Linköping Studies in Science and Technology
Dissertations, No. 1422

# Exploring organizational translation
## A case study of changes toward Lean Production

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**February 2012**

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”Exploring Organizational Translation: A case study of changes toward Lean Production”

Linköping Studies in Science and Technology, Dissertations, No. 1422

ISBN: 978-91-7519-974-0

ISSN: 0345-7524

Cover art by tagxcedo.com

Printed by: LiU-Tryck, Linköping

Distributed by:

Linköping University

Department of Management and Engineering

SE-581 83 Linköping, Sweden

Tel: +46 13 281000

I am always doing that which I can not do,
in order that I may learn how to do it.

– P. Picasso

# Abstract

Lean Production has received massive attention during recent years, and many organizations attempt to introduce it with an ambition to reach the radical improvement effects that are promised in the popular management literature. However, introducing a management concept can be a very challenging task, and research has shown that the majority of such initiatives fail. A common observation is that the outcome of a change initiative differs from its initial intentions, which indicates that the content of the change is somehow transformed during the process. This kind of transformation can be described as organizational translation.

The purpose of the thesis is to provide an account of how processes of organizational translation transpire and to analyze and identify the main determinants of their outcome.

The thesis is based on a longitudinal case study that has focused on the introduction of the management concept Lean in a large Swedish manufacturing company. The study has been performed in two phases. In the first phase, a series of retrospective interviews have been performed with employees at all hierarchical levels within the company. The second phase of the study has been based on a prospective approach. This phase has comprised a combination of interviews, observations and document studies, with focus on a pilot project within the company. The study was performed between 2007 and 2011 and covers events between 2003 and 2011.

By analyzing the changes from a translation perspective, the thesis contributes to explore the meaning of organizational translation and the mechanisms through which Lean is materialized and developed into organizational practice.

Three types of organizational translation are presented in the thesis. These are defined as the activities and processes through which Lean is translated to a local set of ideas, practices and objects, respectively. It is suggested that these three entities and the corresponding forms of translation interact and together influence how people behave, which in turn will affect the results of the change initiative. This implies that all three types of organizational translation need to be addressed for a change initiative to be successful. Further, the suggested change must be translated so that it is represented in physical objects, people's understanding and organizational practice. Lack of alignment between these three entities will create tension, which will likely hinder change and increase the risk of failure.

# Foreword

Writing a doctoral thesis is a long and at times frustrating journey. It has required a lot of confidence, persistence and patience – not only from myself, but also from many people around me. Apart from myself, there are many people that deserve credit for the thesis that you now hold in your hand.

First of all, I would like to thank my main supervisor Mattias for strong support and many interesting discussions about everything from study design and method to theory and analysis. I am especially grateful for the strong support and encouragement you have shown during the final phase of the thesis project. You have really made a difference!

To my co-supervisors Jörgen and François, I am very thankful for the many insightful comments and observations you have made along the way. Thank you for taking the time to share your knowledge.

During the work on my licentiate's thesis a couple of years ago, I received very good feedback from Thomas Magnusson and Andreas Hellström. Although your effort concerned a different text, your comments have helped me develop my ideas, which has made this thesis a better one. Thank you both!

Thank you to Andreas Wallo for your assistance at the design seminar for this thesis.

I would also like to thank Ulf Melin for pointing out the greatest weaknesses and strong points of the thesis at the final seminar. Your feedback was a valuable (and much needed) boost for the final stretch of the writing process.

To all my colleagues at Helix and at the division of Quality Technology and Management, I am very grateful for all our casual chats around the coffee table, and for having had the opportunity to share my frustration with many of you.

Also, I would like to thank the management at Helix giving me the opportunity to take on this project and for funding my research. I have found it a very inspiring experience to be a part of the multi-disciplinary environment that everyone at Helix has contributed to.

To everyone at HiTech, I would like to thank you all for showing interest in this research project and opening the doors to your organization. I have learned a lot from you. Thank you all!

To my wonderful wife, Elina, I thank you for always being there and supporting me every step of the way. Coming home to you after long days (and nights) at the office has been my greatest reward. I cannot thank you enough!

Also, I would like to extend my gratitude to my parents and the rest of my family in Oslo. Thank you for always believing in me and encouraging me over the years.

Although I have written the text on these pages, you have all contributed to this thesis in different ways. It would not have been possible without your support. Thank you all!

Finally, a special thanks to you – yes, you! – for picking up a copy of my thesis. I hope you find it interesting!

Norrköping, February 2012

Jostein Langstrand

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# Introduction

# Lean |lēn|

adjective

1 (of a person or animal) thin, esp. healthily so; having no superfluous fat: *his Lean, muscular body*. See note at THIN.

- (of meat) containing little fat: *Lean bacon*.
- (of an industry or company) efficient and with no waste: *he made leaner government a campaign theme*.

2 (of an activity or a period of time) offering little reward, substance, or nourishment; meager : *the Lean winter months | keep a small reserve to tide you over* **the Lean years**.

3 (of a vaporized fuel mixture) having a high proportion of air: *Lean air-to-fuel ratios*.

(Source: New Oxford American Dictionary 2nd Ed.)

# 1

# Introduction

*The brutal fact is that about 70 % of all change initiatives fail.*

– M. Beer & N. Nohria

*Management concepts often promise to change the world, but is it really as simple as indicated in the popular management literature? The quote above indicates that organizational change is a very difficult task to take on. Although most of us would be deterred by such odds, there are many courageous people who disregard them and take on the challenge. In this thesis, one such example will be presented and thoroughly analyzed.*

*This chapter provides an introduction to the thesis. It begins with a general description of the research problem and the focus of the thesis, and continues with a presentation of the purpose and research questions. Finally, the chapter concludes with a description of how the thesis is structured.*

In 2003, HiTech Inc started their journey towards Lean Production. According to the 'fathers' of Lean (Womack et al., 1990), the company should expect a dramatic reduction of resource utilization in production, higher efficiency and more satisfied customers. However, after more than eight years of working with Lean, the company is still struggling to translate the concept to practice, and to reap the benefits. While some results have been gained, the radical transformation promised in the popular literature still remains to be found. Several efforts have stalled, and the company is still faced with a number of conflicts between their intentions with Lean and current practice within the organization. The picture that we see at HiTech is rather different from the one that is proposed in the popular management literature.

While this is but one example of experiences from working with Lean, it raises an important issue; the expectations that are presented in the literature are not necessarily realistic in all cases. This is perhaps most important to practitioners that aim to change their organizations. When

presented with unreasonable expectations, disappointment and a sense of failure is not far away. From a scientific point of view, the mismatch between rhetoric and reality leads to questions about scientific rigor, generalizability and validity of the kind of research that produces management concepts such as Lean. But also, as a result of the perceived failures among practitioners, the field loses legitimacy, both within the scientific community and towards practitioners.

This brings about a question is how management concepts come to be endowed with such claims of efficacy, and why organizations so often are unable to meet the corresponding expectations. In this thesis, the reasons behind this problematic situation will be explored.

## 1.1 Background to the research problem

Organizational change can mean several different things, such as downsizing, mergers, new product development and so on. Usually, the ambition of the change initiative is to somehow influence organizational behavior and change or replace the current practice within the organization. This is particularly true when it comes to the introduction of management concepts.

One such management concept is Lean production, which has received massive attention in recent years, and has penetrated both private and public organizations. Lean and similar concepts are often presented as being endowed with an innate ability to transform any organization that takes them in. Despite this claimed efficacy, we see that the majority of change initiatives fail to deliver the expected results (Beer, 2003; Quist, 2003; Skålén, 2002). As many as two thirds of all change initiatives have been reported to end in failure, seemingly regardless of the content of the change (Beer and Nohria, 2000; Spector and Beer, 1994; Sveningsson and Sörgärde, 2007). This indicates that we still have much to learn about change processes.

This high proportion of failure has inspired many researchers, and much attention has been directed toward the question of why change initiatives fail; is it the seed or the soil – or something else?

Sveningsson and Sörgärde (2007) argue that most management concepts are presented with an over confidence in their ability to produce controlled and predictable change. The complexity of an organization and the processes that are associated with change is often grossly simplified. Accordingly, the claimed efficacy of these concepts can (and

should) be questioned. Researchers that subscribe to this point of view often argue that these concepts tend to be applied in a ceremonial fashion, and that they rarely lead to substantial change (DiMaggio and Powell, 1983; Meyer and Rowan, 1977).

From this point of view, management concepts are little more than fashion statements that are introduced in order to gain legitimacy from the surrounding context (Abrahamson, 1996). With such a view, it is no big surprise that management concepts fail to deliver the expected results; it is instead surprising that *any* organization achieves positive results at all. In other words, researchers within this tradition would argue that there is a problem with the seed, i.e. the management concept at hand.

A contrasting perspective can be found within the tradition of Quality Management where much attention has been focused on creating models that can contribute to organizational improvement. With this perspective, there is nothing wrong with the seed (management concept); the problem lies with the soil (the organization).

For instance, in a member survey, the Lean Enterprise Institute found that more than 36% of the respondents attributed their failure to middle management resistance. Together with employee resistance and supervisor resistance, these were considered three of the four most significant obstacles to implementing Lean (LEI, 2007). Changing the organization is thereby seen as a Lewinian process of first 'unfreezing' the cultural pattern to prepare the soil for planting the seed of Lean (or another concept) and a subsequent 'refreezing' to prevent regression. According to certain scholars, one way of doing this is working with the fundamental values of the management concept at hand in order to ensure 'correct' behavior in the organization. The underlying assumption is that the right kind of thinking (e.g. 'Lean thinking') will produce the right results (Liker, 2004; Womack and Jones, 2003).

With such conflicting accounts as described by the two perspectives above, we need to look elsewhere for an explanation. Instead of pointing an accusing finger at Lean or the organization that aims to apply it, we should address the interaction between the two, i.e. the process of how Lean is introduced in the organization. According to Bamford & Forrester (2003) there is a lack of research into variations in how individuals perceive and respond to change. Their findings indicate that change processes involve multiple forces with various influences on the outcome, which highlights the merits of a process perspective on change.

Various concepts have been studied from this perspective, for instance *Balanced Scorecards* (Käll, 1999), *Quality Assurance* (Erlingsdóttir, 1999), *New Public Management* (Book et al., 2003; Skålén, 2002), *Human resource management* (Skålén et al., 2005), *Total Quality Management* (Quist, 2003) and *Process Management* (Hellström, 2007), to name but a few. A closer look at these studies may provide further clues as to where the problem lies.

In his study on Balanced Scorecards, Käll (1999) states that the concept changes both in interpretation and effects through several iterations over time in the studied organizations. He shows that the degree of appropriateness of technological support influences the outcome of implementing the concept.

According to Erlingsdóttir (1999), an uncritical application of management concepts without proper knowledge about adaptation and application may lead to unexpected and unwanted effects. She further states that the initial idea tends to change and deviate from the basic intentions, thus leading to unexpected results. Quist (2003) presents a similar argument.

Skålén (2002) identifies conflicts and loose coupling as results of introducing a management concept in the studied organization. The emergence of different groups with different assessments of the concept has led to problems in the change process. Skålén's results indicate that translation also occurs when people in key positions within an organization are replaced.

Following Hellström (2007), introducing a management concept will incur mutual adaptation between the concept and the organizational practice. Inability to take this into account will produce a discrepancy between intentions and application of the concept.

While these studies differ in content, context and theoretical perspectives, they all point to the same problem, namely that management concepts are generally ambiguous and require some effort (adaptation) to get them to work in the context where they are introduced (cf. Røvik, 2007; Benders and Slomp, 2009). Further, we can expect that interpretations of management concepts change with their travel in space and time (Czarniawska and Joerges, 1996; Erlingsdóttir and Lindberg, 2005; Pettersen, 2009a). In other words, the concepts are translated as they are disseminated between people and over time (this point is elaborated in chapter 4).

Employing a translation perspective places focus on the process of change, and as opposed to a static view of the concept or context, this allows the study to capture the mutual adaptation of concept and context over time.

Coming from the tradition of Quality Management, my ambition is to contribute to that field. Having said that, it is important to point out the differences in use of the term Quality Management. According to Giroux and Landry (1998), the meaning of the term has shifted over the years, from 'management of quality' to 'quality of management'. This thesis should be seen as an attempt to contribute to the latter of the two, which, according to Spector and Beer (1994), is lacking in practice as well as research.

## 1.2 Purpose and research questions

The purpose of the thesis is to provide an account of how processes of organizational translation transpire and to analyze and identify the main determinants of their outcome. The purpose can be broken down into the following questions.

1. What kind of activities and processes contribute to translating a management concept (Lean production) from a generic and abstract description to organizational practice?
2. What kinds of output may these translation activities generate?
3. What aspects of the translation process influence the degree of integration and effectiveness of the translated practice?

In answering these questions, the thesis aspires to contribute to our understanding of organizational change processes, and help us explain how and why management concepts grow, and in some cases die out, in organizations. The ambition is that the analysis will contribute to the theoretical development within the field of Quality Management, as well as to provide practical guidance to how organizations can take translation into account in their planning of change initiatives.

## 1.3 Structure of the thesis

The thesis in front of you is a synthesis of a number of journal article, conference papers and other texts that have been produced over the years. Some of these texts have been refined and developed to form chapters and sections in the thesis, and some of them are appended as

full papers. In addition to the research that underpins the appended papers, the principal research project has been an in depth case study, which is placed in the main body of the thesis. While this case is the main focal point of the analysis, the appended papers are used as references throughout the thesis. Thus, the thesis can be seen as a sort of hybrid; a monograph with appended papers.

The thesis is divided into five parts.

In part I, the stage is set for the topic of the thesis. First off is the introductory chapter, which you are about to finish reading. Chapter 2 aims to provide an overview of how one of the main study objects, Lean Production, can be understood from an academic point of view. This chapter draws extensively from appended paper A.

Part II provides the theoretical framework for the thesis. In chapter 3, the discussion about Lean Production continues, but is raised to a more abstract level. The ambition is to discuss what characterizes management concepts in general. In chapter 4, the rest of the theoretical puzzle is provided, with theories of translation and organizational change.

The next two chapters (5 and 6) constitute part III, which contains the methodology of the thesis. Chapter 5 raises the question of what kind of philosophy of science that underpins the discussions in chapters 2 through 4, and consequently the rest of the thesis. The perspectives that are presented here will most of all have implications for the chosen study design and methodology, as presented in chapter 6.

The empirical part of the thesis lies in chapters 7 and 8, which make up part IV. In these chapters, you will find a description of the change processes related to Lean that have transpired at HiTech Inc. Together, these chapters provide the base for the subsequent analysis.

Finally, part V is where all the separate parts of the thesis come together. In chapter 9, the empirical examples in the previous chapters are brought together with the theories in part II. Finally, in chapter 10, conclusions are drawn from the previous chapter, and the thesis is tied together by discussing the theoretical and practical implications of the analysis that has been performed.

# 2
# What is Lean Production?

*Well, is it true what they say about it?*
*They say it's new, but I have to doubt it*
*And then they tell you everything about it*
*Had enough?*
*I got some people saying this way*
*I got some people saying that way*
*I got some people saying there's no way*
*Ain't it tough?*

– R. Fitzsimmons

*As indicated by the quotation above, there are many voices that speak about Lean, and at times these voices are both exaggerated and contradictive. The ambition with this chapter is therefore to try to clear up some of the confusion about Lean and provide a basis for the further discussions in the thesis.*

Most readers of this thesis will probably have experienced first hand the massive attention towards Lean Production that exists today. This attention comes from a wide variety of actors and exists within almost the entire range of organizations in our society – from manufacturing to health care and public administration. And we academics are, of course, not entirely uninterested in this phenomenon. However, when it comes down to the question about what Lean is, it all becomes a bit unclear; 'Lean Production' sometimes becomes 'Mean Production', and ultimately 'What-Do-You-Mean Production'.

## 2.1 The origin of Lean

Considering the strong focus on Lean today, one might draw the conclusion that this is a new concept. Regarding this, I would like to refer to the quote above: "They say it's new, but I have to doubt it". The perhaps most popular book on the topic *The Toyota way* (Liker, 2004) was published only a few years ago. However, the term 'Lean Production'

was first introduced more than 20 years ago in the article *Triumph of the Lean production system* by John Krafcik (1988). This was the first publication from the International Motor Vehicle Program (IMVP), led by the MIT researchers Womack, Jones and Roos, who later published the now famous book *The machine that changed the world* (Womack et al., 1990).

In these two publications, it is concluded that Japanese automakers employ a much more effective production philosophy than their Western counterparts. In Krafcik's article, the Japanese success is largely attributed to a lower amount of in-process inventory or buffers. Here, Krafcik uses the term 'lean' simply to contrast what he calls 'buffered' production systems. However, when discussed by his senior colleagues (Womack et al., 1990), the same research material is used more extensively, and conclusions are made at a much higher level of abstraction; the Japanese do not prevail simply because of their inventory philosophy, but rather because of a superior company culture emphasizing teamwork, communication and continuous improvement in addition to a more efficient use of resources and a relentless war against waste in every form. Over time, the attention has been redirected from Japanese automakers (cf. Womack et al., 1990) to become successively more focused on Toyota (cf. Liker, 2004). Furthermore, emphasis has been shifted from the technical aspects of the Toyota Production System to Toyota in general. Through this process, 'lean' goes from being a term that indicates the amount of inventory in the production system to being an all-encompassing company philosophy.

So the concept is not new; not by far. Although the term 'lean' was not used before 1988, the philosophy that it points to has previously been discussed under different labels, such as Just-in-time production (Schonberger, 1982), World Class Manufacturing (Schonberger, 1986) and of course Toyota Production System (Ohno, 1988; Shingo, 1984). It is interesting to note that all of these predecessors discuss the production system, i.e. the technical aspects of Toyotas business, while later authors have shifted focus to the softer aspects such as management practices and company culture (Liker, 2004; Womack and Jones, 2003). Of course, the technical discussion has not died out, but the claimed reasons behind the success of Toyota and other Japanese automakers have increased in number and variety.

This small sample of publications triggers the question whether the tendency of variation is valid in a wider perspective. Are they really talking about the same thing?

In the following sections, this question will be addressed through an assessment of the construct validity of Lean.

## 2.2 The construct validity of Lean

Toyota, and other Japanese companies have inspired other management concepts as well. One of these is what has become known as Total Quality Management (TQM). As TQM was at the most popular, Hackman and Wageman reviewed the concept and asked a similar question as the one above: "whether there really is such a thing as TQM or whether it has become mainly a banner under which a potpourri of essentially unrelated organizational changes are undertaken" (Hackman and Wageman, 1995, p. 309).

Translated to a more academic language, the question becomes one of construct validity. More specifically, the convergent and discriminant validity of the concept needs to be assessed.

> Convergent validity reflects the degree to which [different] versions of [the concept] (…) share a common set of assumptions and prescriptions. (…) Discriminant validity refers to the degree to which [the concept] can be reliably distinguished from other strategies for organizational improvement. (Hackman and Wageman, 1995, p. 318)

Hackman and Wageman concluded that there in fact *is* such a thing as TQM, and that it passes the above mentioned tests of construct validity.

Following in the footsteps of these researchers, the same question was asked about Lean Production; is there really such a thing?

### 2.2.1 The convergent validity of Lean

A simple way of testing the convergent validity of Lean is a short review of the most influential books on the subject. The most readily available indicator of publication influence is its number of citations. However, citations may be used for different purposes and are not necessarily related to importance. The results must therefore be treated with some caution. Using the citation analysis tool "Publish or Perish" a list of the 10 most frequently cited books on Lean Production was created.

The books that turned out in the search were Womack et al. (1990), Womack & Jones (2003), Bicheno (2004), Ohno (1988), Monden (1998),

Liker (2004), Feld (2001), Dennis (2002), Schonberger (1982), Shingo (1984), Rother & Shook (1998), Jones & Womack (2002) and Smalley (2004).

The aim of this analysis is to identify the core characteristics of Lean, based on the assumption that these would be discussed by all authors on the subject. In other words, a characteristic that is *not* discussed by all authors should not be seen as essential to Lean.

For each book, the goal of Lean Production has been recorded along with any principles, tools and techniques that are mentioned.

*Table 2.1 Goals associated with Lean Production*

| Author(s) | The goal of Lean production is… |
|---|---|
| Bicheno (2004) | …to reduce waste and improve value |
| Dennis (2002) | …customer focus (high quality, low cost, short time) |
| Feld (2001) | …robust production operation |
| Liker (2004) | …one-piece flow |
| Monden (1998) | …to eliminate waste and reduce costs |
| Ohno (1988) | …cost reduction |
| Schonberger (1982) | …to improve quality and productivity |
| Shingo (1984) | …cost reduction through waste elimination |
| Womack et al. (1990)<br>Womack and Jones (2003) | …to make products with fewer defects to precise customer desires |

Excluding characteristics that are mentioned by less than three authors, these are collated for all books and sorted by frequency. Table 2.2 on the next page presents the Lean characteristics that have been identified.

A comparison of the goals listed in table 2.1, once again shows that there is some variation. The common notion is that Lean is about eliminating waste, which is only held by three of the authors (Bicheno, 2004; Monden, 1998 and Shingo, 1984). However, this is a position that is related to a more general goal to increase the internal efficiency of the organization, which provides the gentlemen above with a few more friends (Liker, 2004; Feld, 2001; Ohno, 1988; Monden, 1998 and Schonberger, 1982). The tally of authors who argue that Lean has an external focus – towards satisfying customers – is however a bit shorter. Only three of the publications emphasize this aim, and two of the publications are by the same authors (Womack et al., 1990; Womack & Jones, 2003 and Dennis, 2002). It seems that the view of Lean as an externally focused effort is rather limited. This is also visible in the characteristics; none of them are related to customer requirements.

Further, we see that Kaizen/Continuous improvement along with Setup time reduction are the only characteristics that are discussed in all the reviewed publications. If we follow through on the basic assumption above, we would conclude that these two are the core characteristics of Lean. This seems unreasonable, so there must be something more to this analysis. In my article *Defining Lean Production* (Pettersen, 2009b), a more elaborate analysis reveals that there are in fact some defining characteristics, albeit at a more general level.

Table 2.2 Characteristics associated with Lean Production

| | Womack & Jones (& Roos) | Liker | Bicheno | Dennis | Feld | Ohno | Monden | Schonberger | Shingo |
|---|---|---|---|---|---|---|---|---|---|
| Kaizen/Continuous improvement | X | X | X | X | X | X | X | X | X |
| Setup time reduction | X | X | X | X | X | X | X | X | X |
| Just in time production | X | X | | X | X | X | X | X | X |
| Kanban/Pull system | X | X | X | X | X | X | X | X | |
| Poka yoke | | X | X | X | X | X | X | X | X |
| Production leveling (Heijunka) | X | X | X | X | X | X | X | | X |
| Standardized work | | X | X | X | X | X | X | X | X |
| Visual control and management | | X | X | X | X | X | X | X | X |
| 5S/Housekeeping | X | X | X | X | X | X | X | X | |
| Andon | X | X | | | X | X | X | X | X |
| Small lot production | | X | X | | X | X | X | X | X |
| Time/Work studies | X | X | X | X | X | X | X | | |
| Waste elimination | X | X | X | X | | X | | X | X |
| Inventory reduction | X | X | | X | | X | X | X | X |
| Supplier involvement | X | X | X | X | X | | X | | |
| Takted Production | | X | X | X | X | | X | | X |
| TPM/Preventive maintenance | | X | X | X | X | X | | X | |
| Autonomation (Jidoka) | | X | | X | | | X | X | X |
| Statistical quality control (SQC) | X | | X | | X | | X | X | |
| Teamwork | X | X | | X | X | X | | | |
| Work force reduction | | | | X | | X | X | X | X |
| 100% inspection | | X | | X | | | | X | X |
| Layout adjustments | | | | X | | | X | X | X |
| Policy deployment (Hoshin kanri) | X | X | X | X | | | | | |
| Improvement circles | | X | | X | | | X | X | |
| Root cause analysis (5 why) | X | X | X | | | X | | | |
| Value stream mapping/flowcharting | X | X | X | X | | | | | |
| Education/Cross training (OJT) | | X | | | X | | | X | |
| Employee involvement | X | X | | X | | | X | | |
| Lead time reduction | | X | | X | | | X | | |
| Multi manning | X | | | | | X | X | | X |
| Process synchronization | | X | | | | | | X | X |
| Cellular manufacturing | | | X | | X | | X | | |

According to Hines et al. (2004), the variation referred to above is quite natural.

> Lean as a concept has evolved over time, and will continue to do so. As a result of this development, significant confusion about what is Lean, and what is not has arisen. (Hines et al., 2004, p. 997)

Considering the temporal span of the publications, this might be one of the reasons for the observed variation. However, the same authors point to another source of variation, the split between strategic and operational dimensions. The argument is that Lean exists at both levels. In a similar vein, Shah & Ward (2007) claim that Lean also exists at both a philosophical and a practical level.

In figure 2.1 below, I have substituted the terms *practical* and *philosophical* by the terms *performative* and *ostensive*. I have also substituted the terms *operational* and *strategic* by the terms *discrete* and *continuous*. Through adapting and combining the four approaches to Lean suggested by Hines et al. (2004) and Shah & Ward (2007) respectively, Lean can be characterized in four different ways.

| | *Discrete (Operational)* | *Continuous (Strategic)* |
|---|---|---|
| *Ostensive (Philosophical)* | Being Lean | Lean thinking |
| *Performative (Practical)* | Doing Lean | Becoming Lean |

*Figure 2.1 Four definable approaches to Lean Production*

By including these four dimensions in one figure, we see how the different modes of Lean fit together and give rise to four different aspects of Lean. Starting in the upper right corner, Lean is a state of mind, or a way of thinking, as represented by for example Womack & Jones (2003) or Liker (2004). This can be seen as a basis for guiding the actions in the bottom left square, 'doing Lean' (cf. Bicheno, 2004; Nicholas & Soni, 2006), which necessarily need to take place for a company to 'become Lean' in the bottom right square (cf. Liker, 1998; Karlsson & Åhlström, 1996) and finally reach the or the state of 'leanness' in the upper left square (cf. Krafcik, 1988).

With some effort, one can squeeze Lean into a frame and claim that it does have convergent validity. But the wideness of that frame along with the expected development of the concept over time gives the concept a great deal of ambiguity. We shall come back to this later.

### 2.2.2 Discriminant validity

From their studies, Hackman and Wageman (1995) concluded that Total Quality Management is a consistently defined concept. TQM is therefore a suitable reference point to evaluate the discriminant validity of Lean Production. The specific question that we address here is in what way (if any) Lean differs from TQM. The identification of such differences thereby becomes the final condition for the construct validity of Lean.

While there are many similarities between TQM and Lean, there *are* also significant differences. In this section, the four most important differences will be highlighted. A more elaborate discussion is provided in appended paper A.

The first, and perhaps most obvious difference, is how quality is viewed by the two concepts. While this is a central issue in TQM, it does not receive the same attention in the Lean literature. In paper A, we can see that only vaguely related techniques can be identified in the Lean literature; autonomation (jidoka), failure prevention (poka yoke) and 100% inspection.

Related to this, there is also a clear difference in customer focus. Again, this is one of the main issues in TQM, and several techniques are related to this perspective. As seen in the discussion above, customer focus is also raised in the Lean literature. But a closer examination indicates that the Lean literature only pays lip service to customer focus, as none of the techniques associated with Lean are related to this issue (cf. table 2.2).

Another important difference between Lean and TQM is the view on learning and continuous improvement. While both concepts emphasize that standards are a basis for improvement, this emphasis is stronger in the Lean literature. Here, focus lies on standardization of work and collective learning, while TQM aims to stimulate creativity and individual learning.

The view on learning is somewhat related to the final difference that will be discussed in this section; the view on employees and the quality of their work. According to several authors, Lean has a strong instrumental

view, which indicates that employees are seen as components in the production system rather than a driving force for improvement (Berggren, 1993; Kamata, 1982). In contrast to this, TQM emphasizes complete involvement of all employees in improvement (Hackman and Wageman, 1995).

### 2.2.3 Conclusions about construct validity

There is large variation in descriptions of the purpose as well as the content of Lean. From this point of view, accepting Lean as a valid concept requires a somewhat lenient attitude in terms of rigor and convergence. Despite the weak convergent validity of Lean, it can be confidently concluded that it differs from its close relative TQM.

## 2.3 The efficacy of Lean

Ever since the results from the IMVP studies were presented, there has been an intense storm blowing around Lean Production. Some claim that the concept has tremendous effects, no matter where it is introduced, while others claim otherwise. The following quote is a good example of one position in the debate.

> Lean production will supplant both mass production and the remaining outposts of craft production in all areas of industrial endeavor to become the standard global production system of the twenty-first century. That world will be a very different, and a much better, place. (Womack et al., 1990, p. 278)

In addition to making extremely strong claims about the efficacy of Lean Production, this quote contains many interesting elements. Once again, the difference from Krafcik's use of the term 'lean' becomes apparent. Considering the volume dependency of Lean Production, it is strange that Womack et al. contrast Lean and mass production, a point that is stressed by several authors (Williams et al. 1992; Berggren 1993).

Williams et al. (1992) have also questioned the scientific rigor and especially the validity of the conclusions of the IMVP studies. In their critique, Williams et al. point to several cases of misinterpretation, flawed comparison processes and exaggeration of results.

For example, the claim that Lean uses 'half the human effort in the factory' is severely questioned.

> The WJR claim about 'half the effort' is based not on groups or averages but on Krafcik's (1986) original comparison of the worst American plant (General Motors, Framingham) with Takaoka, the volume plant of Japan's best company. (Williams et al. 1992, p.331)

Cooney (2002) places a large question mark behind the espoused universality of Lean, and argues that the concept is dependent upon a wide range of business conditions that are not always met. Berggren (1993) also questions the universality claim.

> What, for example, do capital intensive sectors like the petrochemical or paper-making industries or research-intensive sectors like pharmaceuticals, have to learn from the almost obsessive focus on hours per unit produced, so evident in the *Machine* book? (Berggren, 1993, p. 166)

Most of the literature that asserts the superior position of Lean is heavily influenced by Toyota or the IMVP study. Other researchers that have studied the effects of Lean outside Toyota do not provide any unequivocal results to support the claims made by Womack and his colleagues (cf. Lewis 2000; Bonavia & Marin 2006).

Lewis (2000) has studied three different organizations, aiming to draw conclusions between their efforts to introduce Lean and their competitive position. However, as pointed out in the paper, "the number, duration and complexity of the Lean production initiatives varies quite considerably" (Lewis, 2000, p. 971). Once again, we see traces of the ambiguity that was discussed above. Lewis further states that each organization will most likely "follow a more or less unique Lean production trajectory" (p. 975). This makes it extremely difficult to predict the outcome of a Lean initiative. Lewis concludes that his study confirms that Lean does not automatically lead to positive financial results. Apart from this, it is difficult to make any general claims about the impact of the concept.

## 2.4 Summary

Lean is a management concept with a number of different interpretations. Most importantly, there is a distinction between the goals that are discussed in the literature. While some propose that the goal is to satisfy an external customer, others present goals that focus on internal efficiency.

There is a lot of room for interpretation of the concept. It is therefore difficult to find a single definition. Based on the literature, Lean can have four distinctly different meanings; a condition (being Lean), a process (becoming Lean), a 'toolbox' (doing Lean) or a philosophy (Lean thinking).

There has been some debate about the efficacy of the concept, and whether it may lead to positive or negative results. Regardless of perspective, the general assumption seems to be that Lean will lead to predictable (and relatively consistent) results. However, the large variation of how Lean is interpreted makes this assumption problematic. Since Lean is not consistently defined, it can be expected to vary significantly across cases, which makes it very difficult to predict the consequences for an organization that aims to apply it.

# Part II
# Theoretical framework

# 3
# Management concepts

*Everyone's gotta have the sickness,*
*'cause everyone seems to need the cure*

– J. Hetfield

*In the previous chapter a number of observations regarding Lean were presented. The chapter concluded that there is large variation in the interpretation of the concept. This tendency makes it difficult to know exactly what is meant when someone refers to Lean, which in turn complicates both practice and research related to the concept. In this chapter, the discussion will be raised to a slightly more abstract level, and some general trends regarding management concepts will be discussed.*

There are many terms that indicate the same thing: Management concepts, management recipes, management fads or management models. Regardless of the chosen term, the reader will probably know that Lean Production is not the only one of these out there. One important question for this chapter is how to differentiate a management concept from other types of management ideas out there.

Following Dean and Bowen (1994), a management concept can be seen as a multi dimensional management approach consisting of principles, practices and techniques. At the most abstract level, a 'principle' in this context is a fundamental value that underpins the various activities related to the concept at hand and guides people's attention towards certain aspects of the organization. At the other end of the scale, the least abstract and most readily observable of these three are the techniques. These are usually quite specific and well defined. The various techniques associated with a management concept are more or less related to one another. Depending on this relatedness, the techniques are aggregated to form 'practices'. We see several examples of this in appended paper A (Pettersen, 2009b); for instance, the four techniques 'Production leveling (heijunka)', 'Pull system (kanban)', 'Takted production' and 'Process

synchronization' are clustered together to form the practice 'Just in time'.

A clear demarcation between practices and principles is difficult to find. However, there is an important and clearly observable difference between concepts and techniques, as summarized in table 3.1, below.

As seen from the table below, a management concept requires a greater effort in terms of time and local adaptation. One reason for this can be found in the level of ambiguity. From the discussions in chapter 2, we see that there is some variation in descriptions of Lean and its purpose. This is an indication that a concept can have many different interpretations. In contrast to this, a technique has much less room for interpretation and is fairly consistently described between various publications.

*Table 3.1 Concepts versus techniques (Nilsen, 2007, p. 67)*

| Characteristics of a concept | Characteristics of a technique |
|---|---|
| Is based on a particular philosophy | Exists in a 'how to' format |
| Implies strategic decisions and consequences | Implies operative decisions and consequences |
| Is based on a holistic view within the organizational context | Can be one of several initiatives within the strategic frame |
| Describes how the parts constitute a whole | Describes technical details of a procedure |
| Implies a great deal of local adaptation | Does not necessarily imply local adaptation |
| Slow introduction (long-term perspective) | Quick introduction (short-term perspective) |

To complicate matters further, Røvik (2000) makes a distinction between different types of management concepts depending on their dissemination and longevity. Røvik uses the term 'institutionalized superstandards' to describe concepts that enter a great variety of

organizations over a relatively short time. These are quickly established as omnipresent ideals for management, and disappear after a short time and are replaced by new ones as they are challenged by competing concepts. This tendency has been observed repeatedly during the past century (Barley and Kunda, 1992). However, the question remains how management concepts emerge and become institutionalized superstandards.

According to Barley and Kunda (1992), the work of Frederick W. Taylor around the turn of the last century could be seen as the first significant management concept. Taylor was critical to what he saw as an arbitrary approach to management, and devised a set of principles that formed the basis of the method he called *scientific management*. Taylor summarized his method in four principles (Taylor, 1977, pp. 36–37):

1. Develop a science for each element of a man's work, which replaces the old rule-of-thumb method

2. Scientifically select and then train, teach, and develop the workman, whereas in the past he chose his own work and trained himself as best he could

3. Cooperate with the men as to insure all of the work being done in accordance with the principles of the science which has been developed

4. An almost equal division of the work and the responsibility between the management and the workmen.

Taylor's method became the standard method for managerial work, and has been both celebrated and criticized over the years. Much of the criticism that has been directed towards Scientific Management has concerned the overly rational management approach, leaving little room for 'softer' aspects of work life. Today, the word *Taylorism* has received a negative connotation and has become associated with poor working conditions and a harsh management style (Niepce and Molleman, 1998). Despite this view, Taylor's dictum of creating 'best practice' based on scientific evidence is very much alive in the management discourse of today (Røvik, 2000).

## 3.1 The emergence of management concepts

So where do management concepts come from? According to Furusten (1999), they are developed in three steps. First, a management practice is observed in one or several organizations. The observations are then analyzed to establish patterns and relationships between variables. Finally, the outcome of the analysis is transferred to a text of some sort; usually a book. In order to find relevance in contexts outside the one that has been observed, the text is usually made quite general and abstract; a process which is called *decontextualization* (Røvik, 2007) or *abstraction* (Lillrank, 1995). Røvik (2007) breaks down this process into two sub processes; dematerialization and delocalization. First, the practice is 'dislodged' from the original context and provided with a philosophical and linguistic representation. In other words, what is context specific in terms of material representation and how the practice is described in the context of origin is detached from the conceptualized practice. This conceptual representation is of course more abstract than the original practice, which simplifies communication and increases its applicability in other settings. According to Sahlin and Wedlin (2008) this activity allows for a *reconstruction* of the practice; the ideas can be reformulated in different terms, perhaps shifting focus to emphasize different elements than in the original idea.

The second sub process is packaging or commodification of the ideas that form the concept. The concepts are usually given catchy names and labels, and in many cases marketed as off the shelf solutions (Huczynski, 1993; Røvik, 2007).

The finished 'product' (management concept) is less dependent on context and therefore more easily transferable and applicable for other contexts. However, since it has been stripped of contextual dependencies, there are several questions that are left open for interpretation, which will have implications for its application.

## 3.2 Ambiguity and universality

While decontextualization leads to an increased transferability and applicability, it simultaneously leads to a higher degree of abstraction, which gives more room for interpretation. The discussion about Lean in chapter 2 is an example of how this tendency can lead to a multitude of interpretations of a management concept. The ambiguity associated with Lean is far from unique; several authors have pointed to this as a core

characteristic of any management concept (Benders and Van Veen, 2001; Czarniawska and Joerges, 1996; Giroux, 2006; Lillrank, 1995). According to Latour (1987), this can be problematic for several reasons. Firstly, the idea will be translated by anyone, leaving the interpretative prerogative up for grabs. Secondly, there will be as many translators as there are actors in the network, leading to a multitude of versions of the idea. Because of this, the idea will have multiple sources, and will thus be impossible to trace historically. Finally, changes in opinion will not be noticeable since there is no 'core' or 'baseline'.

> Due to this ambiguity, TQ [Total Quality] has come to function as a sort of Rorschach test, to which people's reactions vary as a function of their own beliefs and experiences. TQ is seen by some as an extension of scientific management, by others in terms of systems theory, and by still others as an altogether new paradigm for management. (Dean and Bowen, 1994, p. 394)

Simultaneously, the ambiguity is a part of the explanation for their great dissemination and popularity. Latour (1987) claims that the simplest way to spread an idea is to leave the message ambiguous by allowing a 'margin of negotiation'. This way each actor may transform the message as he or she sees fit and adapt it to local circumstances.

This phenomenon seems to be widely applied within the management discourse. Benders and Van Veen (2001) not only agree with Latour, but claim it is necessary for management concepts to be ambiguous or have what they call *interpretative viability*. According to Benders and Van Veen, the ambiguity of a concept allows it to be interpreted in different ways, which increases its potential field of application and thereby its probability of becoming an institutionalized superstandard. Cole (1999) sums up the positive effects of ambiguity by using TQM as an example.

> Because of the vagueness of the concept and its correlates, particularly in the early 1980s, firms and industries were free within a certain range to interpret it, position it, and adopt those practices that fit particular corporate traditions and industry imperatives. (Cole, 1999, p. 11)

Through this 'fluency', a management concept can attract many different people within and between organizations, despite differences in their interpretations and understandings of the concept. According to Löwy (1990), a loosely defined concept can thereby become a strong link between people with different backgrounds and interests; it serves as a common ground for meeting and discussion.

The dissemination of management concepts is also fueled by their ambiguity; the probability that an organization may find a concept relevant increases with greater ambiguity and more general problem descriptions. The problems that are defined through a concept are usually quite general ones, which increases the applicability to include a wide range of organizations. This *universalization* of a concept allows it to be presented as an effective problem solution, regardless of its application in time and space (Røvik, 2002).

The ambiguity is not limited to the technical descriptions of the concept, but also includes the rhetoric that surrounds it. Furusten (1999) has studied the discursive elements of management concepts in detail, and has found some general patterns within the literature. There are differences in focus between management books, and they come from different authors with different backgrounds; still they share the fundamental assumption that the success of organizations can be predicted through a single factor, whether it is effective leadership, inventory control or customer focus. The rhetoric in the literature is also endowed with ideological representations of general and at times vague statements (Furusten, 1999).

Further, the complexity of cause-and-effect relationships is often reduced to encompass a single problem and solution, which commonly coincide (Huczynski, 1993; Røvik, 2000). For instance, within the TQM discourse, quality is the main problem and simultaneously the greatest strategic opportunity; and within Lean, the problem/solution is *usually* resource utilization (as discussed in chapter 2, there is some variation here). As formulated by Røvik (2002), the rhetoric presents a simple (and time-specific) solution to complex (and timeless) problems.

> To take in a popular organizational recipe often also implies the import of a particular problem definition that one may come to perceive as valid also for the own business. The reformative power of the ideas are thereby increased, because there is generally an enormous potential of action and change in gaining acceptance from management that a business has a specific problem and is facing particular challenges. (Røvik 2007, p.19, translated from Norwegian)

The concepts are also often accompanied by 'road maps' for change; not uncommonly presented in the form of 'n-step models' (Alvesson and Sveningsson, 2008). However, such n-step models can only provide a general outline of a change process, and do not address the complexity of organizations.

> Obviously these ideas have been around as long as formal organizations have existed. It is therefore difficult – and from a researcher's point of view, a waste of time – to try to date and locate the origin of these general ideas more precisely. Although these basic ideas are very old and very general, the surveyed literature presents and interprets MBO, DD, and TQM as *new* and *distinct* management tools (…) (Røvik, 2002, p. 123, original emphasis)

While the espoused universality of management concepts is often contested by critics (cf. chapter 2), the ambiguity or interpretative viability enables them to find their ways into a great variety of different organizations; the concepts become universally applicable through their ambiguity.

## 3.3 The dissemination of management concepts

Management is not only an organizational activity; it is also a market. Books, journals and consultant services are just a few of the consumable commodities in the management market. Although management concepts cannot be bought and sold directly, they can also be seen as a form of commodity.

> The recipe is (…) transformed into something resembling a product. Successful commodification means, among other things, that the recipe is formulated as an easily communicated message that catches the attention of a broad audience, it must be perceived as a user friendly product, and the potential user must be given the prospect of positive effects in return for implementing the recipe." (Røvik, 2002, p. 142)

Literature and consulting services related to management concepts is a considerable business that provides a profitable livelihood for many people. Røvik uses the term 'decontextualization industry' to emphasize the focus of many organizations within this sector, and points to four aspects that characterize their routines (2007, p. 267):

1. They monitor and compare a large number of organizations
2. They are continually on the lookout for practices and processes that produce good results
3. They create verbal and numerical descriptions of these practices, and
4. Offer these descriptions as information for other interested parties, usually on a commercial basis.

By offering these descriptions as ready-made solutions, they relieve their customers from the work of analyzing large amounts of information in order to find their own solutions (Huczynski, 1993). As discussed above, such decontextualized descriptions are easily transferred across long distances and between diverse contexts. Sahlin & Wedlin (2008) discuss three modes of dissemination. Most closely linked to the supplier side of idea dissemination is the *broadcasting* mode. This mode has many similarities to Rogers' theory of diffusion (Rogers, 1995), indicating that there is one, mainly unchanging, idea that spreads from a single source. Another mode of dissemination is *mediation*, which also is closely linked to the conception of 'idea suppliers', the meaning being that there are persons and organizations that promote certain ideas and help their dissemination. The third mode of dissemination is the *chain* mode, indicating that the idea spread from organization to organization, in a sequential manner. With this perspective, there is no particular supplier of ideas; rather each organization has an active role in disseminating the idea. These three modes of dissemination will have different effects on the idea that is communicated.

According to Meyer & Rowan (1977), these concepts are established as management standards through the efforts and coalitions of powerful and influential organizations. These organizations manage to

> (…) force their immediate relational networks to adapt to their structures and relations [and] attempt to build their goals and procedures directly into society as institutional rules. (…) Rivals must then compete both in social networks or markets and in contexts of institutional rules which are defined by extant organizations. In this fashion, given organizational forms perpetuate themselves by becoming institutionalized rules. (Meyer and Rowan, 1977, p. 348)

The quote above illustrates what Røvik (2002) calls social authorization, which is an important driver of dissemination.

> The capacity to flow increases if the organizational recipe is socially authorized, that is, clearly linked to and associated with one or more widely reputed and successful organizations or persons. (Røvik, 2002, p. 142)

Concepts with strong social authorization quickly gain legitimacy in the management market, and will influence the general opinion of what is 'correct'. As indicated above, the dominating logic behind the management concepts vary over time.

Consequently, the popularity of concepts associated with a particular logic will also vary, which can be interpreted as a sort of management fashion.

> A management fashion (…) is a relatively transitory collective belief, disseminated by management fashion setters, that a management technique leads rational management progress. (Abrahamson, 1996, p. 257)

Just as all fashions and trends, the popularity of management concepts goes up and down. We can see 'new' concepts come and go, and these will eventually be replaced by 'newer' ones (Abrahamson, 1996; Barley and Kunda, 1992; Giroux and Landry, 1998). As with every other fashion, management concepts are usually contrasted to an 'old' paradigm (Røvik, 2002). This helps to define concepts as a 'modern' solution, which in turn contributes to further their dissemination (Røvik, 2000).

One consequence of the fashion perspective is that most organizations are at the receiving end as more or less helpless 'victims' of the trends in the managerial discourse, or what Røvik calls the 'virus theory' (Røvik, 2007). This conception does not necessarily hold at all levels of analysis. Managers are not necessarily passive receivers of new ideas, although they may be influenced by trends and fashion. As pointed out by Bourdieu (1981), all artifacts that are subject to fashion must have an active receiver for the fashion to endure.

> Objectified, institutionalized history only becomes enacted and active if the job, or the tool, or the book, or even the socially designated and recognized 'role' (…) like a garment or a house, finds someone who finds interest in it, feels sufficiently at home in it to take it on. This is why so many actions, and not only those of the functionary who merges with his function, present themselves as ceremonies. (Bourdieu, 1981, p. 309)

According to Huczynski (1993), managers actively participate in the dissemination of management concepts through a strong belief that these concepts can contribute to solve problems that exist within their organizations. The concepts are often perceived as solutions to critical problems, and can be used as drivers for organizational change, which makes them attractive on the market (Huczynski, 1993). Conclusively, the dissemination of management concepts can usually be described as being driven by the introduction of a solution that seeks a problem rather a problem that seeks a solution (Benders and Slomp, 2009).

Further, introducing a new management concept can have a more personal rationale, as managers (may feel that they) need to do something 'new' in order to prove themselves (Huczynski, 1993).

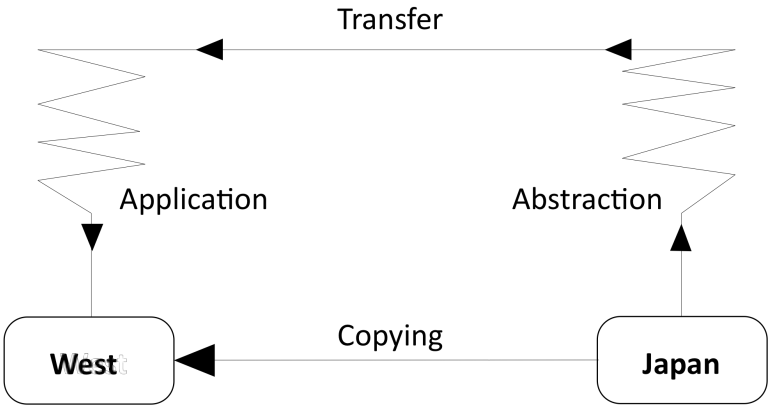


*Figure 3.1 Emergence and application of management concepts (Lillrank, 1995, p. 974)*

While the abstract descriptions in the popular management literature may be easily disseminated and attractive, they are not directly applicable without some adaptation (see discussion above). As described in figure 3.1 , the application or *contextualization* of management concepts therefore becomes a mirror image of the decontextualization process. While decontextualization takes a specific practice and translates it into a generic and abstract description, the contextualization process takes this description and translates it into a specific practice. However, it is unlikely that the initial practice and the final one will be identical.

From a practitioner point of view, one might disregard the diversity of descriptions in academic literature as being a merely 'academic' discussion that has no impact on practice. This may be true, to some extent, but the argument alone does not confine the tendency of diversity to academia. In fact, the same variability is present in industry. Based on a survey among Swedish production managers, paper B (Poksinska et al., 2010) demonstrates that the application of management concepts differ significantly *between* organizations as well.

The tendencies discussed in this chapter are summarized in figure 3.2 below.

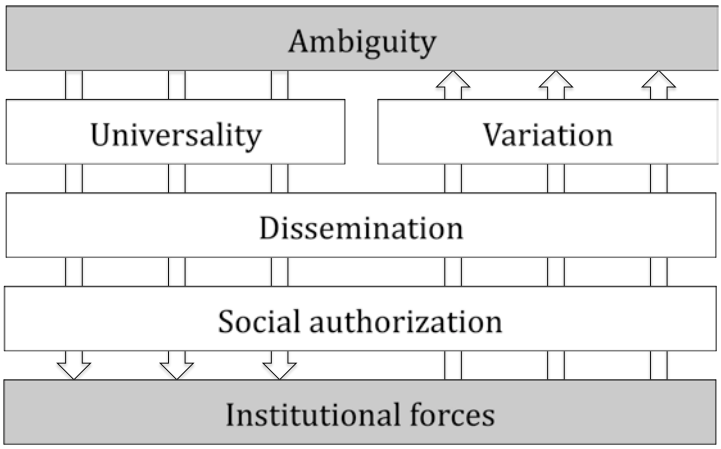


*Figure 3.2* *Ambiguity and institutional forces as key factors in the dissemination of management concepts*

Starting from the top, we see that ambiguity fuels the notion of universality as well as dissemination of the concepts. This leads to a higher degree of acceptance in the management community, which strengthens the social authorization of the concept. By extension, this fuels the institutional forces of fashion and legitimacy. Conversely, these institutional forces reciprocate the social authorization and further dissemination of the concept. The variation in interpretation will result in an equal variation in application, leading to an increasing amount of ambiguity.

## 3.4 Summary

Lean is by no means unique. Most of the characteristics of Lean are shared by management concepts in general. These are ambiguous by necessity. The ambiguity does not limit their application in various contexts, which makes them appear as universally applicable. Further, they are accompanied by a rhetoric that presents them as super effective and universally applicable tools for organizational improvement.

The dissemination of management concepts is driven by institutional (market) forces, in a fashion-like manner. Because the concepts are ambiguous, they permit application in a wide range of organizations, which further fuels their dissemination.

Further, the dissemination of management concepts to multiple contexts increases the variation of interpretations, thereby contributing to the ambiguity of the concepts.

The innate ambiguity and the wide range of contexts in which they are applied constitute a great challenge for researchers that aim to understand the process of introducing such a concept as well as the consequences of doing so.

# 4

# Organizational translation and change

*Always in motion the future is*

– Yoda

*This chapter presents the main theoretical perspectives for the thesis. This chapter will continue the discussions of translation that was briefly touched on in chapter 1, and elaborate the concept in terms of both justification and theory.*

As stated in chapter 1, this thesis aims to analyze the change processes that take place in an organization that aims to introduce a management concept. In this thesis, these processes are approached from the point of view of a translation theory. Therefore, a couple of questions that will most likely linger in the mind of the theoretically inclined reader are "Why translation?" and "How does translation relate to change?".

The choice of 'translation' over 'change' is not simply a matter of stylistic preference. Nor is it an attempt to replace the latter with the first. As will be made clear below, translation should not be seen as a synonym to change; it should rather be seen as a specific form of change. However, existing theories of translation are for the most part not oriented towards the form of change that is addressed in this thesis. This chapter is therefore dedicated to demonstrating the relevance of translation theory for processes of organizational change, and to provide a theoretical foundation for further discussions in the thesis.

## 4.1 Management concepts and change

Changing organizational procedures and structures is a complex matter, especially for those who are involved in the actual change, but also for researchers who aim to understand the processes of change. It is unlikely that anyone will be able to produce a *complete* overview of the research on change; the theory on this topic is seemingly endless. However, there are

some broad themes in the debate that will be useful for understanding change.

In general, discussions about change result in a dichotomization of perspectives; usually, these appear in pairs. First of all, it is widely accepted that the content of a change initiative (e.g. a management concept) will influence the process (see e.g. Pettigrew 1987). A common point of view is that the underlying ideas are *implemented* in organization, which will induce a change of organizational practice that will occur as jumps between points of 'equilibrium' (e.g. Romanelli and Tushman, 1994). This perspective resonates with Kurt Lewin's well-known description of change as a sequence of unfreezing, change and refreezing, which according to Tsoukas and Chia (2002) is the predominant view of change. This point of view presumes that the content of the change will be predefined and fixed.

However, the discussions in chapters 2 and 3 indicate that the content of change (i.e. management concepts) will be highly dependent on individual interpretation and contextual contingencies. A change process with such an ambiguous conceptual base is unlikely to follow a predictable pattern. Instead, as suggested in the introduction chapter of this thesis, we should expect the change process to involve a wide range of interpretations and negotiations of the underlying ideas as well as the direction of the change. As argued by Tsoukas and Chia, this kind of flux should be seen as a normal state in organizations in general.

> Organizational categories and rules are constantly adjusted, modified, or even ignored in the carrying out of actual organizational tasks. (Tsoukas and Chia, 2002, p. 577)

In a similar vein, Weick and Quinn (1999) argue that the distance at which a researcher considers an organization will determine the view of change.

> From a distance (the macro level of analysis), when observers examine the flow of events that constitute organizing, they see what looks like repetitive action, routine, and inertia dotted with occasional episodes of revolutionary change. But a view from closer in (the micro level of analysis) suggests ongoing adaptation and adjustment. (Weick and Quinn, 1999, p. 362)

This process of continuous change implies that organizations never really stabilize; they are living systems, constantly evolving and adapting to a multitude of factors. Authors that subscribe to this view (e.g. Czarniawska and Joerges, 1996; Weick, 2000) therefore argue that

organizational change is really about utilizing the momentum that already exists within the organization. As argued by Chia (1996), change is therefore not about changing states, but about providing a direction for the collective actions in the organization.

## 4.2 An socio-technical perspective on change

According to Johnson et al. (2003), understanding organizational change requires attention to the micro-activities that constitute practice, as they are thought to be of critical importance for the outcomes of organizational change processes. According to Bourdieu (1990), these micro-activities cannot be captured in an abstract description, simply because such a description differs from the practice it attempts to describe on a fundamental level. While an abstract description such as a management concept is more or less independent of time, the practice it attempts to describe is completely immersed in time. From this point of view, one can therefore not reduce organizational change to a simple communication of general principles or application of techniques.

> The theory of practice as practice insists that (…) the objects of knowledge are constructed, not passively recorded, and, contrary to intellectualist idealism, that the principle of this construction is the system of structured, structuring dispositions, the *habitus*, which is constituted in practice and is always oriented towards practical functions (Bourdieu, 1990, p. 52, original emphasis)

Without going too deep into Bourdieu's concept of 'habitus', he refers to a constantly ongoing interaction between practice and people's understanding thereof. This kind of interaction can also be expected in processes of organizational change. As discussed in chapter 2, Lean can be described from two different perspectives; the conceptualized idea (ostensive) and the idea in practice (performative). Feldman and Pentland (2003) argue that these two perspectives can be applied to organizational routines in general, and that the constitution of organizational practice and change requires that we understand both aspects and how they interact.

Further, organizations contain a number of interdependent and interlocking routines, all of which influence people's way of thinking as well as their behavior (Feldman, 2003). According to Chia (1999), current practice will thereby determine the conditions for future routines. As stated by Feldman and Pentland (2003), "routines are enmeshed in far-reaching, complex, tangled webs of interdependence"

(p. 104). However, a practitioner of one routine usually does not see the other routines in themselves, but only the outcome or artifacts of these (Feldman and Pentland, 2003). In other words, the artifacts that are generated by surrounding routines largely shape understandings of how the organization operates.

With an analogous logic to the discussion above, the research tradition based on Giddens' theory of structuration emphasizes the influence of technology on practice. For instance, Volkoff et al. (2007) argue that technology, together with the ostensive aspects of practice, will largely determine the performative aspects of practice. Similarly, Orlikowski (1992) argues that technology (much like management concepts) can be interpreted in different ways, and that people's interpretations guide their actions. Vice versa, the way people interact with technology (according to their interpretations) will influence future modifications and reinterpretations of that technology.

From these theories, a more complex image of organizational change emerges. Instead of relying solely on the 'implementation' of an idea (management concept), we arrive at the conclusion that there are three important elements that influence the process of organizational change; practice, understanding and artifacts. First, there is a reciprocal relationship between practice and understanding; understanding influences practice, and practice influences understanding (Feldman, 2003). A similar relationship can be found between practice and artifacts, where each of them influences the other (Volkoff et al., 2007). And finally, future practice is immanent in current practice (Chia, 1999).

Although it is not a core topic in this thesis, these three elements are analogous to common descriptions of culture. For instance Schein (1990) defines culture in terms of observable artifacts, values and underlying assumptions. Provided that one accepts a clustering together of values and underlying assumptions to form 'understanding', theories of culture and of organizational change largely agree. However, exactly how these entities interact in organizational change processes remains an open question.

The discussions in the two previous sections demonstrate the wide range of theoretical implications related to the introduction of management concepts. Understanding the translation process therefore requires that theory be borrowed from a number of different traditions. As pointed out by Alvesson (2002), this kind of borrowing can be problematic since

it requires that the researcher needs to study a variety of different theories, which increases the amount of work. Furthermore, theories from different traditions are not necessarily compatible, which can make them difficult to combine. Still, as argued by Alvesson, the combination of multiple perspectives will increase the amount of available interpretations, which will likely lead to a deeper understanding of the empirical material (see also appended paper D).

## 4.3 Organizational translation

As discussed in the introduction of this thesis, the outcomes of organizational change processes are often neither expected nor intended. This is an indication that the processes we are dealing with are not entirely predictable.

As a practice is decontextualized and presented as a management concept (see chapter 3), the contextual dependencies of the practice are reduced, whereby its immediate relevance is also reduced. Management concepts therefore require some processing before they can be put to use in organizations (Røvik, 2007). Benders and Slomp (2009, p. 5242) summarize this challenge by posting three questions that need to be addressed:

1. What concrete purpose is 'lean' going to serve?
2. How is this going to be worked out in an organisation-wide change program?
3. How can such a generic program be put to use in concrete change projects within the organisation?

Although this set of questions may be a useful guide in the change process, there are several challenges that will need to be faced along the way. Manley (2000) gives a pertinent summary of this point as well as the processual nature of organizational change:

> The belief in rationality plus the need for effectiveness in organizations where there is not centralized control is precisely what makes processes like TQM necessary. But, in such cases, rationality or efficiency can only be an outcome of a rather "messy" process of mutual alignment and negotiation, rather than a result of increased standardization and centralized control. (Manley, 2000, p. 480)

Understanding organizational change therefore requires us to come to terms with this 'messiness' and to find a theoretical pair of tongs that enable us to grab hold of this elusive phenomenon.

Through the work of Callon & Latour (1981), a first step was taken towards such a theory. In this seminal publication, the "messy" process of change was captured in one simple term, translation.

> By translation we understand all the negotiations, intrigues, calculations, acts of persuasion and violence, thanks to which an actor or force takes, or causes to be conferred on itself, authority to speak or act on behalf of another actor or force. (Callon and Latour, 1981, p. 279)

In contrast to established concepts such as dissemination and implementation, translation suggests that change processes are volatile by nature and that a mutual adaptation occurs between the idea and the context in which it is introduced (cf. Latour 1987).

The connection between translation and organizational change was first made by Czarniawska and Joerges (1996) with the introduction of what has become known as the 'idea model'. Their model illustrates how ideas are disseminated and how they eventually become institutionalized. The main argument is that ideas are materialized, i.e. translated/inscribed to texts, pictures or prototypes which become the basis for action. As actions are repeated, they tend to stabilize and transgress into institutions. The material objects that represent the original idea are easily disseminated, and may inspire new ideas that become subject to the same chain of translations.

Røvik (2007) presents two main perspectives within theories of translation. One is based on Actor-Network Theory (see e.g. Latour 2005), and one on the tradition simply known as 'translation studies' (For an overview see Halverson 1998; Venuti 2004).

Based on the latter perspective, Røvik (2007) describes translation as a conceptual activity through which organizational practice is transformed into a generic description (decontextualization) or a generic description (management concept) is adapted to a specific context (contextualization). In a similar vein, Sahlin and Wedlin (2008) describe the process of 'editing' of the generic descriptions. These three modes of translation represent Lillrank's (1995) description of how management concepts are disseminated (see figure 3.1, p. 34).

As indicated in the discussions above, management concepts are quite abstract and require some work before they can be put to use. In his model, Lillrank (1995) uses the term *application* to denote the transition from abstract concepts to local practice (see figure 3.1, p. 34). This term can easily direct our thoughts towards direct application and

implementation, which we have already established as highly problematic. However, this interpretation is probably not Lillrank's intention since he proposes an adaptation to the local context. This is in line with Røvik's (2007) term contextualization, meaning that the general abstract ideas are given their full meaning in relation to the local context. This process is a mirror image of the decontextualization process described above (see p. 28).

As we are starting to realize, translation can be a confusing term, since it applies to a variety of situations and entities (Scheuer, 2006). However, we can already begin to see the outline of three different forms of translation. On the one hand, translation can be seen as a conceptual activity oriented towards ideas (Lillrank, 1995; Røvik, 2007; Sahlin and Wedlin, 2008). On the other hand, translation is more of a social process that aims at human interaction and practice (Callon and Latour, 1981). Furthermore, translation involves the inscription of ideas into artifacts (Czarniawska and Joerges, 1996).

In order to avoid further confusion related to the translation term, I will use the term *organizational translation* to indicate the processes and activities through which a conceptual representation (e.g. a management concept) becomes associated with other entities. Further, I propose a distinction between three types of organizational translation.

1. Idea-oriented translation: The activities through which conceptual representations are translated to a local rhetoric and set of ideas that aim to influence people's understanding.
2. Object-oriented translation: The activities through which conceptual representations are materialized and represented in various artifacts.
3. Practice-oriented translation: The activities through which conceptual representations are converted to routines that determine organizational practice.

These three forms of organizational translation are illustrated in figure 4.1 on the next page.

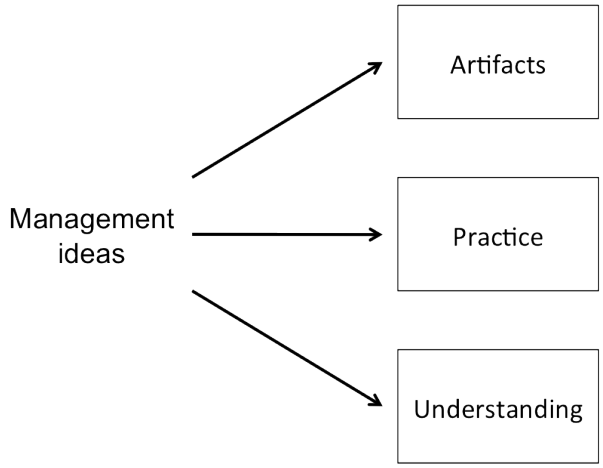


*Figure 4.1 Three types of organizational translation*

From the discussion above, it can be concluded that the translation process involves many activities that include physical, conceptual and social displacement (Callon, 1986a; Latour, 1987), which takes us far beyond a literal interpretation of the translation term. Translation thereby provides a suitable lens through which we can observe and understand organizational change. Czarniawska & Joerges (1996) further stress this point and highlight some benefits of employing a translation perspective.

> This explains why the concept is so attractive to us: it comprises what exists and what is created; the relationship between humans and ideas, ideas and objects, and humans and objects – all needed to understand what in shorthand we call "organizational change". (Czarniawska and Joerges, 1996, p. 24)

In this single quote, Czarniawska and Joerges sums up the focus of the thesis, namely what kind of relationships that exist between artifacts (objects), understanding (ideas) and practice (humans). In order to better understand these relationships, we will dig deeper into the meaning of the three types of translation indicated above, each of which will be discussed individually and in more detail below.

### 4.3.1 Idea-oriented translation

Following Røvik (2000), the introduction of a management concept goes through several phases. In the first phase, which Røvik calls the *justification phase*, the concept and the organization first meet. In this phase, someone in the organization must acknowledge the concept and

initiate the introduction. Subsequently, other actors in the organization must be convinced, and a decision to implement the concept must be made. This is analogous to what Callon (1986) calls *problematization*.

As discussed above, people's understandings guide their actions (Feldman, 2003). In other words, creating an 'image of action' (Czarniawska and Joerges, 1996) is an important step in efforts to change organizational practice.

Following Callon and Latour (1981), power lies in interpretation and translation, which means that every actor basically has the same power. According to Latour, all actors are free to further translate an idea, regardless of its origin.

> …the spread in time and space of anything – claims, orders, artifacts, goods – is in the hands of people; each of these people may act in many different ways, letting the token drop, or modifying it, or deflecting it, or betraying it, or adding to it, or appropriating it. (Latour, 1986, p. 267)

With this quote, Latour pinpoints the source of ambiguity that is inherent in management concepts (see chapter 3). This ambiguity can be used actively to adapt a management concept to local circumstances. An example of this is provided in paper D, where a medical clinic introduces a Balanced Scorecard. The scorecard is designed so that metrics can be added and changed depending on the local circumstances in individual departments. Nilsen (2007) uses of the term 'conceptualization' to denote such an adaptation process. Similarly, Røvik (2007) uses the term 'localization' for the same phenomenon. According to Røvik, this adaptation can involve references to local actors, problems and previous experiences that are included in the adapted version of the management concept. Another analogous term is 'editing' as used by Sahlin & Wedlin (2008).

> Through editing, an idea or an account of a practice may be formulated more clearly and made more explicit; however, the editing process may also change not only the form of the idea or account but also its focus, content, and meaning. (Sahlin and Wedlin, 2008, p. 226)

These theories are mainly focused on the communication of ideas, and not so much about the practical aspects of change. The idea-oriented form of translation thereby functions as a sort of prequel to the actual change process, or a 'pre change' translation. The ambition is, as stated above, to influence people's understanding and create a collective 'image of action' that will guide practice.

### 4.3.2 Object-oriented translation

The idea-oriented type of translation resonates with the classical theories of social construction as put forward by Berger and Luckmann (1967). While this perspective has its merits, it deemphasizes the role of objects. Following Latour (2005), the term 'social construction' is unfortunate, as it indicates that our world is made solely of social connections. Latour argues that any construction must be supported by non-human entities. Arguably, this is also the case regarding processes of organizational change.

Human interactions are not the only important components for supporting an action program. Several authors address the issue of how artifacts influence our actions (Latour, 1987; Orlikowski, 2000; Volkoff et al., 2007). Following Orlikowski (2000), technology that is used recurrently can shape the actions of its users.

> While a technology can be seen to have been constructed with particular materials and inscribed with developers' assumptions and knowledge about the world at a point in time (…), it is only when this technology is used in recurrent social practices that it can be said to structure users' actions. That is, it is only when repeatedly drawn on in use that technological properties become constituted by users as particular rules and resources that shape their action. (Orlikowski, 2000, p. 408)

Whereas the idea-oriented form of translation aims to align human interests, an object-oriented form of translation aims to include non-human actors in the mix. As non-human actors have no voice of their own, their 'interests' are communicated through *inscriptions* in various artifacts (Latour and Woolgar, 1986). For instance, the case in paper D shows that metrics and comments are added to the scorecard, whereby it becomes 'infused' with information from the organization. The task of communication is thereby delegated to the scorecard, which strengthens its position in the organization.

Non-human actors can take part in a translation process in several different ways. A non-human actor can, through its inscriptions, encourage a certain course of action, and thereby contribute to reinforce the associated action program (Hanseth and Monteiro, 1997).

Further, artifacts and resources can be used actively to align the interests of the involved actors and to define roles and identities. Again, there are different terms to denote the same type of activities. Nilsen (2007) uses the term *concretization* to describe the process through which the conceptualized practices become materialized.

Callon (1986b) describes these kinds of activities through the French/English term 'interessement', which in a literal translation (!) means to interpose.

> To interest other actors is to build devices which can be placed between them and all other entities who want to define their identities otherwise (Callon, 1986b, p. 208).

> The model of interessement sets out all of the actors who seize the object or turn away from it and it highlights the points of articulation between the object and the more or less organised interests which it gives rise to. (…) Rather than speak of the rationality of decisions, we need to speak of the aggregation of interests which decisions are capable or incapable of producing. (Akrich et al., 2002, p. 205)

These interessement devices can take on a number of different forms. For example, a group can be identified through their physical collocation, the use of specific tools or something as simple as a common department name.

The mediating role of artifacts interjects them as a source of inertia and resistance in the organization. According to Volkoff et al. (2007), material aspects of organizational practice have a strong influence on people's understanding. A change in organizational practice thereby becomes a question of changing organizational understanding as well as making sure that systems and artifacts are aligned with the proposed change.

As argued by Latour (1992), artifacts often have a preserving and stabilizing effect on our behavior. Similarly, the introduction of new artifacts can also be an effective method for communicating a certain meaning and inspire a change of routines (Gherardi and Nicolini, 2000). Here, another example can be found in paper D. As the scorecard is introduced, it is tied to a new infrastructure for reporting metrics. Because of this connection, any future changes of the reporting structure would also imply a replacement or adjustment of the artifact (scorecard), which makes change slightly more complex. A larger number of artifacts will increase the number of connections in the network, which would increase the difficulty of further changes.

As mentioned above, non-human entities can also influence people's perceptions of their surroundings (Volkoff et al., 2007). The technology in an organization provides a point of reference for understanding the structure and procedures of the organization, and can thereby influence people's behavior *indirectly*. However, it is important to note that

materialization does not equate integration in the organization; as pointed out by Nilsen (2007), this is still an open question.

### 4.3.3 Practice-oriented translation

Following Callon (1986b), the initial part of the translation process also includes definition of necessary actions that need to be undertaken, which is referred to as obligatory passage points. An obligatory passage point (OPP) can be a question, action or goal that the involved actors can agree upon. This is a point that every actor needs to consider in order to gain access to the network. Once again, paper D provides an example. Mandatory activities (reporting and planning) are connected to the scorecard, whereby the employees at the clinic are required to address the scorecard in order to fulfill their duties.

With regards to the formation of a network, an OPP is a necessary element that helps to align the interests of various actors. Being able to agree on the problem definition is the fundamental step towards aligning interests. It is only when interests are aligned that we can speak of a network, and through the definition and distribution of roles we can speak of 'enrolment' of actors into the network.

One of the core ideas of Actor-network theory (ANT) is the formation and maintenance of networks and the distribution and execution of power in the network. The key point of interest is how the entities in these networks together facilitate stabilization and fulfillment of action programs (Callon, 1986a; Latour, 1987). The purpose of a network is to enforce a particular action program, consisting of a desired course of action by actors that are enrolled in the network (Latour, 1992).

Engaging in a project such as introducing Lean in an organization could, in ANT-terms, be seen as an attempt to enforce an action program. The strength of an action program is determined by the degree of alignment between the interests of actors in the network (Callon and Latour, 1981; Callon, 1986a; Latour, 1987).

Management concepts are usually introduced with an ambition to change organizational practice. However, doing so is not simply a matter of 'installing' a new set of procedures. Instead, we can expect to see a process of negotiation between the various components of organizational life and mutual adaptation between the management concept and organizational practice.

In the same way as actors have the power to contest a certain message, they also have the power to contest an action program and create contrary programs – so called *anti-programs* (Akrich and Latour, 1992; Latour, 1986). Thus, the strength of an inscription and its associated action program depends on what the receiver does with it (Latour, 1992). Artifacts contribute in the creation and stabilization of networks, supporting and enforcing certain types of behavior; and the stronger support an actor can mobilize from other actors (human or non-human) the stronger the action program (Callon and Latour, 1981; Hanseth and Monteiro, 1997; Latour, 1987).

In the initial stages of this kind of change, one will usually find power struggles between contesting networks and their associated action programs and anti-programs (Latour, 1987). Eventually, provided that a network succeeds in promoting its action program, interests and inscriptions will be aligned to the extent that the action program is assimilated into practice and taken for granted by enrolled actors.

> The assembly of disorderly and unreliable allies is thus slowly turned into something that closely resembles an organized whole. When such cohesion is obtained we at last have a black box. (Latour, 1987, pp. 130–131)

A black box can thus comprise a number of elements that have displayed a relatively complex relationship in the past, but have been brought together through translation. A network can enroll a number of black boxes, which will stabilize the network and reduce the possibility for further translations (Latour, 1987).

At this point, the network is punctualized (Callon and Law, 1997), and the course of action proposed by the action program is taken for granted by the enrolled actors and becomes a 'black box' (Latour, 1987). In these cases, the user/receiver is left with no viable alternative other than adhering to the action program inscribed in the black box; the inscription becomes a prescription. This reduces the possibility for further translations and causes the network to stabilize.

> The network authorizes multilateral agreements that result from the translation of the actors' disparate interests, which will eventually converge. In contrast, there can also be resistance, for example, as the network becomes more complex and identities more ambiguous. Alternative, unforeseen translations may then take place. (Harrisson and Laberge, 2002, pp. 501–502)

However, as pointed out by Harrisson and Laberge (2002), the network and its corresponding action programs, regardless of their strength, are still vulnerable. Networks and action programs need constant maintenance; if too many components of the network are challenged, weakened or removed from the network, or if an anti-program is allowed to take control, the network may fall apart (Latour, 1987).

A salient example of this is Latour's investigation of the 'death' of the advanced public transportation system Aramis (Latour, 1996). Through his investigations, Latour found that no formal decision was made to cancel the project, but the group's collective action (or lack thereof) created a collective sense of a 'dead' project. In other words, no one had the power to sustain or cancel the project; the power was contained in the group's interactions. And as the interactions seized, what was once a powerful network deteriorated and vanished.

## 4.4 Translatability

In an attempt to assess the suitability to create a conceptual representation (e.g. a management concept), Røvik (2007) uses the term *translatability*. Røvik defines this as "possibilities and limitations associated with the ability to transform a practice to a conceptual representation without leaving out significant elements of that practice" (Røvik, 2007, p. 262, translated from Norwegian). Translatability is operationalized through three parameters; complexity, explicitness and embeddedness.

The complexity is determined by how clearly we can define the cause and effect relationships related to the practice as well as the number of people and the amount of technology that is involved in the practice (Røvik, 2007).

Secondly, the explicitness indicates the amount of tacitness of a practice. If a practice is tacit/implicit, it is difficult to codify, and an initial description of the practice is missing, which in turn will limit the basis for further translation (Røvik, 2007). A similar observation has been made by Lillrank (1995).

> Another aspect (…) is the tacit nature of the knowledge embedded in management models. The original developer of an idea goes through trial and error and in the process accumulates important know-how, not all of which is made explicit. The tacit component grows larger with the human content of the innovations. (Lillrank, 1995, pp. 975–976)

Finally, the embeddedness of a practice indicates how strongly the practice is embedded in its organizational and/or interorganizational context; i.e. the extension to which the practice depends on resources that are outside the control of the unit where the practice is performed (Røvik, 2007).

With some effort, we are able to see a connection between the elements of translatability and the three forms of translation presented above. More precisely, each form of translation addresses central issues in the elements of translatability. Idea-oriented translation addresses the explicitness, object-oriented translation addresses the embeddedness and practice-oriented translation addresses the complexity of a practice. The terms are not interchangeable, but there is a tendency in the focus of the terms.

Although Røvik and Lillrank discuss these elements in terms of decontextualization, it is an interesting question whether they are limited to decontextualization only, or if they are also applicable to contextualization and the introduction of a practice in a new setting. The term 'technological embeddedness' (Volkoff et al., 2007) is a term that has a similar connotation as Røvik's notion of complexity and embeddedness. However, Volkoff et al. use this term to describe the role of technology in organizational change, which in Røvik's terms is described as contextualization. Although this is a promising prospect for expanding the concept of translatability to include contextualization, there are many questions that are left unanswered at this point.

For instance, it is not entirely obvious whether translatability should be aimed at an idea (management concept or technique) or the practice that is targeted for change. One possibility is to apply all of the three aspects on the practice that is to be changed and simultaneously assess the explicitness of the idea that is introduced. In order to provide a viable answer to these questions, we will need reference in empirical data. We will therefore get back to this discussion in chapter 9 (analysis).

## 4.5 Outcomes of translation

From the discussions in chapters 2 and 3, we see that popular concepts (such as Lean Production) are loosely defined and can take on different values depending on the how they are interpreted and applied. As management concepts are created, they are more or less stripped of contextual connections (see *decontextualization*, p. 28).

Once a practice is decontextualized it is no longer directly applicable without a new localization and material representation. This would make the idea qualitatively different, and therefore not so much a copy of the original practice as a new practice altogether. Copying would therefore need to go about without decontextualization (cf. figure 3.1, p. 34). Despite Røvik's (2007) argument that most translation processes occur as "approximated copying", it can be questioned whether copying is at all possible to achieve. It has been shown that even well defined ideas and models can have different meaning once contextualized. For instance, Poksinska (2006) has shown that the application of ISO-standards will differ significantly depending on the approach from individual organizations.

Thus, when a concept is introduced in a new setting, the contextual connections need to be added for the conceptual representation to be materialized and become practice. Nilsen (2007) presents five different levels that she uses to characterize the outcome of a translation process.

*Table 4.1 Levels of translation (Nilsen, 2007, p. 77)*

| Level of translation | Description |
|---|---|
| Formal decision | A formal decision is made to introduce a concept or technique |
| Discourse | The organization has introduced a set of discursive elements associated with the concept or technique. |
| Formal routines | The organization has formulated routines or rules associated with the concept or technique. |
| Procedures | Organizational members act in a manner associated with the concept or technique. |
| Results | The language, understanding and actions of the organizational members are associated with the concept or technique. Measurable results are evident. |

Of course, the notion that a management concept will lead to specific results is not entirely unproblematic. In our discussions above, we have repeatedly seen indications that translation processes can be rather unpredictable. Despite this, Nilsen's categorization points to an important distinction between different outcomes of working with management concepts. Perhaps most importantly, there is a significant difference between the three first levels and the final two; whereas the first group (formal decision, discourse and formal routines) is conceptual, the second group (procedures and results) is practical. The latter group is usually what we are aiming for when we discuss organizational change, and achieving a change on these levels is the difficult part of change initiatives. Contrastingly, changing a formal procedure is quite easy, provided that the initiative comes from people with sufficient authority. While a change in discourse may be slightly more difficult, it suffices to say that this is a lesser challenge compared to changing practice.

Røvik (2007) presents a framework in which he presents some core principles for successful translation of a management concept. First of all, it is necessary to understand the management concept at hand. Secondly, one needs to understand the context from which the concept has emerged. And finally, the context in which the concept is introduced must be well known. These three elements constitute what Røvik has called 'translator competence'.

Although this is yet another promising tool for assessing organizational translation, there are a couple of issues with Røvik's framework. First and foremost, his theoretical perspective is largely limited to the idea-oriented form of translation. It is therefore questionable whether it can be applied to the other forms of translation. Secondly, the term itself indicates that there is *one* competent translator. While this certainly could be the case, it is unlikely that a single person will be able to build up a sufficiently strong network to succeed with a change initiative. For this simple reason, I will propose a slight adjustment of the term. Henceforth, I will therefore use the term 'translation competence' to denote the ability to perform organizational translation. This slight change of the term also implies that this competence can be distributed between several individuals, which resonates with the notion of translation as a collective process.

## 4.6 Summary

Translation is a word with several meanings; literal translation, physical translation and the translation of interests. Translation should be seen as a subset (rather than a synonym) to change.

Three different types of organizational translation are proposed in this chapter. First, the idea-oriented type of translation addresses the issue of how ideas are translated and communicated to influence people's understanding. Secondly, object-oriented translation aims at how ideas are materialized and represented in various artifacts. And finally, practice-oriented translation points to how everything (ideas and artifacts) comes together and is converted to practical action.

The ability to perform organizational translation (in terms of ideas, objects and practice) requires knowledge of an idea, the context in which it originated and the context in which it is to be introduced. Together, these types of knowledge make up what is described as translation competence.

The translatability of a practice is determined by its complexity, embeddedness and explicitness. It remains an open question whether this applies to processes of contextualization.

# Part III
# Methodology

# 5

# Philosophical perspectives on translation and change

*Believe those who are seeking the truth. Doubt those who find it.*
– A. Gide

*In the previous chapters, it was concluded that management concepts are difficult to define, and that the process of introducing them in an organization is likely to be unpredictable. These discussions have implications for the philosophical stance of the thesis. This chapter will therefore discuss the epistemological and ontological foundations of the thesis. This will, in turn, have implications for the operational methodology, which is discussed in the next chapter.*

What is the purpose of science? The meaning of the word itself becomes apparent when we look at its construction in certain languages. Let us, for instance, consider the German word *Wissenschaft*, which literally translates to "knowledge creation". In other words, embarking on a scientific journey implies an ambition to find scientific facts and produce knowledge about a subject. But there are many different kinds of knowledge. And given our object of study, the question is what type of knowledge we can confidently argue that we are able to produce.

As discussed in chapters 2 and 3, several scholars argue that Lean (and other management concepts) will have certain more or less predictable results when introduced in an organization.

Although it is not expressed explicitly in the popular management literature, the underlying assumption behind the focus on content is that the 'correct' technique, and the 'correct' application thereof, will produce the 'correct' results (Beer et al., 1990). In other words, it is assumed that techniques themselves have some sort of innate ability to produce change. One example is Liker's '4P model' (Liker, 2004), according to which changes related to Lean should begin with

addressing the Lean philosophy and that this will have a direct influence on organizational behavior. Similarly, Womack and Jones (2003) suggest that one should "teach Lean thinking and skills to everyone" (p. 264).

The assumption that a certain technique or concept will lead to specific results is not limited to proponents of these; several authors argue that this is the case (Liker, 2004; Parker, 2003; Womack et al., 1990). According to Sveningsson and Sörgärde (2007), there is a general misconception that these models have an innate ability to produce certain results and control change processes within organizations. Lillrank (1995) argues that this is an error of attribution; that the success or failure of a certain organization is falsely ascribed to specific factors or generalized principles.

## 5.1 The fallacy of linear causation

Let us consider a hypothetical example that illustrates the problem of a simple, linear causation between management concepts and results.

Pettigrew (1987) describes change based on three different aspects; content, context and process. He argues that the interaction of these three will determine the outcome of any change initiative. If we disregard context as a factor, for the simplicity of things, we can begin to illustrate the simplest possible causal relationship as follows.

$$X \Rightarrow Y$$

Here, $X$ represents the content of the change – in our case a management concept (e.g. Lean, Six Sigma or Balanced Scorecard) – while $Y$ represents organizational outcomes (e.g. increased efficiency, customer satisfaction or deteriorated work environment). This is the view that many popular management books present. One such example is the quote by Womack et al. on page 19.

As discussed in chapters 2 through 4, many scholars, both proponents and strong critics of certain management concepts, argue for this kind of simple cause and effect relationship between implementation of the concept and organizational outcomes. However, reality is rarely that simple.

As emphasized in the previous chapters, the idea of a 'universal' $X$ is highly idealized. Rather, we can see the various techniques within a management concept as multiple derivatives of $X - x_1, x_2, x_3$ and so on. If we assume that each of these will produce individual effects on the

organization, we can illustrate these as derivatives of $Y - y_1, y_2, y_3$ and so on. This mode of thinking will produce an assumed causal relationship as illustrated below.

$$\begin{aligned} x_1 &\Rightarrow y_1 \\ x_2 &\Rightarrow y_2 \\ &\vdots \\ x_n &\Rightarrow y_n \end{aligned}$$

To complicate matters even further, various combinations – or subsets – of each *x* may be applied, leading to a combination of outcomes. For instance, a number of different techniques may be applied with varying emphasis. Further, the techniques are not necessarily confined to specific outcomes. Instead we can expect to find interaction effects between both techniques and the individual outcomes, leading to an array of outcomes. We might illustrate this as a relationship between two vectors, or linear combination of *x*'s and *y*'s, according to the illustration below.

$$\begin{pmatrix} a \cdot x_1 \\ b \cdot x_2 \\ c \cdot x_3 \\ \vdots \end{pmatrix} \Rightarrow \begin{pmatrix} \alpha \cdot y_1 \\ \beta \cdot y_2 \\ \gamma \cdot y_3 \\ \vdots \end{pmatrix}$$

Despite the complexity indicated by this expression, reality once again serves another difficulty in adding not only *what* is being done, but also *how* it is done. Returning to Pettigrew's categories, we also need to address the *process* of change. Without elaborating on the matter, it suffices to say that the 'mathematical' relationship between input and output will be even more complex. As my old mathematics professors used to say, this will be left as an exercise for the reader.

This simple example points to a rather difficult predicament. Throughout this thesis, we have repeatedly concluded that the content of change will vary across cases. It is hardly a controversial position to claim that there also will be significant variation in the process of change. And, of course, the context will vary as we switch cases.

So, returning to Pettigrew's categorization of change, we can conclude that we will probably see variation in all three categories (content, context and process). The question is then; how can we confidently argue that the outcome will be predictable?

## 5.2 Conflicting views of science

According to Berger & Luckmann (1967), we as human beings act based on how we perceive and make sense of our surroundings. From this point of view, we interpret our surroundings and act upon our interpretations, and the reality we study is a result of this. In other words, practice has a hermeneutic nature; everything is interpreted and thereby socially constructed. This applies to both the 'soft' and 'hard' facts of the world (Knorr-Cetina, 1981; Latour, 1987).

Bernstein (1983) claims that this view is a result of an academic 'trend' toward relativism.

> Whether we reflect on the nature of science, or alien societies, or different historical epochs, or sacred and literary texts, we hear voices telling us that there are no hard "facts of the matter" and that almost "anything goes." (Bernstein, 1983, p. 3)

From a scientific point of view, it is difficult to accept the idea that "anything goes". Science requires a solid ground in order to make valid assessments of the reality that is studied. In my opinion, a fully relativistic perspective will therefore make it virtually impossible to make any scientific progress.

Collins & Yearley (1992) therefore state that a natural scientist should be a *naïve realist*, whereas a social scientist should be a *social realist*. Both perspectives have in common that a scientist should not filter or interpret the empirical material, but rather experience it in a naïve way.

From a critical realist point of view, this is a misconception that leads to a failure to see the underlying structures in society (Bhaskar 2003). The picture painted by Collins & Yearley is an example of an ideal that will lead to this kind of epistemic mistake. Bhaskar argues that reality is not limited to what we can observe directly. For instance, important events may occur at a different point in time and/or space, which makes it difficult to say anything for certain on the sole basis of our observations. Following Bhaskar, we therefore need to consider both the transitive and intransitive dimensions in order to understand our research objects, whether they are socially or naturally produced. But following the advice of Collins & Yearley will categorically disregard the transitive dimension of research and thereby lead to explanatory difficulties.

According to Guba and Lincoln (1994), the dominating view of science compels us to produce absolute results in our scientific endeavors.

> The "received view" of science (…) focuses on efforts to verify (positivism) or falsify (postpositivism) a priori hypotheses, most usefully stated as mathematical (quantitative) propositions or propositions that can easily be converted into precise mathematical formulas expressing functional relationships. (Guba and Lincoln, 1994, p. 106)

The exactness referred to in the quote above is the very ideal for science. However, this is not easily achieved in all theoretical fields. The term 'social science' (as opposed to 'normal' science) is a clear indication that the conditions are not the same across the board.

As shown in chapters 2 and 3, management concepts (including Lean) are infused with a great deal of equivocality, making their practical application difficult to predict. Further, as described in chapter 4, translation is an open process, making its outcomes equally unpredictable.

As argued by Tsoukas (1989), we cannot wish this tendency away by closing our eyes. Instead, as argued repeatedly throughout this thesis, it is necessary to acknowledge the fact that there is a multitude of interpretations of the management concepts that we study, both within and outside academia.

> If positivistic claims about the natural and social sciences were true, scientific activity would not have been possible because most events in the natural and the social world take place in open systems, in which events do not invariably follow a determined and recurrent pattern. (Tsoukas, 1989, p. 552)

If we, at least for a moment, accept that there may be some invariant laws that determine the outcome of organizational change processes, the number of variables – both dependent and independent – are vast, and their relationships are immensely complex. Mapping out these relationships and discovering such laws (which may not exist) is therefore a daunting task for any researcher.

### 5.2.1 A modernist frame for management research

As a research field, Quality Management (QM) has emerged from a normative tradition of research, with emphasis on studies of successful companies. It is heavily based on the practical application of a number of different practices and strategic initiatives, mostly in Japanese and American companies (Cole, 2000). The general assumption is that observations of successful organizations will allow the extraction of a number of 'core principles' that are valid representations of the studied

organization's practice. A further assumption is that these principles are generalizable to 'best practice' that is transferrable between organizations and that will generate success (Hackman and Wageman, 1995; Lillrank, 1995).

There is an implicit assumption within the QM tradition that the principles derived from 'best practices' are absolute entities that will yield predictable results regardless of context, indicating an essentialist ontology (Guba and Lincoln, 1994; Woolgar, 1988). Thereby, any discrepancies between actual results and the promised outcomes of a QM approach are explained by lack of implementation know-how or resistance to change rather than variation in application of principles or techniques (Røvik, 2007). This assumption is rarely expressed explicitly, but is evident in most leading publications within the field, such as Crosby's 14 points (Crosby, 1979), Deming's improvement cycle (Deming, 1986) or Liker's 4P model (Liker, 2004).

The essentialist ontology described above has also given rise to a distinction between 'real' and 'fake' principles, or 'true' concepts and management fads (Cole, 1999), rather than accept the variation in application that is discussed in chapter 3 as a natural part of the field. There are, of course, exceptions to this; many scholars have also pointed to the issue of ambiguity of the subject (e.g. Dean and Bowen, 1994; Hackman and Wageman, 1995), which makes QM a difficult field to define (Sousa and Voss, 2002).

The essentialism in QM rests on a modernistic idea of the detachment between technology (i.e. the principles for 'best practice') and the social system of the organization (Latour, 1993). Further, the 'discovery' of new practices, and the rational approach to management within the QM field are also in line with modernist ideals (Røvik, 2007).

According to Røvik (2007), the modernist perspective on contextualization can easily come across as an instrumental installation of techniques. In Røvik's description of modernism, correct implementation is preferably done as a "well organized top-down process where management plays a central role and combines knowledge with power to get the solution in place" (Røvik, 2007, p. 50, translated from Norwegian).

With this approach to management research, the concepts that we study should be clearly defined entities consisting of specifiable characteristics. Management concepts and their associated methods, principles and

goals should thus be clearly defined. However, as emphasized above, this is not the case. Instead, we see great variation in the concepts, both in theory and practice. According to Woolgar (1988), this ambiguity makes it impossible to establish an unequivocal 'definition' of a representation (e.g. a management concept).

> The underlying reality of a representation is never fixed and always able to change with occasion of use. (…) The character of the representation, as perceived by the actor, changes to accommodate the perceived nature of the underlying reality and the latter simultaneously changes to accommodate the former. (Woolgar, 1988, pp. 32–33)

So does this mean that we need to agree on definitions of various management concepts? The answer is both yes *and* no. It depends entirely on how we treat management concepts. Are they absolute entities with defined content and characteristics or are they equivocal constructs that have different meanings depending on subjective interpretations?

Neither position is problematic in itself. Rather, the problem arises when a *de facto* equivocal management concept is treated as an absolutely defined construct (or vice versa). As demonstrated in chapter 2 (see also paper A), the literature contains different – and partially conflicting – accounts of what Lean really is. This has several unwelcome consequences. From a scientific point of view, this creates some problems with validity. The external validity of social science is often questionable, but also at times regarded as irrelevant (Tsoukas 2000), but even the internal validity can be called into question if we as researchers are not clear about our object of study. This is a serious problem that may weaken the legitimacy of management research (Sousa & Voss 2002). As discussed throughout this chapter, the relativistic nature of management concepts makes it difficult to establish cause-and-effect relationships. Furthermore, treating loosely defined concepts as hard facts can easily lead to false conclusions and, in extension, to erosion of the scientific foundation of management research.

The assumption that organizations are directly comparable based on their choice of management concept will probably create an unstable foundation for scientific investigations. For instance, Lewis (2000) compares the results from three organizations aspiring to become 'lean'. Although all of these organizations are working with the same concept, the actual changes that have been made differ substantially. In addition, differences in context, ambition and execution complicate the matter

and make it virtually impossible to say anything definite about the organizational effects of Lean. In fact, Lewis also highlights this point by proposing the following:

> The success of Lean production in delivering sustainable competitive advantage will be contingent upon the external context of the firm. Contextual factors might include: type of market (competitor activity, different demand profiles); dominant technology in sector; supply chain structure etc. (Lewis, 2000, p. 965)

Considering the relativistic nature of management practice, the ambition to reach objective truths can be questioned. Of course, it is still possible to theorize about the optimal approach to management, through simulation and other methods. However, when studying practice, we need to take contextual factors into account and to consider the relativistic nature of the management concepts that we study.

### 5.2.2 The postmodern research tradition

Compared to modernism, a postmodern perspective on management implies a shift in focus from the technical aspects of change to emphasize the social dimension instead. Institutionalism, which was touched on in chapter 3, is one example of a postmodern approach to management research. Unlike research in the Quality Management tradition, the institutional school is very much open for the relativism that is discussed above. Inspired by classical sociological theory as represented by Marx, Weber and Durkheim, institutionalism has a strong constructivist perspective (Hinings and Tolbert, 2008).

According to Meyer and Rowan (1977) organizations are strongly influenced by collectively constructed rules that determine their legitimacy. With influence over a wide variety of organizational aspects such as products, techniques and policies, organizations tend to become ever more similar, a tendency referred to as isomorphism (DiMaggio and Powell, 1983). While such institutional rules can be drivers for bringing an organization closer to the norm, they can also limit the viable options for the institutionalized organizational aspects. Institutions can thereby be seen as a driver as well as a be a major obstacle to change (Greenwood and Hinings, 1996).

The main issue of interest for the institutional school is to explain the formation and preservation of institutions in organizational life (Greenwood and Hinings, 1996). Therefore, focus is on stability rather than change.

However, the dissemination and 'application' of management concepts is also an issue that has been studied from an institutional perspective. The quotation marks around the term application are there to mark an important distinction between institutionalism and other fields such as Quality Management. Whereas a QM researcher will see a management concept as a tool for organizational improvement, an institutionalist will see it as a tool for legitimacy. According to institutional theory, management concepts are therefore usually 'applied' merely in a ceremonial fashion (Zbaracki, 1998). This skepticism to the claimed efficacy of management concepts is characteristic of the institutional perspective.

> As an increasing number of organizations adopt a program or policy, it becomes progressively institutionalized, or widely understood to be a necessary component of rationalized organizational structure. The legitimacy of the procedures themselves serves as the impetus for the later adopters. (Tolbert and Zucker, 1983, p. 35)

Thus, from an institutional perspective, management concepts are not powerful in themselves, but gain power as they are disseminated and become part of the institutional rules (Sahlin and Wedlin, 2008). From this point of view, institutional theory can be seen as a critique of normative theoretical directions such as Quality Management.

As indicated above, institutionalism is characterized by a macro perspective. This has a number of consequences. First, this causes a lack of interest in the technical details of management concepts. Because management concepts are treated as purely constructed entities, they are thought to have no practical implications; their content is therefore of little interest (Røvik, 2007). According to Zbaracki (1998), this is an issue that deserves closer analysis from an institutional point of view.

> To understand the institutional value of practices like TQM, we must take into account the technical dimensions of those practices. Like previous subjects of institutional research, TQM presents a social construction problem in which a variety of dialectic processes shape the everyday reality of organizational life. (Zbaracki, 1998, p. 633)

Similarly, Greenwood and Hinings (1996) argue that institutional theory does not pay sufficient attention to the micro processes of change, which pertain to the formation and proliferation of institutional rules. Røvik (2007) argues that institutionalists simply equate the application of a management concept with a formal decision to introduce it. Instead of analyzing the internal dynamics in an organization, the institutional perspective implies a step away from practice in order to analyze

macroscopic patterns. This creates a 'hole' in the institutional theory package, in that it only emphasizes the *outcome* of change and not the processes through which that change comes about (Hinings and Tolbert, 2008).

Related to this, the macro perspective allows little room for emphasis on actors (Røvik, 2007). According to institutional theory, actors are bound by an institutional context (Meyer, 2008). From this point of view, their actions are largely determined by the institutional rules and search for legitimacy.

According to Hinings and Tolbert (2008), it is important to expand the institutional perspective to include the view of isomorphism as a process, and not only as an outcome. On a related note, Greenwood and Hinings (1996) argue for an extended attention to the micro processes through which management concepts gain legitimacy *within* organizations.

## 5.3 An eclectic approach

Let us revisit the purpose of the thesis for a moment. The formulated ambition to 'describe', 'explain' and to 'provide practical guidance' implies a pragmatic knowledge interest. As suggested by Tsoukas (1989), this corresponds to the nomothetical norm in management studies. The goal with such an approach is to explain the world we live in through various tests and procedures to find the 'true' explanations for the phenomena under analysis, and thereby find 'universal laws' of management. However, the discussions above suggest a relativist epistemology. Fishman (1999) points to the central paradox at hand.

> Modernism – the natural-science-centered worldview deriving from the Enlightenment – is a seductively attractive belief system in its promise of clear, absolute, "objective" answers in a complex, ambiguous, troubled world. (Fishman 1999, p.3)

As Fishman so eloquently points out in this quote, there is a difference between our scientific ideals and the observations we can readily make. Because of this tension, research regarding management concepts is subject to a sort of 'Cartesian anxiety' (Bernstein 1983), which follows in the backwaters of the claim that management concepts have no solid ground or 'Archimedean point'.

In another eloquent quote, Bernstein describes the consequences of this problem.

> With a chilling clarity Descartes leads us with an apparent and ineluctable necessity to a grand and seductive Either/Or. *Either* there is some support for our being, a fixed foundation for our knowledge, *or* we cannot escape the forces of darkness that envelop us with madness, with intellectual and moral chaos. (Bernstein, 1983, p. 18, original emphasis)

I would argue that there is no need to have an either/or approach to management research. If it were possible to achieve, a solid, watertight definition and homogenous interpretation of every management concept would make our task as researchers much easier. However, this is only fantasy, since there are about as many interpretations of management concepts as there are people addressing them. In some cases the differences may be small, but still significant (cf. paper A), and most importantly, the application of them differs (cf. paper B). Accepting this type of relativism does not necessarily have the dark consequences as implied in the quote above, but is a necessary condition for making valid conclusions in our scientific work. As paradoxical as it may sound, we need a little relativism in order to reach objective results.

While the modernist view of QM emphasizes the technical aspects of change (content) and neglects the social processes that make them happen, the postmodern view of institutionalism neglects the technical aspects and emphasizes the social aspects, albeit at a macroscopic level. Latour (1990) takes a different stance and agrees with the classical realism with its ontological perspective that we access 'things in themselves'. He does, however, disagree with the correspondence based realist epistemology. He quite strongly argues that scientific results are socially produced or constructed (Latour and Woolgar, 1986; Latour, 1987, 1990), a perspective that finds support in classical constructivism and relativism. But just as with realism, Latour has objections towards relativism and the supposition that reality itself is socially produced.

> Yes, the scientific facts are indeed constructed, but they cannot be reduced to the social dimension because this dimension is populated by objects mobilized to construct it. (Latour, 1993, p. 6)

Latour therefore proposes an eclectic approach, with a realist ontology and a relativist epistemology. Provided that we accept Latour's argumentation, we reject both the modernist perspective as represented by Quality Management as well as the postmodernist perspective as represented by institutionalism. With such an *amodern* view (Latour,

1993), one accepts the notion that management concepts are socially constructed and endowed with a large amount of variability. Simultaneously, one accepts that these concepts are *real*, in the sense that they have (at least potentially) causal efficacy once the construction process has resulted in reasonably stable interpretations.

Let me clarify the position of this thesis by taking this line of reasoning one step further. With a foundation in Quality Management, this thesis has a pragmatic knowledge interest, which is related to the ambition to produce actionable results. Simultaneously, I am reluctant to accept the assumed linear causation between the management concepts and specific results, as indicated by the QM tradition. Notwithstanding that I agree with the assumption that the introduction of management concepts can have rational motives, I am also inclined to agree with the emphasis that the institutional school places on legitimacy as a driver. From this point of view, I embrace the tension between the Quality Management tradition and the institutional school. This resonates with what Røvik (2007) has labeled 'pragmatic institutionalism'. On the one hand, this view recognizes the institutional forces, the search for legitimacy and the possibility of ceremonial application of management concepts. On the other hand, it recognizes the tenets of Quality Management, indicating that management concepts can be useful tools in the pursuit of organizational improvement.

## 5.4 Summary

There is great uncertainty around what we are actually talking about when we discuss a certain management concept, both in theory and practice. Therefore, we cannot confidently conclude that we are dealing with the same object based on its name alone. If we treat management concepts as absolute, we run a larger risk of drawing false conclusions.

Because of this 'flexibility', we need to be open for the idea that the same label may have different meanings. The meaning of a name or label is socially constructed and constantly reconstructed, which calls for a relativistic approach to management concepts.

A relativistic perspective on the content of change does not necessarily imply a relativistic perspective on the context or process. In this thesis, I combine a relativist epistemology with a realist ontology.

There are strong institutional forces that contribute to management fashion. In some cases, this can lead to a ceremonial application of management concepts. However, one ambition of the thesis is to contribute to the 'provide practical guidance' related to translation. The combination of these conflicting perspectives can be described as *pragmatic institutionalism*.

# 6

# Studying the contextualization of Lean

*If you don't know where you are going,*
*you will probably end up somewhere else.*

– L. J. Peter

*This chapter gives a presentation of how the study has been performed. Based on the previous chapter, research concerning the application of management concepts should be broadly aimed at both technical and social aspects of the change process. As stated above, this will influence the methodological choices of the study, which will be discussed in this chapter.*

*The chapter begins with an overview of how the study has been designed, continues with a presentation of methods and analysis strategy, and concludes with reflection on these issues.*

The research behind this thesis has been done within the Helix VINN Excellence centre at Linköping University. The centre aims to create an arena for research and innovation where researchers from multiple disciplines collaborate with public and private organizations in the mutual development of knowledge. Helix has formed a partnership with a large number of local organizations that contribute to the development of research questions and projects as well as access to practice.

Traditional research is based on a research system where the researcher is an expert and the practice system is reduced to a research object. This kind of research is conducted *on* the practice system (Svensson et al., 2002), which is sometimes referred to as 'mode 1' research (Gibbons et al., 1994). Gibbons et al. propose a different approach with the so-called 'mode 2' research, meaning that research should be multidisciplinary and directed towards a real, practical problem. This kind of research can

easily become a sort of consultant service, where research is conducted *for* the practice system (Svensson et al, 2002).

Helix is built on the ideals of interactive research (Aagaard Nielsen and Svensson, 2006; Helix VINN Excellence Centre, 2011). The idea is to collaborate with the practice system, but not be directed by it. Research should not be conducted *for* nor *on* the practice system nor *on behalf of* certain practitioners, but rather together *with* the practitioners (cf. Svensson et al, 2002).

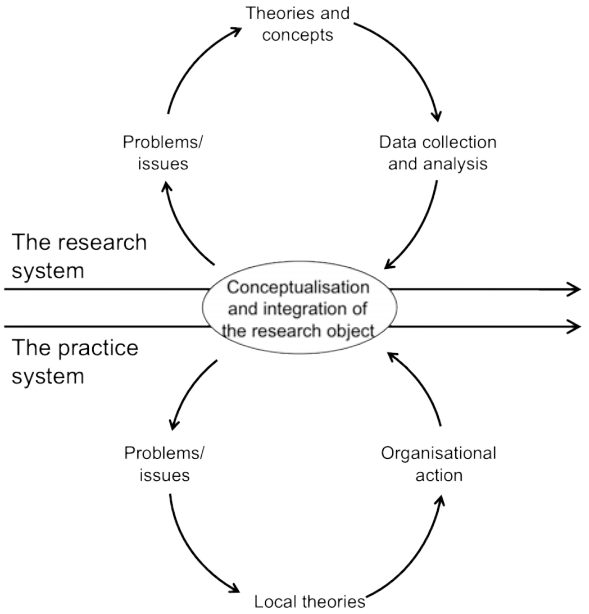


*Figure 6.1 The interactive research system (Ellström, 2007)*

Aiming to integrate the practitioners in the research system and avoiding the 'research *for*' trap is a balancing act. As illustrated in the figure above, the research projects are based on *mutually* formulated questions, which are of practical as well as theoretical/academic interest. These questions are then reformulated into practical questions and research questions and used as input to theory generation in each system. In the practice system, these theories are converted to actions, whereas the researchers collect and analyze empirical material. The researchers and practitioners then converge and discuss their findings. This allows a mutual creation of knowledge in an interactive way.

## 6.1 Finding focus

The specific study that underpins this thesis has been designed within the frames of the overall research project "transferring production philosophies between different cultures", which has been generated through the interactive model described above.

The purpose of the project has been formulated in the following way.

> The aims are to identify consequences that may arise when new production concepts are transferred to new national and organizational cultures, and to give examples of how these new concepts can be transferred, adapted and implemented in a way that supports health, learning and innovation. (HELIX Operational plan, 2011-2013, stage III, p. 32)

While the overall frames of the research project were set from the beginning, the specifics of the study have been formed together with the organizations in the Helix partnership, in line with the interactive approach. This has been done through a number of seminars and meetings with the interested parties.

During a project seminar, a participant pointed to the problem of succeeding with the introduction of a new management concept such as Lean.

> The production system and the work in itself, that's not 'rocket science'. But what happens when we implement the different tools? (Participant in seminar, January 2008)

Another participant made a similar observation.

> The technical part is not that difficult. It is rather easy. What is difficult is to capture and retain the knowledge and build up a culture. That is the challenge. (Participant in seminar, January 2008)

These comments echo the discussion in the introduction of this thesis, which is an indication that the topic has both theoretical and practical relevance. However, it is not viable to include all the partner organizations within Helix, so some limitations were necessary.

After some discussion with the partner organizations, it became apparent that one of them (here given the pseudonym HiTech inc.) was in the starting phase of creating a new production system inspired by Lean production. This was deemed a unique opportunity to study the processes through which an organization designs and implements a new production system. After some discussions with management at HiTech, it was decided that there was a mutual interest in doing the study.

## 6.2 Principles for designing the study

There are several methodological implications from the discussions in the previous chapters. Firstly, as shown in chapter 2, Lean is a volatile concept in terms of definition. This makes it very hard to grasp from both an epistemological and empirical point of view. Because of the great variation and ambiguity that is associated with the concept, there can be no a priori definition of what Lean is and what it could mean at HiTech. Further, the difficulty of finding 'absolute' knowledge about socially constituted phenomena (such as organizational change) make the prospects of the task at hand particularly open ended.

So how can we study change processes towards Lean based on this scientific perspective?

As indicated in chapter 4, the foundation in translation theory implies a performative (as opposed to an ostensive) perspective on change. A study of organizational change should therefore emphasize the actions of organizational members and the process through which the organizational structures and routines emerge. Tsoukas and Chia emphasize this point.

> If we focus our attention only on what becomes institutionalized, an approach largely assumed by synoptic accounts of organizational change, we risk missing all the subterranean, microscopic changes that always go on in the bowels of organizations, changes that may never acquire the status of formal organizational systems and routines but are no less important. (Tsoukas and Chia, 2002, p. 580)

Following Tsoukas and Chia, understanding organizational change implies a study design that allows the researcher to capture the microscopic changes within an organization. This is not possible to achieve through the use of blunt instruments such as surveys or other types of cross sectional approaches. Instead, we need a study design that is able to catch the events as they unfold. As stated by Pettigrew (1990), "truth is the daughter of time". This implies a longitudinal approach and what Van de Ven and Poole (2005) have labeled process methods.

> The driving assumption behind process thinking is that social reality is not a steady state. It is a dynamic process. It occurs rather than merely exists (…). Human conduct is perpetually in a process of becoming. The overriding aim of the process analyst therefore is to catch this reality in flight. (Pettigrew, 1997, p. 338)

Pettigrew (1997) argues that the purpose of a processual analysis is to produce a case study by which one can identify patterns in the process

and the underlying mechanisms that shape these patterns. In order to achieve this, he presents five guidelines (Pettigrew, 1990; 1997):

1. Embeddedness: Processes should be studied on multiple levels of analysis
2. Temporal interconnectedness: Processes should be studied in the past, present and future
3. The analysis should address the relationship between context and action
4. The process should be searched for holistic (rather than linear) explanations
5. The analysis should be linked to outcomes of the process

The thesis aims to describe and explain the phenomenon of organizational translation. From the discussion above, we can conclude that such a purpose requires a process oriented method that is able to consider the emergent properties of translation. For these reasons, this thesis is based on an in depth longitudinal case study.

## 6.3 A case study approach

Although this thesis draws extensively from a number of studies (the appended papers), the main body of the thesis is centered on a single case study.

The ambition is to create an interpretative/theoretical case study that links the empirical material to existing theory, along the ambitions formulated by Pettigrew (1990). More precisely, this is an "attempt to interpret the narrative but also to link emerging conceptual and theoretical ideas inductively derived from the case both to stronger analytical themes within the case and wider theoretical debates in the literature" (Pettigrew 1990, p.280).

Following Yin (1994), there are three conditions that influence the choice of research strategy.

- The type of research question
- The researcher's control over events
- Contemporary vs. historical focus

As stated in chapter 1, the purpose of this thesis is to "to provide an account of how processes of organizational translation transpire and to analyze and identify the main determinants of their outcome". In this formulation, there is an ambition to answer questions of 'how' and 'why' organizational translation takes place. According to Yin, research questions of this kind ('how' and 'why') are related to research strategies using experiments, histories and case studies.

According to Yin, when the researcher does not have control over events, the use of experiments as a method is ruled out. Further, when access is limited and contemporary events are not in focus, a historical method (e.g. document studies) would be preferred.

However, in the study at hand, contemporary events *are* in focus, and there is definitely no problem with access. So given the combination of 'how' and 'why' questions, a contemporary focus, and events that are outside the control of the researcher, the case study is the preferred research strategy.

According to Stake (1994), there are two main types of case studies. On the one hand, there is what he calls an *instrinsic* case study. In such a study, there is no ambition to build theories or generalize the results to a wider population; it is the case itself that is in focus. In contrast to the intrinsic case study, the *instrumental* case study downplays the case itself and aims to contribute to theory development and provide insight into a wider array of phenomena related to the one that is studied.

> The case is often looked at in depth, its context scrutinized, its ordinary activities detailed, but because this helps us pursue the external interest. The case may be seen as typical of other cases or not. The choice of case is made because it is expected to advance our understanding of that other interest. (Stake, 1994, p. 237)

In an academic thesis, theory development is (usually) in focus. The choice of instrumental versus intrinsic case study influences the ability to meet this ambition. However, it is not always possible to make a clear cut distinction between these two kinds of case studies. As indicated in previous chapters, this thesis aims to contribute to theory development, indicating an instrumental case study. But, as will be shown in the following chapters, there are also elements in the case that are interesting by themselves, without making explicit contributions to theory development. From this point of view, the current study may be seen as a point on a floating scale between the intrinsic and instrumental, albeit closer to the latter end of the scale.

### 6.3.1 Structure of the case study

While the study at hand is a single case, it contains a number of largely independent projects that are studied and analyzed separately. These can be seen as different cases that are embedded in the overall case. According to Yin (1994), such an embedded case study can strengthen the overall design.

> The initial study questions may have reflected one orientation, but as the case study proceeds, a different orientation may emerge, and the evidence begins to address different questions. (Yin, 1994, p. 42)

Yin claims that this is one of the strengths of the case study approach, but still argues that this kind of 'slippage' should be avoided. If it occurs, one should start over with a new study design (Yin, 1994). In a sense, this is how the main study in this thesis was done. The initial ambition was to create a holistic case that targets the overall Lean initiative at HiTech, aiming to provide an account of how a process of organizational translation transpires. However, as the study went on, it became apparent that the Lean initiative in fact consists of a number of sub-projects.

*Table 6.1 An overview of embedded cases*

| Main case | Embedded cases |
|---|---|
| Overall Lean initiative at HiTech Inc. | Housekeeping, 5S |
| | Visual Management |
| | The 'U-cell' project |

All of these embedded cases provide useful examples of organizational translation, and contribute to a sort of replication that strengthens the validity of the overall study.

Inspired by Barley (1990), the study is done in two phases. The first phase employs a set of retrospective interviews that aim to record the events prior to the start of the study, i.e. the period between 2003 and 2007. These interviews were performed during the spring of 2007.

*Table 6.2 An overview of the study design*

| | Phase 1 | Phase 2 |
|---|---|---|
| Time period in focus | 2003-2007 | 2008-2011 |
| Perspective on time | Retrospective | Prospective |
| Data types | Interviews | Interviews<br>Observations<br>Documents |
| Sampling | Entire organization | Project members and managers |

In the autumn of 2007, a decision was made to continue with the second phase of the study, which was initiated in the spring of 2008. Here, a longitudinal approach is used, with the ambition to catch the changes 'on the fly' through contextual interviews and observations. The study was concluded in the spring of 2011.

The study thereby covers the period from 2003 to 2011. Throughout the study a number of internal documents have been collected and studied. The study comprises several sources of information, such as participation in meetings and direct observation of operative work.

As will be discussed below, steps are taken to minimize the risk of bias in the empirical material. However, this risk can never be entirely eliminated. By combining several different information sources, individual methods are given less emphasis, which reduces the effects of potential bias in any of the methods. Further, the methods complement and strengthen one another. The ability to observe practice and take part of various documents provides a basis for understanding the context, which is of value when performing the interviews. By contributing with different pieces of the puzzle, the results from each individual method facilitate the analyses of other parts of the empirical material.

## 6.4 Methods and sampling strategy

When reading about longitudinal research, more often than not authors describe it as a difficult and laborious journey. Barley (1990) gives a description that is similar to my experience of being in the field.

> I embarked on the project with little more than a handful of general questions and no strongly articulated hypotheses. Far more important for determining the study's focus were personal interests and the circumstances of my location in time and space. (Barley, 1990, pp. 220–221)

This approach allows for gradual development of the research questions and the conceptual framework (Miles and Huberman, 1994). As a result of this, decisions about sampling are postponed, and a so called 'snowball sampling' strategy may be applicable.

> Even though the case is decided in advance (usually), there are subsequent choices to be made about persons, places, and events to observe. Here again, training and intuition tell us to seek a good sample. (Stake, 1994, p. 244)

However, there is a problem with this kind of approach. Without sufficient experience in field research, one may easily be overloaded with data and run the risk of 'data asphyxiation'.

> The looser the initial design, the less selective the collection of data; *everything* looks important at the outset if you are waiting for the key constructs or regularities to emerge from the case, and that wait can be a long one. The researcher, submerged in data, will need months to sort it out. (Miles and Huberman, 1994, p. 17, original emphasis)

Although it is difficult for any researcher, let alone an inexperienced one, to do this kind of research, there are some arguments that support a loose research design.

In the study at hand, we are dealing with a single case study without the ambition of making cross case comparisons or statistical analyses. The approach is exploratory rather than confirmatory; there are no a priori defined concepts or models. Although one might argue that Lean is a predefined concept, the discussions in chapters 2 through 4 indicate that we cannot expect the interpretations at HiTech to fall into predefined categories. Therefore, a rich description of the context is necessary to understand the emergence of these interpretations. Further, the case study is based entirely on qualitative data, and there is no ambition to do formal generalization. According to Miles and Huberman (1994), all of these factors are arguments for a loose research design.

Although the initial design has been rather loose, the study has been guided by a number of elements, such as theory, researcher interest and the natural boundaries of the case itself. Also, the choice of methods and sampling frequency influence the possible directions of the study. For practical reasons, the visits to the field have been dispersed over time. According to Miles and Huberman (1994), this has the beneficial effect of reducing the risk of the researcher being influenced by the case or 'going native'. The choice and combination of research methods is also a factor that influences this kind of bias. By taking the advice from Miles and Huberman (1994) to use several different data collection methods (triangulation), this risk has been reduced.

According to Yin (1994), the case study uses many of the same methods as a historical study, but the case study adds the use of direct observations and systematic interviewing to the repertoire. In the study at hand, the primary methods have been interviews and observations. In addition to interviews, internal documents have been used to validate findings and provide a wider account of certain phenomena. Each of these methods, along with their respective application, will be discussed below.

### 6.4.1 Interviews

In phase one, interviewees have been selected in order to trace a complete branch of the organization from top to bottom in the hierarchy, thus providing a sample of the whole organization. At the operative level of the organization, interviews have been performed in two different sections of production, in order to get a diversified account of the initial change process, and thereby increase the internal validity of the study. Also, this sampling strategy avoids the bias of 'elite' respondents (Miles and Huberman, 1994).

The interviewees that are mentioned explicitly in the case description (part IV) have also been given pseudonyms in order to protect their identities. A list of interviewee roles and pseudonyms are given in table 6.3. The names have been chosen to reflect their roles at HiTech.

*Table 6.3 Interviewees in the first phase of the study*

| Role | Pseudonym |
|---|---|
| Managing Director | Manny |
| Division Manager | Dave |
| Production Manager | Pierre |
| Floor Manager | Florence |
| Production supervisor 1 | - |
| Production supervisor 2 | - |
| Lean Coordinator | Leanna |
| Lean Implementer | Leander |
| Operators | - |

As pointed out by Kvale (1996), an explorative study like this one calls for a quite loose structure. The interviewees were informed beforehand that the introduction of Lean at HiTech was the general theme. But apart from that, little information was given.

The interviewees were asked to freely describe how they first encountered Lean Production and how they experienced the change effort. Following Isabella (1990), this strategy is based on a notion that the interviewees themselves determine critical events in the change process.

> Events like those of interest here unbalance established routines and evoke conscious thought on the part of organizational members by their very nature. In so doing, they signal "common breakpoints" for the perception of change (…). Because these events make a difference in people's thought and action, they are "key events" in the eyes of organizational participants. (Isabella 1990, p.11)

Since respondents were only interviewed once, it was necessary to be sensitive towards possibly recurring themes or 'common breakpoints' that could be of importance. Potentially important topics that arose

during interviews were noted. Upon identification of such 'common breakpoints', respondents were asked to elaborate.

This approach is quite demanding, and requires a wide attention span from the researcher. Leonard-Barton sums this up quite well in the quote below.

> One needs to keep previous interviewee responses in mind while simultaneously probing with the current informant; one needs to be very aware of the significance of what is left unsaid as well as what is said. (Leonard-Barton, 1990, p. 263)

While this has been a challenge in the second phase as well, the frequency and amount of interviews has been much lower, allowing more time for analysis and reflection between the sessions. In this phase, a specific project, known as the U-cell project (see chapter 8), has been in focus. The selection of interviewees has therefore followed a different logic compared to phase one. One initial series of interviews was held with a number of people associated with the project, in order to identify key actors and get an overview of what had happened in the project up to that point in time.

After this initial investigation, a group of people identified as key actors were selected for a series of recurring interviews. These respondents are listed in table 6.4.

*Table 6.4 Interviewees in the second phase of the study*

| Role | Pseudonym |
|---|---|
| Production Manager | Pierre |
| Floor Manager | Floyd |
| Production Supervisor | Stewart |
| Production Planner | Paul |
| Operators | - |

These sessions were slightly more structured than the initial ones. While there have been no predefined categories for the overall study, the interviews in this phase were guided by a framework inspired by Van de Ven and Poole (1990). An interview guide was created to cover changes

in five different categories; ideas, people, transactions, context (internal/external) and results. The interview guide is presented in the appendix of this thesis.

Altogether, the study comprises 46 interviews with 30 respondents. The interviews ranged from about 45 to 90 minutes, and except for two of them, all were performed with single respondents. All interviews were recorded and transcribed, and the transcripts were used as a basis for analysis together with other empirical material.

### 6.4.2 Observations

In order to get first hand information about the 'inner workings' of the production unit and the project, observations were used. These were focused on three specific areas.

Firstly, as a part of the project, the production unit convened in biweekly meetings to exchange information about the progress of the project. In addition to these, another set of meetings were held within the project management team. In both types of meetings, I sat in and observed the interaction and noted parts of the conversations. The ambition was to be as 'invisible' as possible, with the exception from a few questions for clarification purposes.

In addition to the meetings, the operative work within the unit was observed at a number of occasions. I paired up with the operators in the various stations within the unit, and also got the opportunity to participate in parts of the operations.

Unlike the interviews, these observations have not been guided by particular categories. Instead, the aim has been to produce a detailed description of the situation at hand and document any changes that have taken place. For obvious reasons, the respondents' documentation has been limited to the meetings, which has required the documentation of the observations to be slightly more detailed.

### 6.4.3 Internal documents

Unfortunately, I did not have the opportunity to participate in all meetings related to the U-cell; some because of conflicting appointments and some because they were simply held before the observation period began.

To compensate for this, the meeting minutes along with any presentation material used at the meetings were collected electronically and used as supplements to the observation notes.

With regards to the overall Lean initiative, HiTech has produced a large amount of presentation material (mostly in the form of electronic slideshows). Some of this material was made available to me, and has been a useful complement to the other types of data described above.

### 6.4.4 Feedback seminars

In line with the fundamental idea of the interactive approach, a number of feedback seminars were held with the key actors at HiTech. This kind of seminar was held three times, one after each interview session. In these seminars, a summary of the preliminary findings were presented and discussed. Also, a final seminar was held once the field work was done, with the purpose of discussing results from the entire study. The seminars thereby serve the dual purpose of giving back something to the organization under study as well as providing an opportunity for respondent validation. In this way, the seminars contribute to the research system as well as the practice system (see figure 6.1 above).

## 6.5 Analysis strategy

According to Silverman (2006), an effective analysis requires a limited amount of data. However, the research process described above has generated a sizable amount of notes, transcripts and internal documents. A conceptual framework is therefore of utmost importance in such a situation. However, as described in the beginning of this chapter, the initial study design was quite loose, which has made it difficult and quite time consuming to compress the study design and find a suitable conceptual framework.

In the description of the interactive approach above, it was explained how the generic research questions were based on practical issues found within organizations in the Helix partnership. Although these questions provide some guidance in terms of study design, they are far too general to provide a conceptual framework. After having reviewed much of the literature on organizational change along with publications on Lean, the ambiguity described in chapters 2 and 3 became apparent, whereby translation emerged as a feasible theoretical lens for the study.

As I entered the field, the research questions gradually became more defined, and the empirical material contributed to a new understanding of theory. This interaction between observations and theory continued throughout the entire study, and even well into the writing process.

In essence, this process is what is referred to as abduction, albeit somewhat more elaborate compared to the general description provided by Alvesson and Sköldberg (2009). According to Pettigrew (1997), this is a natural part of the research process.

> (…) deductive structuring is only a prelude to a more open-ended process of inductive reasoning and pattern recognition. (…) It is in this constantly iterating cycle of deduction and induction that the real creative process of the research takes place. (Pettigrew, 1997, p. 344)

In practice, the process has involved analysis on several different levels, as discussed by Miles and Huberman (1994). First, a rough conceptual framework was produced, based on the theories presented in chapter 4. This framework was then adapted into a coding system, which was used to highlight elements in the interview transcripts, meeting minutes and other documents. With some iteration, the conceptual framework was reassessed and adjusted, and the material was searched for trends. After further iteration, the conceptual framework was adapted further, and finally tested for the bulk of material, whereby the final analysis was created. This process is illustrated graphically in figure 6.2 below.

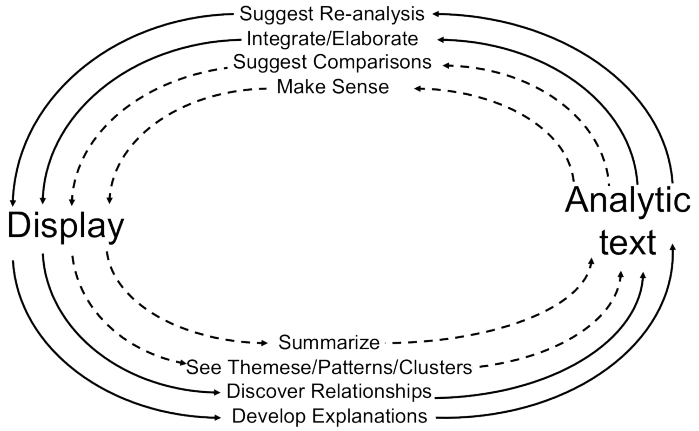


*Figure 6.2 Iteration between graphical displays and analytical text (Miles and Huberman, 1994, p. 101)*

In figure 6.2, the process begins somewhere along the inside track. In this particular situation, the start was a conceptual framework (display).

For each iteration, the process advances radially, with the goal of developing explanations for the final analytic text.

> The holistic ambition is not just about pattern recognition of the process stream, or handling the analytical complexities of explanation in the interactionist field, but also lies in linking these analyses to the outcomes of the process under investigation. (Pettigrew, 1997, p. 340)

According to Yin (1994), this kind of "explanation-building" mode of analysis is iterative by nature. In accordance with Yin's sentiments about this type of analysis, the final explanation was not fully developed at the beginning of the study.

## 6.6 Structuring the case

With a study design inspired by Barley (1990), it is probably not surprising that the analysis strategy borrows from the same source. In phase 1 of this study, a static image of the HiTech organization is produced. There *is* an element of time in the interviews, since they span over a time period of a few years, but overall the outcomes of this phase can be viewed as a snapshot of the organization. In phase 2, however, time is an essential elements as the changes unfold. Following Barley, this gives rise to two different modes of analysis, synchronic and diachronic.

> Whereas a synchronic analysis would freeze time and look across a (…) department as a whole, a diachronic analysis would seize time and examine the developmental path of a specific technology's use. Said differently, a synchronic analysis would compare technologies with each other, whereas a diachronic analysis would contrast earlier and later periods of a single technology's use. (Barley, 1990, p. 223)

Because of the different nature of both empirical material and aims, the results from the two phases are presented in two separate chapters, 7 and 8, respectively.

Case studies are often presented as some kind of narrative. By the nature of the case study, these narratives tend to become rather 'thick' as they aim to capture reality in all (or at least most of) its complexity (Flyvbjerg, 2006). According to Yin (1994), a narrative approach may help to identify causal relationships between elements in the case that are not necessarily included in the original theoretical propositions. The case description can thereby have a greater contribution to theory development.

There are of course several ways to structure such a narrative. As suggested by Yin, the description can be built from theoretical propositions, which enables it to be used as a clear basis for a subsequent theoretical discussion. Similarly, the case can be structured based on a number of research questions that are 'asked' to the empirical material. While these approaches definitively have their merits, there is a downside. According to Flyvbjerg (2006), such an approach points the reader towards a particular interpretation of the case and hinders alternative explanations of the phenomena at hand.

> The goal is not to make the case study be all things to all people. The goal is to allow the study to be different things to different people. I try to achieve this by describing the case with so many facets—like life itself—that different readers may be attracted, or repelled, by different things in the case. (Flyvbjerg, 2006, p. 238)

Based on Flyvbjerg's idea, I have aimed to prevent the case description from becoming all too infused with particular theory. I have therefore chosen a structure based on the chronology and thematic affinity of events.

The discussion above does not only apply to the structuring of the case, but also to all the methodological decisions that have been made throughout the process. With this in mind, it is pertinent to reflect on what implications these choices may have for the quality of the study.

## 6.7 Reflections on methodology

Most scholars in qualitative research will agree that all observations are infused with theoretical assumptions. Despite our at times rigorous scientific methods, there is always a need for us as researchers to interpret our observations and draw conclusions. The interplay between our basic assumptions, theories and empirical data is something that most scientists can agree on, regardless of ontological stance (Fishman, 1999; Fleetwood, 2005; Hassard, 2007).

According to Alvesson and Sköldberg (2009), it is impossible to separate knowledge from the researcher. As phrased by Hassard (2007), this requires that "we must possess the ability to be critical of our own intellectual assumptions" (p.312). From the tradition known as sociology of scientific knowledge, we have learned that this also applies to the natural sciences (Knorr-Cetina, 1981; Latour, 1987). The implication of this is that any scientific study is unlikely to be able to discover the true

nature of things. According to Hassard, such ambitions should be considered "naive and mistaken" (2007, p. 312).

Instead, a researcher must critically reflect on how s/he influences the results of the study (Alvesson and Deetz, 2000). Alvesson and Sköldberg (2009) suggest an extensive form of reflection on multiple levels of a study. I will not take on such a bold ambition here, but there are some areas that deserve closer attention.

### 6.7.1 Reflections on the study design

The theoretical contribution of a case study is often assessed in relation to its validity. With respect to this discussion, Yin (1994) distinguishes between three types of validity. Firstly, the *construct validity* indicates the establishment of the study object as a clearly defined entity. The discussion about the convergent and discriminant validity of Lean in chapter 2 is an example of how construct validity comes into play. However, it is not enough to demonstrate a cohesive definition of the study object. The researcher also needs to prove that the study object in fact is a relevant indicator of the more general phenomenon that the study addresses.

Secondly, the *internal validity* of a study pertains to the causal relationships between elements in the study (Miles and Huberman, 1994). If the researcher wants to show that $X$ leads to $Y$, s/he must show that this relationship holds true, and that the simultaneous (or successive) occurrence of $X$ and $Y$ is not random or bound by contextual factors that are not addressed in the study (Yin, 1994). According to Miles and Huberman (1994), the researcher needs to establish a chain of evidence that links $X$ to $Y$, without any gaps in the chain.

Related to the internal validity, Miles and Huberman (1994) recommend the researcher to keep a low profile in order to avoid influencing the case; a piece of advice that has been implemented in this study.

Thirdly, a study is assessed based on its *external validity*, which applies to the generalizability of the study findings. The main question is how the researcher is able to draw conclusions outside the boundaries of the case/s included in the study. The case study approach has received much criticism on this point, with arguments that it is not possible to generalize beyond the boundaries of the case (Flyvbjerg, 2006; Tsoukas, 1989). A common approach to overcome this criticism is to increase the number of cases, which is considered to increase all three types of

validity; in particular regarding the external validity (Numagami, 1998; Yin, 1994). Vice versa, the validity of a case study is held to be low with a limited number of cases.

However, there is a merit to case studies that goes beyond the number game. Following Flyvbjerg (2006), being in situ allows the researcher to interact with people in the studied context, which can be a useful way to keep the researcher alert and avoid 'academic tunnel vision' by validating observations. The case study also allows the researcher to gain first hand experience from the context that is studied, thereby providing a more nuanced view of reality compared to other approaches.

> The most advanced form of understanding is achieved when researchers place themselves within the context being studied. Only in this way can researchers understand the viewpoints and the behavior, which characterizes social actors. (Flyvbjerg, 2006, p. 236)

According to Flyvbjerg, this kind of learning process often leads to a reassessment (and sometimes rejection) of the researcher's own preconceived hypotheses, thus leading to a more elaborate and advanced understanding.

Although a multiple case study is usually held as the ideal, there are some instances where the single case study has its merits. According to Firestone (1993), one of these is when the study constitutes a 'critical case', i.e. where the study is particularly suited for demonstrating a certain phenomenon, or a 'deviant case' that challenges prevailing perspectives on the subject matter. If the findings from such a case were to oppose existing theory, it could be seen as a part in a popperian falsification of theory, and a step towards improving or shifting theoretical positions (Flyvbjerg, 2006). Similarly, a single case may be used to confirm and strengthen existing theories, simply by providing yet another example, or applying them in a different area and expanding their scope.

In essence, the choice of study design is related to the overall knowledge interest of the study – whether the ambition is to prove something or to learn. These ambitions are related to two different types of generalization; formal and analytic generalization (Firestone, 1993; Yin, 1994).

In the study at hand, there is no ambition to make any formal generalizations, which is an argument that a single case is not problematic. However, there is a potential problem with the single case.

Compared to a multiple case study, individual respondents and contextual factors account for a greater proportion of the total material, which makes the study more vulnerable to bias from these sources. Also, the replication involved in a multiple case study allows for more repetition in terms of practical method, and would thereby provide a basis for comparison across cases, which would ultimately strengthen the study design. However, multiple cases require more work, which would imply that the depth of the study would need to be sacrificed. For the study at hand, a compromise is made between depth and generalization. The focus on a single case allows a richer description and deeper understanding of the case, and the embedded cases allow some comparison, albeit at a more superficial level compared to a multiple case design.

### 6.7.2 Reflections on structure and sampling

It is never easy to take on a research project for the first time, with new theoretical perspectives in an unknown organization, (mainly) by oneself. All of these factors have made this study a difficult one. However, these factors are difficult to avoid altogether, not at least because they are inherent to the doctoral research process.

But the study is also designed in a way that complicates matters. First, and perhaps most importantly, it is difficult to structure a prospective study. In several cases, authors of method books have described it as 'designing the plane while flying it', which is definitely an analogy I can relate to. This design principle has made the study rather open-ended, which also has implications for sampling. How does one make a good initial sampling? Perhaps another organizational unit would have provided a better and more interesting empirical basis? Although the subsequent 'snowball' sample at least accounts for a good direction for the study, one cannot help but wander if a better result could have been achieved with a different initial group of interviewees.

Also, being an explorative study, much effort is invested in going through documents and interviewing people that are later found to be of little relevance to the case. This is, of course, a consequence of a loose initial design. Creating a tighter design would perhaps have been time well invested in terms of efficient field work. On the other hand, the loose design provides many opportunities for learning that can be useful for future research endeavors.

On a similar note, finding out what is important for the case is both difficult and time consuming in a prospective study. Already before the field work has begun, interesting things are happening within the organization. And as a researcher enters the field, all sorts of (seemingly) interesting things are taking place all around. Catching all of these events 'on the fly' is an impossible ambition. It takes some time to sort out all the impressions and select the areas on which to focus.

In this study, there is one clear cut example of a missed opportunity. One of the main changes in the U-cell project (see chapter 8) was to invest in and install new machines. However, as will be shown in chapter 8, the delivery date was postponed over and over again. Most of the changes at the production unit rested on these machines being in place, or so I thought. So I did not focus all my attention on the case until the machines were installed. In hindsight, my assumption was incorrect, and many interesting things happened while I waited for the machines to be delivered. Although the events under this period were captured in retrospect, it would have been better – and more in line with the ambitions of the study – to witness them first hand.

### 6.7.3 Reflections on the chosen methods

This study is to a large extent based on interviews. Although parts of the study are aimed at the interviewees' subjective experiences, there is also an ambition to capture the actual events that have taken place at HiTech. There are several sources of uncertainty that need to be considered. First of all, the assumption that there is a correspondence between subjective experiences and actual events is not necessarily correct (Alvesson and Sköldberg, 2009). However, this does not automatically imply that the interviewees' accounts are entirely made up and decoupled from reality. Their experiences and interpretations are, in a sense, what constitutes reality at HiTech, since this shapes their understanding of the organization and guides their actions (Feldman, 2000).

Further, the subjectivity can be aggregated to a general level to produce a collective construction of a given situation or phenomenon (Ford, 1999). This is especially relevant for the first phase of the study. Being based on retrospective interviews, there is a risk that the interviewees describe a collectively constructed sequence of events, or simply that their recollection fails (Voss et al., 2002). This is, of course, problematic from a representationalist point of view. However, as stated above, the

subjective accounts are interesting on their own, and if it is possible to identify some sort of collective subjectivity, this is interesting by itself, especially from a translation perspective. From this point of view, a purely 'objective' description would actually provide less interesting results.

Although we can conclude that the element of subjectivity in interviews is not necessarily a problem, there are other things that might be more problematic.

According to Kvale (1996), there is a common misconception that an interview can be compared to an informal conversation between the interviewee and the researcher. There is in fact a great power imbalance between the involved parties, which begins even before the interview session. The researcher sets the topic for the interview and thereby limits the possible outcomes. According to Alvesson and Deetz (2000), this projects a number of expectations on the interviewee, and will inevitably shape the statements that s/he produces. The outcomes will thereby be shaped by cultural norms in the setting within which the interviewee normally acts as well as in the interview situation itself (Silverman, 2006). This may create an overly positive bias in the interviews, whereby the interviewee strives to fulfill the researcher's expectations rather than provide a 'truthful' account of the situation in question (Alvesson and Deetz, 2000). In order to avoid this kind of confirmation bias, care has been taken not to disclose to the respondents what is known about the case (Miles and Huberman, 1994).

### 6.7.4 Reflections on producing the text

While the initial challenge was to find focus in the very broad and complex field of organizational change, the challenge in the latter stages of the study has been to know when to stop the abductive iteration and collate the results. Even now, in the very moment that I am writing these words, new impressions and possible interpretations of the empirical material come to mind.

## 6.8 Summary

This study has been developed through an interactive approach in close cooperation with the company that has been given the pseudonym HiTech Inc.

The study has been performed as a single case study, with focus on the introduction of Lean at HiTech. This process has included a number of minor projects that have been treated as embedded cases.

The study has been carried out in two phases; one retrospective and one prospective. While the first phase of the study has been based on interviews alone, a longitudinal approach has been used for phase 2, studying one of the pilot projects at the case company HiTech Inc. The second phase of the study has used interviews as a primary source of information, together with other methods such as direct observation and document studies.

The results from each visit to the company have been summarized and presented to the respondents in feedback seminars. These seminars have served the dual purpose of communicating preliminary results of the study as well as providing an opportunity for validation.

The overall analysis strategy can be described as an *abductive* process, with several analytical iterations.

# Part IV
# Case study

# 7

# Lean at HiTech Inc.

*You certainly usually find something, if you look,*
*but it is not always quite the something you were after.*

– T. Oakenshield

*This chapter is largely based on the first phase of the study, and provides an overview of the Lean initiative at HiTech. The chapter describes how the concept was introduced in the company along with the initial attempts to convert it to organizational practice. This description will function as an empirical backdrop to chapter 8 and will also provide a basis for the analysis in chapter 9.*

The main empirical base of this thesis is a case study at a large manufacturing company in Sweden, HiTech Inc. (a pseudonym). HiTech produce, sell and service complex machinery for industrial applications. The majority of the company's production is located the middle part of Sweden. The main site has approximately 2000 employees and is thereby one of the largest organizations in the region.

The HiTech site is a quite complex organization. From a wide perspective, the organization can be described as a divisional structure, comprising seven divisions. Each of these divisions can be described as a traditional hierarchical structure with functional departments. The case study at hand is centered on the production division of the company, which is distributed across three factory floors, each comprising up to eight production units. The production division employs about 500 people.

## 7.1 Introducing Lean at HiTech Inc.

In 2003, an initiative to introduce Lean came from the corporate production coordinator, Cody. Drawing on his experience from the automobile industry, Cody wanted to make improvements at HiTech by

introducing Lean methods. His main contact was the division manager Dave.

Just as many others at the time, Dave had a quite negative perception of Lean prior to the current Lean initiative. The view that Lean implied downsizing and harsh working environments was well established within HiTech. Dave referred to the conception of Lean as being 'mean production' and leading to 'anorectic organizations'.

> Input from professors at the university, together with something you read, and then there were a couple of us that triggered each other to dislike Lean, based on that perspective. (Dave, production manager)

However, Dave explains that through discussions with Cody, he gradually revised his negative view of Lean, and started to see the possible benefits of the concept. Together, Dave and Cody discussed what they saw as fundamental principles of Lean and made the decision to introduce the concept at HiTech.

> It was about teamwork. It was about continuous improvement. It was about standardization and improvement based on a standard. It was about simplification. It was about takt, that you takt and pulse and create a sense of pace in the organization. So, standard, continuous improvement, teamwork, level workload, takted production flow; somewhere around there were the fundamentals. (Dave, division manager)

Dave and the production management team carried further discussions about the possible benefits of becoming a 'Lean organization'. However, they quickly discovered that they needed a deeper understanding of the upcoming challenges.

With the ambition to increase their knowledge about Lean, the members of the production management team attended lectures on the subject, made field trips to other organizations that had experience of the concept. They also had a book circle on the book 'The Toyota Way' (Liker, 2004). However, the initiative was not very successful.

> We were supposed to read a chapter every third week and then meet a couple of times, and then it became a never ending story. It would perhaps have been better to read the whole book in a month or one and a half, and then take a one-day seminar on it or something, but that is easy to see in hindsight. It didn't work. (Dave, division manager)

Seeing that they did not have the capacity to drive the change process on their own, a 'Lean coordinator' was brought in as an advisor to the

management team, and they also invited an external consultant to assist them.

## 7.2 Planning the change

With the help of the consultant, the previously vague idea of Lean Production started to take form. He constructed an implementation plan that advised HiTech to begin their journey towards the vision by implementing a few basic methods, and use these as a base for successively implementing other methods associated with the Lean concept. The consultant suggested that HiTech should start off with two methods; 5S and Visual Management.

The first method, Visual Management (VM), is a version of policy deployment oriented towards communication and problem solving. The division manager, Dave, explains.

> Visual management contains a bit of Lean thinking. The purpose is to improve the information flow, reviewing what works and what doesn't. (…) We focus on the production flow instead of upper management, and use a process that goes bottom-up and then top-down in terms of problem solving. (Dave, division manager)

As the purpose of VM is to put focus on the vertical flow of information within the organization, it is a method that involves people at all hierarchical levels. The VM method is described in more detail in section 7.3.1.

The second method was 5S (housekeeping), which aims to reduce the time spent on looking for tools and materials by maintaining an orderly work environment. The 5S method is described in more detail in section 7.3.2.

These two methods were supposed to be the first stepping stones towards creating a Lean production system at HiTech. However, when asked to explain the next steps of the implementation plan, no one seems to be able to provide an answer. Several people were asked about the plan, but no one was able to produce it or to give an account of the next steps in the process.

> Well, for our part, it feels like it is only this housekeeping business we have been exposed to. It is difficult to say anything else. I do not even remember what we were supposed to do next (laugh). (Operator)

The closest thing to an implementation plan was the list of principles that came out of the discussion between Cody and Dave. Cody's

ambition was to use these principles as a foundation for creating a set of measurements through which he could control the change from a distance. The Lean coordinator translated these measurements into a chart that would provide an overview of the progress towards Lean.

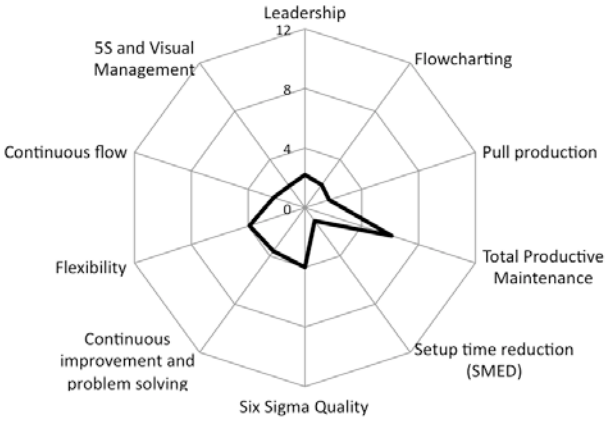


*Figure 7.1 Assessment of Lean at HiTech, December 2004*

One of the ambitions with the chart was to use it to control the change process. However, this did not really work out as planned.

> We had a spider chart that was an attempt to show how far we had come in the Lean transition. Cody tried to set concrete measurements for the implementation. (…) I guess the thought was that we were supposed to be influenced, but in reality we were not really affected. (Dave, division manager)

Although several respondents refer to the chart in the interviews, it was surprisingly difficult to locate. Dave referred to the Lean coordinator that had constructed the chart, but it turned out that he had left his position and was not available. The production manager, Pierre, was also unable to find the chart. The new Lean coordinator, Leanna, was able to retrieve the chart from the company server, but at the same time, she pointed out that the chart was not in use anymore. This was not surprising, since neither Dave nor Pierre were able to locate the chart. The lack of use was also apparent from the file information, which revealed that the chart had not been updated for more than two years.

## 7.3 Practical applications of Lean

As mentioned above, the initial phase of the 'Lean journey' was focused on the two methods 5S/Housekeeping and Visual management (VM). Almost the entire organization was affected by these two methods. In order to promote the implementation progress, a number of Lean experts were assigned. The overall efforts are coordinated through the 'Lean coordinator' who is a part of the production manager's staff. At the operative level, 'Lean implementers' were recruited to support production supervisors and operators in introducing the new methods.

### 7.3.1 Visual Management

The VM method is based on a set of interconnected daily meetings across the organization. Fifteen minutes is allocated to each meeting. Beginning with the shop floor, each production unit has a meeting during which non-conformances and current problems are discussed. If someone is able to solve the problem, s/he is given the task to do so and report at the next meeting. Problems that cannot be solved directly are brought up to the next hierarchical level in the organization, which will convene half an hour later. This principle is repeated all the way up to the top management team, who will decide what to do with issues that have not been solved at the lower levels.

Visual Management is held in a designated meeting area, and always at the same time of day. The meeting area is dominated by a big whiteboard, which gives an overview of the main points of interest for each department.

Figure 7.2 gives an illustration of the layout of a VM board, which is taken from HiTech's internal material. The production level board is divided into four sections; (1) Work environment/Health and safety, (2) Quality, (3) On-time deliveries and (4) Production volumes. Each of these is divided in sub-sections that illustrate the current status and any trends. The side of the board has an area allocated for any action points that are decided during the meetings.

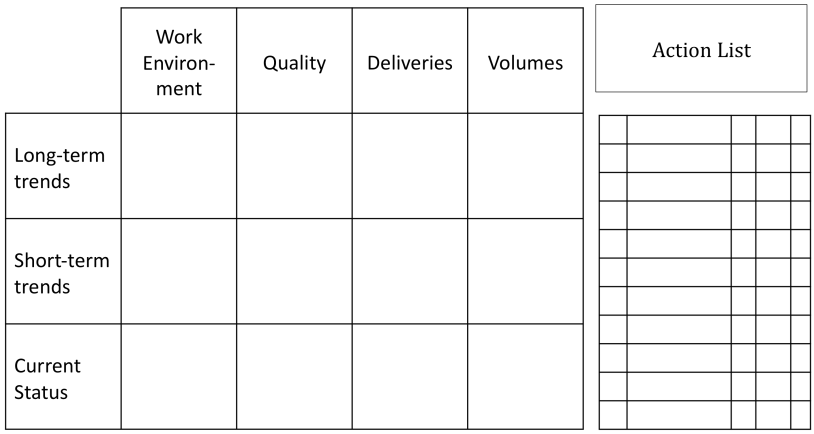


*Figure 7.2 The layout of a VM board*

As indicated above, the VM board also serves as an agenda for the meeting. Going from left to right, each topic is covered, and any new information is recorded on the board.

It seems that things have worked quite smoothly regarding VM. Most people seem to appreciate the method, and claim that it has worked well.

> It has been very appreciated in the entire organization. I can tell you, it wasn't at first. But now, after a few years, it has become very powerful. (Dave, division manager)

> Visual management came up through our discussions in the management team. We have run it for a couple of years, and everyone thinks it is very positive. (Florence, floor manager)

This positive view of VM is consistent across the interviews. It seems that the method is well established and positively received throughout the entire organization.

### 7.3.2 Housekeeping (5S)

The other method, 5S, aims to tidy up the workplace and to standardize the placement of material and tools. This implies a great deal of cleaning and discussion among the personnel at each workstation. The method is summed up in five words all beginning with 'S'; sort, set in order, shine, standardize and sustain (for an elaboration, see Chapman, 2005).

The division manager, Dave, explains the purpose of 5S in the following way.

> The way I see it, 5S is a foundation for creating a standardization perspective. That there is a standard that is followed, and that it starts to permeate the workplace, and the idea is that eventually it will influence processes and so on. (Dave, division manager)

The idea has been to go through each 'S' one at a time, beginning with simple cleaning and ordering, and then increase the level of standardization successively. It has primarily been focused on production, with an ambition to include administrative processes at a later stage.

According to internal documents at HiTech, the progress of 5S is followed up on a monthly basis through audits led by the production manager and floor managers. During the audits, each work station is evaluated based on eight criteria; (1) Shelves and tables, (2) Unnecessary items, (3) Cleaning equipment, (4) General workplace, (5) Information boards, (6) Health and Safety, (7) Documents and (8) Tools. All of these are rated on a five grade scale.

After the audit, any outstanding points are documented in an action list; and the eight evaluation criteria are visualized in a spider chart, both of which are posted on a small whiteboard at each work station. In order to support the operators' activities, a checklist for 5S is also posted on the board.

The work regarding 5S has worked smoothly in some units, and in some cases, operator teams have initiated 5S activities on their own. However, the overall picture points to a number of difficulties.

> We perform 5S audits, because it is important to show an interest in the work. But these audits (…) I do not feel that they have worked properly. People can feel that you step on their toes – that we are out meddling with production. And I get the impression that some feel that it is a bit ridiculous, but others think it is fun that we come out. (…) Taking a coffee cup and throwing it into the wall and screaming "darned idiots" in a 5S audit – that has happened. (Dave, division manager)

All of the activities around 5S obviously take time. All of the involved actors (both managers and operators) are already pressed for time to take care of other tasks. The cleaning and the audits are added to the total number of activities, thus increasing the time pressure even more. The number of evaluation criteria makes the audits very time consuming, and

eventually this causes the audit procedure to seize entirely. One production supervisor explains.

> We definitively do not have enough time to work with these issues, not even the Lean implementers. There are so many other things. We don't even have the time to do the audits to the extent we want to. (…) we are not so good at this because it takes a horrible amount of time.

The audits were a crucial part in emphasizing the method, and since they are not performed as planned, the interest in the method has decreased. As the audits became ever less frequent, it seems that the general interest in 5S diminished. The operators lose interest and invest less energy in 5S. Consequently, checklists are not used, and 5S-boards are used for other purposes (e.g. common notice board). A quite ironic example of this was encountered during a visit to one of the production units; the 5S-board for that unit lay on the floor, covered in dust and grease.

Through this negative spiral, the links in the 5S-network are gradually weakened until the network deteriorates and there is no choice but to start over.

> We have come a bit on the way, regarding 5S, but now we want to make a new start. We want to include the entire production organization and simplify the auditing procedure to make it better. (Pierre, production manager)

> Now, we have reconsidered 5S, and instead of having advanced audits with fifty checkpoints, we will go through the workplace and tidy up. Then we will take a photograph and use that as a reference. So when we do an audit, we will simply look at the photo and see if the workstation looks the way it is supposed to or not, and then we will create an action plan. (Floyd, floor manager)

In contrast to Visual Management, 5S has not been received in the same positive manner. Many people are critical to the method, and the perceived lack of time is a great obstacle to its application.

### 7.3.3 Training and information

As mentioned above, much time has been dedicated to discussing Lean within the production management team. The book circle, lectures, seminars and field trips to other companies are examples of efforts to enhance the understanding of Lean.

The change has been managed as a typical top-down process. In contrast to the efforts invested in training the managers, the operators

have only received general information about the concept at common meetings.

> Leander was supposed to be in charge of 5S, and he took a few courses and had some contact with others in the same position. (…) But I cannot remember that we had any kind of training for everyone, (…) we only informed people that this was going to happen. (Production supervisor 1)

The ambition to train the operators appears to be rather restricted. It seems that it has been limited to keeping them informed about the coming changes.

> We have given an information package at least once in all the production units. And Dave has given presentations when we've had larger gatherings. But it has probably not stuck in people's memories, and I don't expect it to either. (Pierre, production manager)

As opposed to the operators, managers and supervisors have been given courses several times over the years. All floor managers have attended a university course in Lean, and supervisors have been given a shorter course via a local training agency. However, it does not seem that training has made the image of Lean much clearer.

> When we sent the first group of production supervisors [for a Lean course], they asked 'what is this for?', and I answered that this is to raise their competence so they can work with Lean and improve the business. But they had a hard time realizing this. They want to have someone tell them what to do, but it's not that simple. (Pierre, production manager)

One of the production supervisors provides a similar account, and says that the level of abstraction in the training seminars sometimes become far too abstract.

As a consequence of the dispersed efforts of communication and training, different messages have been sent to different groups in the organization, resulting in different images of what Lean is.

## 7.4 Variation in the interpretations of Lean

A part of the study aimed to investigate the perceptions of Lean at HiTech. When respondents were asked to describe their interpretations of Lean and its purpose at HiTech, the accounts vary significantly across the hierarchical levels in the organization.

The people most committed to the Lean initiative are Dave and Pierre. Both of them describe Lean as a philosophy that should permeate the entire organization. The managing director Manny provides a

completely different, and more pragmatic description. He describes Lean as any conceivable form of cost reduction, for example putting barcodes on a box to simplify registration of shipping information.

Among the operators, however, there is an almost unanimous consensus that the purpose of Lean is 5S and Visual management. As stated by one operator "you only take in what you want to – or what you are exposed to. And that is 5S and Visual Management".

One respondent even said that some interpret Lean as "meetings where we have coffee bread". This was probably (and hopefully) said with some irony, but it still illustrates the difficulties of reaching out to people and create a coherent image of the concept.

When asked to explain the lack of coherence regarding Lean, both Dave and Manny point to difficulties in communication between various organizational groups, and the hard challenge of creating consensus between several hundred employees.

> A book written by a professor, how many of the individuals in the organization can make use of that? (…) And that is the problem, that in the upper pyramid [upper management] there are academically trained people who can do that, but in the base [operative level] you have engineers and metal workers. That is where it happens. (…) You need to have grounded people who can turn the theories into a language that people understand. (Manny, managing director)

Dave states that there are some managers who do not express their disagreements on the decisions being made at management meetings, but rather go back to their departments with their own agendas. One of these people is the floor manager, Florence.

> We looked into it and concluded that Lean was in line with the way we want to work and are working already. (…) we work a lot with reducing lead times out here, since it is so important; we have such long lead times. (…) I mean what is Lean really? It is lead time reduction. (Florence, floor manager)

Florence says that there is a difference in perspectives between the production management team and the work in his department. He says that lead time reduction is essential in his part of production. Together with his subordinates, a local interpretation of the concept has therefore been created in order to place focus on reducing lead times.

## 7.5 Perceived obstacles to change

In terms of organization HiTech is very traditional; budgets, responsibilities and resources are tied to specific departments. One effect of this is difficulties in making cross-departmental changes, which is a sine qua non for reaching the goal of a synchronized production flow. Although attempts have been made for years – since long before the Lean initiative – to overcome departmental barriers and create a greater process orientation in the organization, not much progress has been made in this area.

> We have had the same problem every time we have talked about processes, whether it has been under the cover of Lean or if it has come from a quality perspective or whatever, it is a heavy and really old hierarchical business to introduce a process perspective. (Dave, division manager)

> Although we've been working with this since 2003, I would say that 90 % of all supervisors want queues in front of their machines, to ensure a steady generation of income [machine utilization], regardless of whether there's a customer need downstream. So this is a major cultural change, and we need to accept that it takes time. We have made some progress, but we still have far to go. (Pierre, production manager)

Several respondents point to the need of educating people in order to break their existing behavioral patterns, and when discussing the results of the change initiative, communication and training are recurring issues. For instance, when commenting on the outcomes of the 5S initiative with the division manager Dave, he argues that problem lies with the inability to reach the operators' understanding of the method.

> We have probably not succeeded in explaining the depth and the ideas of 5S, but it has rather been seen as a ridiculous cleaning project. (…) In our management group, we were very clear about this being a step towards the establishment of standardized work. To what extent that was communicated in other management groups or directly towards operators, I do not really know. (Dave, division manager)

This was one of the reasons for bringing in the consultant. He was supposed to train managers and make sure everyone had the same knowledge base. However, as described in the previous section, this did not work out according to plan, and the general knowledge about the concept was left open for people to explore and interpret on their own.

> He [the consultant] was mostly a management consultant, so he supported Dave mostly. The rest of us did not feel that we had any use of him, because we are more operative. And if we are going to do something concrete, just talking does not work. And he did not cut it when it came to that level. So we have learned that on our own. (Pierre, production manager)

However, communication is not the only issue in the change process. Several respondents also point to an inherent conflict between contextual factors and some core ideas of the Lean concept. For instance, the tension between the budgeting system and the principle of just in time production.

> If there is no demand from the customer, do we stand still? In our world, that costs millions a day. (…) We have, traditionally, been very focused on machine utilization, which is connected to our budgeting system. (Floyd, floor manager)

The Lean implementer Leander points to a central problem that follows in the backwater of this issue:

> You create problems for yourself if you reduce the lead time without volume to put in. It reduces your income, and thereby the interest. (…) It is difficult to do changes when you do not have support from above and when there are [financial] goals that point in the opposite direction.

Several respondents point to this issue, and argue that top management needs to establish a vision and a strategy regarding Lean in order to overcome this issue. But as described above, there is substantial disagreement between managers at different organizational levels about what the proper approach to Lean should be, which has left the employees without an image to guide their actions.

> This image does not exist – what is Lean? Well, it does not exist with the operators, and I would argue that it does not exist within the management team either. We do not have a production strategy or philosophy or what we should call it, what we should aim for. (Florence, floor manager)

## 7.6 Lean at the strategic level

HiTech has encountered a number of different management concepts and been subjected to several change efforts over the years. The corporation has a standardized framework for improvement work, which is heavily based on Six Sigma. In recent years, there have been discussions at the corporate level to include Lean in this framework.

However, this decision was fraught with uncertainty for a long time, which has stalled the process.

> The connection between Lean and Six Sigma has varied in strength, where Six Sigma has been considerably more mature while Lean has been immature at the top level [of the corporation], and this is why they have not known how to control it or even whether they should control it. (Dave, division manager)

Because of this hesitation, the Dave and his team took charge of the process and focused the Lean initiative on the production organization. Lean was thereby introduced as a standalone concept that was decoupled from the official improvement framework. Several interviewees point to an apparent conflict between Lean and Six Sigma. As a part of the official framework, the organization has a separate unit of internal consultants that lead improvement projects. Several of these seem to feel threatened by the Lean concept.

> You work hard with Lean in one place and work hard with Six Sigma in another place, and then you feel that they are in conflict with each other. We have seen this in the organization. (…) Some Six Sigma experts express their frustration. I believe this is because they do not know what Lean is. (Internal consultant)

The production manager, Pierre, provides another aspect of the 'conflict' in pointing to a fundamental difference in the corporate view on Lean and the one that has emerged at the local level.

> The corporation probably has a different approach to Lean, where it is seen more as a project in which Lean tools are used to run simpler projects, and when they become more advanced it transgresses into Six Sigma. And this is the complete opposite of mine and many others' view of Lean. (…) And it is clear that there are people who subscribe to Six Sigma and want to include Lean as a subset to Six Sigma and vice versa. (Pierre, production manager)

Since the signals from the corporate level were quite vague, an ambition to create a localized version of Lean emerged within the production division at HiTech. Dave and Pierre have been the principal agents in this initiative. Their attitude to Lean has changed dramatically, from being skeptical to being totally convinced that this is the right approach for HiTech.

Over the years, the approach to Lean has evolved from being rather general and vague (cf. fig 7.1) to becoming more focused. In 2008, the initial hesitation had turned to an ambition to create a localized version of Lean – HiTech Production System. In line with this ambition, a new

set of focus areas were developed to guide and monitor the progress towards Lean operations. These are visualized in a rudimentary graph that provides a rough estimate of the current status for each of the nine focus areas. This graph (with the status from February 2010) is presented in figure 7.3.

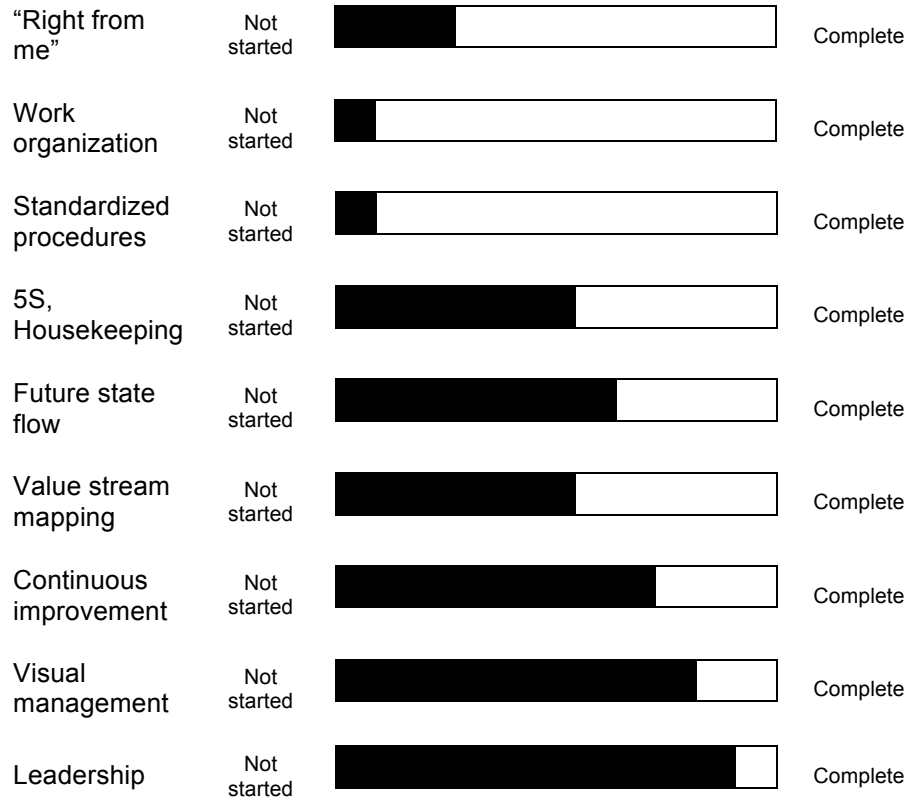


*Figure 7.3 Focus areas at HiTech February 2010*

The graph serves a dual purpose; first, and foremost, the nine areas serve as reminders of what the important factors are in the progress toward Lean. Also, the estimates of current performance constitute a high level action plan for the ambition to create a HiTech production system.

Simultaneously, the move from hesitation to conviction also took place at the corporate level. And just as the HiTech Production System was about to be launched, orders came from the head office that every site within the corporation should now apply the new Corporate Production System (CPS).

> We were about to launch our own production system two years ago, but it was halted because we found out that there is a corporate production system that all sites are expected to be a part of. We have done a so called screening, where we have gone through the organization in eighteen different areas. The thought is that we work with it ourselves and develop action plans and so on. And we do this every second year, is the idea. (Pierre, production manager)

However, not all parts of the organization are committed to the corporate initiative. The production division, under Dave's supervision, is the prime driver regarding Lean within HiTech, while other parts of the organization are not as enthusiastic. Dave expresses some frustration that the managing director, Manny, does not take steps toward a harmonization of Lean within the entire organization.

> On some occasions, he has mentioned Lean as an approach, but he has never formulated anything under the word Lean. He has not assumed a position or even discussed the level under the word Lean. Well, at least not publicly. (Dave, division manager)

While Manny explains that he feels obliged to mention Lean from time to time in order to satisfy the expectations from other actors, he is also hesitant toward including Lean in the overall strategies of the company.

> My opinion is that Dave needs to consider the tools he needs, of which Lean is one. But another part of the business, for instance sales, will approach it in a completely different way. We have seven large divisions. And from my point of view, they need to live their own lives, since they are so different. (Manny, managing director)

Pierre explains that the lack of consensus within HiTech has resulted in political discussions and power games. Pierre explains that people in purchasing do not want to be subordinated to a 'production system'; they prefer to work with 'world class purchasing' instead. According to both Dave and Pierre, it is a big problem that the entire organization is not included in the Lean initiative. They both argue that this causes difficulties in synchronization between different units, for instance between purchasing and production, which in turn increases the risk of sub optimization.

> Toyota has a great advantage in having top management commitment in this, but it is not like that in other companies. When it comes in farther down in the organization or someone higher up says 'you take care of this', it is not the same thing. (Pierre, production manager)

In recent years (since 2009), the responsibility for Lean has been placed in a staff function, led by the Lean coordinator, Leanna. Dave explains that he sees some risks with this structure.

> I was hoping that we, in some way, could create a linkage (between construction and production) and that I could be a part of that linkage. But the linkage is now in Leanna's network, which places it outside the management structure. And that makes it less robust. (Dave, division manager)

The Lean coordinator, Leanna, presents a picture that is somewhere in between the perspectives of Dave and Manny. She describes the overall Lean initiative within HiTech as a local adaptation of the corporate model. Leanna explains the logic behind the model.

> We have discussed our fundamental values in relation to our interested parties; customers, ourselves and our owners. This is shared for the entire site. Then, what methods and techniques that are used is up to each individual unit. Some people would like to standardize this part [methods/techniques] as well, so that it will be the same for the entire site. And perhaps we'll get there, but I have wanted to stop here for now. And if we can agree on this, I will be very pleased. (Leanna, Lean coordinator)

The corporate framework is quite extensive, and rather specific in terms of techniques and activities. In an internal document, the framework is described as consisting of nineteen action areas (similar to the focus areas in figure 7.3) and twenty-one different techniques. In addition, each site should have a set number of experts, certified according to the CPS framework.

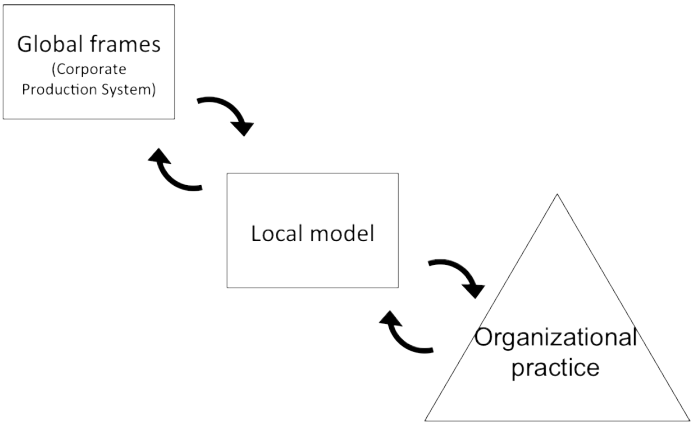


*Figure 7.4 HiTech's model for localizing the global frames*

Leanna describes her network as a filter that adapts the global frames of CPS to create an adaptation that is more in line with the local needs (see figure 7.4).

According to Leanna, this is necessary in order to create the individual freedom of the various units. She describes the local model in terms of values, principles, techniques and results. She explains that the values and principles need to be the same across the organization, but that the techniques, goals and results can be tailored to the individual needs.

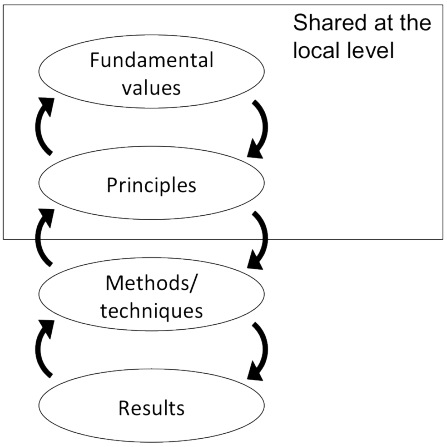


*Figure 7.5 HiTech's description of the local model for Lean*

This model then becomes the basis for each unit within HiTech to find their own application of Lean.

> This 'Lean@HiTech' is a local and national adaptation. It is connected to the global level – there is no conflict between them – but still, on this level, it is possible to create these local dialects. (Leanna, Lean coordinator)

The idea is that there should be a set of fundamental values and principles that are shared across the units at the local level (the HiTech site). Based on these values and principles, each unit has the freedom to decide what techniques to use, and what results that they aim to produce. From this perspective, Dave has decided to stop waiting for Manny to become convinced. Instead, he aims to create a Lean pamphlet that describes "our way of working with Lean" within the production division.

Also, based on the difficulties of implementing Lean across the board, a decision was made to initiate a number of pilot projects to learn how

different tools and techniques can be applied in practice. One of these pilot projects will be discussed extensively in the next chapter.

## 7.7 Outcomes of the Lean initiative

As described above, there is some variation in the outcomes of the different efforts related to Lean. On the overall level, there is much confusion about the meaning of Lean, and many different voices that communicate different messages.

The expectations on Lean also vary within the organization. All of the interviewees express a positive attitude to Lean, albeit with different levels of conviction. A few interviewees indicated that some operators have a negative attitude, but among the ten operators who have participated in this initial interview study, all of them have a positive attitude to the overall concept and believe that the quality of work will improve as a result of Lean. They state that Lean will provide greater possibilities for influencing their work and increase the efficiency of operations. However, when asked to describe the results that have been achieved, the response is very limited. One of the operators states, "I guess Lean is supposed to lead to better quality, but we haven't noticed anything". This notion is far from unique; when asked to describe the effects of the Lean initiative, none of the interviewed operators were able to point to anything concrete beyond the visible changes associated with new equipment and steps towards a cleaner workplace.

According to the Lean coordinator Leanna, a large proportion of the effort regarding Lean has been invested at a very abstract level. A lot of energy has been committed to the development of models and the identification of possible methods and techniques. However, according to Leanna, not much has been achieved in terms of action and results in the organization as a whole.

> We need to show more concrete results; otherwise we [the Lean network] have no justification for existing. We cannot only talk about Lean; we need to do things as well. And some people think that I am a pain in the neck for having that opinion. (Leanna, Lean coordinator)

As mentioned above, HiTech has initiated a number of pilot projects in order to reach this ambition. One of these has been studied extensively and is described in the next chapter.

## 7.8 Summary

The introduction of Lean at HiTech began during 2003, as a result of an initiative from the corporate head of production. The initial efforts were focused on introducing the methods known as 5S/Housekeeping and Visual Management (VM). The outcomes indicate a mixed success; 5S has not worked as planned, while Visual management has become an integrated and appreciated part of the practice at HiTech.

On a more abstract level, there is a multitude of interpretations of what Lean is and how it should be applied at HiTech. The meaning of Lean has been the subject of much debate, and is constantly negotiated.

In order to learn more about how the principles and methods of Lean can be applied at HiTech, a number of pilot projects have been initiated. One of these will be described in the next chapter.

# 8

# The U-cell project

*Try again. Fail again. Fail better.*

– S. Beckett

*This chapter is entirely based on the second phase of the study. Here, we will dig deeper into the application of Lean at HiTech by studying one of the pilot projects that were mentioned in the previous chapter. The chapter provides a detailed description of the project, which will, along with chapter 7, comprise the basis for the analysis in the next chapter.*

GV is a department within HiTech that produces components for the finished products. During the autumn of 2005, an initiative was made to improve the efficiency of production within GV. Two students did a project in which they analyzed the production flow within the department to identify opportunities for improvement.

As Lean was started during 2003/2004, it was realized that reference areas were needed for testing of principles. This led, among others, to the project at GV. According to the production manager Pierre, there was a curiosity to try kanban. One of the employees at GV expresses that introducing kanban "would be fun". This interest in kanban was one of the factors that formed what has been called "the U-cell project".

> The U-cell is considered a pilot project where we test parts of the Lean philosophy. (…) We need to learn for ourselves what it is, what is suited to our business and how we should control this. (Pierre, production manager)

During 2001, a decision was made to insource the products now produced at GV. The costs were high and there were problems with quality. The components produced within GV had previously been produced externally, and was gradually insourced between 2003 and 2005. Hence, the production of these components was quite new at HiTech/GV at the start of the student project.

At this point in time, GV had a product mix consisting of 41 different variations of the same component, with a total volume of about 500 units per year. In other words, this is an example of high variety/low volume (HVLV) production (Jina et al., 1997), which complicates the application of methods associated with Lean. A further complication is a large amount of variation in lead-time for the components, ranging from 10 to 70 days.

Despite these limitations, the department was seen as a good starting point to explore the further application of Lean methods and principles.

## 8.1 Project charter

The production flow in GV comprised seven different functions. Because of some looping, the production flow consisted of twelve different operations in total. The process can be summarized in the following steps:

1. Rough machining of raw material
2. Heat treatment for stress release
3. Fine machining
4. Sanding of rough edges
5. Inspection
6. Laser cutting
7. Sanding of rough edges
8. Parting
9. Inspection
10. Assembly
11. Soldering
12. Final inspection

The change initiative at GV was largely planned based on the logic of the five principles of Lean thinking described by Womack & Jones (2003), i.e. starting with specifying the value of the product, and then continuing by mapping the value stream, creating flow, applying the pull principle and continuously improve the system in pursuit of perfection.

After having mapped the value stream at GV, the project students arrived at the following suggestions.

- Setup times are long and need to be reduced
- The physical layout is inefficient and should be changed to produce a more linear flow and reduce transportation
- The process should be balanced to create a level work load
- Enhance throughput by introducing a fixed production pace
- Increase efficiency through a pull system with kanban control of material

Based on the suggestions from the project report, management developed a set of goals for improvement. These are presented in table 8.1 below. In May of 2006 a workshop was held to discuss the possibilities of realizing these goals. Based on the overall vision as sketched up by management, employees at GV were invited to take part in the discussion and suggest their ideas for layout changes within the department. The idea that was deemed most attractive involved the investment of two new machines to cover operations 1 and 3 listed above. These were to be installed to create a U-shaped layout, which gave the project the nickname 'the U-cell project'.

*Table 8.1 Goals for the U-cell project*

| *Area* | *Goal* | *Estimated time* |
|---|---|---|
| Production scheduling | Kanban system installed | 6 months |
| Layout | Decision on new layout | 7 months |
| Investment | New machines installed | 18 months |
| Lead time | 20 days | 2 years |
| Product cost | 20% reduction | 2 years |

In addition to the issues above, management held a presentation of the Lean concept, and discussions were held about risks of the project as well as immediate possibilities for improvement and preparations related to the project.

## 8.2 Expectations on the project

Apart from the explicit numerical goals listed above, there are many expectations on the project. First of all, certain expectations are explicitly formulated in the project charter. These include the introduction of pull production through a kanban system and production with limited manpower. Related to these goals, there are also a number of implicit expectations. One implication of having limited manpower at GV is internal flexibility among the operators, which in turn implicates a greater degree of standardization.

Further, the initial struggle to implement Lean across the board caused the division manager to reassess the strategy, whereby a decision was made to initiate a number of pilot projects in different sections of production. Being one of these pilot projects, there is an expectation on the U-cell project to contribute to a deeper understanding of the challenges of applying Lean at HiTech. A part of the pilot strategy is to test different Lean methods and evaluate their applicability in the organization in order to find the "HiTech way" of applying Lean.

> There are many projects. There is the M-cell, and we have the R-flow, which are both part of cleaning up operations. And then there is the U-cell, which is considered a pilot project where we test parts of the Lean philosophy. (Pierre, production manager)

There is also a political dimension to this project. Being a part of a multinational corporation, HiTech is eager to demonstrate that Swedish production can compete with low cost countries in terms of cost efficiency. In addition to the explicit goals of improved efficiency within the project, there is an expectation that the U-cell will contribute to a better understanding of Lean in general and in extension improve the efficiency of the whole manufacturing section of HiTech.

## 8.3 A new production flow

The current production layout is far from optimal in terms of efficiency. The flow of material is difficult to follow and the same material is handled several times in the same machines.

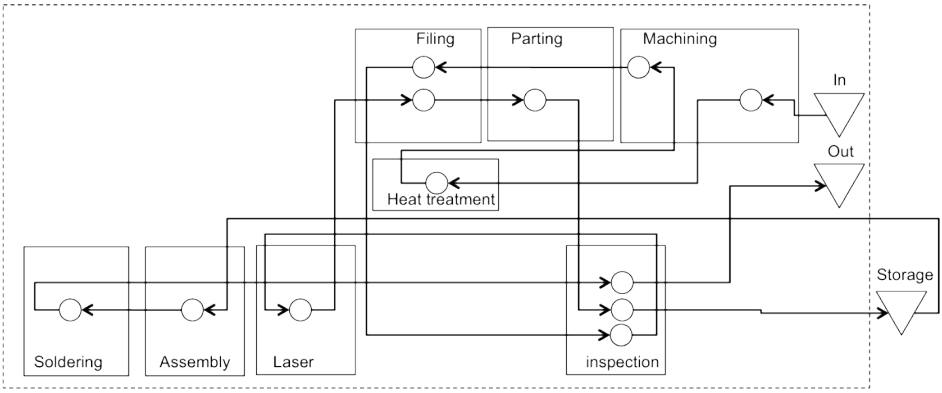


*Figure 8.1 The material flow at GV before the change*

Several changes are made in the production flow; both in terms of layout and equipment. New machines are purchased for operations 1 and 3. And instead of heat treatment, vibration is used to release stress in materials.

The basic design principle was that there should be two main shelves for inventory – one for incoming material and one for finished products. Also, in order to compensate for some of the variation in the production mix, buffers were to be placed between operations 8 (parting) and 10 (assembly). The shelves and the buffer were divided into subsections corresponding to the different product variants, and each variant would have a dedicated section.

So there will be about 30 units in the incoming shelves. The material is picked off the shelf and into the first machine for rough machining. It then goes into vibration treatment, and on to the second machine for fine machining.

From there, it goes into the laser to cut profile holes, continues over to parting, and into the buffer. From the buffer, the material goes to assembly, further to soldering and then final inspection. The finished products are then put into the shelves for finished goods.

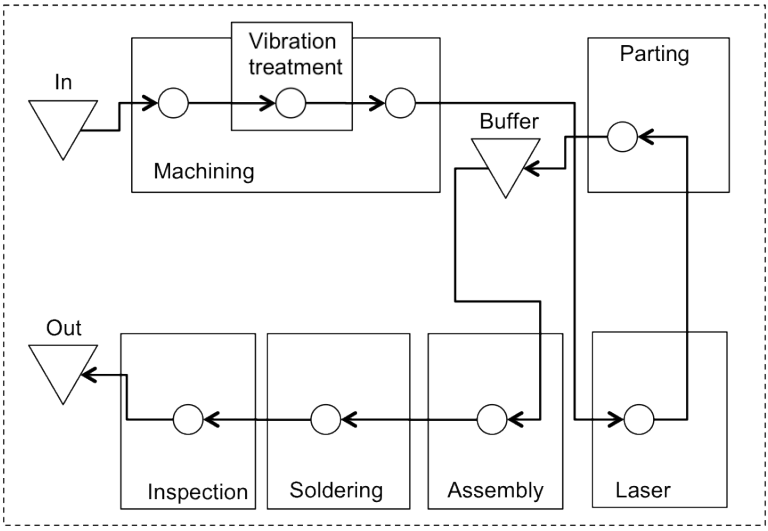


*Figure 8.2 The new production layout and flow of material*

So when the customer (final assembly) takes a component from the shelf, a signal goes to the person in assembly, who takes a part from the buffer and starts to assemble the component that is taken off the shelf. At the same time, a signal goes to the first step, machining, to begin the production of a new component of the same kind.

With the new layout, the flow of material creates (almost) a u-shape, which has given the project its name. The flow is also smoother and much easier to follow. There are no longer any loops in the flow; all material passes through an operation once, as opposed to the previous layout. To a large extent, this is achieved by incorporating inspection in the other operations. Only the final inspection is done as a separate task.

Since inspection activities are distributed, the inspector will have more time available. This allows him to be used as a resource for other operations, when necessary. This is illustrated in figure 8.3.

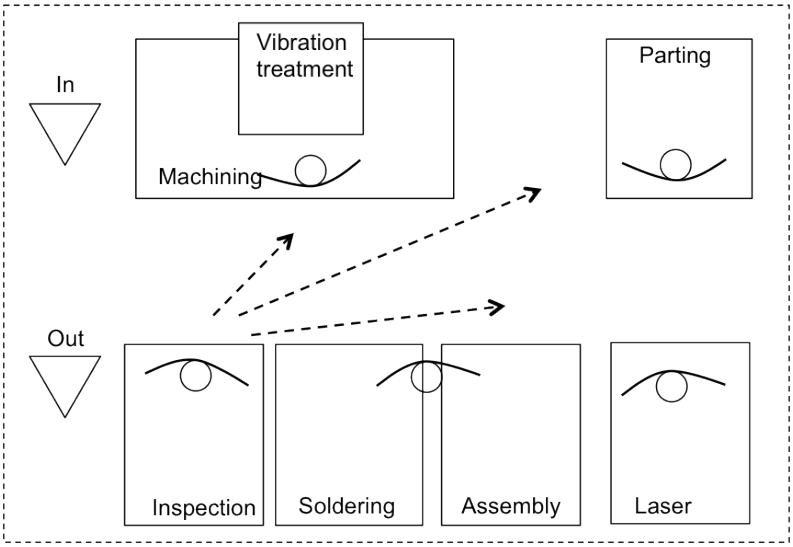


*Figure 8.3 The multi-manning idea at GV*

A key component in making this new layout work is the machines in the first operation. Since the old machines are used for many other operations, it would not be possible to have them available for production of GV components as soon as a production signal comes. A decision was therefore made to invest in new machines that could be dedicated to making GV components.

## 8.4 The machine investment

The machines that were in use at the outset of the U-cell project were far from perfect for GV's products. Being very flexible and advanced machines, one of the central ideas of the project was to free up resources in the current machines, and invest in new ones that were more specialized for the task at hand.

This decision was made very early in the project and has several benefits. Firstly, having machines that are specialized for a certain task reduces the complexity and will likely increase the speed of the operations. Secondly, and perhaps most importantly, having machines that are dedicated to one single type of product ensures their availability and thereby contributes to a more predictable production scheduling. The machines thereby play an important role in creating a fully functional kanban system. The entire project therefore rests on having the machines in place.

The investment project was initiated during the spring of 2006, and a project manager was hired. However, already after six months, the investment project manager leaves, and a new person need to be recruited. This, of course, delays the project somewhat.

A few months later, a new project manager is recruited, and the project is up and running again. A number of different machine suppliers are evaluated and an investment suggestion is sent to the division manager, Dave. He is positive to the investment, but would like a deeper analysis of how it would influence flexibility in volume. The investment decision was postponed, pending further analysis, which delayed the project further.

Once the analysis was done and a supplier was selected, the project meetings at GV were recommenced. During the 'relaunch' of the project in November of 2007, the time schedule was reassessed. According to the new schedule, the machines were expected to be in place one year later, in November 2008, and the project goals were expected to be reached six months later. In effect, the entire project has been delayed by more than a year.

A few months later, in March of 2008, HiTech discovers that the machine suppliers has large financial problems, and is threatened by bankruptcy. In the following months, this risk is deemed ever more realistic, and a decision is made to take over the machines in their current condition and finish the building in house. In the late summer of 2008, the bankruptcy is a fact, and during January of 2009, the machines are moved to HiTech and the work to finish them commences.

One of the main ideas in the U-cell is multi-manning; one person will run three operations (1-3) in parallel. This is largely dependent on the machine monitoring system, which has not been realized at this point. The operators explain that they need to trim the system. Also, there are tool problems that need to be solved, and there are some bugs in the control system that need to be sorted out. All these factors contribute to even more delays.

In November 2009, HiTech finally take over the machines, and a new schedule is made. A more or less 'normal' production starts in April of 2010, two whole years behind the original schedule.

## 8.5 The kanban idea

The principle of pull production is part of the Just-in-time philosophy. A common way to realize this principle is sending cards backwards through the production flow to signal the need for material. This method, known as kanban (the Japanese word for card), triggers production when the material is needed in later stages of the production chain, and creates a 'pull' of material through the production flow. Controlling the flow of material through a kanban system was one of the core ideas that emerged from the student project.

> An immediate improvement is realized by introducing a pull system using kanban and a paced production. Thereby, the queue times at each operation and the lead time is reduced (…) to seven days with a value adding time of 48 percent. (Project report)

Biweekly meetings were held to follow up on the progress of the planned changes. Already at the outset, the kanban initiative was delayed. The first meeting was held six weeks after the kickoff. In this meeting, the goals were discussed and through brainstorming around the kanban idea, the first step towards a realization was taken.

Although it was decided that traditional cards should be used to control the material flow, the possibility of controlling the flow through the business software SAP R/3 was soon brought up in the project. This option was explored in parallel with the introduction of the physical cards. In September of 2006, a meeting was held with the IT department to discuss the possibility of using the SAP module. A project description was created shortly after and was later assessed by IT to involve a substantial cost. This caused some concern for GV, and after some analysis and discussion the cost estimate was somewhat reduced.

However, a further problem in getting this process going is the issue of billing. Since the IT department is a shared service that technically is outside the HiTech organization, the final decision needs to be made in conjunction with the business improvement staff who are responsible for larger improvement activities in the company.

At this point in time, the machines were expected to be in place by the end of 2007, and all the details around the kanban system would therefore need to be worked out by then.

However, the project (and the test run) coincided with the introduction of a new version of the business system, which caused further trouble.

> It didn't work out with our new version of SAP, so I decided, ok, let's go with the standard then. But suddenly we have a full stop when we want to run the standard module. Why the heck can't we run a standard module? Well, that is… I don't want to think about it. (Stewart, production supervisor)

The ambition with the new version of the business system was to harmonize its appearance across the entire corporation. Apparently, the kanban module was not going to be included in this version, making the project bigger than it originally was. Because of this, the decision was pushed upwards in the organization, which caused further delays.

In April 2007, a new meeting was held with IT. It had finally been decided that GV can test the kanban module. An IT expert was assigned to the project with an allocation of 20% of his time. He suggested that the production flow should be modeled in SAP's test environment to see how it would work. This was to be finished by the end of May, but was unfortunately (like everything else) delayed.

> There is a lot of internal fighting, and it's because we do not understand each other. I am frustrated because I don't understand their processes and do not really know how to handle it or why it is stuck. It is my project, and my budget. And it cannot be a matter of resources, because this IT guy keeps calling me and wants to get going. (Stewart, production supervisor)

During the autumn of 2007 the kanban module is finally tested. The conclusion from the test is that the module supports the suggested control system at GV. However, a number of manual operations complicate the procedure, which could be amended through some minor adjustment of the system. The main problem, however, is that the primary/internal customer would have too many variants to handle in the software environment. Therefore, the project to create an electronic kanban system was terminated.

Although GV had been testing the card based kanban system for about two years, they were also using traditional production scheduling. Despite this seemingly long time, many issues were still unsolved.

For instance, the production planner Paul points to a conflict of interest between different systems (cf. section 7.5).

> We don't measure delivery dependability or delivery speed, we measure machine hours. The idea is to run according to needs and when there are none, we do improvements. These things contradict each other, and we have no clear directions from management regarding this. (Paul, production planner)

When asked about the strategic connection to Lean, the floor manager Floyd confirmed the opinion of Paul, that there is a conflict of interest between Lean and the financial system. However, he did not really have an answer to how this issue is addressed from a strategic level.

> There is a problem with the financial model with regards to the U-cell and the other parts where we want to create flow. We have not really discussed it, just decided that this will probably be the best way in the long run. (Floyd, floor manager)

The operators also express some frustration about the lack of clear signals from management. They say that 'everyone' is aware of the goal to reduce lead time, but argue that there are no routines for how the work should be done.

> We do not have kanban for everything – only for one component. (…) But we still work in the old traditional way according to the list, and then these [cards] drop in, and then you do not really know which one goes first. (Operator)

Curiously enough, in May of 2010, people were still waiting for the kanban system to be launched, although there was an 'official' start during the winter 2006/2007.

> Most of the problems are solved now, so it is really just a question of when the starting gun goes off. (Paul, production planner)

One issue that the respondents came back to was the filling of the inventory shelves and the buffer spaces. Although this seemed a quite simple task, the respondents always had reasons for not doing so. For the most part, it seemed that everyone was waiting for some other issue to be solved first – before the starting gun could go off.

> It has been a long journey, and we have felt that we are getting closer and think that we can start any time. But then we get some problems that we haven't thought of at all – like this problem with our raw material. I have spent a lot of time on that. (Paul, production planner)

Although a lot of time and energy has been spent on designing and testing the system, it seems that people are a bit insecure about the whole kanban idea.

> I think most people understand the basic idea, but we don't even know whether it works yet. (…) I am a project member, and I am still confused. (Operator)

Surprisingly, not many people outside the core team seem to be familiar with the ambitions of introducing this new control method. At one point, during the spring of 2010, it became apparent that only a limited number of people are involved.

> Researcher: So, how are things going with kanban?
> Operator: What is that?
> Researcher: You know, these cards that you are supposed to use.
> Operator: Oh, those. I don't know. I am not involved in that.

Despite this small issue, the people at HiTech expressed optimism towards realizing the kanban system. The production planner, Paul talked about the future in terms of "when we are going to work with kanban". The floor manager Floyd was equally positive. During an interview in January 2010, he expressed that "we are going to start in April". According to Floyd, it was just a question of getting the machines run in. The entire change would be fully implemented within the end of the year. The production supervisor, Stewart, shared his optimism, although he had a slightly different opinion of the remaining challenges.

> We have sent the first cards [kanban], and it has worked fine… Well, as expected. There is no 'grand opening' but we have practiced a bit. But now I guess what is left is filling the shelves and from the first of June organize the way we have decided to, and then just go. (Stewart, production supervisor)

However, shortly after, a big bump appears in the kanban road. Two new product variants are introduced, which means that the shelf spaces for raw material and finished products and in-process buffers would need to be expanded. This did not seem feasible.

> In a sense, we have reached our pain threshold for material in the production flow, and we really do not have space for more. And some of these variants – maybe – are rarely scheduled, we don't know yet. So it is a concern that the magnitude is greater. (Stewart, production supervisor)

During the latter part of 2010, the main assembly, which is the primary customer for GV, moved to a different location. This was yet another big bump in the road, which in effect derailed the entire project.

> We have not made any progress, in my opinion. And I don't think we will ever get to a pure kanban. Our whole concept fell apart when assembly moved. So all this does not really fill any function. (Paul, production planner)

The floor manager Floyd also comments.

> Well, there will need to be a complete reinterpretation of that [kanban], because what we had in mind won't work with all product variants that we have or will have. So we need to sit down and create a new vision. (Floyd, floor manager)

## 8.6 Outcomes of the project

In hindsight, it is apparent that the change that was scheduled to take about one year in fact took more than four years. Several respondents point to the problems that have arisen in the backwaters of the many delays in the project. One such problem is that many of the original project members have switched jobs during the process. This is illustrated in figure 8.4.

In figure 8.4 we see that several people change jobs or leave the company during the change process. A closer look at the illustration shows that several key people have left the project altogether. Three different people have had the role of Lean coordinator over the time period covered by the study. Although only one replacement was made during the U-cell project, the timing was far from optimal. Since this occurred just before the machines were in place, the newly appointed Lean coordinator would need to get an overview of the entire project in a very short time. Another key person was the production planner, who left halfway through the project. The production supervisor Stewart comments on the changes.

> Of course, I think this project group has been weakened a lot. And the knowledge and energy that was once there is not there any more. And that is partly because we lost our previous planner who was extremely skillful. (Stewart, production supervisor)

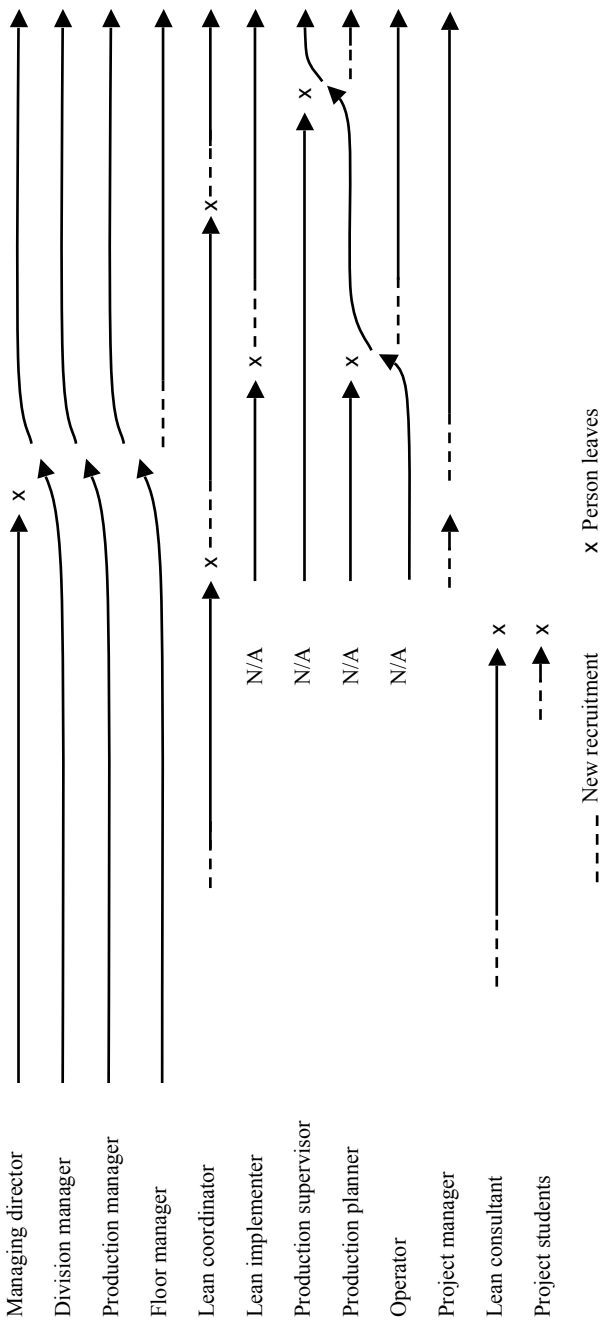


*Figure 8.4 Personnel changes within HiTech*

As the replacements were unable to reach the knowledge level of their predecessors, they never really managed to take over their roles entirely. In fact, the newly appointed Lean coordinator did not actively participate in the project at all. The production manager Pierre comments.

> Things like these [people changing jobs] make things fall between chairs, and we lose focus and make reassessments of the project. But I have kept track of it, and I feel like Stewart and I have the same perspective. But the longer time, the greater the risk that we change a large part of the core team. (Pierre, production manager)

Despite all the problems described above, the end result still points to a staggering improvement of the efficiency of the GV unit. According to the floor manager Floyd, the current lead time was eleven days in November 2010. This accounts for a total lead time reduction of 85% (from 72 to 11 days). The production supervisor, Stewart, says that getting down to the long term goal of nine days "only rests on us getting used to the new way of working". In addition, the product cost reduction is estimated to about 30%.

The respondents had different explanations for the actual improvements. For instance, the production planner, Paul, emphasizes the technical changes that have been made.

> The big explanation [for reaching the goals] are really the machines, and that we have been able to adapt them to the product. And we have managed to remove a tempo on all products. Now we finish them in one setup. (…) Well it is because the machines are horizontal, so just a simple thing like chips falling down and lying on the table. It is a big thing. In the old machines, we had to go in three to four times to clean up. (Paul, production planner)

Paul further explains that the stress release used to take about 12 hours, and the oven took about 10 products at a time. Now, stress release is achieved through vibration, and takes about 30 minutes.

In addition to the technical changes, the production supervisor Stewart points to changes that have been made in the process.

> We have removed, or included in other operations, a lot of non value adding activities. We have had inspections between and after machining, which we now replace with more correct tests. And traditionally the products have gone from machining to filing where it has queued for four days, and then the operation has been done in an hour or so. Now it is the responsibility of the machine operator to send on goods that are filed and ready. (Stewart, production supervisor)

However, one of the core ambitions of the project – introducing kanban – was not realized. Despite the trouble of launching a fully functional kanban system, the numerical project goals were realized. The floor manager, Floyd comments on this.

> We see that we can realize enormous savings in terms of lead time. And we see these effects although we have not started up completely. (…) We have reached, and surpassed, the goals that were set for the project. We even set tough goals. We wanted to push ourselves to see what we could reach, and we have surpassed that. (Floyd, floor manager)

In conclusion, the results have been achieved through various efforts that are not commonly seen as Lean. There have been attempts to achieve a higher degree of visualization through the shelves for incoming material and finished goods. The kanban effort is a typical Lean technique that also ties into this ambition. However, none of these have been particularly effective. The production planner Paul comments.

> The U-cell is supposed to be something of a 'bragging object' (skrytobjekt). But this visual stuff no longer exists as far as I am concerned. Well, the only thing that is Lean is that we have one operator running three machines. (Paul, production planner)

Although the technical changes seem to have had great impact on the results, the production manager Pierre expresses some frustration over how the U-cell project has become focused on the wrong things. He argues that the 'softer' project goals related to learning have been lost.

> There has been so much focus on these darned machines, and that's a pity. We have lost focus on the process itself, but I hope that we can regain that focus now. Because three years have passed since we started, we lose something. It is difficult to maintain focus when it takes so long. That's something to be learned here. (Pierre, production manager)

## 8.7 Summary

The pilot project (U-cell) has been associated with many different expectations. The main ambition has been to reduce product cost and lead time. In addition, there has been an ambition to introduce pull production (kanban). Although the primary reason for introducing kanban has been to learn how the method can be applied at HiTech, this has not been clearly communicated and the method has become associated with the numerical project goals.

The project has met a number of different obstacles, mostly because of changes in the surrounding context. The project has been delayed many times, causing the entire project duration to increase from two years to more than four.

The use of "Lean tools" has been very limited, and the ambition to apply kanban has not worked out as planned. The project has surpassed the numerical project goals. Since this has been possible despite the failure of introducing kanban, the commitment towards the method has diminished.

# Part V
# Discussion

# 9

# Analysis

*We all get lost, everyone in different ways*

– L. Beethoven

*As mentioned in chapter 1, this chapter is the heart of the thesis. Here, the theories presented in part II are brought together with the case descriptions in part IV. The analysis revolves around the three types of organizational translation that were presented in chapter 4. Based on the analysis, a model is presented in which the three types of translation are related to one another. The chapter concludes with a discussion of contrasts between the current study and previous research.*

As we have seen from the discussions in the previous parts of this thesis, there are many considerations that complicate matters when one attempts to introduce a new management concept. The question is how we can make sense of all the events discussed in part IV based on the theory section (part II) of this thesis.

As stated in chapter 1, the purpose of the thesis is to analyze how Lean is translated from a generic description to organizational practice, and to identify the aspects of the translation process that influence the outcome. In order to achieve this, the translation process will be analyzed step by step, from introduction, through the various translation activities to the outcome of these.

## 9.1 Drivers for introducing Lean

While people at HiTech describe their ambition to introduce Lean as a rational decision, there are forces outside the company that have had strong influence. HiTech does not operate in a vacuum. There is an institutional pressure from the surrounding context, which is probably

felt the most in the higher levels of the organization. An example of this is Manny's sense of being 'forced' to mention Lean in certain situations. Also, the initial push to introduce Lean came from the global production coordinator, Cody, and not from within the company. At this point in time, Lean received a lot of attention, and almost every company in the manufacturing sector was considering it as a primary concept for organizational improvement. For instance, in 2006, a national program for Lean ("Produktionslyftet") was created. Although this was done a few years after HiTech began their 'Lean journey', it is a clear indication of the massive attention towards the concept during that period. It would therefore be very strange if HiTech somehow had been immune to this trend.

Another common view is that management concepts are introduced as a response to specific problems within the organization. HiTech does not, however, seem to have any specific problem that Lean is supposed to solve. Instead, we see descriptions of Lean as a multi purpose tool that will bring some kind of unspecified improvement to the organization. This resonates with Røvik's argument that problems usually are externally defined (cf. section 3.2).

As far as problem definition goes, HiTech has certainly subscribed to the general problem definition associated with Lean terminology. The main issue described by respondents at HiTech is efficiency and resource utilization. According to Røvik (2000), problem definitions provided by management concepts such as Lean are characterized by three factors that increase their attractiveness. Firstly, they offer simplifications that are attractive to the organizations. Secondly, they augment the notion that all organizations are alike and therefore have the same problems. Thirdly, and perhaps most importantly, they are presented in a scientific manner, which increases their credibility. All of these seem to apply in the HiTech case. Further, the concept is introduced by a manager with references from the automobile industry, and perfectly in line with the Lean discourse, it is assumed that principles of auto manufacturing are applicable in the high variation/low volume industry where HiTech is active.

Further, as argued by Røvik (2002), the problem definitions associated with management concepts are usually so generic that virtually every organization will be able to relate to them. Røvik argues that the problems addressed by management concepts are timeless while the solutions are very much products of their time, strongly influenced by

trends at the point(s) in time when they are produced (Røvik, 2002). As described in chapter 2, there is some variation within the Lean discourse, but the main problem is often presented as waste in production operations. While this may be a widespread issue in many organizations, the idea that inefficient resource utilization (e.g. the eight forms of waste) is *the* cause of this problem a simplification that does not hold the same universality. However, it is difficult for a manager at HiTech to argue against the scientific 'evidence' that Lean is a super effective method against waste. From a conceptual point of view, Lean has become a 'black box' and anyone who attempts to open it is faced with the challenge to disentangle all the connections within the network inside that box (cf. Latour, 1987). As demonstrated in chapter 2, this is a daunting task, even for a scholar within the field, and virtually impossible for a practitioner. It is therefore understandable that a manager at HiTech will succumb to the brute force of the discourse that is presented; especially when presented by someone higher up in the organizational hierarchy.

## 9.2 Breaking down the translation process

From the discussions in chapter 4, it was concluded that there are three levels of analysis that influence the outcome of organizational change initiatives; understanding, artifacts and practice. Analogously, there are three different types of organizational translation that correspond to each of these levels of analysis. These were defined as the activities and processes through which the conceptual representation of Lean becomes associated with ideas, artifacts and practice within the organization. Consequently, in order to change the organization, all of these levels need to be addressed somehow – directly or indirectly. Moreover, studying organizational change from a translation perspective will put focus on the activities and processes aimed at these levels of analysis. In this section, the three types of organizational translation are analyzed based on their presence in the case.

### 9.2.1 Idea-oriented translation

Introducing a new idea in an organization is problematic for a number of reasons. One important reason is that the new idea will always meet other ideas with which it may have to compete. The case at hand is by no means an exception to this.

As described in chapter 4, idea-oriented translation aims to influence people and try to make them adopt an 'image of action' that is in line with the proposed changes. In other words, the ambition is to impose a certain set of ideas on the people that will be influenced by the management concept at hand.

According to Røvik (2000), the strength of a management concept will, amongst other things, depend on its social authorization; the concept needs to be associated with an actor that is perceived as an authority, be it a person or an organizational entity. Of course, a concept will benefit from having this support from outside as well as from within the organization. While Lean is a concept that has massive support from various organizations and people in the management field, the sponsorship at HiTech ends with the division manager, Dave. Manny (the managing director) does not want to emphasize Lean as part of the overall strategy for the company. Instead, he wants to let each individual division make decisions about their internal management framework and interpret Lean as they see fit. However, Dave wants to have Manny on board before exploring the application of Lean principles, and works insistently to gain his approval. This process of persuasion therefore goes on for years, which causes waiting and creates translation space in the lower levels of the organization.

Since Dave does not want to take the lead role in the Lean initiative, there is no primary actor that leads the Lean program, and it is therefore weakened and up for grabs. The result is a multitude of interpretations of the purpose and 'definition' of Lean throughout the organization (cf. section 7.5).

There are several efforts under the Lean initiative that are associated with idea-oriented translation. One example is training. The main target group in terms of training is the floor managers. While the floor managers are given extensive training at the university, the unit managers are given a less detailed course, by a different provider. For operators, there is no formal training; only information activities led by the managers. Furthermore, at the top management level, there is no requirement to consider Lean, and consequently no training program. The result is that there is no homogenous knowledge base regarding Lean.

In the following phases of the change process, the externally defined problem definition becomes apparent. HiTech spend a large amount of

resources on making sense of the concept and see how it can benefit the organization. Among other things, Lean is communicated in meetings, training and through analyses.

As described in chapter 2, there are many different perceptions and interpretations of Lean in the literature, and in chapter 3 we saw that the same variability is present across organizations (see also paper B).

This variation is also present in the empirical material, at all levels of the organization. The innate ambiguity of management concepts seems to be transmitted to HiTech, which creates extensive translation space. The outcome is a plethora of interpretations of Lean that circulate within the organization.

*Table 9.1 Interpretations of Lean by respondents at HiTech*

| Person | Role/position | Lean is… |
|---|---|---|
| Manny | Managing director | Common sense, cost reduction |
| Dave | division manager | A philosophy and culture |
| Pierre | Production manager | A production system, philosophy and culture |
| Floyd | floor manager | Lead time reduction |
| Florence | floor manager | A production system |
| Stewart | Production supervisor | A collection of techniques (that could become a production system) |
| Paul | Production planner | A collection of techniques (that could become a production system) |
| Operators | | Cleaning, new equipment |

The respondents' descriptions of Lean give an indication of the source of their knowledge. The middle managers (Dave, Pierre, Floyd and Florence) have all studied Lean from a conceptual point of view, which reflects their description of Lean. The remaining respondents have not gone through such studies, leaving their daily work and the general

discourse at HiTech as the only points of reference regarding Lean. In this case, we see that their descriptions are more limited and specific.

Further down in the organization, we see that the efforts to influence people's understanding through training do not really pay off. Instead of being convinced that Lean is the big answer they are looking for, they are ever more confused and see difficulties in relating the conceptual knowledge to their practical work.

Also, we see several attempts to grab the interpretative prerogative from various actors within the organization. For instance, the managing director, Manny, is not convinced that Lean is the universal solution that it is sometimes presented to be. Being frustrated with this, the division manager, Dave, attempts to convince him that Lean should be a part of the overall strategy of HiTech. But as we have seen, this effort is unsuccessful, which largely reduces Lean to an isolated effort within the production division. Similarly, the floor manager, Florence, decides to equate Lean with lead-time reduction, although some of his colleagues disagree.

As regards the U-cell project, there are several initiatives that aim to influence people's understanding of the proposed changes. The official start of the project is a kickoff where all personnel at the GV unit are gathered to discuss possible layouts for the unit. Involving the personnel in producing the layout suggestions makes them part of the process which provides a stronger base for gaining acceptance for the proposed changes. Also, the use of the typical Lean-rhetoric with reference to Toyota's improvements over the years provides further legitimacy for the initiative.

As the project went on, the biweekly meetings served as a vehicle for further reinforcement of the ideas behind the project goals. As pointed out by the unit manager Stewart, these meetings had the foremost purpose of gaining acceptance for the changes In other words, the ambition is to influence the employees' understanding of the organization and the proposed changes, which is a clear example of idea-oriented translation.

While the entire production unit has been involved in these activities, the analyses that were performed in the student project project were a major input to the kickoff. These analyses (e.g. layout analyses and value stream mapping) primarily aimed to inform the project management team in

their decision process. Thus, the student project could be seen as a sort of idea-oriented translation aimed at the project management team.

Unlike the initiatives described above, the idea-oriented translation related to 5S and Visual Management were limited to information activities. Of course, the activities related to the methods themselves will contribute to reinforcing the ideas behind the methods, a point that will be revisited in the coming sections.

### 9.2.2 Object-oriented translation

The second type of organizational translation is the object-oriented type, which aims to create artifacts that reinforce the core ideas associated with Lean. As an example, let us consider the kanban initiative. Several artifacts are created to support this initiative; a new layout is made, a meeting structure is created and an implementation plan is made. The in-process buffers and the shelves for incoming material and finished goods are also attempts to align practice with the kanban idea. Further, the kanban idea is represented by the cards that are designed to control the flow of material. All of these artifacts mediate the ideas that define the kanban initiative and help guide practice in the desired direction.

While artifacts may be effective in strengthening an action program, they will need to replace or outplay artifacts that serve contesting purposes. In the U-cell project, the ambition has been to use kanban to control the material flow. By definition, a kanban card has strong inscriptions; it is an explicit signal to initiate production as well as an embodiment of the principle of just-in-time. Used correctly, kanban cards can therefore be powerful tools to support the just-in-time action program. In this case, however, there is a competing action program represented by the accounting system.

The kanban idea is a subset of the Just-in-time philosophy, which aims to reduce the amount of work in process by pushing back manufacturing operations as close to the deadline as possible. Essentially, production would stand still if there is no customer order. The accounting system, however, is based on a contradictory paradigm; the value generated by a production unit is measured from the number of production hours, and a production unit can increase their financial results by producing more than is required. In other words, since the accounting system provides input to higher level management's assessments of organizational performance, they would see the U-cell as inefficient as long as products are manufactured just in time with a kanban system. Consequently, the

accounting system is an antagonist of the kanban system, and can be seen as a strong actor in one of the U-cell's anti-programs.

Although the accounting system is part of an anti-program, it is betrayed by one of its sisters from the same business system. The inventory system has a kanban module that can be used to electronically monitor and control the material flow in a kanban based production unit. However, as described in the previous chapter, this module is later enrolled into yet another anti-program; the ambition to harmonize the use of SAP across the entire corporation (see p. 126) permanently closes the door to an electronic kanban system. The traitor is forced to step in line.

This battle between competing principles continues at the operational level of the organization. The existing principle for production control is represented by a different set of artifacts, in the form of production lists that specify the available production orders. The operators consult these lists – and their colleagues – to select the appropriate order to produce. While these lists and the kanban cards coexist, there will be a tug-of-war between the competing action programs. Traces of this tension are visible through the operators' comment that they "do not really know which one goes first" (see p. 127).

The question that arises is whether the new action program is sufficiently strong. Can the kanban cards mediate the 'correct' understanding of the organization and help to generate the 'correct' type of practice? In our case, it does not really work. The kanban cards succeed in causing some initial confusion and uncertainty for the operators. However, they are not sufficiently strong to win the fight. The planning lists represent a stronger action program and a more solid network compared to the kanban cards. In contrast to the kanban method, the established procedure for scheduling has a large network of supporting actors that includes the accounting system, upper management and a report structure that extends all the way to the corporation's head office. At the local level, the main artifacts that keep this network together are the production lists in which the entire action program is inscribed. Being much stronger, the lists easily win the tug of war against the kanban cards. The result is that practice is directed by the institutionalized practice, whereby the kanban cards are outmaneuvered.

The biggest setbacks in the U-cell project come from two close allies. For each finished product, there are about ten different products from the U-cell. The finished products are assembled just a few meters from the U-

cell, meaning that the kanban system can ensure that a tight communication can be upheld between the two production units, which is critical to maintain the idea of just-in-time production. However, as the decision to move the assembly to a different location, the products from the U-cell will not be collected and assembled one by one, but all at once. This disrupts the direct feedback mechanism that is designed into the kanban system and complicates its execution.

Further, the entire material control system in the U-cell is based on the product variants that exist. The system and the product variants are perfectly aligned – they are part of the same network. That is, until two new variants are introduced. In theory, it would of course be possible to create more shelf space for the new variants. But in practice, this is not feasible, as it would imply a massive increase of space allocated to incoming material and semi-finished products. One of the most important allies betrays the rest of the network. This becomes the final nail in the kanban coffin. The increase in product variation creates an impossible need for shelf space, which ultimately breaks the system. Thereby, a complete redesign of the material control system is required.

A contrasting example is provided by the use of whiteboards in Visual Management. As described in chapter 7, each team has a whiteboard with a predefined structure. The content and layout of the board serves a dual purpose; to visualize information during the meeting and to provide an agenda for the meeting. Since the structure of the board is generic, the participants will easily recognize themselves when attending meetings in different settings, and since the board determines the location of the meeting, the action program is further reinforced. The entire action program is inscribed in this single artifact, making it an extremely powerful ally in the VM network.

As for 5S, the ideas are represented by a formal structure (audits) and whiteboards that visualize the outcome of the previous audit along with an action plan. So far, the 5S program resembles VM, and it seems that the artifacts that are created support the overall 5S initiative. However, at closer scrutiny, it becomes clear that they do not in fact reinforce the standardization and orderliness that are at the core of 5S. Unlike the VM boards, the 5S boards seem to have non-existing (or at least very weak) inscriptions as they obviously do not influence behavior in an apparent way. Instead, the structure and the whiteboards reinforce ideas of management control and supervision. Although this control and supervision is thought to support 5S, it generates negative energy, and

people feel that the managers are 'stepping on their toes'. Further, the audits constitute a task that is added to an already full plate – for both operators and managers. This creates a conflict of prioritization, and people feel that 5S 'steals' time from the core activities.

In general, operators do not seem to find 5S meaningful, and the managers are not sufficiently active. The first line managers feel that 5S steals production hours and higher managers do not have time for the audits. This creates a negative spiral in which management attention is reduced, and as a consequence, 5S loses legitimacy as a method. In contrast to the example of Visual Management, the artifacts (audit procedure and the 5S boards) are not charged with the positive and reinforcing energy that would help sustain the practice. Instead, they are weakened by neglect and eventually ignored altogether. The dirty and dusty 5S board on the floor is a very clear signal that the artifact has lost its value – if it ever had any.

As for the overall Lean program, there are no associated artifacts. However, the division manager, Dave, aims to change this. Seeing that Manny does not waver in his assessment of Lean, Dave decides to go on to make a Lean pamphlet to describe the implications of Lean at division level. ("We want to describe 'our way' of working with Lean".) In doing this, Dave does several things. The pamphlet itself becomes a representation of the HiTech approach to Lean, whereby it potentially can contribute to strengthen the network around Lean and associated action programs. In addition to this, Dave takes the role as main sponsor for Lean at HiTech (or at least the production division), which clarifies the social authorization of the concept. Using another of Røvik's (2000) terms, this is also an example of how Lean is *localized*; the concept is given a local identity.

Operative efforts to apply Lean techniques also contribute to this localization, and are of course input to the pamphlet. Lean is also increasingly localized through a Lean expert network that aims to synthesize the generic version of Lean and the corporate version of Lean to suit the purposes of the organization.

### 9.2.3 Practice-oriented translation

As described in chapter 4, the purpose of practice-oriented translation is to translate ideas into action programs. By defining a question or action that everyone needs to address one creates an obligatory passage point (OPP) that ties the network together (see also section 4.3.3). In the U-cell

project, there is a clear and well defined OPP represented by the project goals. The ambition is to assess the possibility of using kanban to control the material flow as well as decreasing cost and lead time. The question that everyone needs to address is how kanban can be used to control the material flow in production at GV. However, despite the fact that exploring the use of kanban is one of the main objectives of the project, it turns out to be an optional method. How is that?

The underlying assumption is that kanban will be the tool that will yield these results. This is but one example of how the Lean discourse penetrates the organization all the way down to operative plans. As will be discussed below, the U-cell project can be seen as an action program that comprises a number of sub-programs, each with an OPP of its own (Callon, 1986b; Law and Callon, 1992).

A number of different OPPs can be observed in different parts of the project. The main OPP (reducing cost and lead time) is addressed through a number of more or less technical solutions, such as new equipment, layout changes and various changes in the work organization at the GV department (see figure 9.1). These changes can be seen as OPPs within the main OPP that contribute to the main purpose of the project; reaching the numerical goals. Thus, the project can be seen as consisting of a set of intertwined translation processes in which each of them has a separate action program that connects to the overall action program as indicated by the main OPP. This is illustrated in figure 9.1 on the next page.

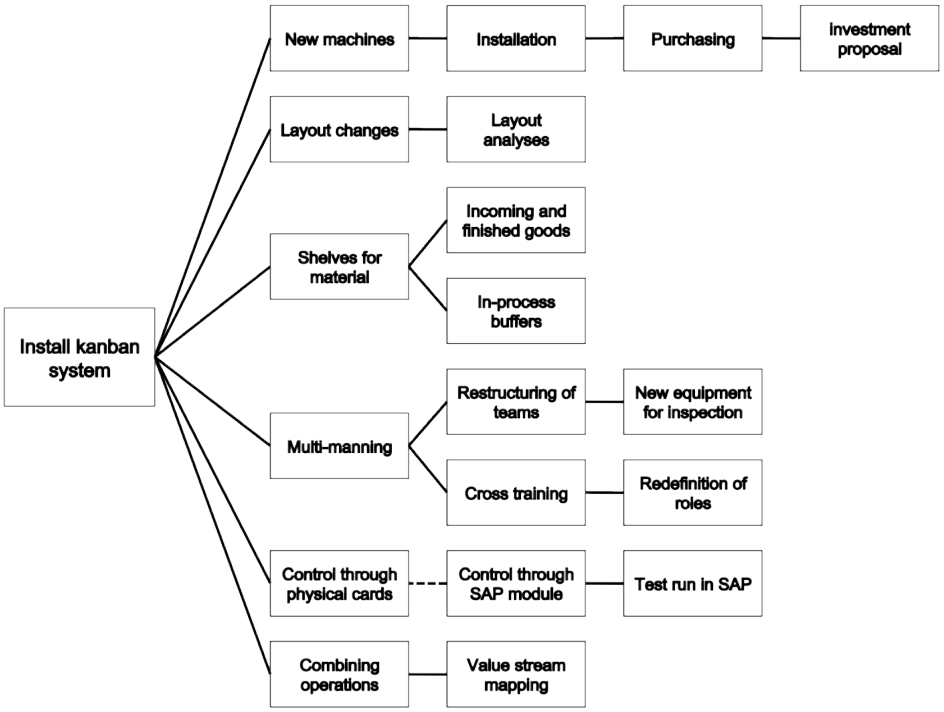


*Figure 9.1 OPPs in the U-cell project*

With this image in mind, it becomes apparent that the ambition to install a kanban system within GV is not one single question, but a collation of OPPs that converge in one collective ambition.

However, as the project progresses, the goals are in fact reached *without* a functioning kanban system. Kanban can thereby be seen as a constructed need that does not address the key issues of the main OPP. From the beginning, there has not been an assumption that kanban will cause major improvements at GV. Instead, the production manager Pierre's ambition has been to explore the possibility of applying the method at HiTech, and learn how it could be applied in a suitable way. He has, however, not communicated this clearly, and people at GV do not seem to have realized that learning is a goal of its own. In this sense, the U-cell project has two goals; to improve efficiency and to learn about kanban. Since kanban is not a necessary condition for reaching the efficiency goals, it becomes a very weak OPP. Its connections to the efficiency goals are not sufficiently intimate, and kanban can therefore be bypassed.

In contrast to other efforts, the practice-oriented translation has worked well regarding Visual Management (VM). Related to VM, we find the most successful action program in the study. Since the VM meetings are mandatory, actors are funneled into the network, which makes the OPP very strong. Challenging this OPP is a tremendous effort, because of its organization-wide position and the sheer number of actors enrolled in the network. The combination of frequent repetition (daily meetings) and a strong supporting network has established the method as a new organizational routine that has quickly become a 'black box'.

The routine around VM creates a compelling structure; there is an explicit expectation of participation. It will be obvious if one does not comply, which makes it difficult to refuse to be enrolled in the network. 5S also has a compelling structure in the audits. However, this only applies to the operators; the structure is not compelling for the managers. If they are absent, the audit will simply not be carried out. This, of course, has a negative effect for the stability of the network, as discussed above. However, there is no immediate consequence for the absent managers, making the audit a weak OPP for them.

Unlike Visual Management, the process has not run as smoothly for 5S. All the activities associated with 5S are added to an already tight schedule. All of the involved actors (both managers and operators) are already pressed for time to take care of other tasks. The number of evaluation criteria makes the audits very time consuming, which eventually causes the audit procedure to seize entirely.

The 'heavy backpack' of the 5S audits is an example of how anti-programs can inadvertently be inscribed in formal procedures and cause resistance. By extension, this diminishes the management attention towards 5S and thereby reduces the legitimacy of the method.

One remaining question is how we can relate these efforts to the overall Lean program. In contrast to the examples of OPPs provided above, there does not seem to be any clear OPP for the general Lean program. Instead, the practice-oriented translation is found in the Lean techniques that have been discussed above (kanban, 5S and Visual Management – and of course other pilot projects that have not been covered in this study). These can be seen as subsets, or 'sub-programs', to the main action program of introducing Lean at HiTech (cf. Latour, 1987). This creates a similar situation as for kanban; the sub-programs are self sufficient, but the Lean-OPP can be bypassed. Although the methods in

the sub-programs theoretically are parts of Lean, there is no requirement that this aggregation must be made; one can work with 5S, kanban or VM as isolated methods that do not need to be seen as parts of Lean.

## 9.3 Conclusions about translation at HiTech

As discussed in chapter 4, the goal of a translation process is to make sure that network connections are securely fastened in such a manner that one principal actor can represent the entire network; the action program becomes a black box (cf. Latour, 1987).

For the overall Lean program there is very little that drives the change in this direction. The only collective actions associated with the overall Lean program are the discussions in the production management team and the general training for selected employees. Apart from these activities, the Lean program rests on the execution of its sub-programs, and based on the discussions in this chapter, Visual Management is the only real success. The other efforts (5S and kanban) seem to be continually sent back to the drawing table.

Using the terminology by Nilsen (2007), we can identify three different aspects of the translation process; conceptualization, concretization and control. Conceptualization is evident when the concept is introduced and the initial discussions take place, leading up to the decision to introduce specific Lean techniques. This same process is repeated a few years later, with regards to the U-cell project. As the conceptualized practices become materialized, concretization comes into play. Finally, as the practice becomes an established part of the organization, a number of control mechanisms can be established to maintain the practice. Figure 9.2 provides an overview of how these categories can be applied to describe the progress of the Lean initiative at HiTech and its related techniques (VM, 5S and kanban).

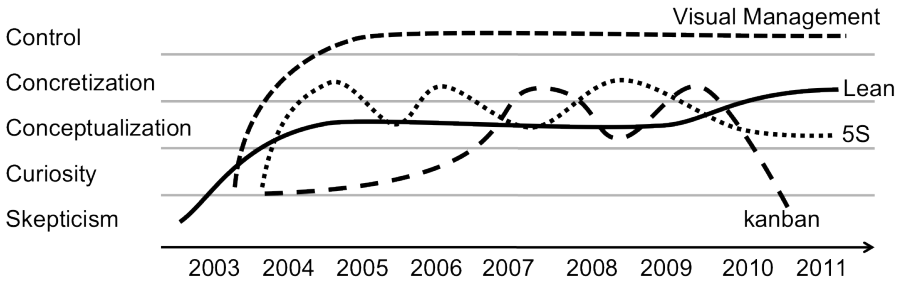


*Figure 9.2 The development of Lean at HiTech*

From the figure above, we can see how Lean and its associated techniques shift emphasis over the time period of the study. There is a tendency that the activities related to a technique oscillate between abstract and concrete. For 5S and kanban (and consequently for Lean in general), there has been iteration between conceptualization and concretization as various obstacles have come into play in the projects. As indicated in the previous discussions, Visual Management is the only technique that has been entirely successful, which is also reflected in the figure.

In contrast to the position held by Røvik (2007), the translation is never 'finished'. Rather, the case suggests a more 'liquid' form of translation, where the involved actors play a crucial part. In this situation, what has initially been 'translated' (from Røvik's perspective) needs to be revisited over and over again. This constant revisiting of the conceptualization phase causes recurring reassessment of the ideas, which can be described as a sort of continuous translation. Other scholars have also made a similar observation and claim that this kind of iteration is a common characteristic of change (Morris and Lancaster, 2006; Volkoff et al., 2007).

However, when it comes to Visual Management (VM), there is no such tendency. The technique has quickly been integrated in organizational procedure and become institutionalized. In fact, some respondents describe a hypothetical deinstitutionalization as a threat.

Yet another question is what causes the iteration described above. While there, of course, may be several causes behind this, at least three important factors are evident in this case. These will be discussed in the following three sections.

### 9.3.1 In search of a translator

As emphasized by most scholars of translation theory, successful translation requires a strong network and a primary actor. In forming a network, Callon (1986) uses the term *enrolment* to describe the process through which new allies are recruited and roles are defined and distributed between the actors. In the U-cell case, a perhaps more relevant term is what could be described as *disenrollment*; a number of people change jobs and are dissociated from the various networks. Of course, the people who leave their positions need to be replaced.

However, the people that come in to fill their shoes do not possess the same knowledge about the specific analyses and decisions that have been made in the project. This causes turbulence in terms of information loss and some reinterpretation. Consequently, the goal of creating a stable and consistent network around Lean is never really reached.

As a consequence of this discussion, another question that naturally comes to mind is whether there is a program if there is no principal actor or obligatory passage point (OPP). Who is the principal actor in the Lean program?

In relation to this, Røvik (2007) argues that the important actors are the ones with translation competence. As presented in section 4.5, this involves knowledge about three aspects; the idea, the context of origin and the current context. In this case, the current context can be divided into two parts; the overall organization and the specific settings in which the Lean techniques are applied. Table 9.2 presents an assessment of these aspects for some of the key respondents in this study.

*Table 9.2 Translation competence at HiTech*

| | Knowledge of… | | | |
|---|---|---|---|---|
| Role | The idea(s) | The context of origin | Current context: Overall organization | Current context: Specific settings |
| Managing Director | ○ | ○ | ● | ○ |
| Division Manager | ● | ◉ | ● | ◉ |
| Production Manager | ● | ◉ | ● | ◉ |
| Floor Manager(s) | ◉ | ◉ | ● | ◉ |
| Production Supervisor | ○ | ○ | ◉ | ● |
| Operators | ○ | ○ | ○ | ● |

○ Limited ◉ Moderate ● Extensive

The attentive reader will recognize that the categorizations in table 9.2 are rather crude. However, the rationale for presenting the table is not to provide an exact evaluation of the respondents' knowledge. Rather, the table aims to illustrate a tendency that none of the key actors in the organization live up to the requirements of being a 'competent translator', as suggested by Røvik (2007). Instead, we see that the translation competence is distributed among the actors, and that their collective knowledge covers all the necessary elements in the translation process.

The collective knowledge is, however, not utilized as such. Instead, efforts to create localized versions of Lean and its subsets are also distributed across the organization, leading to a number of disparate initiatives, which in turn contributes to the large variety of interpretations discussed above. With further knowledge of translation processes, this tendency could probably have been reduced.

### 9.3.2 Types of translation in the case

The analysis reveals another factor that appears to be influential in the translation process; the types of translation that are emphasized in the process. As proposed above, all three types must be addressed for the translation to be successful. The table on the next page provides an illustration of which types of organizational translation that have been emphasized in the case.

As shown in table 9.3, most efforts are aimed at influencing people's understanding (idea oriented translation). While some of these efforts involve a number of different artifacts (whiteboards, checklists, Lean pamphlet, local framework etc.), these are usually not integrated in the daily practice, making their influence on behavior rather limited.

*Table 9.3 The translation process at HiTech*

| Idea-oriented translation | Object-oriented translation | Practice-oriented translation |
|---|---|---|
| Lean-principles (pp. 100, 102) | VM-board (p. 104) | VM meetings (p. 103) |
| Book circle, Management team (p. 106) | 5S-board (p. 105) | 5S audits (p. 105) |
| External seminars, Management team (p. 106) | New equipment (p. 123) | U-cell project meetings (p. 127) |
| Field trips, Management team (p. 106) | New production layout (p. 124) | |
| Information activities, 5S/VM (p. 107) | Shelf system (p. 123) | |
| Training courses (p. 107) | Kanban cards (p. 127) | |
| Focus areas (p. 112) | | |
| Corporate Production System (p. 112) | | |
| Local model for Lean (p. 114) | | |
| Project goals (p. 121) | | |
| Multi-manning (p. 125) | | |
| Value stream mapping (p. 121) | | |

In contrast to the idea-oriented efforts, very little is done to influence behavior directly, which is probably a result of the explorative approach to Lean. Also, we see that very little effort has been dedicated to idea-oriented translation related to VM. Still, the method has become an established part of organizational procedures. This raises the question of whether idea-oriented translation is an effective tool in the pursuit of organizational change.

### 9.3.3 Translatability

The final issue that will be raised here is that of translatability. In chapter 4, the translatability of a practice was defined through its explicitness, complexity and embeddedness (see p. 50). According to Røvik (2007), the translatability of a practice will be the main determinant of successful translation. However, Røvik's notion of translatability is limited to decontextualization. So how do these factors relate to contextualization?

Answering this question calls for a closer look at the practices that have been subject to the Lean initiative at HiTech. The translatability of these practices is assessed and summarized in the table below.

*Table 9.4 Translatability of Lean-related practices at HiTech*

| | Practices associated with… | | |
|---|---|---|---|
| | Visual Management | Kanban | 5S/ Housekeeping |
| Explicitness | Low | Moderate | Low |
| Complexity | Low | High | Low |
| Embeddedness | High | High | High |

Beginning with Visual Management, this method is aimed at problem solving and dissemination of information within HiTech. Before VM was introduced, these processes were rather implicit and distributed across the organization, indicating low explicitness. Further, the very nature of problem solving makes it quite simple to determine the outcome of such processes, making the complexity of these activities rather low. On the other hand, problem solving usually involves people

from various parts of the organization, making the embeddedness rather high.

As VM is introduced at HiTech, the conceptual representations of the method bring attention to the flow of information within the organization. The meetings in which these representations are created can be seen as idea-oriented translation activities that make the information flow more explicit. In addition, the meeting structure under VM can be seen as a practice-oriented translation activity that brings the actors together as a team and makes problem solving more of a collective exercise. The outcome of these activities is a more explicit practice that is less dependent on external networks (lower embeddedness). Hence, the translatability of the practice is increased, which according to Røvik (2007) would facilitate the transition to a new practice.

Further, kanban aims to change the control of material in production. As described extensively above, the established procedure for doing this involves the use of planning lists. This is something that anyone who knows the work flow will be able to explicate. However, exactly how these lists are used and the decision processes involved in determining the order of production is not clearly defined. This indicates that the practice is moderately explicit. On a related note, it is difficult to determine the outcomes of a change in production order, which in part results from an extensive dependency on other parts of the organization. This high degree of embeddedness contributes to a high degree of complexity as well.

Similarly to VM, the explicitness of the material control process is increased through the analyses and information activities related to kanban. Also, an effectuation of the kanban system would contribute to decreasing the complexity of the practice and increase the overall translatability. However, no activities are aimed at improving the embeddedness of the practice, and the dependency on external actors remains. As described above, this dependency turned out to be detrimental to the kanban system, and the project was effectively terminated.

Finally, 5S places focus on the ordering and structuring of the workstations. Before the 5S initiative, this has been more or less up to the individual operators to determine, making this a very implicit activity. Conversely, the complexity of the activity is rather low. A more structured workplace will likely reduce the time spent looking for tools.

However, as discussed above, finding the time for 5S activities is rather difficult and very dependent on the general workload in production. This makes the embeddedness high.

Just as with kanban, the translation activities related to 5S were mostly idea-oriented, which resulted in an increased explicitness of the practice together with an unchanged embeddedness. Again, the outcome is failure to integrate 5S in the organization.

So what does this analysis add up to?

As indicated above, there is a relationship between the three types of translation and the three elements of translatability above. Comparing the table above to the translation activities at HiTech reveals that the translation activities related to VM actually improves the translatability of the related practice. Whereas VM is successfully integrated in the organization, this is not the case for kanban and 5S. The contrast between these three examples indicates that translation activities can improve the translatability of a given practice, which in turn would facilitate organizational change. However, since the only confirmatory example (VM) is a case within the case, this result must be interpreted with caution.

## 9.4 A proposed model for organizational translation

Based on the empirical data of this study, a dynamic relationship can be observed between the three levels of analysis. This relationship is illustrated in figure 9.3 below. As described in section 4.2, these can be seen as a simplified description of cultural elements.

In our case, we see that the managers direct most of their attention towards understanding. Education, training, meetings, book circles and meetings are some examples of efforts that aim to influence people's understanding of Lean. The basic assumption – which is imported from popular management literature (e.g. Womack & Jones, 2003; Liker, 2004) – is that a change in understanding will generate change of organizational practice. The idea is that there is an intimate cause-and-effect relationship between understanding and practice. For instance, the initial failure of 5S is explained by an inability to explain the purpose of the method (see p. 107). This explanation is, however, somewhat too simplistic. The assumption that understanding will guide practice resonates well with Feldman's (2003) model, albeit unilaterally. Feldman's description of the reverse relationship – how practice creates

and reinforces understanding – is not explicitly addressed by the respondents. There are, however, several examples of this in the case.

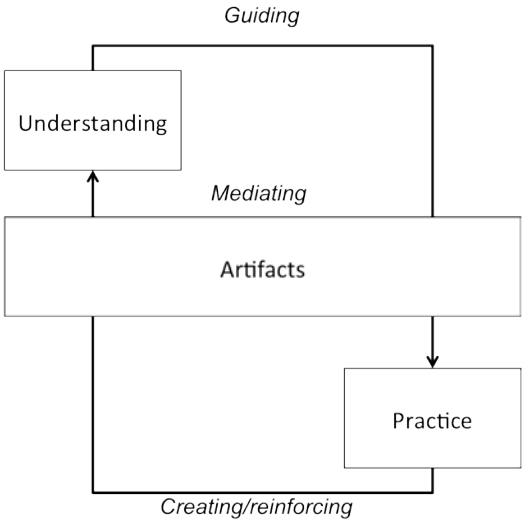


*Figure 9.3* *A dynamic relationship between organizational understanding, artifacts and practice*

In the empirical material, there are several indications of how people's understanding is shaped by the practices they are involved in. For example, the floor manager Floyd describes Lean as lead time reduction, because that is what he and his subordinates have been exposed to. Also, there are operators that describe Lean as cleaning and new equipment, because that is what *they* have seen. The middle managers (Dave and Pierre) describe Lean more in terms of philosophy and a production system, because they have found input from literature on the subject. At the highest level of the organization, the managing director Manny has a more pragmatic view, that Lean is cost reduction. He has not been involved in much of the practical issues around Lean, and he has not studied is from a theoretical point of view. With limited input, his view of Lean therefore becomes rather simplistic, and lands in some sort of generic rationalization.

These examples are indicative of how people make sense of practice and create a certain type of understanding. The relationship between practice and understanding can thereby be seen as a closed loop in which these two entities reinforce one another. If no contrasting input is thrown into this loop, little or no change will be made in either of the entities. If a change is to be made, attempts must be made to influence

the loop at some point, and as discussed above, the efforts at HiTech have for the most part been aimed at the upper part of the model.

The relationship is further complicated by the influence of artifacts; physical objects, formal routines, software, organizational structure and so on. In our case, an excellent example is provided in form of the whiteboard in Visual Management. The whiteboard serves a number of different purposes. First, it serves as a guide for the VM method; the structure and content of the meeting is manifested through the board. Further, it is a sort of organizational memory, in that it represents previous interactions inscribed in action lists and visualization of information. Also, since the board is located in a designated area, that place becomes associated with the practice around VM. The board thereby embodies the very idea of VM, and it brings people together to a specific place and dictates what they should discuss. While the fundamental idea of VM will guide people's actions, this is also mediated by the whiteboard. Since the interactions in the VM meetings are recorded on the board, it becomes infused with value and people's reflections on practice, which reinforces their understanding of the VM method. This small example illustrates the powerful effect of aligning the three entities in the model above.

There is also a time aspect in the model, although this is not expressed graphically. The model has an implicit assumption that previous practice will influence future practice. In reality, this will occur as people reflect on their actions, which will influence their understanding of the current context.

*

In this section, we have pointed to a number of connections between understanding, artifacts and practice. From the examples, the artifacts do not seem to form any self sufficient loop with understanding or practice alone. Instead, the artifacts are interposed 'between' or amidst practice and understanding. They receive their 'charge' as people reflect on and make sense of practice, and they help to guide practice by reminding people of the outcomes of that reflection.

The respondents do not seem to be consciously aware of the need to create supporting artifacts; it is merely something that is done. Similarly, there does not seem to be any explicit awareness of the need to assess the impact of other artifacts and competing action programs.

## 9.5 Reflections on the case

The depiction of management concepts as answers to specific problems is often a rationalization (Røvik, 2007). However, one may argue that new ideas function as sensitizing concepts that bring attention to certain problems in the organization. Thus, the introduction of an idea may 'produce' problems that did not exist before.

Concepts contribute with new perspectives and new languages in the organization. In this case, Lean can be seen as a sensitizing concept; it emphasizes issues that previously have not received much attention, e.g. lead time, inventory levels, work in process etc. Through working with Lean at a conceptual level, these issues have been highlighted and made subject for analysis and eventually improvement. It also brings a new terminology to the organization.

Although these ideas have been introduced as a result of institutional pressure, we see that they also contribute to improvement of performance through the introduction of new terminology and emphasis on certain issues.

### 9.5.1 Is it really Lean?

So what does it mean to work with Lean? Depending on how we interpret this question, we will arrive at different conclusions.

Based on the discussions above, we see that methods such as 5S and Visual Management have only a minor influence on the daily operations, and the ambition to implement the pull principle is never really reached. The actual changes made in the process are mostly technical (new equipment) and quite disconnected from the Lean concept altogether. This leads to the conclusion that it is possible to reach remarkable results *without* implementing Lean. This poses a strong challenge to the myth of Lean being the 'one true way', and tells us that Lean is really not a crucial factor in this specific situation.

Another interpretation – as made by several respondents – is that the core of the Lean initiative lies in the use of VSM and combining operations as a result of that analysis. In that case, one could argue that the work related to Lean is done *prior* to the actual change, and that there is really no *implementation* of anything related to Lean apart from technical changes based on the initial analysis. Also, it punches a big hole in the argument that all the parts of Lean need to be implemented for the concept to have an effect.

The case also demonstrates the fallacy of initiating change based on a given technique without first assessing its applicability. A lot of time and energy is invested in trying to find a way to implement the pull principle (kanban); unfortunately without any success.

From this case, we can conclude that it is not only interesting to raise the question of how an organization becomes Lean, but also what Lean becomes within a certain organization. Given a loosely defined concept as Lean, this is definitively an open question.

In the introductory pages of this thesis there is an excerpt from a dictionary that defines the word 'lean'. From the analysis, we can see traces of all three meanings of the word; it can contribute to reducing the amount of fat (waste) in an organization, but at the same time it has the risk of offering very little reward and it has a high proportion of air.

### 9.5.2 Departures from previous research

There are several interesting observations that can be made from the case description in the previous two chapters, and a number of interesting points that are revealed through the analysis. Not all of these agree with what was expected at the outset.

For instance, Lean has been strongly criticized over the years, from several directions, especially from the workers' unions. Also, respondents at HiTech explain that they were reluctant to introduce the concept at first. Still, the critical voices against Lean are surprisingly weak in the case. The issue was brought up with several of the respondents, including union representatives, but the general attitude was rather positive. The most negative voices expressed doubt to the expected effects of the concept, but no critique was directed towards the concept or the initiative as such.

Another interesting point is that the rhetoric of Lean is used as a 'vision' while most problems and solutions are quite technical. This indicates a disconnect between the rhetoric and reality of Lean. While this tendency has been discussed extensively within the institutional school (e.g. Brunsson, 1989; Meyer and Rowan, 1977), it definitely challenges the assumptions of the popular Lean literature.

Further, according to actor-network theory, translation is synonymous with establishing a cohesive network. However, in the HiTech case, the network is not very strong. In contrast to what is predicted – and at times prescribed – by theory, the Lean initiative at HiTech does not really

have any primary actor. Several of the sub-programs are fronted by strong actors, but no such tendency can be found at the aggregate level. Also, regarding the kanban initiative, it is curious that not more people at GV are informed and involved in the change. Related to this, there is a surprisingly weak OPP (if any) and no clear leading actor for the change initiative. The issue seems to be floating about, and is up for grabs. While Røvik (2007) presents translation as an activity performed by a 'competent translator', this case is an example of translation as dispersed across the organization, which can be described as a collective form of translation competence. This observation is related to the large amount of variation in the interpretations of Lean. Relatively little effort is dedicated to homogenize the image of Lean; training is offered to a select few, and the training programs vary with their target groups.

## 9.6 Summary

In this chapter, the three types of organizational translation presented in chapter 4 have been analyzed as related to the case. It has been demonstrated that the outcome of the three translation activities (understanding, practice and artifacts) are related in a dynamic manner. The analysis suggests that understanding and practice are mutually reinforcing and that artifacts are interposed between the two and will influence the interaction by mediating certain ideas.

While all three types of organizational translation are present in the case, idea-oriented translation activities are mostly in focus. The analysis indicates that these activities have little impact on practice, and that object- and practice-based translation may be more effective.

Unlike what is suggested by theory, there is no central actor who drives the translation process. Rather, the activities as well as the competence to drive the process are distributed between a number of different actors in the organization, which makes the process largely uncoordinated.

The analysis also suggests that translation is typified by a constant tension between theoretical templates and practical work. This tension will result in iteration between theoretical templates and practical application, resulting in a non-linear, iterative and largely unpredictable process.

Finally, it is suggested that the three forms of translatability can be used to increase the translatability of a practice, which will facilitate change.

# 10

# Conclusions

*Most of the things we have been studying,*
*we have ignored or misunderstood.*

– B. Latour

*In this final chapter of the thesis, the ambition is to draw conclusions from all of the previous chapters and see what we have learned. The outcomes of the study are discussed in terms of impact for both practice and theory development. The chapter concludes with some prospects for future research.*

The point of departure for organizational change is some kind of conceptual representation of the change initiative. In this thesis, the conceptual representation is in the form of the management concept Lean. Further, the processes through which such conceptual representations are given new forms are summarized under the term organizational translation.

As stated in chapter 1, the purpose of this thesis has been to "provide an account of how processes of organizational translation transpire and to analyze and identify the main determinants of their outcome".

Three types of organizational translation have been presented in the thesis. Firstly, the practice-oriented type of translation aims to translate the conceptual representation – in this case Lean – to organizational practice. The ambition is to create routines and procedures that directly influence people's behavior. Secondly, in order to provide a rationale for a new set of practices, the idea-oriented type of translation aims to translate the initial conceptual representation into a local set of ideas and discourse that can influence people's understanding of the concept and/or the organization in general. Finally, the object-oriented type of translation aims to create various artifacts that can represent the desired practice.

Further, it is proposed that the outcomes of translation – practice, understanding and artifacts – are intimately related to one another and make up the conditions for organizational change. In the proposed model for how these entities interact (see pp. 157-159), it is suggested that understanding and practice form a mutually reinforcing loop and that artifacts have a mediating function between the two. People's understanding will guide their actions, and their actions will create and reinforce their understanding. Artifacts in their immediate surroundings will influence this interaction and mediate certain ideas. This relationship points to the necessity of ensuring that there is agreement between the understanding, practice and artifacts that are associated with a change initiative.

A consequence of this proposition is that an ambition to change organizational routines will be influenced by people's understanding, current practice and artifacts with which people interact. More specifically, these entities (understanding, practice and artifacts) may represent different ideals or action programs, which in turn will lead to tensions that will become a source of inertia in the organization. It is therefore proposed that organizational change requires attention to all these entities in order to ensure alignment between them and facilitate the change process.

While all three types are present in the case material, it is evident that a majority of the managerial efforts are directed towards influencing the employees' understanding of Lean and the organization. In other words, the idea-oriented form of translation is mostly in focus, and very little effort is directed towards recruiting non-human allies (object-oriented translation) or directly changing practice (practice-oriented translation). This creates an unbalanced relationship and tension between these three entities, which complicates the change process.

In the introduction chapter, it was stated that the majority of change initiatives fail. With the observations about organizational translation, this thesis contributes with at least one piece of the puzzle that can explain this high failure rate.

## 10.1 Contributions of the thesis

In the introduction of this thesis, it was stated that one ambition is to "contribute to the theoretical development within the field of Quality Management". In my opinion, this has been achieved by highlighting the processes of translation as an important factor that will influence the outcome of organizational change. The weak links between the various parts of the Lean initiative at HiTech were revealed as a result of the case study approach in combination with the open research design.

As formulated by my supervisor, traditional research within this field largely disregards such processes and places too much emphasis on the technological side of management concepts.

> Traditionally, researchers within the field of Quality Management tend to focus on the technology itself, ignoring the organizational system of its use. (Elg, 2001, p. 212)

From such a traditional point of view, the study would probably have been guided by a predefined 'definition' of Lean, which would probably just contribute to reifying the concept and discover little about the conditions for change.

Although a decade has passed since the words in the quote above were written, I would argue that there still is some truth in this statement. In particular, the popular management literature seems to be stuck in the old tire tracks, and still emphasizes content over context and process. As argued repeatedly throughout this thesis, the popular management literature commonly describes management concepts as quick and universal solutions. This literature contains a great deal of 'cookbook theory' that indicates that organizational improvement is reached quite simply by following a recipe. This assumed linear causation creates unreasonable expectations on the effects of introducing a management concept, which may damage the legitimacy of the field. The case description in this thesis is an example of how linear causation does not necessarily apply.

However, the field *has* evolved, and several researchers draw from other theoretical fields that previously have received little attention from the traditional school of Quality Management. By borrowing theories from other fields, this thesis has demonstrated how processes of translation are naturally associated with the introduction of management concepts.

Thereby, the thesis will hopefully contribute to further expansion and strengthening of the field.

The three types of organizational translation that have been developed in this thesis are all based on existing theories. Thereby, the thesis has not really contributed with anything new in terms of theory. However, by combining the three entities in the same analysis and introducing a new terminology, the thesis contributes with a framework that unifies the three forms under the umbrella of organizational translation. Further, by demonstrating a dynamic relationship between the outcomes of organizational translation (understanding, artifacts and practice), the thesis clarifies the implications of translation in organizational change – for both theory and practice.

By highlighting the importance of a translation perspective in relation to organizational change, the thesis conveys a message to that practitioners do not need to – and should not – be slaves under 'by the book' descriptions of organizational change. Instead, it is proposed that emphasis should be shifted from the management concept at hand to the translation processes and the overall organizational system.

From this case study, it is indicated that the idea-oriented form of translation is in focus. This could be an outcome of the strong focus on these aspects in the popular management literature. However, the study suggests that object- and practice-oriented translation may be more effective for producing change. However, considering the limited empirical basis of this study, it is difficult to claim that such a conclusion would be valid for every situation. Making such a claim would require more research.

The case discussed in this thesis shows that a management concept is not necessarily a single entity, but rather a complex array of several more or less interrelated components. Each component thereby implies a change process of its own, and the success or failure of the entire concept will rely, at least in part, on the outcome of these micro processes of change.

In other words, the problem lies with the management concept itself as well as the context in which it is introduced. The challenge is to make sure that these two are compatible by adapting them to one another, and the process of making this adaptation requires attention towards all three areas of translation, and not just the idea-oriented type. Inability to achieve this will create tension between the various elements of the organization, and the risk of failure will be imminent.

As we have seen above, the change process may be halted by many small issues that may in fact be outside the control of the people who strive to change the organization. Here, as in so many other cases, there is an old saying that sums it up well: The devil is in the details.

## 10.2 Future research

As previously stated, the ambition of this thesis has been explorative rather than confirmative. The empirical foundation of a single case study leaves many questions unanswered for future research projects.

For instance, it is indicated that the idea-oriented form of translation has received most attention in the case. An interesting question is whether there are any general patterns of focus on the three types of organizational translation.

Further, it is suggested that the object- and practice-oriented types of translation may be most effective for producing change. However, presenting this argument with confidence would require a wider empirical base. A related question is how the importance of these three types of translation varies with context (sector, industry, organization size etc.).

A final issue concerns the practical relevance of the theories in this thesis. Earlier, I have argued that "translation should not be approached normatively" (Pettersen, 2009a, p. 53). However, the analysis in this thesis places a question mark behind this statement. While organizational translation may be a useful 'sensitizing concept' for both scholars and practitioners, the theory development could perhaps be taken one step further. The question is whether it is possible to elaborate theories of organizational translation and develop a set of guidelines for how translation can be used deliberately to facilitate organizational change.

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# Appendix

# List of quotes

**Introduction to thesis**

"I am always doing that which I can not do, in order that I may learn how to do it."

Quote by: Pablo Picasso, Spanish artist (1881 - 1973)

Source: BrainyQuote

[http://www.brainyquote.com/quotes/quotes/p/pablopicas107571.html]

**Chapter 1**

"The brutal fact is that about 70 % of all change initiatives fail."

Quote by: Michael Beer and Nitin Nohria, professors at Harvard Business School

Source: Beer, M. and Nohria, N. (2000), "Cracking the code of change," *Harvard Business Review*, Vol. 78 No. 3, p. 133.

**Chapter 2**

"Well, is it true what they say about it? They say it's new, but I have to doubt it. And then they tell you everything about it. Had enough? I got some people saying this way. I got some people saying that way. I got some people saying there's no way. Ain't it tough?"

Quote by: Randy Fitzsimmons, Mysterious songwriter

Source: "Walk idiot, walk", from the album "Tyrannosaurus Hives" by The Hives

**Chapter 3**

"Everyone's gotta have the sickness, 'cause everyone seems to need the cure."

Quote by: James Hetfield, American rocker/songwriter

Source: "Cure", from the album "Load" by Metallica

**Chapter 4**

"Always in motion the future is."

Quote by: Yoda, Jedi master (When nine hundred years old you reach, look as good you will not!)

Source: "Star Wars: Episode V – The empire Strikes Back"

**Chapter 5**

"Believe those who are seeking the truth. Doubt those who find it."

Quote by: Andre Gide, French writer (1869 - 1951)

Source: The Quotations Page

[http://www.quotationspage.com/quote/1450.html]

**Chapter 6**

"If you don't know where you are going, you will probably end up somewhere else."

Quote by: Laurence J. Peter, American writer (1919 - 1988)

Source: The Quotations Page

[http://www.quotationspage.com/quote/353.html]

**Chapter 7**

"You certainly usually find something, if you look, but it is not always quite the something you were after."

Quote by: Thorin Oakenshield, Dwarf king under the mountain

Source: Tolkien, J. R. R. (1996) *The Hobbit*, London, Harper Collins Publishers, p. 54

**Chapter 8**

"Try again. Fail again. Fail better."

Quote by: Samuel Beckett, Irish writer (1906 - 1989)

Source: Wikiquote [http://en.wikiquote.org/wiki/Samuel_Beckett]

**Chapter 9**

"We all get lost, everyone in different ways"

(Originally: "Wir irren allesamt, ein jeder irret anders")

Quote by: Ludwig van Beethoven, German composer and pianist (1770 - 1827)

Source: "Wir irren allesamt", Beethoven's final composition (WoO 198)

Cooper, B. (2008), Beethoven, Oxford University Press.

**Chapter 10**

"Most of the things we have been studying, we have ignored or misunderstood."

Quote by: Bruno Latour, professor at Paris Institute of Political Studies

Source: Latour, B. (2005), *Reassembling the social: An introduction to actor-network-theory*, Oxford, Oxford University Press, p. 123

Linköping Studies in Science and Technology
Dissertations, No. 1422

# Mot en teori om organisatorisk översättning
(sammanfattning)

av

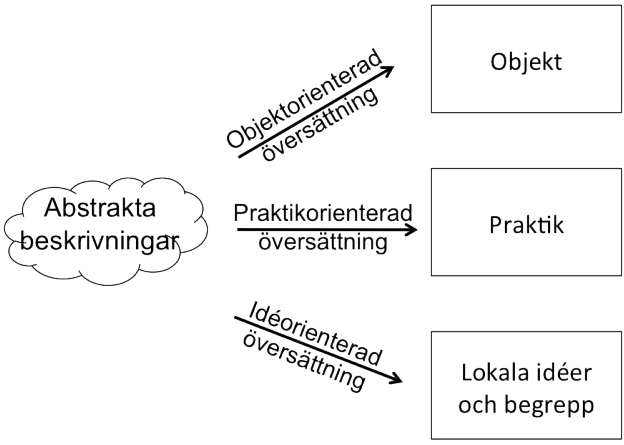
*Jostein Langstrand*

Lean Production är ett ledningskoncept som har fått stor spridning under de senaste åren. I den populära managementlitteraturen presenteras konceptet som någon sorts universallösning som har förmågan att bidra med radikala förbättringar inom vilken verksamhet som helst. Det finns däremot mycket forskning som visar att det hela är mycket svårare än så. Ofta skiljer sig utfallet av en förändringsinsats från de mål som sattes upp inledningsvis, och så mycket som 70 % av alla förändringsinsatser misslyckas. En vanlig men också grovt förenklad förklaring är att misslyckanden beror på att bristande förståelse för konceptets innehåll, eller att man inte har fokuserat på de ”rätta” delarna av konceptet.

I denna avhandling flyttas fokus från innehållet och läggs istället på förändringsprocesserna varigenom ett ledningskoncept – i det här fallet Lean – förs in och anpassas till verksamheten ifråga. Avhandlingen bygger på en studie av hur ett stort svenskt tillverkningsföretag under åtta år har arbetat med att införa Lean.

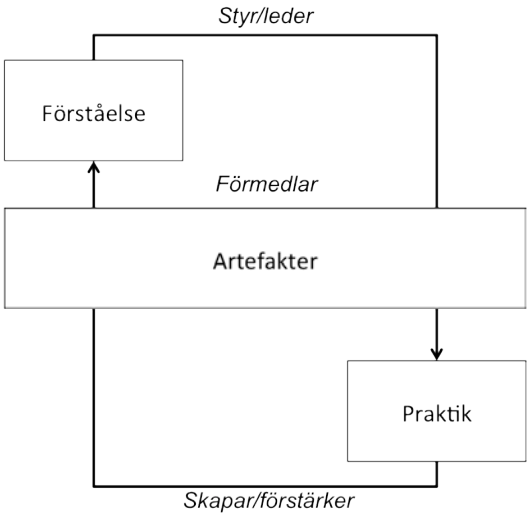
Avhandlingens huvudfokus ligger på det fenomen som här kallas *organisatorisk översättning*, vilket definieras som de aktiviteter och processer varigenom en abstrakt beskrivning av ett ledningskoncept omvandlas till mer konkreta enheter. Avhandlingen beskriver tre olika sådana enheter och därmed också tre olika former för organisatorisk översättning. Den formen som ligger närmast en vardaglig form för översättning är den som här har getts namnet *idéorienterad* översättning. Denna fokuserar på hur de abstrakta beskrivningarna i management-litteraturen omvandlas till en uppsättning av idéer och ett språk som är mer anpassat till den aktuella verksamheten. Vidare kan beskrivningarna

översättas till rutiner och aktiviteter, vilket beskrivs som en *praktikorienterad* form för översättning. Slutligen kan beskrivningarna representeras genom olika beskrivningar, dokument, maskiner och andra objekt som har relevans för den organisatoriska praktiken, vilket beskrivs som *objektorienterad* översättning.




**Figur 1** Tre sorters organisatorisk översättning

I avhandlingen föreslås en modell där utfallet av dessa tre formerna för översättning (idéer, praktik och objekt) interagerar och tillsammans påverkar den organisatoriska praktiken. Alla tre enheter antas ha inverkan på mänskligt beteende. De lokala idéerna och språkbruken påverkar människors förståelse av verksamheten, vilket in sin tur påverkar deras beteende. Vidare påverkas människors beteende av de förutsättningar som skapas genom objekten som kopplas till praktiken. Slutligen kan beteendet i stor grad styras genom obligatoriska aktiviteter.




**Figur 2** Interaktion mellan översättningarnas utfall

De tre enheterna påverkar också varandra, och kan antingen förstärka varandra eller skapa spänningar i systemet. Förståelsen styr och leder praktiken i en viss riktning, och praktiken skapar och förstärker förståelsen av verksamheten. Artefakterna (objekten) förmedlar också en bild av verksamheten som kan motsvara eller motsäga förståelsen, och på så sätt styra praktiken i en annan riktning. På ett liknande sätt påverkas förståelsen av hur människor interagerar med artefakterna, vilket kan förändra förståelsen.

I det fall som studeras i avhandlingen framgår det att större delen av förändringsinsatsen inriktas mot den idéorienterade formen för översättning, och således mot människors förståelse av verksamheten och Lean-konceptet. Däremot finns ett antal artefakter och praktiker som inte motsvarar idéerna och språkbruken som kopplas till Lean. Denna konflikt leder till stora svårigheter att genomföra förändringarna i önskad riktning.

Slutsatsen från avhandlingen är att förändringsinsatser behöver ha ett brett fokus och omfatta en analys av interaktionen mellan språk, idéer, objekt, rutiner och aktiviteter. Med andra ord behöver förändringsarbetet inriktas mot alla dessa aspekter och eftersträva överensstämmelse mellan förståelse, praktik och artefakter. Eventuella konflikter mellan dessa kommer sannolikt att försvåra förändringsarbetet och öka risken för misslyckande.

# Interview guide, phase 1

*This interview guide has been used for the first phase of the study. Since the interviews have been semi-structured, the questions have not necessarily been formulated as below or treated in the order they are listed. The guide has been used more as a form of checklist rather than a sequence of explicit questions.*

1. What does Lean imply for the daily work? Methods? Principles?
2. What is the purpose of Lean?
3. Has the work related to Lean been controlled in any way? Frames? Scope and limitations? Autonomy?
4. First contact with Lean…
    a. Where did the information come from? Who? Where? Under what circumstances? In what way?
    b. What were the reactions…
        i. In relation to personal values and goals?
        ii. In relation to existing work practices?
        iii. Other?
5. Decision to implement…
    a. Who made the decision?
    b. What were the reactions…
        i. Personal reactions?
        ii. Within different groups?
6. The implementation process…
    a. Time perspective?
    b. Directives? Training? Organizing: Groups? Reinterpretations?
    c. Assessment/view of the concept?
    d. Conflicts/resistance?
    e. Artefacts? Documents, PPT-slides etc.
7. Operationalization
    a. Directives? Training? Organizing: Groups? Reinterpretations?
    b. Assessment/view of the concept?
    c. Conflicts/resistance?
    d. Artefacts? Documents, PPT-slides etc.

# Interview guide, phase 2

*This interview guide has been used for the second phase of the study. Since the interviews have been semi-structured, the questions have not necessarily been formulated as below or treated in the order they are listed. The guide has been used more as a form of checklist rather than a sequence of explicit questions.*

### About the U-cell project/Lean (innovation idea)

1. How does the project relate to the general plans to introduce Lean?
2. Are there any other important projects or efforts that link to the Lean initiative?
    a. At the local level? (Factory floor, Site)
    b. At the global level? (Corporation)
3. Are there any other initiatives that influence the U-cell project?
4. What Lean principles are in focus at the moment?
5. What principles/methods do you intend to introduce in the future?
6. What do you think of the project and the proposed changes?
7. Has your opinion changed during the project?
8. How and when did your opinion change?

### People

9. Who are involved in the project?
10. Which of these are key people in your opinion? (assign resources, information exchange, cooperation, personality)
11. Have your 'key people' changed recently?
12. What kind of changes have been made regarding personnel and roles?
13. How and when did these changes take place?

### Transactions

14. Can you describe what agreements that have been met with other parties?
15. Have these agreements changed over time?
16. How and when did these changes take place?

## Internal organisational context

17. Are there any general organizational factors that influence the project?
18. Have any changes been made within the local organization?
19. How and when did these changes take place?

## External context

20. Are there any external factors that influence the project?
    a. Industry/market/customers
21. Have these factors changed during the project (or recent time)?
22. How and when did these changes take place?

## Results

23. What criteria exist for evaluating progress and success?
    a. For the U-cell?
    b. For the overall Lean initiative?
24. How would you assess these criteria at the current time?
25. Have the criteria been changed?
26. Has the assessment ('grade') of the project changed? Positively or negatively?
27. How and when did these changes take place?

## Concluding questions

28. What important challenges have been present during the recent period?
29. What challenges does the project face at the moment?
30. What measures have been taken to handle the problems?
31. What important challenges do you expect in the future?