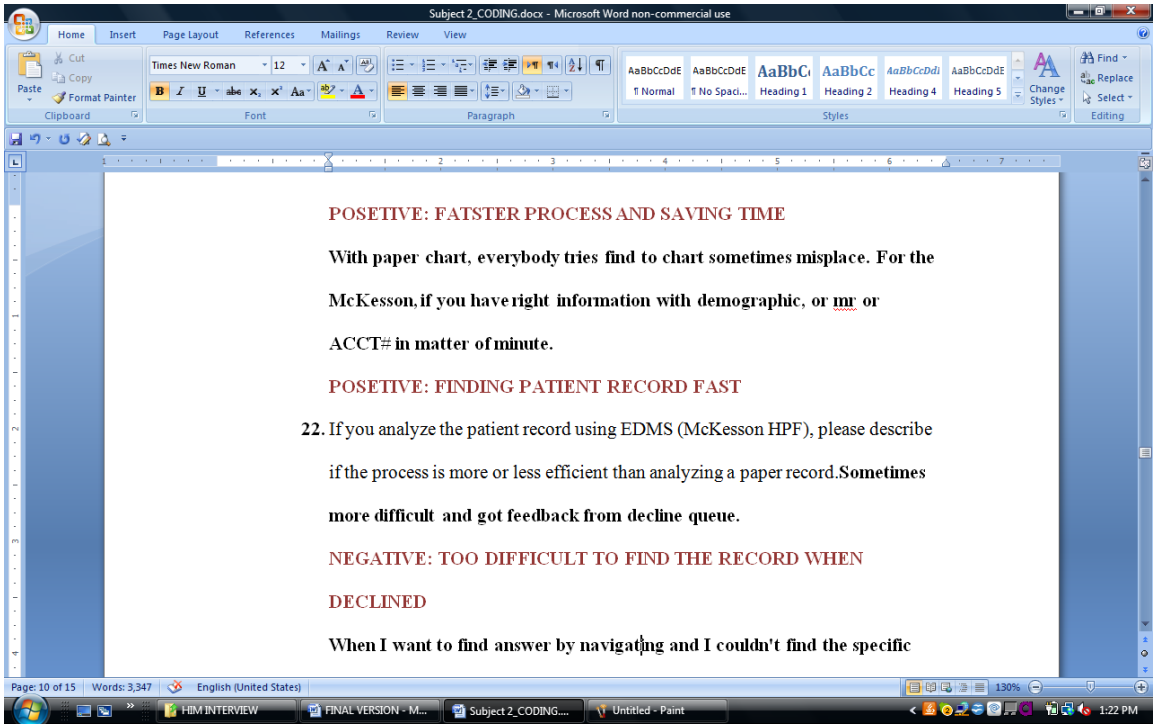
NEGATIVE: SERACH FUNCTIONS DOES NOT WORK WELL

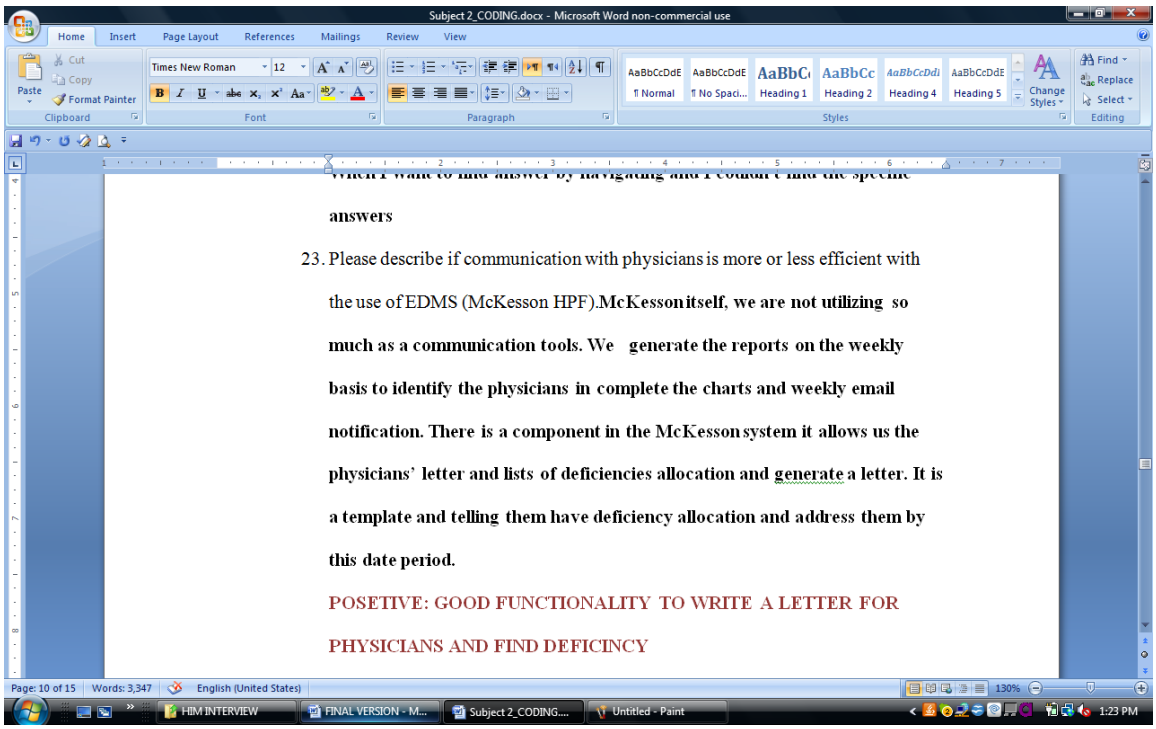
NEGATIVE: ERROR QUEUE AREA DID NOT DESGN WELL

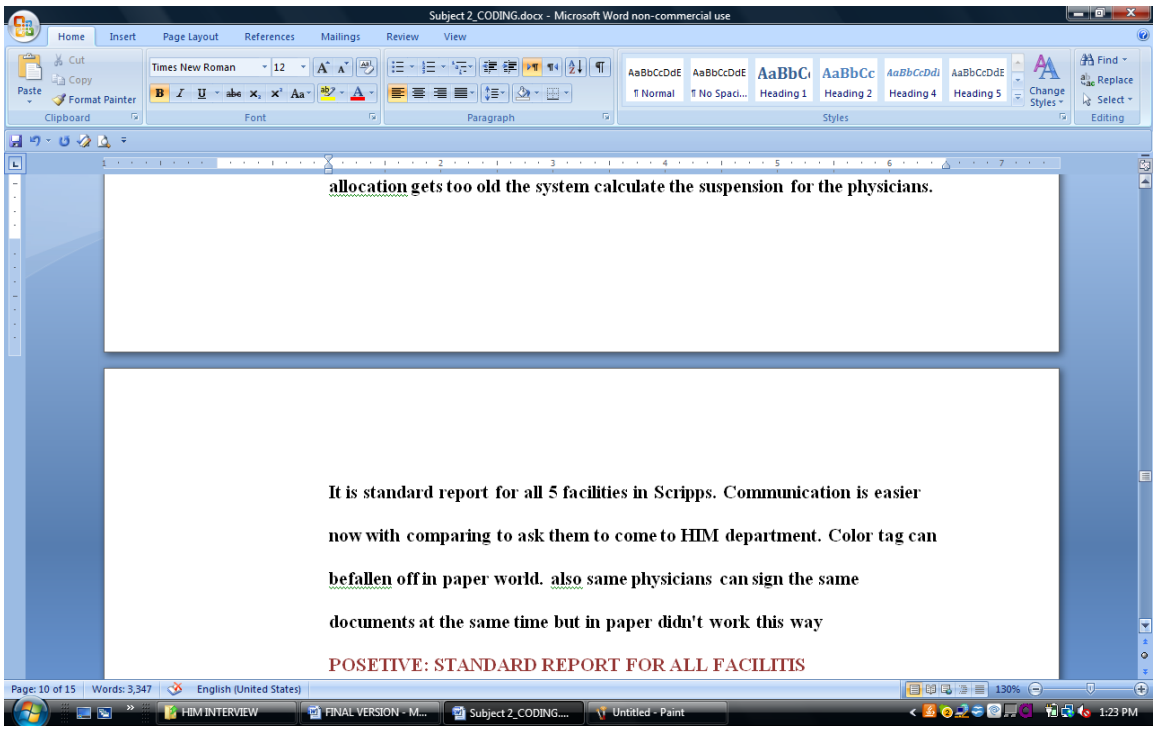
20. How much time do you spend prepping a chart now, compared to prepping a paper chart before?**if the patient is staff members /celebrities and vip people hospitalized in Scripps and I will be take place and prep and scanning them for the patient confidentiality**

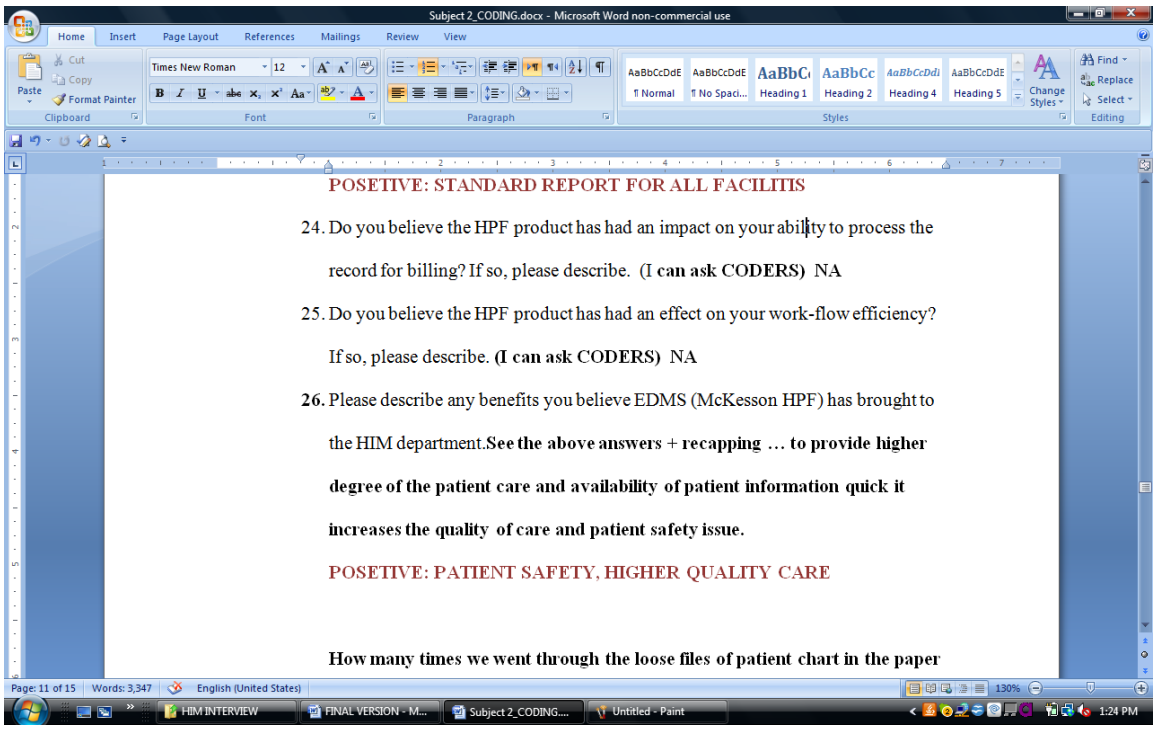
ISSUES WITH CONFIDIENTIALITY WITH CELEBERITIES

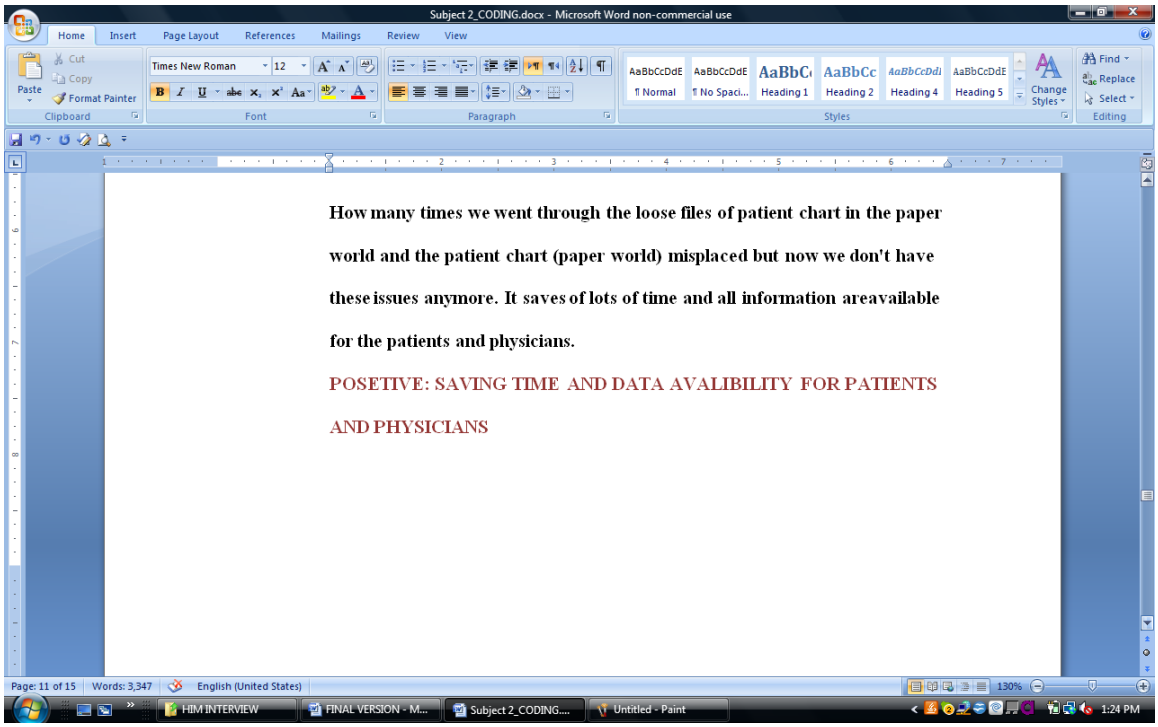
21. Can you access a patient's record faster or slower usingaEDMS (McKesson HPF), as compared to accessing a paper record? If faster, what is the estimated time saved?**Much faster time saving it is hard to say number on.**

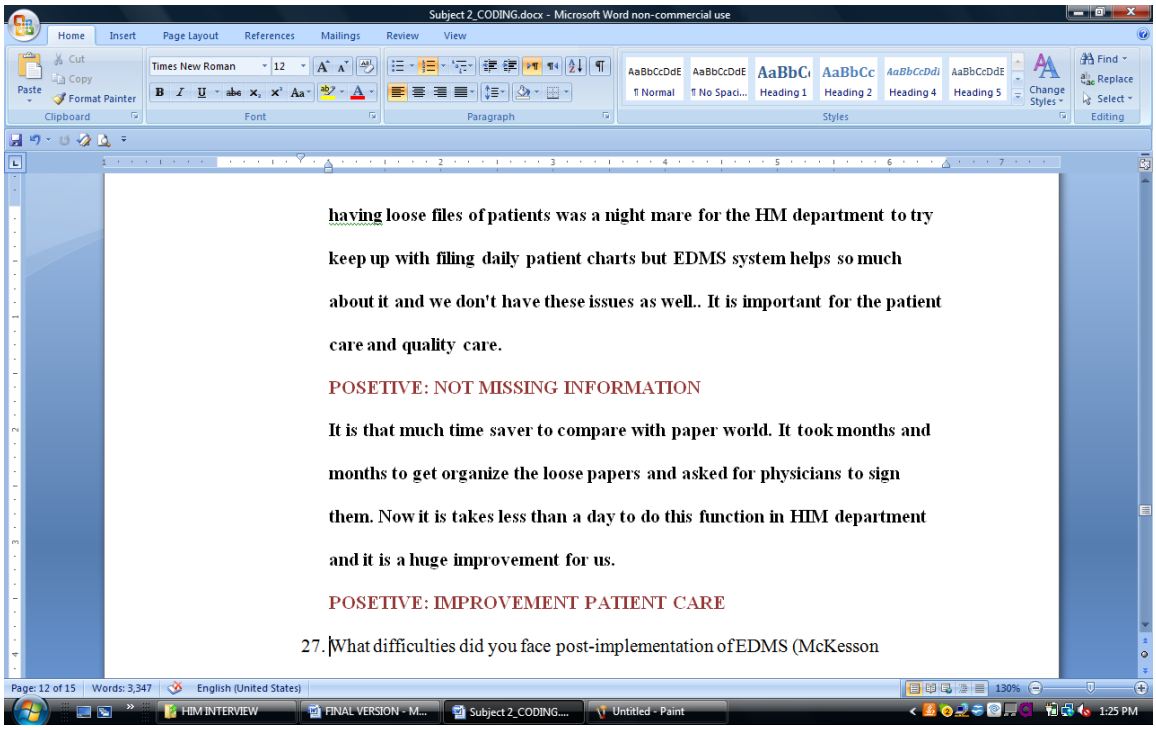

Subject 2_CODING.docx - Microsoft Word non-commercial use
POSETIVE: FATSTER PROCESS AND SAVING TIME
With paper chart, everybody tries find to chart sometimes misplace. For the McKesson, if you have right information with demographic, or mr or ACCT# in matter of minute.
POSETIVE: FINDING PATIENT RECORD FAST
22. If you analyze the patient record using EDMS (McKesson HPF), please describe if the process is more or less efficient than analyzing a paper record.Sometimes more difficult and got feedback from decline queue.
NEGATIVE: TOO DIFFICULT TO FIND THE RECORD WHEN DECLINED
When I want to find answer by navigating and I couldn't find the specific
Page: 10 of 15
Words: 3,347
English (United States)
130%
1:22 PM

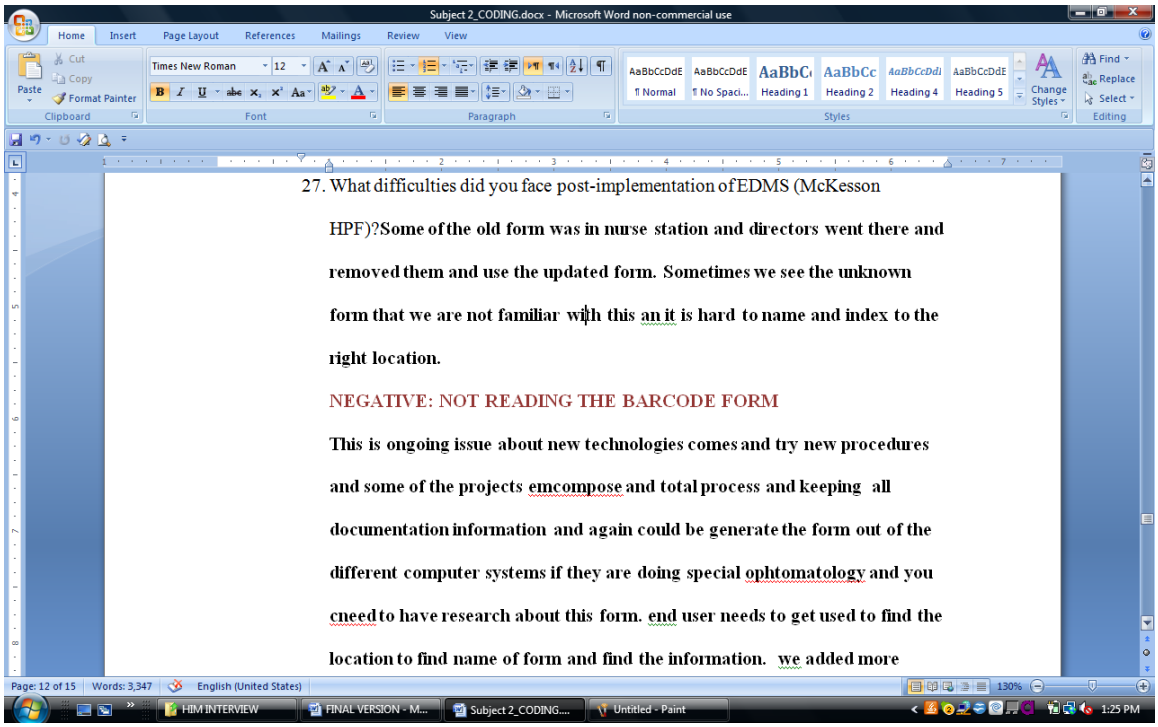

Subject 2_CODING.docx - Microsoft Word non-commercial use
answers
23. Please describe if communication with physicians is more or less efficient with the use of EDMS (McKesson HPF).McKesson itself, we are not utilizing so much as a communication tools. We generate the reports on the weekly basis to identify the physicians in complete the charts and weekly email notification. There is a component in the McKesson system it allows us the physicians' letter and lists of deficiencies allocation and generate a letter. It is a template and telling them have deficiency allocation and address them by this date period.
POSETIVE: GOOD FUNCTIONALITY TO WRITE A LETTER FOR PHYSICIANS AND FIND DEFICINCY
Page: 10 of 15
Words: 3,347
English (United States)
130%
1:23 PM

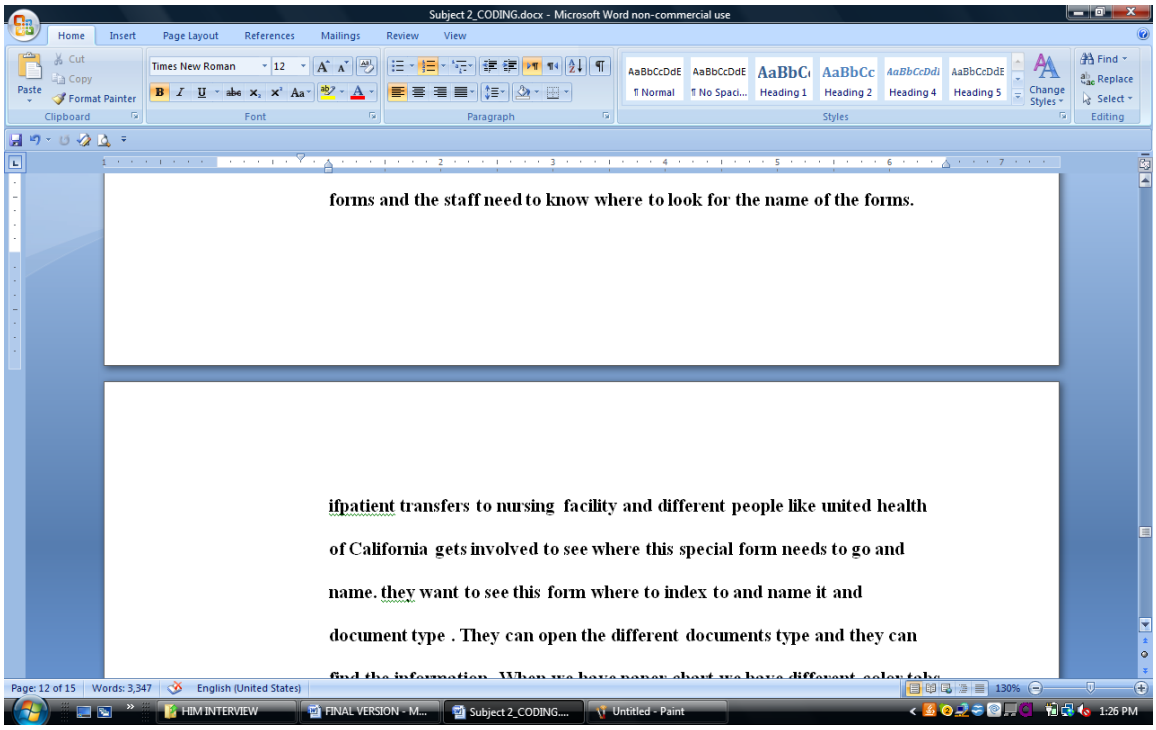

Subject 2_CODING.docx - Microsoft Word non-commercial use
allocation gets too old the system calculate the suspension for the physicians.
It is standard report for all 5 facilities in Scripps. Communication is easier now with comparing to ask them to come to HIM department. Color tag can befallen off in paper world. also same physicians can sign the same documents at the same time but in paper didn't work this way
POSETIVE: STANDARD REPORT FOR ALL FACILITIS
Page: 10 of 15
Words: 3,347
English (United States)
1:23 PM

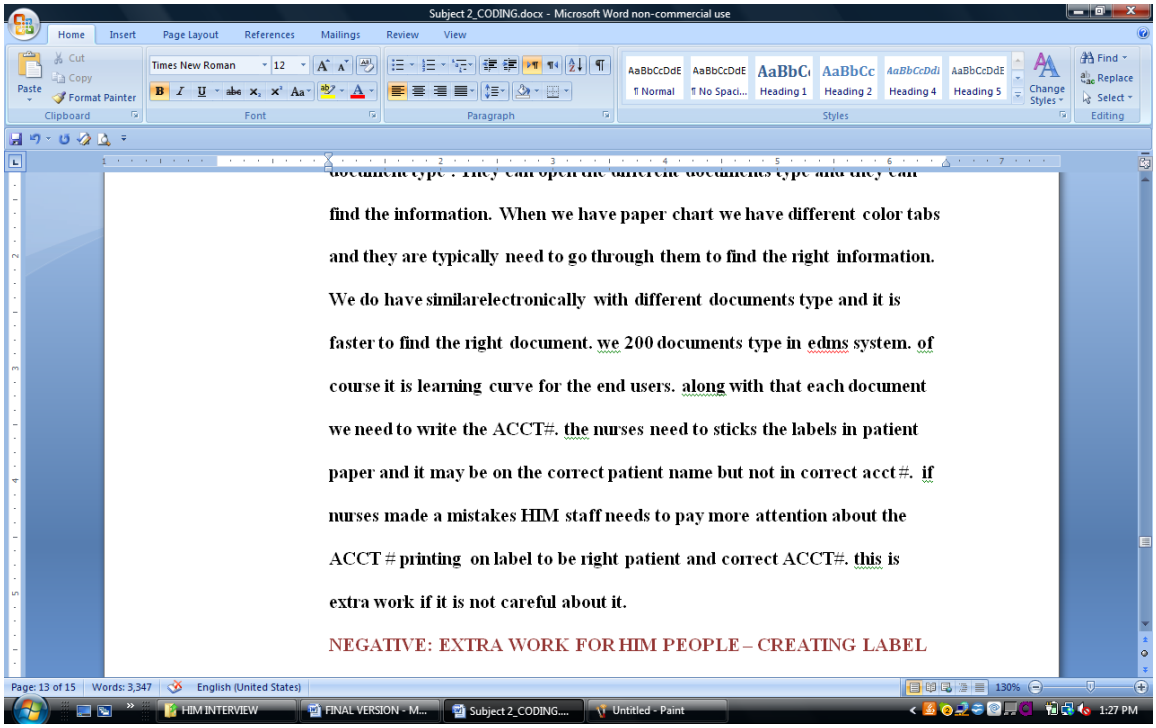

Subject 2_CODING.docx - Microsoft Word non-commercial use
POSETIVE: STANDARD REPORT FOR ALL FACILITIS
24. Do you believe the HPF product has had an impact on your ability to process the record for billing? If so, please describe. (I can ask CODERS) NA
25. Do you believe the HPF product has had an effect on your work-flow efficiency? If so, please describe. (I can ask CODERS) NA
26. Please describe any benefits you believe EDMS (McKesson HPF) has brought to the HIM department.See the above answers + recapping … to provide higher degree of the patient care and availability of patient information quick it increases the quality of care and patient safety issue.
POSETIVE: PATIENT SAFETY, HIGHER QUALITY CARE
How many times we went through the loose files of patient chart in the paper
Page: 11 of 15
Words: 3,347
English (United States)
1:24 PM

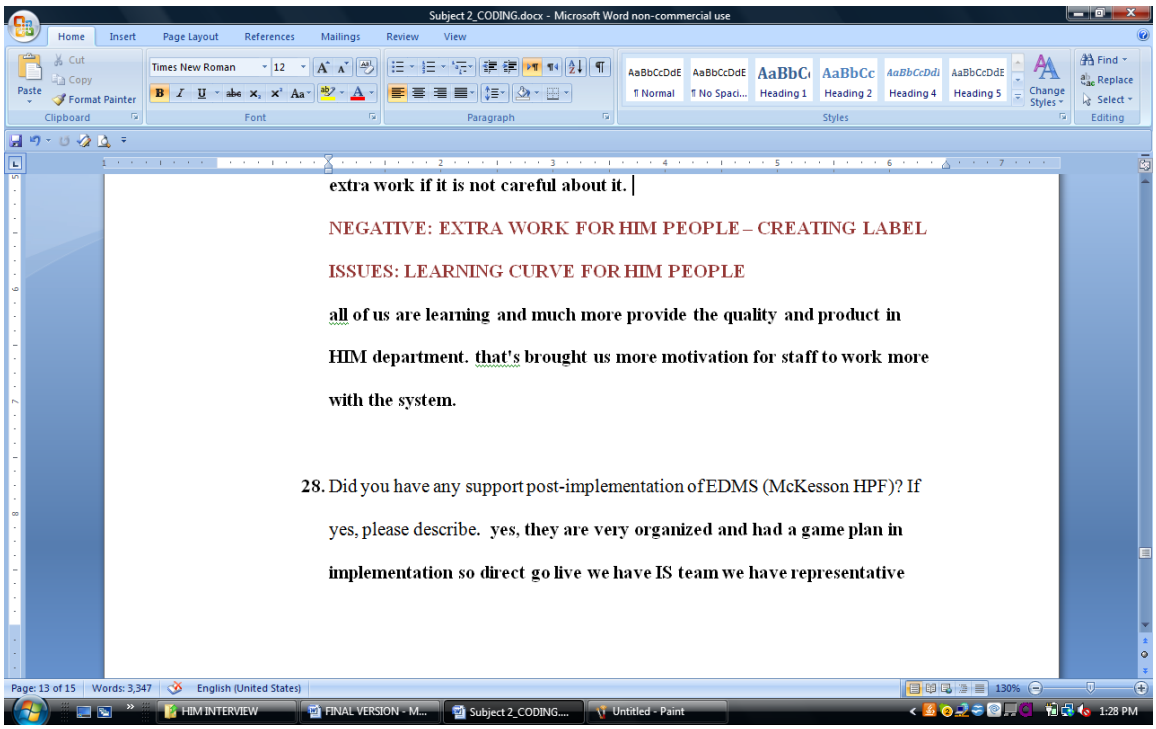

Subject 2_CODING.docx - Microsoft Word non-commercial use
How many times we went through the loose files of patient chart in the paper world and the patient chart (paper world) misplaced but now we don't have these issues anymore. It saves of lots of time and all information areavailable for the patients and physicians.
POSETIVE: SAVING TIME AND DATA AVALIBILITY FOR PATIENTS AND PHYSICIANS
Page: 11 of 15
Words: 3,347
English (United States)

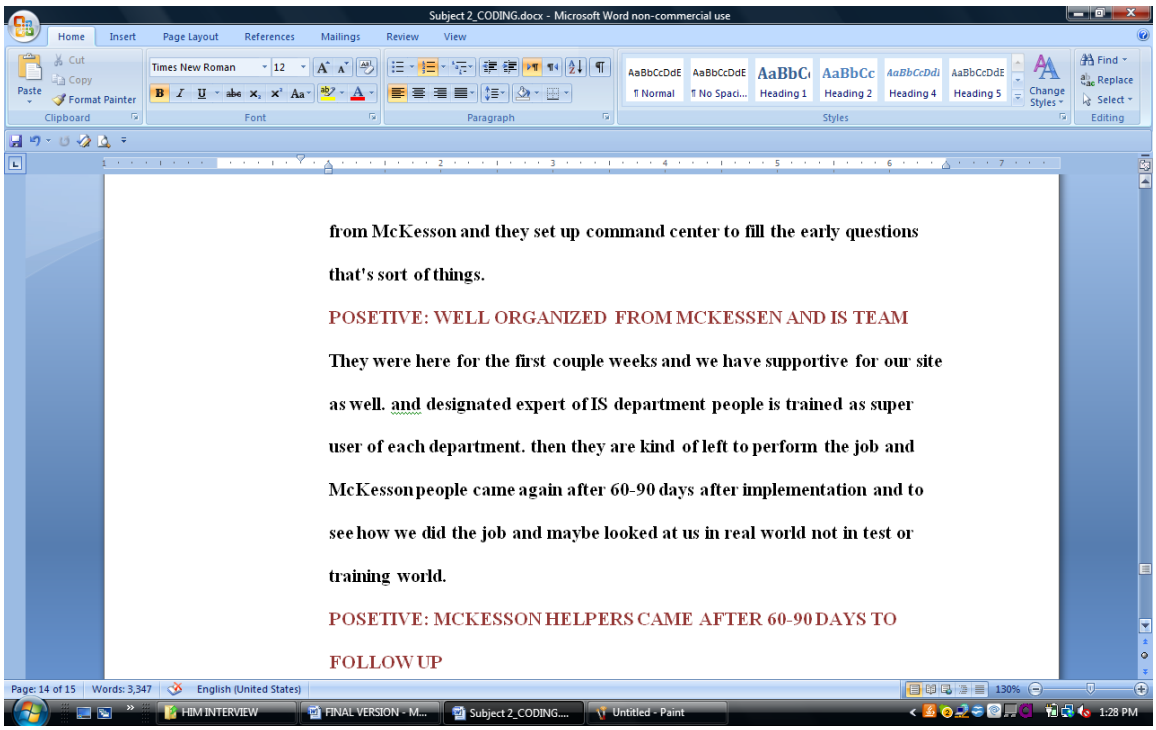

Subject 2_CODING.docx - Microsoft Word non-commercial use
having loose files of patients was a night mare for the HM department to try keep up with filing daily patient charts but EDMS system helps so much about it and we don't have these issues as well.. It is important for the patient care and quality care.
POSETIVE: NOT MISSING INFORMATION
It is that much time saver to compare with paper world. It took months and months to get organize the loose papers and asked for physicians to sign them. Now it is takes less than a day to do this function in HIM department and it is a huge improvement for us.
POSETIVE: IMPROVEMENT PATIENT CARE
27. What difficulties did you face post-implementation of EDMS (McKesson
Page: 12 of 15
Words: 3,347
English (United States)

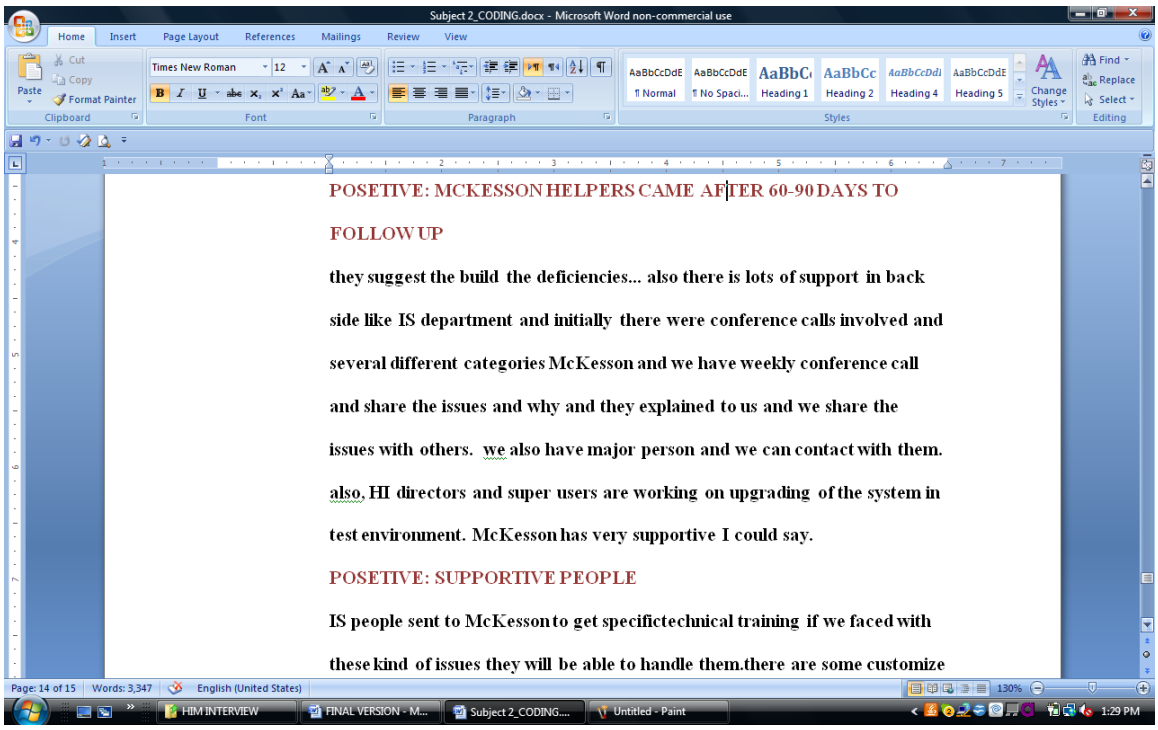

Subject 2_CODING.docx - Microsoft Word non-commercial use
Home Insert Page Layout References Mailings Review View
Times New Roman 12
Paste Cut Copy Format Painter
Clipboard Font Paragraph Styles Editing
Find Replace Select
Change Styles
AaBbCcDdE ¶ Normal
AaBbCcDdE ¶ No Spaci...
AaBbC Heading 1
AaBbCc Heading 2
AaBbCcDdi Heading 4
AaBbCcDdE Heading 5
27. What difficulties did you face post-implementation of EDMS (McKesson HPF)? Some of the old form was in nurse station and directors went there and removed them and use the updated form. Sometimes we see the unknown form that we are not familiar with this an it is hard to name and index to the right location.
NEGATIVE: NOT READING THE BARCODE FORM
This is ongoing issue about new technologies comes and try new procedures and some of the projects emcompose and total process and keeping all documentation information and again could be generate the form out of the different computer systems if they are doing special ophtomatology and you cneed to have research about this form. end user needs to get used to find the location to find name of form and find the information. we added more
Page: 12 of 15 Words: 3,347 English (United States)
130%
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:25 PM

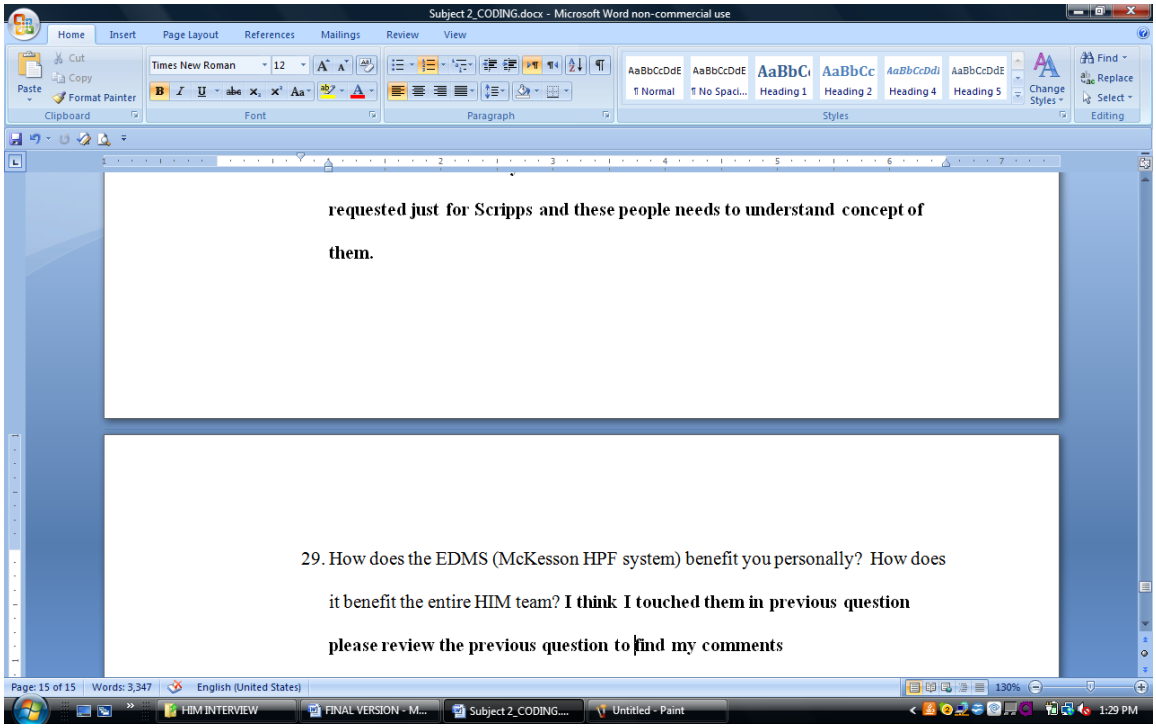

Subject 2_CODING.docx - Microsoft Word non-commercial use
Home Insert Page Layout References Mailings Review View
forms and the staff need to know where to look for the name of the forms.
ifpatient transfers to nursing facility and different people like united health of California gets involved to see where this special form needs to go and name. they want to see this form where to index to and name it and document type . They can open the different documents type and they can
Page: 12 of 15 Words: 3,347 English (United States)
130%
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:26 PM

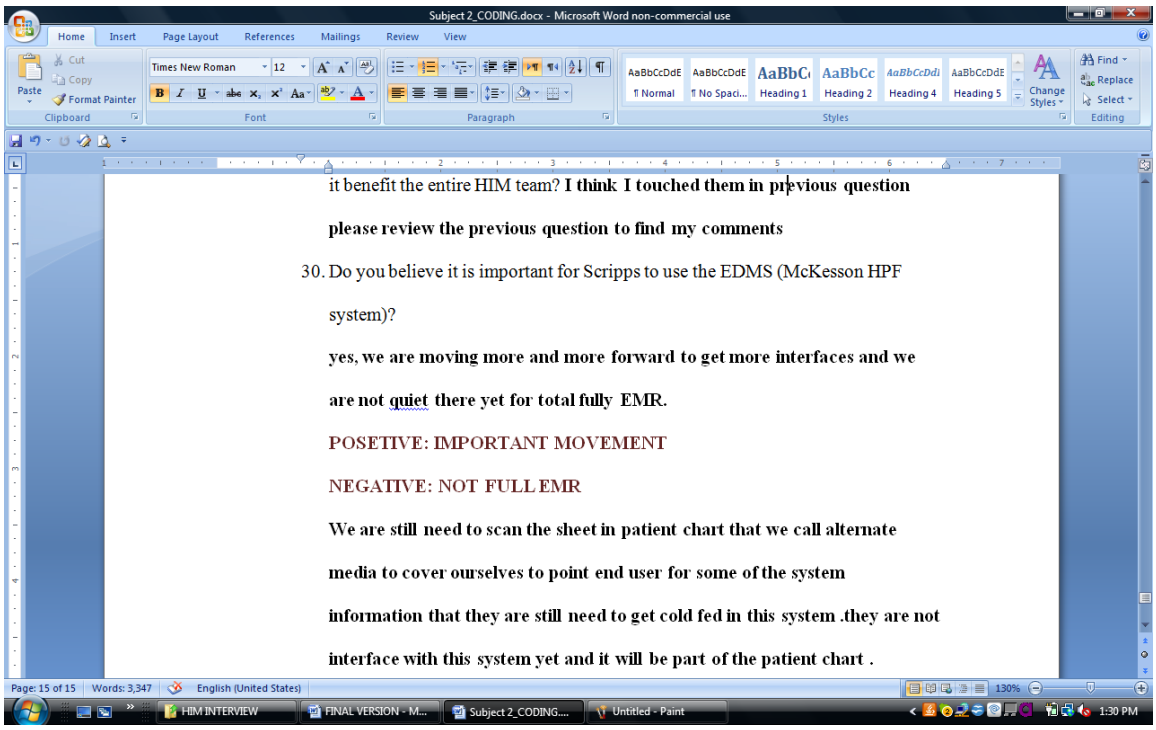

Subject 2_CODING.docx - Microsoft Word non-commercial use
find the information. When we have paper chart we have different color tabs and they are typically need to go through them to find the right information. We do have similarelectronically with different documents type and it is faster to find the right document. we 200 documents type in edms system. of course it is learning curve for the end users. along with that each document we need to write the ACCT#. the nurses need to sticks the labels in patient paper and it may be on the correct patient name but not in correct acct #. if nurses made a mistakes HIM staff needs to pay more attention about the ACCT # printing on label to be right patient and correct ACCT#. this is extra work if it is not careful about it.
NEGATIVE: EXTRA WORK FOR HIM PEOPLE – CREATING LABEL

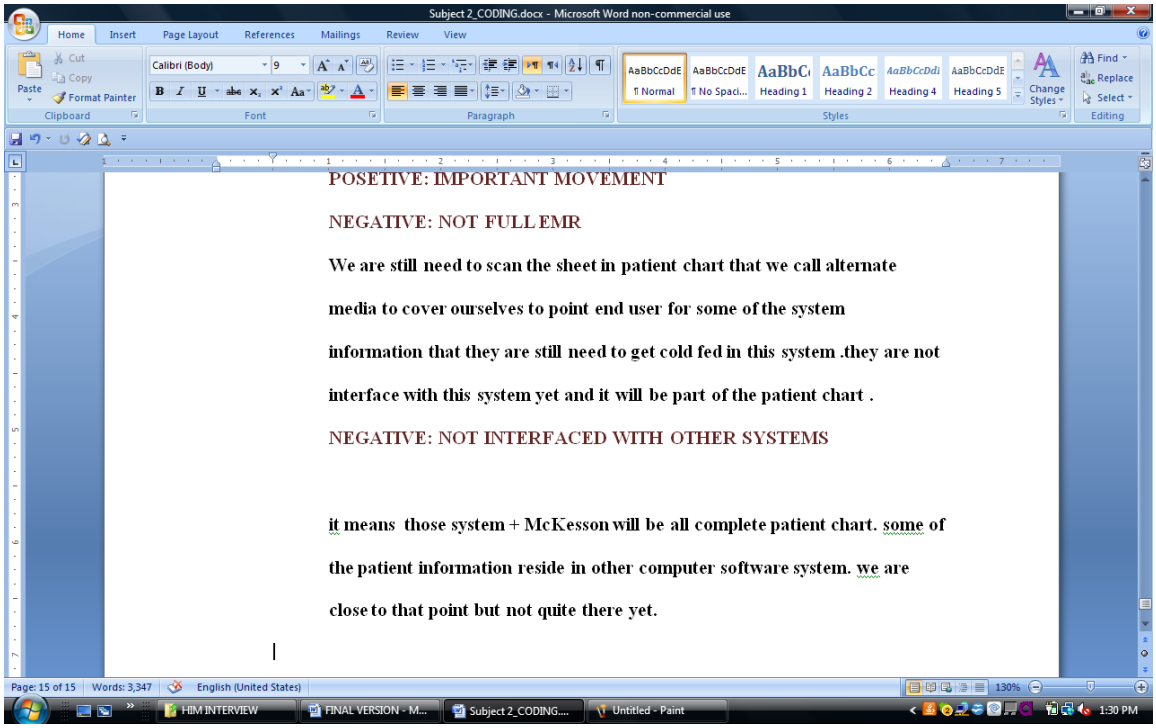

Subject 2_CODING.docx - Microsoft Word non-commercial use
extra work if it is not careful about it.
NEGATIVE: EXTRA WORK FOR HIM PEOPLE – CREATING LABEL
ISSUES: LEARNING CURVE FOR HIM PEOPLE
all of us are learning and much more provide the quality and product in HIM department. that's brought us more motivation for staff to work more with the system.
28. Did you have any support post-implementation of EDMS (McKesson HPF)? If yes, please describe. yes, they are very organized and had a game plan in implementation so direct go live we have IS team we have representative


Subject 2_CODING.docx - Microsoft Word non-commercial use
Home
Insert
Page Layout
References
Mailings
Review
View
Times New Roman
12
Paste
Cut
Copy
Format Painter
Clipboard
Font
Paragraph
Styles
Change Styles
Find
Replace
Select
Editing
from McKesson and they set up command center to fill the early questions
that's sort of things.
POSETIVE: WELL ORGANIZED FROM MCKESSEN AND IS TEAM
They were here for the first couple weeks and we have supportive for our site
as well. and designated expert of IS department people is trained as super
user of each department. then they are kind of left to perform the job and
McKesson people came again after 60-90 days after implementation and to
see how we did the job and maybe looked at us in real world not in test or
training world.
POSETIVE: MCKESSON HELPERS CAME AFTER 60-90 DAYS TO
FOLLOW UP
Page: 14 of 15
Words: 3,347
English (United States)
130%
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:28 PM


Subject 2_CODING.docx - Microsoft Word non-commercial use
Home
Insert
Page Layout
References
Mailings
Review
View
Times New Roman
12
Paste
Cut
Copy
Format Painter
Clipboard
Font
Paragraph
Styles
Change Styles
Find
Replace
Select
Editing
POSETIVE: MCKESSON HELPERS CAME AFTER 60-90 DAYS TO
FOLLOW UP
they suggest the build the deficiencies... also there is lots of support in back
side like IS department and initially there were conference calls involved and
several different categories McKesson and we have weekly conference call
and share the issues and why and they explained to us and we share the
issues with others. we also have major person and we can contact with them.
also, HI directors and super users are working on upgrading of the system in
test environment. McKesson has very supportive I could say.
POSETIVE: SUPPORTIVE PEOPLE
IS people sent to McKesson to get specifictechnical training if we faced with
these kind of issues they will be able to handle them.there are some customize
Page: 14 of 15
Words: 3,347
English (United States)
130%
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:29 PM


Subject 2_CODING.docx - Microsoft Word non-commercial use
requested just for Scripps and these people needs to understand concept of them.
29. How does the EDMS (McKesson HPF system) benefit you personally? How does it benefit the entire HIM team? I think I touched them in previous question please review the previous question to find my comments
Page: 15 of 15
Words: 3,347
English (United States)
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:29 PM


Subject 2_CODING.docx - Microsoft Word non-commercial use
it benefit the entire HIM team? I think I touched them in previous question please review the previous question to find my comments
30. Do you believe it is important for Scripps to use the EDMS (McKesson HPF system)?
yes, we are moving more and more forward to get more interfaces and we are not quiet there yet for total fully EMR.
POSETIVE: IMPORTANT MOVEMENT
NEGATIVE: NOT FULL EMR
We are still need to scan the sheet in patient chart that we call alternate media to cover ourselves to point end user for some of the system information that they are still need to get cold fed in this system .they are not interface with this system yet and it will be part of the patient chart .
Page: 15 of 15
Words: 3,347
English (United States)
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:30 PM


Subject 2_CODING.docx - Microsoft Word non-commercial use
POSETIVE: IMPORTANT MOVEMENT
NEGATIVE: NOT FULL EMR
We are still need to scan the sheet in patient chart that we call alternate media to cover ourselves to point end user for some of the system information that they are still need to get cold fed in this system .they are not interface with this system yet and it will be part of the patient chart .
NEGATIVE: NOT INTERFACED WITH OTHER SYSTEMS
it means those system + McKesson will be all complete patient chart. some of the patient information reside in other computer software system. we are close to that point but not quite there yet.
Page: 15 of 15
Words: 3,347
English (United States)
HIM INTERVIEW
FINAL VERSION - M...
Subject 2_CODING....
Untitled - Paint
1:30 PM

Appendix H: Glossary

Account Number: A unique numeric value assigned to each patient's visit.

AHIMA: American Health Information Management Association. AHIMA is the Association of Health Information Management professionals worldwide working on developing standards.

CENTRICITY: An enterprise level software system for core clinical, financial and administrative solutions for hospitals.

COLD: Acronym for Computer Output to Laser Disk; it is a system for archiving data such as reports to one or more optical disks in a compressed but easily retrievable format. Around one million paper pages can be stored on a single 5 1/4 inch optical disk. A COLD system is a form of EDM and is often used together with an imaging system. In hospitals and clinics, COLD system is typically used to store radiology reports and thelike.

COLD FED: Feeding already digitized documents into an EDMS system. An EDMS does not necessarily include scanning modules for digitization of documents.

COPATH: A software application for reporting of clinical pathological (laboratory) results.

DCS/QCI: Acronym for Document Capture Quality Control Indexing. A software application connected to a high speed scanner which scans and captures previously bar coded patient charts and digitally stores the data based on bar code information.

Deficiency: The absence of a required element needed to assure compliance with licensing and regulatory agency standards. With respect to medical records (patient charts), there are three types of deficiencies: signature, dictation, missing text.

DOS: Acronym for Duration of Stay – the time a patient stays at a hospital.

EDMS: Acronym for Electronic Data Management System.An Electronic Document Management System (**EDMS**) is a collection of technologies that work together to provide a comprehensive solution for managing the creation, capture, indexing, storage, fast and easy retrieval, and disposition of records and information assets of the organization.

EKG: Acronym for Electrocardiograph. EKG is the recording of the electrical activity of the heart in the form of a transthoracic (across the thorax or chest) interpretation of the electrical activity of the heart over a period of time, as detected by electrodes attached to the surface of the skin and recorded or displayed by a device external to the body.

EMR: Acronym for Electronic Medical Record. EMR is a digital version of the traditional paper-based medical record for an individual. The EMR represents a medical record within a single facility, such as a doctor's office or a clinic.

EHR: Acronym for Electronic Health Record. An electronic health record (EHR) is an official health record for an individual that is shared among multiple facilities and agencies.

Encounter Number: A unique numeric value assigned to each patient's visit.

HIM: Acronym for Health Information Management. HIM is the practice of acquiring, analyzing and protecting digital and traditional medical information vital to providing quality patient care.

HIPAA: Health Insurance Portability and Accountability Act of 1996. The primary goal of the law is to make it easier for people to keep health insurance, protect the

confidentiality and security of healthcare information and help the healthcare industry control administrative costs.

HPF: Acronym for Horizontal Patient Folder which is the name of a commercial EDMS system. It is a data repository for patient data.

Medical Record Number: A unique numeric value assigned to an individual patient.

Metadata: Metadata is data about data. The main purpose of metadata is to facilitate the discovery of relevant information. There are two type of Metadata: Structural and Descriptive.Metadata is similar to information found in the card catalogs of libraries. By describing the contents and context of data files, the quality of the original data/files is greatly increased. For example, a digital image may include metadata that describe how large the picture is, the color depth, the image resolution, when the image was created, and other data. A text document's metadata may contain information about how long the document is, who the author is, when the document was written, and a short summary of the document.

PACS: Acronym for Picture Archiving and Communication System. PACS is a medical imaging technology which provides economical storage of and convenient access to and images from multiple modalities (source machine types).