



LICENTIATE THESIS IN TECHNOLOGY AND HEALTH
STOCKHOLM, SWEDEN 2014

Senior Managers and Lean - The importance of becoming a practitioner

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ABSTRACT

Considered to be one of the most influential paradigms in manufacturing, Lean has developed and expanded beyond the shop floor and manufacturing environment of the auto industry. Lean is considered to be applicable throughout organizations and other industries besides manufacturing. Interest in both research and implementation of the Lean concept, heavily influenced by Toyota Motor Company, is said to continue to increase despite the fact that the concept is said to be both ambiguous and difficult to implement. Two main traditions of Lean are said to exist: “toolbox Lean” and “Lean thinking.” The particular translation of the concept that is accepted will influence management’s approach in implementing a Lean way of working. The Toyota Motor Company, where Lean originates, is described as a learning organization. Therefore, a management approach and leader behavior supporting organizational learning would be required to successfully implement an enterprise system inspired by both the Toyota Production System and Lean. This thesis approaches the Lean concept through an organizational learning perspective, thereby highlighting the importance of knowledge of organizational learning in a Lean development effort.

Difficulties regarding Lean implementations have been shown to often occur due to the overlooked but crucial differences in approach in management. There is, however a stated gap in the literature on Lean production regarding management. The purpose of this thesis is to explore senior management’s ability to implement and sustain a Lean-based enterprise system. Three studies are included in the thesis. The first study focuses on how the view on Lean among managers implementing Lean affects its implementation. The study was performed as a case study and conducted at a larger, international manufacturing company. The study covered management levels from shop floor manager to the president of the company. Findings show that all management levels had a similar view of Lean and that this influenced the implementation. The first study further showed that the view on Lean may develop and change during an implementation, revealing unforeseen managerial and organizational challenges and obstacles. The second study focused on how management of Lean is described in the existing literature. The results revealed a dualistic complementarity between leadership and management, which can be seen as reflected in the two foundational Toyota principles of continuous improvement and respect for people. This duality can also be found in descriptions of prerequisites for organizational learning where the ability to combine transactional and transformational leadership is considered a success factor. The third study focused on implications for senior management and aimed to research senior managers’ ability to support a Lean implementation process. The study is based on interviews with eight senior managers. The study revealed four main managerial obstacles to Lean implementation. Lack of initial competence evaluation and ensuing competence development for senior management was found to be a central obstacle to Lean implementation.

Main conclusions in the thesis are that initial understanding of the aims of a Lean implementation, and the ensuing implications for the organization is central in order to be able to support the development. Additionally, initial senior management competence development is indicated to be vital in order to ensure the ability to understand the organizational and managerial implications brought on by a Lean implementation. Leading with action is indicated as providing an opportunity for senior management competence development.

Keywords: Lean, leadership, management, Lean management, senior managers, Lean implementation

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APPENDED PAPERS

- Paper A: From fantasy to reality-Learning from seven years of Lean implementation
Journal of US-China Public Administration. Vol. 10, No. 4, pp. 368-378.
- Paper B: Lean leadership-a matter of dualism
Submitted to: *International Journal of Human Resources Development and Management*
- Paper C: Senior managers' perspectives on obstacles to Lean implementation
To be submitted to: *Leadership and Organizational Development Journal*

1 Introduction

This section provides an introduction to the Lean concept and its origins, as well as a description of the purpose of the thesis and related research questions.

1.1 Lean implementation- A managerial challenge

Interest in both research on and implementation of management and production-systems based on the Toyota-influenced Lean concept remains high (Stone, 2012; Emiliani, 2006; Bhasin, 2012). The Lean concept has spread globally, within both industry and service organizations (Stone, 2012). Few organizations, however, have managed to implement the concept successfully. Instead, it appears that only 10 percent or fewer companies attempting to implement Lean actually reach their goals (Bhasin, 2012; Bhasin and Burcher, 2006.). Lean management is described as being impossible to grasp without daily practice since even though the concept may appear conceptually simple it requires considerable hands-on involvement to learn and understand (Emiliani and Emiliani, 2013). One reason curiously few manufacturers have managed to copy Toyota's way of working successfully, even though Toyota has been very willing to share its practices, is given by Mann (2010), who points out a gap in the literature on Lean production regarding management and finds that difficulties regarding Lean implementations often are results of overlooked but crucial differences in management-approach. This statement is supported by Emiliani et al. (2007) and by Liker (1997) who early on pointed to management as an area that does not receive enough attention from researchers and companies during Lean implementations. Also, Bhasin (2012) points to barriers to Lean implementations often being connected to insufficient senior management skills and insufficient understanding of the concept. Furthermore, Emiliani et al. (2007) point out that understanding Lean as a management system that requires senior management commitment and participation as well as a specific set of leadership behaviors is something a majority of organizations attempting to implement Lean struggle with.

That apparently no consensus on a definition of the Lean concept exists in the contemporary literature may be one reason for the difficulties in understanding Lean as a management system. Opinions differ regarding which characteristics the concept should be based on. Stone (2012) states that Lean thinking has evolved from the manufacturing environment to be applicable in industries and organizations beyond manufacturing. This is supported by Hines et al. (2004) who point out that over time Lean has evolved considerably. Pettersen (2009a, p. 39)

describes Lean production as a “translated version of the Toyota Production System (TPS).” He further states that “*Lean Production has itself been translated into many different versions.*” Two main traditions of Lean are said to exist, and these are described as “toolbox Lean” and “Lean thinking” (ibid., p. 132). On the same topic, Hines et al. (2004) point out that Lean exists at two levels and the customer centered strategic thinking applies everywhere but the shop floor tools do not. This is something which is said to have generated frequent misunderstandings and confusion. The multitude of translations of what Lean Production is also clearly affects the measurement of the results of implementation. Unless the Lean concept is clearly defined by an organization implementing it and the improvements aspired to are specified, measuring results when implementing Lean will prove to be difficult. As described by Pettersen (2009a) it would be unrealistic to expect Lean to generate specific results since any results would be determined by how the organization intending to implement it has interpreted the concept of Lean. In larger organizations, it is possible that the Lean concept is translated differently in different parts of the organization, thus complicating communication and prioritization in regard to implementation. As shown by Pettersen (2009a) individual actors tend to translate the core ideas of the Lean concept in such a way that they become more in line with their own frames of reference, which “*causes the concept to have several different meanings within the organization*” (p.33).

That Lean tools often are prioritized in an implementation and applied without their supporting principles or any strategic thinking behind them, i.e. a “tool-box” approach, is by several sources described as a reason for low success rate and sustainability in Lean implementations (Bhasin and Burcher, 2006; Emiliani, 2006; Liker and Hoseus, 2008; Seddon, 2005; Spear, 2004). The principles, in a way the origins of the tools, form the foundation for leadership behavior and management approach and need to be clearly identified by the organization intending to implement Lean. Top management commitment and understanding in this initial step is crucial for sustainability. There has, however, been an almost complete lack of discussions about strategic-level thinking in Lean programs (Hines et al., 2004). Discussion has instead focused on how to apply a series of different tools and techniques, an approach they argue has led to a lack of sustainability in many Lean implementations (ibid.). Evaluations of Lean implementations that fail to reach their aspired results often relate the initiative’s collapse to failure to adhere to the Lean design at lower levels of the organizations. This failure, however, is described by Mann (2009) as being caused by changed, weak, or absent support by senior management. Senior management leadership may thus be considered essential but often lacking in Lean implementations. A leader’s mission, which is partly to

eliminate barriers to desired change (Liker, 2010), may thus prove rather difficult if the leaders themselves are the barriers.

Senior management support and participation in a Lean implementation effort is even more important when an organizational learning perspective is applied. Toyota is frequently referred to as a learning organization (Emiliani, 1998; Liker and Hoseus, 2008; Rother, 2010; Spear and Bowen, 1999). Senge (2000, p. 73) states that *“The famous ‘Toyota production system’ is in fact a learning system inseparable from the knowledge embodied in the people who make up the system.”* A learning organization requires a specific type of leadership and management in order to function and be sustainable (Senge, 2006; Vera and Crossan, 2004). To succeed in implementing a Lean-based enterprise system, a change in leadership behavior and management approach may thus be required. The teaching and learning approach used by Toyota managers, as described by Rother (2010), is allowing employees to discover and learn the desired job approach by participating in solving problems. But this approach, which is described as an effective teaching method, leads to implicit knowledge. This may be one reason Spear and Bowen (1999) state that the Toyota Production System so far has been transferred successfully only when managers have been able and willing to engage in a similar process of questioning to facilitate learning by doing.

Given that both the description of Toyota as a learning organization and the Toyota influence on the Lean concept are accepted, understanding organizational learning and the ensuing implications for senior management can be considered vital with regard to a Lean implementation and development effort.

Due to the weak inscriptions regarding the Lean concept, Pettersen (2009b) states that the concept itself cannot be directly implemented without significant translation efforts and that potential communication difficulties may occur. This translation initially needs to take place in top management in order to create a clear executive vision and a management approach. By this perspective it appears obvious that both initially and along the road of a change-initiative such as a Lean implementation, top management approach and involvement is crucial. The need for the management approach to change due to demands implicated by a new way of working may impact a Lean implementation effort. Whether management understands the prerequisites for organizational learning can be considered central to how well the organization succeeds with continuous improvement. In what way senior management is able, or willing, to support the desired changes brought on by an implementation will condition or limit any effort. This would mean factors creating resistance or support regarding change within senior management itself are

of interest. Peter F. Drucker (2007) argued already in 1954 that the major obstacle to organizational growth is managers' inability to change their attitudes and behavior as rapidly as their organizations require. Even when managers intellectually understand the need for changes in the way they operate, they sometimes are emotionally unable to make the transition. This would indicate the presence of a knowing–doing gap.

The ambiguity of the Lean concept and the fact that, as mentioned above, Lean requires senior management commitment and participation clearly indicates that senior management is central in a Lean implementation. Since Lean management is described as being impossible to grasp without daily practice, senior management involvement in daily practice during an implementation is of interest, as are possible obstacles for involvement. The existence of a gap in the literature on Lean regarding management (Mann, 2010) points to a need to further explore this involvement. Furthermore, since difficulties regarding Lean implementations are said to often be results of the overlooked but crucial differences in approach in management (ibid.), this need is made even clearer.

1.2 Purpose

The purpose of this thesis is to explore senior management's ability to implement and sustain a Lean-based enterprise system.

1.3 Research questions

Based on the purpose, the research questions in the study are:

1. How do manager's views on Lean impact the implementation process?
2. How can leadership and management be understood in regard to the Lean concept?
3. What obstacles affect senior managers' ability to implement and sustain a Lean-based enterprise system?

The thesis approaches the Lean concept through an organizational learning perspective highlighting both the importance of knowledge of organizational learning and structures and support for organizational learning required by senior management in a Lean development effort. The interpretation of Lean, understanding of managerial requirements, and organizational prerequisites for organizational learning are all important.

2 Research methods

This section strives to provide the reader with an understanding of the execution of the study and the methods used for data collection and analysis. Specific circumstances pertaining to quality of the research are also discussed.

2.1 Scientific approach

This study is based on a social constructionist perspective. It involves inquiry into how the management approach affects implementation and change as the approach itself is subject to change. At the core of the management approach are individual leaders and managers. The function and results of the management approach are thereby dependent on how these individuals perceive and understand their roles, responsibilities, and prerequisites. Thus, the intention is to inquire into how individual leaders and managers understand and experience the demands of the Lean- concept within the social context in which they act. The social context of the organization can be seen as an institution (Berger and Luckman, 1966) generated by reciprocal typification of habitualized actions. Institutions are established over time with a foundational history and constitute a system of “social control.” Berger and Luckman (*ibid.*) state that institutions, by the very fact of their existence, control human conduct by setting up predefined patterns of conduct. Institutionalized behavior over time becomes real, a given reality, that is not readily changed.

For research questions 1 and 3 a case study approach was used. Creswell (1998) defines qualitative research as an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex and holistic picture, analyzes words, reports on informants’ detailed views, and conducts the study in a natural setting. A case study approach in qualitative research is the study of a “bounded system,” with the focus being either the case or an issue that is illustrated by the case (or cases). A qualitative case study provides an in-depth study of this “system” based on a diverse array of data collection materials, and the researcher situates this system or case within its larger “context” or setting (*ibid.*). Since the studies for papers A and C are based on exploratory research questions and examine complex change processes within the management process dependent on its context, case study methodology is considered suitable.

For data analysis for papers A and C, interpretative phenomenological analysis (IPA) was used. IPA is a qualitative research approach originating in psychology

but increasingly used in human, social, and health sciences (Smith et al., 2009). The aim of IPA is to explore how participants make sense of their personal and social world. The approach is phenomenological in that it involves detailed examination of the participant's life world; it attempts to explore personal experience and is concerned with an individual's personal perception or account of an event or object, as opposed to an attempt to produce an objective statement of the event or object itself. IPA emphasizes that the research exercise is a dynamic process in which the researcher plays an active role (Smith and Osborn, 2008). Usually research questions in IPA projects are framed openly and broadly. The intention is not to test a researcher's predetermined hypothesis; the aim is rather to explore, flexibly and in detail, an area of interest. Sample sizes on which IPA studies are conducted are generally small, since detailed case-by-case analysis is time-consuming. The aim of the study is to say something in detail regarding perceptions and understandings of a particular group, rather than prematurely making more general claims (ibid.). Data collection for IPA analysis can be done in a number of ways. The most frequently used and the preferred way, according to Smith et al. (2009) is the semi structured interview. This form of interviewing allows the researcher and participant to engage in a dialogue where the initial question may be modified in light of the participants' response, giving the interviewer opportunity to more deeply probe areas of interest that may arise. Interviews are recorded and transcribed for analysis. The transcripts are read a number of times and emerging theme titles are documented, later to be analyzed for connections, theoretical ordering and clustering. As the clustering of themes emerges it is checked with the transcript for relevant connections with the primary source material in an iterative process. Themes are later coherently ordered and presented in a table. This table of themes is the basis for a narrative argument interspersed with verbatim extracts from the transcripts to support the case.

For research question 2 a literature study was performed. The study takes a snowball approach in order to identify writers' influential on the topic through their writings. Co-author Bengt Halling and I searched the databases ISI Web of Science, Scopus and Google Scholar with search terms pertaining to the research question. To further focus the results of this initial search, we utilized a snowball approach, where central persons were identified through their publications. This was done by searching with the citation analysis tool Publish or Perish, using the same search terms as in step one. The result, which presented the most cited books and articles first and then in descending order according to citation frequency, was examined for relevance and connection to the purpose of the study. The second search generated a number of articles and books that were perceived as central for the study. The reference lists of these central books and articles were a further

source for publications found to be relevant for the work. A more detailed description of the process is given in paper B.

2.2 Sources of data

The studies for papers A and C were carried out at a globally established Swedish manufacturing company. The studied company was at the time divided into several independent strategic business units which in turn contained several production units. The total number of employee's at the time of the studies exceeded 8000. The studies both took a multi-level, vertical perspective to the studied organization's managerial structure. In the first study five hierarchical management levels of the organization were covered, from shop-floor manager to the president of the company. The third study covered the two senior management levels, company president and area vice presidents.

Paper B is based on literature with input from the databases ISI Web of Science, Scopus, and Google Scholar, as well as a comparison with Publish or Perish.

2.2.1

Research question 1: How do manager's views on Lean impact the implementation process?

The purpose of the first study was to address the question of how managers' views on Lean as "toolbox Lean" or "Lean thinking" affect their view of the implementation process, with the aim of increasing understanding of the relationship between how Lean production is defined and implemented. The study was performed at the company mentioned in 2.2. A further description of the company is provided in section 4.1.

Data for this study was collected by means of semi structured interviews with 20 managers on different levels of the organization. My priority was the experiences and perspectives of senior management. Thus, I performed interviews with 10 senior managers, of which 5 were to be used in the study based on organizational belonging. Interviews with 1 production unit manager, 3 production managers and 11 first line managers were performed by my co-author Halling. As it was considered to be of interest to obtain a vertical or hierarchical understanding of the Lean implementation and the managerial view of Lean, cooperation with Halling, whose focus was primarily on production managers, was established. Both researchers performed interviews using the following set of interview questions:

- What is Lean for you? (Is there a company definition?)
- Does Lean affect leadership? –If so, how?
- Do you have a vision of what it is going to look like when Lean is implemented in the company?
- Do you think that people in the company have the same view of the new Lean-based business system?
- How is the implementation done?
- How do you perceive the implementation- how is it working?
- What problems/challenges do you anticipate in the implementation of Lean?

The interviews were initially transcribed by the respective interviewer, and then both authors jointly analyzed the interview material. Analysis was influenced by interpretative phenomenological analysis (IPA) and was performed by initially using a large white board where themes emerging from the transcribed material were clustered. As the clustering of themes emerged, it was checked with and supported by verbatim extract from the transcripts for relevant connections with the primary source material in an iterative process.

The final results were structured and are presented as the following three themes:

1. The managers' view on Lean
2. The managers' view on the implementation process
3. The relationship between the definition of Lean production and its implementation

2.2.2

Research question 2: How can leadership and management be understood in regard to the Lean concept?

The purpose of the study for paper B was to conceptualize the concepts of leadership and management in regard to the Lean concept and thus increase understanding concerning the roles of leadership and management in Lean. The study is based on literature with input from the databases ISI Web of Science, Scopus, and Google Scholar, with a subsequent comparison with Publish or Perish. The study takes a snowball approach to identify people influential on the topics through their writings. The initial search showed that leadership and management are topics with a huge number of publications. As a result of this the next step was to search for central publications and writers in terms of citations, inspired by

Pettersen, (2009a, p. 128) and Langstrand, (2012, p. 13) by using the citation analysis tool Publish or Perish (PorP).

Initially a search was conducted in PorP using the search word *leadership*. The three most cited works were three books:

Schein, E. H. *Organizational Culture and Leadership*
Bass, B. M. *Leadership and Performance beyond Expectations*
Yukl, G.A. *Leadership in Organizations*

Descriptions of distinct differences between leadership and management generated from this first search resulted in the next step being a search in PorP with the search words: *management vs. leadership*. The three most cited works were three books:

Hersey, P., Blanchard, K. H., and Johnson, D. E. *Management of Organizational Behavior*
Yukl, G. A. *Leadership in Organizations*
Kotter, J. P. *A Force for Change- How Leadership Differs from Management*.

In this search result Warren Bennis and John Kotter are described as authorities on leadership. Thus the next search in PorP was on these two researchers. The search on Kotter resulted in one article being included based on the purpose of the study: "What leaders really do" (2001). The search on Bennis resulted in two books: *On Becoming a Leader* and *Why Leaders Can't Lead*.

An additional search in PorP was then done for recent publications, from 2013 and onward, with the search term *Lean leadership*. This was done since older publications have an advantage to be cited compared to more recent publications. Two articles were considered relevant to the purpose of the study and were thus included. These publications were Poksinska et al., "The daily work of Lean leaders- lessons from manufacturing and healthcare" (2013) and Emiliani and Emiliani, "Music as a framework to better understand Lean leadership" (2013).

In the analysis, descriptions of leadership and management were compared to descriptions of Lean development approaches, Lean value flow, and Lean principles.

2.2.3

Research question 3: What obstacles affect senior managers' ability to implement and sustain a Lean-based enterprise system?

The purpose of the third study was to investigate perceived implications and possible obstacles for senior management in Lean implementation. The paper addresses lessons learned among senior management with regard to seven years of Lean implementation. The paper is based on a case study at a globally established manufacturing company. The company is further described in section 4.1 and is identical to the company in paper A.

The study covered the company's two top hierarchical senior management levels, including the president of the company and area vice presidents. Individual semi structured interviews were used to collect input from eight managers. The interviews were 1-2 hours long, digitally recorded, and conducted by one person, the author of this thesis. After the interviews the recordings were transcribed by an external consultant. Analysis of the material was thereafter carried out jointly with the co-author of paper C, Camilla Niss. Analysis was made using an interpretative phenomenological analysis (IPA) approach. The transcripts were read a number of times and emerging theme titles were documented and analyzed for connections, theoretical ordering, and clustering. As the clustering of obstacles emerged it was checked with the transcripts for relevant connections with the primary source material in an iterative process. As a result, four central themes related to perceived senior management obstacles to Lean implementation, are presented in the paper.

2.3 Quality of the study

In this section the quality of the study is addressed in terms of internal and external validity, reliability and reflexivity.

2.3.1 Validity

Internal validity concerns whether the study investigates what it is meant to investigate (Malterud, 2001) and the integrity of the conclusions generated from the study (Bryman, 2008). The data, by its extent and nature, will determine what conclusions can be drawn about what.

A data triangulation approach was used in the two interview-based studies, where several hierarchical levels of the organization were involved as well as several

managerial functions. This would be in line with Brymans (2008) claim that internal validity or credibility can be strengthened by the use of multiple sources. Furthermore, cooperation with fellow researchers and authors was important in the analysis in the quest for an increased understanding of a potentially complex phenomenon. Validity of the studies can also be said to be further strengthened by comparisons to previous research on Lean implementation and potential barriers; a number of commonalities were found.

Regarding the second study, which was based on literature, it was clear that the concepts of leadership, management and Lean have all been extensively researched and documented since the initial search generated a very high number of hits in databases. A viable approach was found to be the use of the program Publish or Perish, which was used in order to identify central publications and authors based on the frequency of citations.

Based on the described use of data triangulation by both study participants as well as with the literature, as well as the cooperation with fellow researchers in order to balance my preconceptions regarding the studied phenomena I consider the results of the included studies to have been improved.

External validity concerns in what contexts the findings of a study can be applied. Discussions regarding who and what the findings actually relate to are a key component of external validation in a qualitative study (Malterud, 2001). The aim with respect to external validity in qualitative inquiry is to ascertain whether or not results generated in the study may be applied in other settings (*ibid.*). On one hand, results generated in the included studies regarding senior management and management approach in Lean implementation focus on complex change processes within the management process, dependent on its context and thereby dependent on a multitude of variables. This complexity and content-specific limitation can be said to limit external validity. On the other hand, however, comparing the difficulties and barriers to Lean implementation described by management to other studies on the topics of leadership, organizational change, and Lean implementations reveals several similarities. This would indicate that the findings presented in the studies are relevant for change management in general and for Lean implementations in particular. Thus, I argue that the thesis contributes with relevant input to and increased understanding of the studied field.

2.3.2 Reliability

Minimizing errors and biases in a study by means of good documentation and protocol can be said to be the objective of reliability. This is important in order to allow other researchers, or oneself, to repeat an earlier study. By assuring the ability to repeat a study and produce the same results reliability is achieved which is imperative for generating support for theory or to strengthen or disprove results from previous research. To facilitate the replication of previous research, documentation and detailed descriptions of the research process are considered vital. Taking a social constructionist approach, however, it can be argued that research is not about identifying objective facts, since reality may be inaccessible or inseparable from our discourse about it (Burr, 2003) and therefore all knowledge may be considered provisional and contestable. The concept of reliability as it is usually understood may therefore be considered inappropriate with regard to judging the quality of social constructionist research. Alternative ways of justifying analyses or enhancing the rigor of social constructionist research are described by Burr as referring to “usefulness” or “fruitfulness” of the research as well as demonstrating soundness by explicitly showing the logic of arguments presented in a study and explaining how it emerges from the steps of the analysis. This would mean that based on an awareness of the perspectives used by the researcher as described by Niss (2009), the steps of the research and the abductive process are made explicit. The ability to replicate the study may thus be limited, but the process of the research is available for evaluation regarding its trustworthiness and soundness.

The included studies are all described in their respective papers. In papers A and C the participating informants are described, as well as the interview questions, interview technique, and analysis approach. In paper B, which is based on literature, the approach and tools used in the search are described as well as the search criteria. Based on this the studies are argued to be well grounded as well as contributing to the field of study.

2.3.3 Reflexivity

Reflexivity, according to Malterud (2001), starts by identifying preconceptions brought into the project by the researcher. These preconceptions represent previous personal and professional experiences, pre study beliefs regarding how things are and what is to be investigated and how.

Reflexivity thus addresses the effects of the researcher on the research process and also ensuing findings, interpretations, and conclusions. The background and perspective of the researcher will affect the choice of what to investigate as well as methods deemed suitable for the purpose.

Malterud (2001) states that dependent on positions and perspectives, different researchers might access different, although equally valid, representations of the situation that is studied. In the studies presented in this thesis I have consciously strived for cooperation with other researchers, specifically regarding work with interview preparations, analysis, and the process of generating results and conclusions. This decision is based on the belief that in qualitative research, as described by Malterud, different or individual ways of approaching the same subject will result in an increased understanding of complex phenomena. Multiple researchers may therefore strengthen the design of a study, not for the purpose of consensus or identical readings, but rather to supplement and contest each other's statements (ibid. p. 484). This I consider to be of importance, since I as a researcher and author of this thesis have previous experience of the studied organization as a production manager in the company and also as an internal company management and leadership consultant. Giving readers the ability to assess how factors such as identity, credentials, occupation, gender, experience and training might have influenced the researchers' observations and interpretations subsequently improves the credibility of the findings (Tong et al., 2007). Thus, my background in the studied organization needs to be taken into account. Preconception, however, is not to be considered just as a limiting factor or a problem. As described by Patel and Davidson (2003), preconception can also aid the researcher in better seeing and understanding the context of questions and research results, which may further deepen the understanding of a study. Yet in order to utilize personal issues as valuable sources of information and interpretation, reflexivity needs to be considered and thoroughly maintained. This I consider to have done in the included studies by cooperating with fellow researchers and authors. Along the way I have also had to reevaluate some of my previous "truths" regarding the challenges of the studied company's Lean efforts as well as senior management's understanding of the Lean concept and its development within the organization.

3 Theoretical Framework

The theoretical framework will address the Toyota Way, Lean, and managerial barriers to Lean implementation. In line with the purpose of the thesis, which is to explore senior management's ability to implement and sustain a Lean-based enterprise system, along with the fact that I approach the Lean concept through an organizational learning perspective, organizational learning, management, and learning and culture will also be addressed.

3.1 The Toyota Way

Toyota is widely recognized for having developed an effective management system which continues to interest both service and manufacturing companies and researchers. Initial influences from the Ford system and western industrial management approaches such as TWI are stated to have contributed to shaping TPS into what it is today. Many of Ford's principles in their purest forms are argued to still be valid and to form the basis of what we today know as TPS (Krafcik, 1988, p. 42). Similarly, elements of the Ford system and TWI are described by Holweg (2007, p. 422, with reference to Fujimoto, 1999) as having been integrated by people like Taiichi Ohno, Eiji Toyoda and Shigeo Shingo in a new environment, thus contributing to the creation of a hybrid system. The initial descriptions of the Toyota Production System available in English appears to be the paper entitled "Toyota production system and Kanban system Materialization of just-in-time and respect-for-human system," by Sugimori et al. (1977). In 2001, the Toyota Motor Corporation published an internal document called "The Toyota Way 2001," which states the two objectives of "continuous improvement" and "respect for people" as top-level company principles. This document is not publicly available, but most of its content can be found in "*The Toyota Way*" (Liker, 2004).

In keeping with the two main company objectives mentioned above Liker and Hoseus (2008) describe the following five foundational principles. *Challenge*: We form a long-term vision, meeting challenges with courage and creativity to realize our dreams. *Kaizen*: We improve our business operations continuously, always driving for innovation and evolution. *Genchi Genbutsu*: We believe in going to the source to find the facts to make correct decisions, build consensus, and achieve goals at our best speed. *Respect*: We respect others, make every effort to understand each other, take responsibility and do our best to build mutual trust. *Teamwork*: We stimulate personal and professional growth, share the opportunities of development, and maximize individual and team performance (ibid., p. 15).



Figure 1: The Toyota Way 2001, Courtesy of Liker, J. K. "Toyota Culture: Developing a culture of continuous improvement" Seminar, 24 February 2010, KTH/Lean Centrum.

To support working according to these principles, there are methods or tools such as 5S, SMED, TPM, Kan-Ban, Poka-yoke, Value Stream Mapping and A-3 Reports. These tools are sometimes in themselves regarded as Lean but they must be seen in the context of the basic values and principles they emerged from in order to be sustainable. As stated by Seddon (2005): *"The tools that have resulted from the codification of Ohno's methods have valuable uses and can certainly solve problems in manufacturing. But it is the philosophy behind the tools- how managers think about the design and management of work- that is key"* (p. 15).

Indicated here is a managerial view that focuses on processes as well as goals in order to support learning, and on systemic understanding in order to reveal and eliminate waste. These are characteristics of a learning organization. The tools of TPS were designed to highlight and identify problems within the organization. According to Liker (2004, p. 37), the key to success is to have a production system that highlights problems and a human system that produces people who are able to identify and solve them.

3.2 Lean

Lean is described by Hines et al. (2004) as one of the most influential paradigms in manufacturing. The concept, heavily influenced by Toyota, has developed and expanded beyond the shop-floor and manufacturing environment of the auto industry to application throughout organizations and within industries outside manufacturing (Stone, 2012). Interest in both research and implementation of the Lean concept is said to continue to increase (ibid.), in spite of the fact that the concept is said to be both ambiguous and difficult to implement.

The term *Lean* which was to be spread globally by the introduction of the book *The Machine That Changed the World* by Womack et al. (1990), was first used by John F. Krafcik as an opposite to buffered production systems (Krafcik, 1988). Toyota's management system is due to its origins in production and operations management said to commonly be referred to as "Lean manufacturing" (Emiliani 2006). However, this epithet implies too narrow a focus; Emiliani (2006) claims the term "Lean manufacturing" is recognized as incorrect, since Lean principles and practices can be applied to any organization.

Opinions appear to differ regarding the fundamental characteristics of the Lean concept. Hines et al. (2004) describe the concept as having evolved considerably over time; Pettersen (2009a) reports that it is a translated version of TPS that has been translated into numerous additional versions. According to Pettersen, two main versions of Lean exist, which are described as "toolbox Lean" and "Lean thinking" (ibid., p. 132).

Toolbox Lean can be perceived as internally focused and concerned with a collection of "waste reduction tools," whereas Lean thinking can be described as also being externally focused and thus taking a strategic and system-wide perspective. As described by Emiliani et al. (2007, p. 4): "*Lean principles and practices have to be part of how all senior managers think about everything all the time, not just how a few senior managers think about operations.*"

On the same topic, Hines et al. (2004) state that Lean exists on two levels; strategic and operational. The strategic thinking, which is described as customer-centered, is said to apply everywhere; the operational shop-floor tools, however, do not. The confusion and misunderstanding regarding this and an almost complete lack of discussion regarding strategic thinking in Lean initiatives is described as having led to a lack of sustainability for many Lean programs (ibid.).

It appears that in initiatives to implement a Lean way of working it is common for organizations to selectively apply certain Lean tools in order to achieve short-term results (Emiliani and Emiliani, 2013). The tendency to seek short-term improvements that generate direct bottom-line financial impact, such as selecting specific Lean tools and delegating implementation of these to consultants, indicates a lack of understanding of Lean as a management system. This lack of understanding is something that Emiliani and Emiliani (2013) assert "handicaps" senior management's ability to lead enterprise-wide Lean transformations. Further, Hines et al. (2004) state that it is crucial to distinguish between Lean thinking at the strategic level and Lean production at the operational level in order to understand

Lean as a whole and apply the right tools and strategies to provide customer value. Companies which use only the toolbox without embracing the underlying philosophy are unlikely to gain more than limited and temporary results, according to Seddon and Caulkin (2007).

The tendency to focus on tools may thus be one reason for the reportedly low success rate of Lean implementations. Even though the concept has been widely popular for some time and is still considered a valid way to improve organizational performance, reports indicate that only 10 percent or fewer organizations attempting to implement Lean actually reach their goals (Bhasin, 2012; Bhasin and Burcher, 2006). The fact that Lean as a concept has evolved significantly and has expanded beyond its original narrow definition around shop-floor improvements within the auto industry is stated to have led to confusion regarding what constitutes Lean and what does not (Hines et al., 2004).

A further consequence of a tools-only focus while continuing with already established conventional management practices is that it may generate what Emiliani and Emiliani (2013) call “fake Lean.” Fake Lean reflects a fundamental misunderstanding of Lean management where the initial purpose is to grow and improve businesses operating in competitive markets with a win-win approach. Instead, fake Lean results in cost reductions and improved results generated at the expense of key business stakeholders such as employees, subcontractors, or customers.

Lean and the consequences an implementation of the concept may bring with it can generate criticism. A critique regarding labor relations of organized workforces and worker stress is pointed out by Stone (2012). Consequences such as highly repetitive work patterns that are intensified by *kaizen* initiatives and just-in-time (JIT) principles and with limited control by the employee are described by Börnfeltdt (2006). The fact that employees are expected to participate in improvement work in a monotonous and highly controlled work environment is addressed by Börnfeltdt as something of a contradiction, since repetitive work with limited possibilities for one’s own decisions is said to limit independent thinking and individual initiatives, as well as motivation.

Drawing on his own experiences at a Toyota affiliate and sub-contractor in Japan, Mehri (2006) describes a way of working that is radically different from what is usually presented in the literature. While much of the literature describes TPS as capable of achieving maximum production and quality while maintaining a harmonious and humane workplace, Mehri (ibid.) points to the human cost of high-

productivity, product development and a global market share. Lean work according to Mehri, has little to do with improving the lives of workers and much to do with producing vehicles for the least amount of money in the quickest time. What management at the studied company said and did is described as being two fundamentally different matters. Company policies accordingly are described as either *tatema*e (public expressions of what you are supposed to feel or do) or *hon*ne (underlying obscure reality regarding what you actually feel and do). International enthusiasm for TPS is a consequence of western observers' inability to discern the *hon*ne within the *tatema*e, according to Mehri. The displayed pattern or *tatema*e has been readily but erroneously accepted as a given while Japanese reality and potential losses in translation have been disregarded. The true cost of the results generated by the TPS is described as the adverse impact on employees, such as an unsafe work environment and oppressive mechanisms of worker control (ibid.).

3.3 Managerial barriers to Lean implementation

Since Toyota has been described as a learning organization (Liker and Hoseus, 2008; Rother, 2010; Senge, 2000), a prominent role of management in Lean implementation and development will, if continuous improvement and not just implementation of tools is desired, be to support the structures and behaviors needed for organizational learning. Lean systems based on Toyota will thus require a management system that meets the requirements of a learning organization. Emiliani (2006) indicates that the management approach is of fundamental importance in Lean development, stating that the preferred description for this *management system* outside of the Toyota Motor Corporation is "*Lean management*" (p.167). However, despite indications for the importance of management there is a gap in the literature on Lean production regarding management Mann, 2010), and difficulties regarding the implementation of Lean often occur due to the overlooked but crucial differences in management approach (ibid.).

To shape a company into a learning organization is a severe undertaking. It has taken Toyota close to a century to get where they are now, and it took them over ten years to shape their US operations into something that resembles what they achieved in Japan. Liker and Hoseus (2008) are adamant in their opinion that the process begins with top management setting long-term strategy based on a philosophy that aims at generating value for customers as well as society and employees. Start from the top, engage employees from the bottom up, let middle management advocate the change, and understand that it takes time to develop people who truly understand and live the philosophy they say. This requires senior

management commitment as well as participation. Furthermore, it requires a coaching management approach and not merely a chain of control, and participative behavior rather than merely directive. For management it would also imply reflection on managers' own behavior and results in order to promote self-development. It also means long-term thinking that accepts short-term losses in exchange for long-term stability and gain. For many companies not developed as learning organizations and often focused on mass-production, these changes would mean significant cultural alterations.

Two reasons indicated for management's ineffectiveness in leading Lean implementations are lack of insight as to what an implementation would actually mean in terms of commitment and change, and the Lean concept being inconsistent with the short term-business pressures faced from influential stockholders (Emiliani 2006). Researchers have claimed regional cultural differences form barriers to implementation, (works in Japan, but not here), but productivity and quality levels have been shown to be independent of plant location. Krafcik (1988, p. 41) states that corporate parentage and culture appear to be correlated with plant performance, whereas the level of technology and plant location do not. One of the reasons the book *"The Machine"* by Womack et al. has been so influential is partly due to showing that JIT was in fact transferable and not culturally bound to Japan, explains Holweg (2007, p. 428)

Management and leadership are frequently pointed out as important in Lean implementation and change initiatives. The responsibilities that management needs to take in a Lean implementation are many, but the reasons for not taking them are seldom clarified.

Poor leadership is identified by Hines et al. (2008, p. 46) as the reason for poor sustainability of Lean change, with the top reason being "Lack of clear executive vision." They further state that leaders must be seen to be "walking the talk" and that it is the leader's job to develop people by mentoring, coaching and example. On the topic of a clear executive vision Bhasin and Burcher (2006, p. 67) state that; *"...the major difficulties companies encounter in attempting to apply lean are a lack of direction, a lack of planning and a lack of adequate project sequencing."* These difficulties can be directly linked to the participation and involvement of senior management and the leadership hierarchy, who need to be directly involved through teaching and coaching (Liker and Hoseus, 2008, p. 49) and by developing a vision and leading from the very top of the company (ibid., p. 525).

Regarding lack of understanding about what a Lean implementation would actually mean, Senge (2006, p. 317) quotes O'Brien saying "*If this type of organization is so widely preferred, why don't people create such organizations? I think the answer is leadership. People have no real comprehension of the type of commitment that's required to build such an organization.*" In line with this, Bhasin (2012) points out that Lean thinking based on the Toyota Way involves a far deeper and more pervasive cultural transformation than what most organizations had anticipated, and that most Lean implementations that fail or come up short can be attributed to culture and change, i.e., leadership-related challenges.

As described by Pettersen (2009), the Lean concept may due to its weak inscriptions require significant translation efforts prior to an implementation. If Lean is to be connected to strategy, top management involvement in this initial translation effort is crucial in order to create a clear executive vision and management approach. From this perspective it is obvious that both initially and along the road of a Lean implementation senior management is central, since it is here the strategic intent is initially seen (and thereby the sense of urgency to change), and it is here financial control of the organization lies.

The difference in perspectives and perhaps inability to share perspectives make directing an organization in one direction, such as a new way of working, challenging and may generate resistance. The managerial challenge of initiating change is described by Kotter and Schlesinger as: "*Managers who initiate change often assume both that they have all the relevant information required to conduct an adequate organization analysis and that those who will be affected by the change have the same facts, when neither assumption is correct. In either case, the difference in information that groups work with often leads to difference in analyses, which in turn can lead to resistance.*" (2008, p. 5). Further challenges for senior managers initiating Lean implementations and the importance of participation and role modelling are described by Rother (2010), who points out that it is middle and lower level managers of an organization who are the ones who will implement and drive Lean within the organization, but that they will not initiate this work independently. Instead, they will tend to wait and see, and base their own actions on the deeds and not the words of senior management, since it is their actions that will give directions on the true priorities and what will really happen (ibid.). Hence, senior management action and participation in a Lean implementation may be considered central in order to promote the desired change and to visualize the priorities.

It is, however, common that it is the operations group and not senior management that typically becomes the target of change programs and organizational learning efforts (Schein, 1996). However, in organization after organization it has been found that the innovations and more effective operations generated in such efforts do not diffuse upward in the organization or last (ibid.). Therefore, even though operations may change and develop, this is not followed by an adaptation in management to support the development, something that most likely affects sustainability.

Thus the perception of Lean as a toolbox that may be used in production and operations to reduce waste and improve quality is limited in that it does not take a systems approach or address management as a way of assuring sustainability. The adaptation of management in a Lean implementation in order to support people development, structures and behaviors needed for organizational learning can be seen as vital. Isao Kato, an initial master trainer at Toyota, addressed the issue of people development by stating that; *“If people want to succeed with Lean or TPS they have to emphasize people development and making leaders capable of delivering improvements”* (Liker and Meier, 2007, p. xxiii). Kato also addresses the issue of people development by pointing out that it is not possible to separate people development from production development and succeed in the long run (ibid. p. xxiii). The Toyota system consists of two complementary, interdependent parts or intertwined streams (Liker and Hoseus, 2008). One is the production value stream, which is what the Toyota Production System represents and the other is the human value stream, which is represented by the Toyota human system. The interdependency between these two parts is further described by Liker and Meier (2007) as the technical side, *Toyota Production System*, being designed to identify and highlight problems, while the human side, *Toyota Human System* is designed to develop and engage people in such a way that they are willing and able to solve the identified problems. The combination of these two sides is also addressed by Osono et al. (2008), who find that what has made Toyota successful is the ability to combine the technical and the human side and to focus on the human being as the center of production and consumption. Toyota expresses this in the statement pictured in Figure 2.

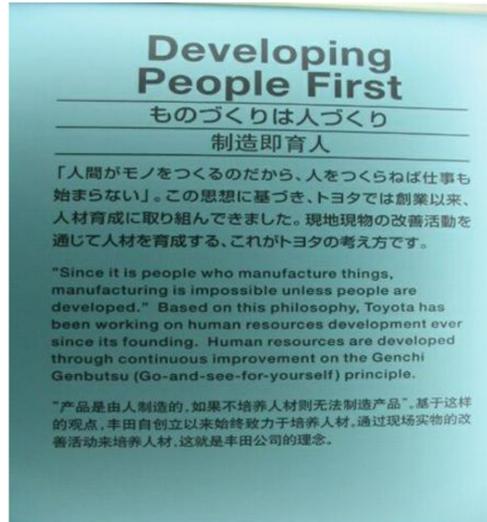


Figure 2. Exhibit label from Toyota exhibition-center, Toyota City, Japan
Photo by J. Renström

Based on this, a management approach that prioritizes people development and considers the human being as central to productivity and continuous improvement can be said to be central to Lean operations. One way of approaching and understanding this perspective is by the concept of human factors ergonomics (HFE). HFE focuses on systems in which humans interact with their environment (physical, organizational and social) and addresses joint improvements of performance and well-being (Dul et al., 2012). Improvements in performance and well-being are achieved by improving human/system integration by “*fitting the environment to the human*” (ibid., p. 3). A comparison can be made between the Toyota principle of “Respect for People” and the HFE statement that “*With a better fitting environment, humans are better able to contribute to performance*” (ibid., p. 3). A differential characteristic of HFE is the focus on the two joint outcomes of performance and well-being; disciplines such as engineering share the focus on one of these outcomes with HFE, but not on both outcomes (ibid., p. 6). System decision makers, e.g., managers are defined as a main HFE stakeholder group by Dul et al. (ibid.) and benefits from HFE are stated to be better productivity, quality and reliability, lower operating costs, and more innovation (ibid., p. 13). These benefits closely resemble results usually aspired to in Lean implementations.

3.4 Toyota as a learning organization

As previously mentioned Toyota has been referred to as a learning organization by several sources (Liker and Hoseus, 2008; Rother, 2010; Senge, 2000). A learning organization can be viewed as an ideal type of organization that has the ability not only to facilitate the learning of its members but also to transform this learning into continuous organizational renewal. The importance of people development and interaction within a learning organization is reflected in Senge's (2000) statement regarding Toyota where he describes TPS as being "*in fact a learning system inseparable from the knowledge embodied in the people who make up the system*" (ibid., p. 73).

A learning organization aims for increased and improved cooperation to generate participation and ownership regarding company goals. Improved ways of cooperating are also said to promote both development and utilization of competence. Senge (2000) writes on this topic:

"The key to local goal setting that serves the health of the whole is helping people at the local level see how they fit into the larger system. Only then can they shape a field of local goals consonant with system-wide health."(ibid., p. 73)

To continually learn how to learn together and to nurture expansive patterns of thinking (ibid., p. 3) would imply increased contact both horizontally and vertically for managers within the organization. A prerequisite for this is having connections to co-workers available within the organization. These connections can be formalized within the organization or be allowed to take shape in an informal way. Examples of formalizing can be seen in Toyota's concepts of *genchi-genbutsu* and *hoshin-kanryu*.

"Human resources are developed through continuous improvement on the Genchi-Genbutsu (Go-and-see-for-your-self) principle".
(Toyota exhibit label)

Liker describes the concept of *hoshin-kanryu* used by Toyota as meaning "*to gain acceptance for strategic decisions,*" and states that it is Toyota's way of communicating its visions from the executive level to the shop-floor team level. In the process demanding targets are set at the top-management level and are then transformed into measurable targets for the year by each level of the organization.

The targets need to be very specific; unclear targets are not acceptable, (Liker, 2010).

This requires a specific behavior and structure of the organization and its managers and can be seen as the foundation for implementing the principles and methods of Lean ways of working. According to Toyota's 9th principle:

“Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others.” (Liker, 2004, p. 182)

Characteristics of a learning organization as described by Schein (2004) can be compared with Toyota's view on learning, as described by Liker and Hoseus (2010).

Schein (2004) describes a learning culture as one that assumes that the world can be managed and that it is appropriate for humans to be proactive problem solvers. Schein further states that accurate and relevant information must be allowed to flow freely in a fully connected network and that reality and truth must be pragmatically discovered. Liker and Hoseus (2008, p. 40) describe Toyota's view on learning by a quote from the Toyota Way 2001:

We view errors as opportunities for learning. Rather than blaming individuals, the organization takes corrective actions and distributes knowledge about each experience broadly. Learning is a continuous company-wide process as superiors motivate and train subordinates; as predecessors do the same for successors; and as team members at all levels share knowledge with one another.

Liker and Hoseus (ibid.) go on to describe Toyota's production systems as being designed to “expose problems” and as being a means to the end, and not the end in itself. They further describe problem solving as being the focus of the Toyota organization, with people feeling comfortable to admit they have a problem and being supported in problem solving and learning by committed and knowledgeable leaders and daily management systems.

Both perspectives here clearly indicate that proactive problem-solving and sharing of information and knowledge are central aspects. For a company to work according to these principles however, structures such as a target setting process or *hoshin-kanryu* as well as supporting managerial behaviors must be set up.

3.5 Organizational learning

The term “learning organizations,” connected to Peter Senge, is described by Eikeland (2012) as primarily indicating an organization as a unit or a structure that learns as humans and individuals might learn. Individuals then may learn in different ways. Single- or double-loop learning are two different ways of learning, where single-loop learning indicates learning to do things the right way, whereas double-loop learning implies learning to do the right or proper things.

Organizational learning as described by Eikeland (ibid.) is not an entity, unit or organization but rather a special *form* of learning. It concerns how something is learned, who it is that is learning, and what it is that is being learned.

Considered to be collective experiential or experimental learning, organizational learning is *learning based on doing things together*. Organizational learning thus requires testing, experimenting and analyzing together with others. It differs from theoretical learning which can be achieved by individually or collectively reading or listening to information. Nor is it learning by doing in the form of an apprenticeship or imitation or learning by doing individually. Organizational learning rather indicates collective learning through practical experience or, as stated by Eikeland (ibid.) learning by trying to solve tasks or perform better together. This type of learning involves individuals interacting for a purpose but goes beyond “team learning,” since it involves interaction between organizational departments and levels.

Organizational learning may be considered a fundamental strategic process and a vital competitive advantage for companies in facing current and future competition, as well as a critical process for firms’ strategic renewal. Interest in the field of organizational learning has grown considerably since the late 1980s. Ellström (2010) finds that globalization and increased corporate competition are generating a need to find alternatives to established forms of organization. The abandonment of traditional Tayloristic and bureaucratic models of work organizations in favor of allegedly more flexible and integrated work systems, characterized as high-commitment work systems, is said to be a reflection of this (ibid.). There appears to be little consensus on how to define the concept of organizational learning, since it contains several dimensions. Individual learning is considered a necessary but not sufficient condition for organizational learning, because organizational learning is assumed to imply individual learning, but not vice versa. The transfer mechanism between individual and organizational learning, that is the process through which

individual learning becomes embedded in an organization's memory and structure, is evidently at the heart of organizational learning (Kim, 1993).

The team is said by Senge (2006) to be the fundamental level of learning within an organization, since the learning at a collective group level differs from the sum of each individual's learning. Vera and Crossan (2004) describe organizational learning as interplay between different system levels or as a dynamic process over time and across levels, indicating that individual, group and organizational levels all need to be considered (Figure 3).

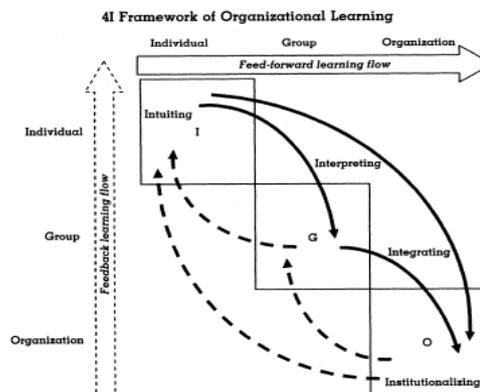


Figure 3: Framework of organizational learning by Vera and Crossan (2004).

Organizational learning is a dynamic process (Vera and Crossan, 2004). Not only does organizational learning occur over time and across levels, but it also creates a tension between assimilating new learning (feed forward) and exploiting and using what has already been learned (feedback). Crossan et al. (1999) explain the phenomenon as follows:

“Through feed-forward processes, new ideas and actions flow from the individual to the group to the organization levels. At the same time, what has already been learned feeds back from the organization to group and individual levels, affecting how people act and think. The concurrent nature of the feed-forward and feedback processes creates a tension, which can be understood by arraying the levels against one another, as shown in Figure 1.(Figure 3 in this thesis) Doing so illustrates that, in addition to the processes that feed forward learning from the individual and groups to the organization, learning that has

been institutionalized feeds back and impacts individual and group learning.” (p. 532)

Crossan et al. (1999) elucidate these interacting “flows” by examining two relationships they find especially problematic: interpreting-integrating (feed-forward) and institutionalizing-intuiting.

The first one, *interpreting-integrating*, requires a shift from individual learning to learning among individuals or groups. This requires sharing individually constructed cognitive maps in a way that creates a shared understanding among members of a group. To achieve this, individual group members must first be able (and willing) to communicate their own cognitive maps. This can be challenging since many aspects of cognitive maps are tacit and thus require a process of surfacing and articulating the ideas and concepts to be communicated. Assuming this is achieved, the second challenge is to make the understanding shared in a group, something that is not achieved just by communication. Comprehending language is complicated by cognitive maps that act as individually unique filters on the communication; we thus tend to see and hear what we believe rather than believe what we see and hear (ibid.). With a learning perspective like the one described by Crossan et al. (1999) it is suggested that *leading with action* rather than just focusing on cognition may provide an alternate way to a shared understanding because action provides an opportunity for shared common experience which may be helpful. For novel ideas that shared understanding may thus not evolve unless shared action and experimentation are attempted.

The second problematic relationship, *institutionalizing-intuiting* (feedback), requires experimenting or setting aside the institutional order to enact variations that allow intuitive insights and actions to surface and be pursued. Actually stepping back from institutionalized learning generated from proven, objective success and allowing unproven and subjective experimentation can be challenging both structurally and cognitively.

The sociocultural approach to organizational learning has received considerable attention in recent years as an alternative to the cognitive-behavioral approach, which has been criticized for a decontextualized view of knowledge, according to Ellström (2010). Indicated here is that learning is a matter of participating in practices and that learning cannot be separated from work and other social practices where it is assumed to take place.

Implied by the concept that “learning about practice is less central than learning to become a practitioner” (Ellström, 2010, p. 50) is socialization. The concept of socialization is addressed by Nonaka et al. (2000) in a description of knowledge conversion as taking place in four modes: socialization, externalization, combination and internalization. Knowledge is here described as being context specific and either tacit or explicit. Tacit knowledge is deeply rooted in action, procedures, routines, values, and emotions and not easily communicated. Also, tacit knowledge is not easily changed, according to Schein (1996), who states that norms held tacitly across large social units are much more likely to change leaders than to be changed by them. Culture viewed as ways of perceiving, thinking and reacting that are taken for granted, shared and tacit, is stated to be one of the most powerful and stable forces operating in organizations (ibid.). Managers who have the ability to lead by what Vera and Crossan (2004) call shared action and experimentation may thus be considered vital in order to generate a shared understanding of desired ways of working in a Lean implementation.

Effective organizational learning, according to Kim (1993), requires a balance of conceptual and operational learning, since conceptual learning creates changes in frameworks or opinions that are taken for granted, which lead to new ways of looking at the world, whereas operational learning produces new or revised routines that are executed in lieu of old ones. An operational perspective here indicates learning at a procedural level such as routines and SOP's, whereas a conceptual perspective indicates thinking and learning about why things are done in the first place.

Strategic leadership and top management play an important role in the development of organizational learning, due to the decisions they are empowered to make. Despite a growing interest in the field, researchers have unfortunately said little specifically about the role of senior management in implementing organizational learning in their firms (Vera and Crossan, 2004). Vera and Crossan (2004) strive to bridge this gap by integrating strategic leadership theory and organizational learning and by describing specific behaviors and practices of strategic leaders that either facilitate or hinder organizational learning. Strategic leadership theory refers to the study of people at the top of the organization and covers executive work, not only as a relational activity but also as a strategic activity and a symbolic activity. The creation of a learning culture depends on how well the strategic leader can balance transactional and transformational behaviors as described by Bass (1999), such as task and relationship orientations and authoritarian and participative systems (ibid.). Furthermore, strategic leaders with both transformational and transactional behaviors need to shape the firm's structure to accommodate both

mechanistic and organic features, to facilitate both the reinforcement of institutionalized learning and the development of new learning. Vera and Crossan (2004) argue that in order to manage organizational learning the most effective strategic leaders will be those best able to make use of both transformational and transactional leadership depending on situational requirements. Both leadership styles are effective in facilitating organizational learning, albeit in different situations, and can be said to be complementary. Vera and Crossan (2004) disagree with the tendency to equate organizational learning with only the feed-forward processes of exploration, a characteristic of transformational leadership, stating that this perspective misses much. The full breadth of organizational learning also needs to account for the requirement to extend lessons learned to the far reaches of the organization and the need for leadership to refresh and reinforce institutionalized learning.

3.6 Management and learning

Strategy concerns the evolution of an organizations basic mission (Schein, 2004) and is according to Brown et al. (2005) the ultimate responsibility of senior level managers. Johnson (1987) points to long term-direction of the organization towards a future likely to be uncertain, decisions demanding an integrated approach, and managing change and adjustment as all being characteristics of strategic management, i.e. senior-level management. He also states that it cannot be regarded as separate from other forms of management but is likely to be distinguished by complexity and a higher degree of uncertainty. Argyris (1999) describes organizational strategy as originally being conceived as: *“a kind of planning aimed at formulating broad policies based on appreciation of a firm’s position in relation to its markets, competitors, technologies, materials and skills”*(p. 2). Attention is stated to have shifted over time from planning to implementation of plans and then to the interaction of planning and implementing in a process: *“explicitly described as organizational learning”* (p. 2). With this perspective and if organizational learning is considered a fundamental strategic process and a vital competitive advantage for companies as well as a critical process for firms’ strategic renewal, senior-level management is vital.

On the topic of learning Emiliani (2003) states that beliefs, behaviors, and competencies of Lean leaders cannot be classified as either transformational or transactional. In line with Vera and Crossan’s (2004) statement that the creation of a learning culture depends on how well the strategic leader can balance transactional and transformational behaviors, Emiliani argues for a complementary view in writing that *“the path to competency development is rooted in action*

learning through kaizen, which combines elements of both transactional and transformational leadership in a blame-free environment” (2003, p. 908).

The interplay and complementary aspects of leadership and management, sometimes perceived as two seemingly contradictory forces, can be found in theories regarding organizational learning as well as in the Toyota system. Kim (1993) points out that effective organizational learning requires a balance of learning both conceptual (why things are done in the first place) and operational (routines and SOP's). Also, Vera and Crossan (2004) point to an ability to balance transformational and transactional leadership, which are stated to be complementary leadership styles, depending on situational requirements as a success factor. Similarly, Liker and Hoseus (2008) describe the Toyota system as consisting of two complementary, interdependent parts: the production value stream represented by the Toyota Production System and the human value stream represented by the Toyota Human System. Liker and Meier (2007) describe the technical systems side as being designed to highlight problems while the human system side is set up to develop and motivate the people who will solve the identified problems.

Leaders within a learning organization are described by Senge (2006, pp. 321-340) as individuals who are dedicated to both self-development and, in the role of teacher or servants, to developing others in line with the organization's guiding ideas. Leadership at Toyota as described by Liker and Hoseus (2010, p. 335) is in many ways similar to what Senge (2006) describes regarding leadership within learning organizations. Liker and Hoseus (2010) point to the fact that Toyota leadership is sometimes referred to as “servant leadership” and that leaders are the ones who develop culture and hence Toyota invests years to develop leaders who carry the DNA of the company in their thoughts, words, and actions. Toyota prefers to develop leaders from within gradually, rotating them broadly but with deep experience at each step. But when it is necessary to hire from the outside, the selection procedure is rigorous, searching for the kind of technical awareness characterized by *genchi genbutsu* and the “soul” of the Toyota spirit.

Implications are that a leader managing reactions from the organization during Lean development and implementation will have to be thoroughly trained him- or herself in the system aspired to in order to be able to function as a steward or a role model for the desired culture. He or she must also be able to spend time both on growing and developing employees by taking part in problem-solving activities and on his or her own growth and development. Leaders must become the change they wish to see in others.

3.7 Summary of framework

Even though management and leadership are pointed out as vital in Lean development (Emiliani et al., 2007; Spear, 2004; Liker and Hoseus, 2008) the management approach is considered to often generate difficulties in Lean implementations (Bhasin, 2012). In addition, research is lacking on Lean and management (Mann, 2010).

There are numerous descriptions of Toyota as being a learning organization and as an organization able not only to facilitate the learning of its members but also to transform this learning into continuous organizational renewal (Emiliani, 1998; Liker and Hoseus, 2008; Rother, 2010; Senge, 2000). Lean based on the Toyota Way may thus be considered to entail preconditions related to organizational learning. We must recognize assumptions such as errors being opportunities for learning and a production system being a way to expose problems and a means to an end, not an end in itself (Liker and Hoseus, 2008). Taking this perspective it is clear that Lean is a continuous company-wide process where managers have a clear obligation to train and develop both themselves and their co-workers (Liker, 2004; Liker and Hoseus, 2008,) by actively participating in and initiating problem solving.

Organizational learning is considered to be collective experiential and experimental learning, and thus requires testing, experimenting, and analyzing together with others (Eikeland, 2012; Schein, 2004). Theoretical learning achieved by individually or collectively reading or listening to information is not sufficient. What is required is *collective* learning through practical experience or as described by Eikeland (2012): learning by trying to solve tasks or perform better together. Organizational learning is a dynamic company-wide process over time and across all levels: individual, group, and organizational. It requires both the ability to surface and articulate ideas and concepts as well as the ability to set aside the institutional order to enact variations that allow intuitive insights and actions to surface and be pursued and eventually incorporated in the institutional order. This means having the ability to accommodate both mechanistic and organic features in order to facilitate both the reinforcement of institutionalized learning and the development of new learning. Thus, a managerial ability is required to balance transactional and transformational behaviors (Vera and Crossan, 2004).

Regarding managerial implications, the organizational learning perspective suggests that leading with action rather than just focusing on cognition may provide an alternate way to shared understanding of the Lean concept. Since the

comprehension of language is complicated by cognitive maps that act as individually unique filters on what we hear or read, a shared understanding of novel ideas within an organization, such as Lean, may thus not evolve unless members of the organization attempt to share action and experimentation. Managerial ability to lead by what Vera and Crossan (2004) call shared action and experimentation may therefore be considered vital in order to generate a shared understanding of desired ways of working in a Lean organization. Managerial participation and interaction are necessary to assure managerial competence development regarding the Lean concept as well as for generating understanding about related needs and requirements within an organization during a Lean development effort.

To sum up, taking the perspective that Lean based on the Toyota Way mandates organizational learning (Liker and Hoseus, 2008; Rother, 2010; Senge, 2000) brings with it certain managerial implications. The following points can be said to be central and will be referred to in the general discussion.

- Lean and organizational learning means learning together collectively through practical experience or as stated by Eikeland (2012), learning by trying to solve tasks or perform better together. As described by Emiliani and Emiliani (2013), the Lean concept may appear conceptually simple but requires considerable hands-on involvement and daily practice to grasp and understand.
- This type of learning entails learning among individuals interacting for a purpose (Senge, 2000) yet rather than “team learning” it involves interaction between organizational departments and levels (Vera and Crossan, 2004). To support this interaction and to assure both the acquisition of new knowledge and the utilization of knowledge, structures such as target-setting processes or *Hoshin-Kanryu* (Liker, 2010) are vital. In establishing and supporting such structures and in assuring a balance of transactional and transformational behaviors (Vera and Crossan, 2004; Emiliani, 2003), senior management is important.
- Managerial participation and interaction in implementation efforts are vital for managerial competence development regarding the Lean concept (Emiliani and Emiliani, 2013), as well as for generating understanding regarding needs and requirements within their own organizations. Both managerial participation and the ability to lead by what Vera and Crossan (2004) call shared action and experimentation may be vital in order to

generate a shared understanding of desired ways of working in a Lean implementation.

4 Summary and Results of Appended Papers

This chapter presents a case description and the results of the three appended papers.

4.1 The studied company

The studied company began the implementation and development of a Lean-based enterprise system nine years ago. According to the president of the company the organization was performing below its potential in areas such as lead times, profitability, and quality, leading to the decision to develop by implementing a Lean way of working. The standardized way of working and organizational approach aspired to by the company is intended as an enabler for running the operations in a decentralized way and yet assure continuous improvement of the business and competitiveness.

At the start of the implementation work the company employed more than 8000 people divided over some 50 production units and 30 sales units spread globally. The company, according to its president, was making decent profits overall but could do a lot better. The president described the process as awakening a sleeping giant with untapped potential. Sixteen week-long implementation initiatives were initially launched within production areas of the organization. These initiatives were conducted as joint operations, where external consultants worked together with internal change agents in order to train and develop the company's future experts. The implementation-initiatives were later run entirely by the company's own change agents, in total about 50 people, in production, sales and marketing, and product development.

The financial goals that were set up at the start of the implementation were reached, according to the company president. Following this achievement the ensuing goals of the company have been to grow its operations and to further ensure success and develop its way of working with continuous improvement of productivity. The development and implementation of the system has after nine years reached a point where demands are made across the organization in the form of mandatory progressively harder standards that are to be met by local units, which can be seen as a way of sequencing the change-effort. The change in approach- from focused 16-week initiatives in specific units of the organization to a wider approach across the organization- was a result of a perceived lack of sustainability generated by the initial way of working. More of a coaching approach has evolved over time. The

complexity and high intentions of previous implementation efforts has been reduced to sequences of changes.

Responsibility for the development has over time also shifted from an initial situation where the external and internal experts approached the organization as experts who in detail pointed out what to do and in a way took over responsibility from line managers. The current coaching approach instead of the expert approach means helping the line organization and managers see and understand the desired standards and ways of working and then coaching them in taking decisions regarding what needs to be done in order to reach the standards. A result of this approach is that the responsibility for changes more clearly rests with line management and not the company's experts or change agents. This change in approach has also resulted in a drastic decrease in the number of change agents. The endurance of the implementation and the fact that the approach has been allowed to develop and generate the insights that shape it today can be considered rather surprising. Much of this endurance, I believe, can be accredited to the president who initiated it and despite the lack of initial sustainability maintained a firm belief that the development aspired to was achievable and would bring with it needed improvements for the company.

4.2 Summary and results of paper A

The purpose in paper A was to increase understanding regarding the relationship between how Lean is defined and implemented. How do the managers' views on Lean impact the way Lean is implemented? Does a "toolbox Lean" view or "Lean thinking" view generate approaches that tackle a project with a time limit or approaches that take the implementation more as a start of a continuous developmental process? Based on a case study at a globally established manufacturing company described in 4.1, the paper provides a perspective covering five hierarchical levels of the organization. Individual semi structured interviews were conducted with 20 managers and included the company's president as well as product area presidents, production managers and shop floor managers.

Findings in the study show that the interviewed managers had altered their view of Lean as a result of the implementation work. Their way of defining Lean had evolved from a "toolbox" view toward more of a "Lean thinking" definition. As a consequence of this altered perspective, their views on the implementation process have changed, since with a different perspective new and perhaps unpredicted deviations or needs become visible in the organization.

Further findings indicate that the development of production units individually without support from middle management or human resources (HR) generates fragmentation and sub-optimization within the organization, which may hamper the intended development. The need for a system-wide approach and cross-functional cooperation that depends on management systems and management approach was found to be important.

Informants for the study described the focus on selected production units within the organization as targets for change and development initiatives as having caused functions and management levels to be bypassed, apparently causing ambiguity regarding priorities and work approach.

The paper contributes to a deeper understanding of the needs for a system-wide approach where interdependent functions develop together. It also adds to the learning related to Lean development that may cause the targets of a Lean implementation to shift during the process.

4.3 Summary and results of paper B

Paper B addresses the role of leadership and management in a Lean enterprise system. The purpose of the paper was to conceptualize the concepts of leadership and management in regard to the Lean concept and thus increase understanding concerning the roles of leadership and management in Lean.

The study is based on the literature in the field of management science. Input was generated by searching the databases ISI Web of Science, Scopus, and Google Scholar. Search results were compared using the Publish or Perish program. The study takes a snowball approach to identify people influential on the topics through their writings.

In the paper my co-author Halling and I show that leadership and management are two different but complementary concepts. We argue that these two seemingly contradictory concepts are present in the duality and complementarity of Toyota's two foundational principles of Continuous Improvement and Respect for People. Differentiating between the two concepts is important in order to understand and meet organizational needs during Lean implementations, where both management and leadership have relevant but different and complementary functions in the development process. Implications of the study include a need for greater understanding regarding the differences between management and leadership as well as a need to train managers in leadership. Furthermore, the tendency to apply

Lean as a mere tool-box rather than an enterprise system that encompasses both cultural and behavioral standards may be a result of the fact that organizations are stated to be over-managed and under-led. An over-managed and under-led organization most likely lacks the ability to work with organizational culture and to influence behavior.

The ability to combine dualistic systems of action such as standardization and improvement, leadership and management or the technical and the human side while maintaining focus on the human being as the center of production and consumption can be considered a key success factor. The paper highlights the need for understanding the complementary aspects of management and leadership and contributes to the understanding of how these two seemingly contradictory concepts contribute and are needed in a Lean approach.

4.4 Summary and results of paper C

Paper C addresses lessons learned among senior management with regard to nine years of Lean implementation and focuses on perceived implications and possible obstacles that may affect senior managers' ability to implement and sustain a Lean-based enterprise system. The study covers the two top hierarchical senior management levels of the organization. The studied organization is identical to the one in paper A and is further described in section 4.1. Individual semi structured interviews were performed with eight senior managers to collect data for the study.

Four central obstacles related to senior management and Lean implementation are presented in paper C:

- The absence of initial senior management competence evaluation and training regarding Lean
- The disconnect between Lean implementation and company strategy
- The lack of a system-wide approach
- The failure to involve key players such as HR in initial implementation efforts

Lack of initial senior management competence evaluation and ensuing training related to the Lean implementation is stated to have impeded the Lean implementation process. This is said to have resulted in consequences such as the desired change- a Lean way of working- not being connected to company strategy, key players not being involved and held accountable, and consequently the initiative being slowed by organizational fragmentation. The authors argue that

recognition and acceptance of senior management's own lack of competence or developmental needs must be part of the implementation process and development of the organization. The recognition or understanding of such competence gaps may not be possible to initially explain to, or force on a senior management team, but may have to develop over time as the team generates a deeper understanding of Lean management. Lean, thus, is as much a developmental process for senior management as it is for the rest of the organization. Learning by doing appears to be the way to bridge this knowing-doing gap. These results can be seen as providing a background to claims of insufficient management skills and insufficient understanding of the potential benefits of Lean. This study points to possible reasons for these obstacles to Lean implementation efforts to occur and draws managerial implications. The results stress the importance of initial senior management competence evaluation and development in connection with initiating a Lean implementation. Understanding how reward systems or other conditioning factors influence senior management behaviors and attitudes towards their own competence evaluation and development is vital in order not to impede a Lean implementation. Lean needs to be identified as the preferred enabler for strategy implementation and long-term financial results by senior management prior to initiating a Lean effort. Finally, the tendency to delegate the leading of change to specialists or consultants was found to impede competence development for senior management, thus in a way robbing them of the ability to fully support a Lean implementation.

5 Discussion

The three research questions will here be discussed from an organizational learning perspective. Since Lean may be considered tightly linked to organizational learning, the concept will be discussed with this perspective in mind. The discussion aims to further generate understanding of Lean prerequisites and consequent managerial implications.

5.1 How do manager's views on Lean impact their view of the implementation process?

The studied organization started its Lean journey with the help of external consultants and what can be described as a "tool-box" view of Lean. The Lean initiative was considered a way to increase delivery precision and productivity and thereby profitability. Hence, the initial transformation efforts focused on production units and for the most part left out support functions such as HR within the organization.

This initial focus on mainly producing units generated conflicting priorities within the organization and resulted in a fragmentation of the organization where, as described in paper A, HR was not actively participating in training and people development activities connected to the implementation.

In order to deal with the perceived fragmentation and described ambiguity and conflicting priorities, members of the organization expressed a need for increased dialogue and cross-functional interaction. -One area president indicated that just communication is not sufficient, since even if people use the same words, that does not mean that the meaning behind the words is the same. What is indicated here is a need for both a structure and behavior to support organizational learning. The comment is a good example of how language comprehension is complicated by cognitive maps (Crossan et al., 1999), which act as individually unique filters on communication. Therefore, we tend to see and hear what we believe rather than believe what we see and hear. Intentional organizational learning generated from the interplay and shared action between different system levels and functions was evidently not made possible here, due to a lack of communication between organizational system-levels and areas. As indicated in the statement from the manager, words are sometimes not enough; action and role modeling may be needed to generate a shared understanding of what is to be achieved. Leading with action rather than just focusing on cognition provides an alternate way to shared understanding of a topic since action provides an opportunity for shared common

experience, which may aid in the development of shared understanding Crossan et al., 1999). In this case, however, the implementation of Lean was delegated by senior management to external and internal experts, thus ironically bypassing and leaving out part of the management and rendering them incapable of leading with action and participating in the change process.

Over time the managerial understanding of the Lean concept evolved into something more than just a toolbox, which brought new and unforeseen demands for management. Managers at all levels of the organization described in the interviews how their view of Lean had changed over time from a technical, toolbox view to a philosophy view, with more focus on people, learning and behaviors. Yet other management levels perceived senior managers as maintaining a toolbox view of Lean and as not yet having understood the importance of leadership and people-development. A characteristic of organizational learning as described by Vera and Crossan (2004) is that it involves interaction between organizational departments and levels. The findings here, however, indicate a lack of participation and dialogue between management levels and organizational functions, which is likely to have generated the conflicting priorities experienced in the organization and over time might cause a lack of trust between management levels and functions. Indications of this were found in activities interviewees described, such as using “safety-umbrellas” to keep away undesirable input or demands that were considered detrimental to a unit’s development work.

The study found that the approach of expecting production units within an organization to develop individually without coordination with other organizational functions and stakeholders hampered the Lean implementation. This approach is found to create tension and ambiguity within the organization and to result in units trying to shield themselves from other parts of the organization. Even if certain positive results can be achieved by locally applying Lean tools, the sustainability of the tools and the way of working with them require a system-wide approach (Seddon, 2005). Such an approach would need to involve both middle management and functions such as HR in order to align people development and target-setting activities within the organization. In the studied case, however, the HR function considered a key player in aligning and supporting people development was considered more of an obstacle than a support since it was described as increasing the managers’ workload with assignments considered not to be in line with shop floor needs related to the Lean development.

That Lean may be reinterpreted and that the initial meaning of the concept may change or develop during an implementation effort is something this study

concludes. Even if the initial focus is on tools and their application, and the tools themselves initially are regarded as Lean the insights generated from working with the tools may cause the implementation to evolve into also addressing culture as well as the design and management of work. A “toolbox” approach (Pettersen, 2009; Seddon, 2005) may thus start out as a project-like implementation but may over time evolve into an effort of continuous improvement. Lean development efforts initially directed at production units within an organization as described in paper A might thus over time evolve into a process of continuous improvement directed towards the entire organization, provided the initiative is allowed enough time to generate these insights. This would mean development from shop-floor tools to a more customer-focused strategic approach covering both Lean levels, as described by Hines et al. (2004). It can thus be said that even though an organization may initiate a Lean implementation with one specific focus and intention, this focus may develop and change as the organization interprets the Lean concept and generates awareness and understanding regarding its own specific needs and circumstances.

The presence of individual cognitive maps and the ensuing multitude of different perspectives and analyses present within any organization clearly make communication, dialogue, and opportunities for shared action essential in coordinating and directing an organization towards a desired objective. The lack of a “feed forward” process as described by Crossan et al. (1999), in this case most likely affected by the tendency to by-pass management levels and to rely on consultants, resulted in a lack of target-setting and follow up, as well as an unclear connection to company strategy. Desirable alterations in company processes and standards, as well as reward-systems needed to support the desired change were thereby overlooked. However, the managers expressed a newfound understanding of an increased need for leadership, people development and dialogue brought on by the Lean effort. The need to balance transactional and transformational leadership, said to be central within a learning organization (Vera and Crossan, 2004; Emiliani, 2003), is clearly demonstrated here. On an organizational level, senior management and the competence of senior managers regarding Lean are of vital importance.

Thus, the question of how manager’s views on Lean impact their view of the implementation process can be summed up by stating that their view on Lean generated a production focus in the implementation work that left support units out of the change effort. However, as the managerial understanding of the Lean concept evolved into something more than just a toolbox, their views evolved. This

change in view brought with it new and unforeseen demands for management and leadership.

5.2 How is management of Lean described in the literature?

Leadership and management were found to be essential to a Lean implementation in the first study. The statements from managers regarding how their roles changed to involve more people development activities and more influence on behavior led to the focus of the second study.

In study 2 leadership and management were found to be two different but complementary concepts. Paper B argues that these concepts can be seen as reflected in Toyota's two foundational principles of Continuous Improvement and Respect for People, as described by Liker (2004). The ability to differentiate between the two concepts is necessary to understand and meet organizational needs during Lean implementations, where both management and leadership have relevant but different and complementary functions in the development process. The fact that organizations are said to generally be over-managed and under-led (Kotter 2001) indicates that the ability to work with organizational culture and to influence behavior may be lacking, which may be one potential reason for the tendency to address Lean as a tool-box rather than an enterprise system covering all of its operations and entailing cultural and behavioral standards.

The study points to a need for greater understanding regarding the differences between management and leadership, as well as a need to train managers in leadership. Just as the ability to accommodate and balance both mechanistic and organic features is central to organizational learning, the ability to balance management and leadership fills the same organizational needs. The balancing of transactional and transformational behaviors as described by Bass (1999), for instance enables a learning culture (Vera and Crossan, 2004). The ability to handle seemingly contradictory systems of action, such as authoritarian and participative approaches, is necessary in order to deal with fundamentals such as standardization and improvement.

A complementary view is also advocated by Emiliani (2003), who describes competence development as rooted in action learning through *kaizen*, which is said to combine elements of both transactional and transformational leadership. That organizations are said to often be over- managed and under-led, as pointed out by Bennis (1997) and Kotter (2001), may indicate that the ability of many organizations to work with organizational learning is limited or not readily

understood, which may further account for the tendency to treat Lean as a tool-box rather than an enterprise system for improvement and organizational learning. The understanding of and ability to combine these dualistic systems of action may be considered essential in order to succeed with implementing and developing a Lean way of working that is not mere utilization of selected Lean tools for waste reduction but rather aimed at organizational learning and continuous improvement.

Thus the question of how management of Lean is described in the literature can be summed up by stating that leadership and management are found to be two different but complementary concepts. It is essential to differentiate between these two concepts, because both management and leadership have relevant but different and complementary functions in a Lean implementation process.

5.3 What obstacles affect senior management's ability to implement and sustain a Lean-based enterprise system?

At the time of the third study, the Lean implementation and development effort had been going on at the studied company for nine years, said by all senior managers to be a long-term development effort. One can see in the interviews a clear understanding that the management approach needs to change, but at the same time an unwillingness to actually do so and perhaps ambiguity as to *how* it needs to change. In the study four obstacles for the Lean implementation, related to senior management, are concluded to be central. The absence of initial senior management competence evaluation and training regarding Lean is the first. The second is the Lean implementation not being connected to company strategy. That the approach has not been system wide within the organization and that key players such as HR have not been involved in initial implementation efforts are the third and fourth obstacles.

As described in paper C, senior managers in the company have taken what initially perhaps appeared to be shortcuts by delegating the implementation of Lean to consultants and specialists rather than personally learning and engaging in daily practice in order to understand the system of Lean management. Reasons for this may have been a desire to save time and to avoid confronting ambiguity and the admission of lack of competence.

Unfamiliarity with the Lean concept and its implications regarding senior management is stated to have generated symptoms such as the development activity not being connected to, and not being perceived as an enabler for, company strategy. These findings align with Emiliani and Emilianis (2013) descriptions of

how senior managements' difficulties understanding and practicing Lean management handicap their ability to lead Lean transformations. Other symptoms such as the initiative not being system-wide and thereby bypassing or leaving key players out of the implementation work are also mentioned. Prestige and a reluctance to admit to lacking knowledge regarding Lean management appear to have caused the lack of competence evaluations and training within senior management. The inability or perhaps unwillingness to recognize that a deep understanding regarding Lean is required at senior management levels may also be connected to this. An unwillingness to admit to lacking knowledge within an area indicated by the company president as strategically important clearly impacts the initiation of a Lean implementation. Furthermore a lack of teamwork or shared analysis (considered central to organizational learning, cf. Eikeland, 2012 and Schein, 2004) within the senior management team and perhaps the composition of the management team resulted in key players not being involved in the initial execution of the implementation. As a result, lack of team problem-solving and shared learning most likely negatively affected the competence development within senior management and resulted in certain needs being kept hidden. It appears that the obstacles identified here are influenced by prestige and reluctance to admit to lacking knowledge regarding Lean, a lack of teamwork within the senior management team and an initial failure in the management team to perceive Lean as an enabler for company strategy.

The pressure of quarterly financial reporting at this level, tied to personal benefits and track records, may be a further reason for senior management to, in the shorter perspective, prioritize financial performance indicators. This is in line with statements from Emiliani (2006), who describes how short-term business pressures from influential stockholders at times may be inconsistent with a Lean approach. This prioritization downgrades the importance of developing the enablers for long-term financial development. If this is the case, clearly reward systems for senior management should play a vital part in any change initiative and need to be reviewed prior to initiating a Lean implementation.

That the Lean implementation initially was not considered an enabler for company strategy resulted in the implementation being considered a side-project not connected to strategy. This may also be the reason for the perceptions that follow-ups regarding the implementation were not as serious as follow-ups regarding financial results, and that understanding the Lean way of working was more important for production units than for senior management. The understanding that Lean exists on two levels, Lean production at the operational level and Lean

thinking at the strategic level, as described by Hines et al. (2004), appears to have been missing.

The lack of initial senior management training and competence evaluation regarding Lean and the demands it brings with it clearly impedes and slows down the Lean implementation process. A lack of initial competence development for senior management brings with it consequences such as the desired change -a Lean way of working -not being connected to company strategy, key players not being involved and held accountable, and consequently the initiative being slowed by organizational fragmentation. Furthermore, an inability to coordinate cross-functional initiatives and ineffectiveness in managing functional interdependencies appear. These undoubtedly slow the implementation process down. With regard to organizational learning, the interplay among different system levels and functions described by Vera and Crossan (2004) is clearly affected when implementation is delegated to consultants and parts of the management system are thereby bypassed in the process. Furthermore, from a learning perspective shared understanding of novel ideas may not evolve unless shared action and experimentation is attempted (Crossan et al., 1999). Focusing on mere cognition and none other than a theoretical understanding of a Lean management approach may thus not be enough. Leading with action, however, is considered an opportunity for shared common experience, which aids in the development of a shared understanding for novel ideas (ibid.).

The recognition and acceptance of senior management's own lack of competence or developmental needs may be considered part of the implementation process and development of the organization. This recognition or understanding may not be possible to initially explain to or force on a senior management team, but may rather have to develop over time as the team generates a deeper understanding of Lean management. As described in paper C, the moment managers recognized that the desired Lean way of working was an enabler of financial results and strategy execution, not an optional tool-box, they realized they did not understand Lean deeply enough. Lean thus is as much a developmental process for senior management as it is for the rest of the organization. However, in order to lead the development of the organization and be able to act as stewards for the change aspired to, senior management needs to be ahead of the rest of the organization. To intensify the development process, learning by doing might be the most efficient way to promote learning within senior management and to bridge the apparent knowing-doing gap related to the Lean implementation. It may also be a way to develop the required balance between transactional and transformational behaviors

present in the organization, a vital step for a learning culture, according to Vera and Crossan (2004).

Thus, the answer to what obstacles were identified in the study to affect senior management's ability to implement and sustain a Lean-based enterprise system can be summed up as follows:

1. There was a lack of initial senior management competence evaluation and training regarding Lean.
2. The Lean implementation was not connected to company strategy.
3. The approach was not system-wide within the organization.
4. Key players such as HR were not involved in initial implementation efforts.

5.4 General discussion

Assuming that Lean is based on the Toyota Way and that Toyota is considered to be a learning organization (Emiliani, 1998; Liker and Hoseus, 2008; Rother, 2010; Senge, 2000,) there are, from an organizational learning perspective, implications for leadership and management. In order to support organizational learning there are several areas that can be said to be important. Learning together collectively through practical experience is essential (Eikeland, 2012), and managerial implications include that senior management needs to make sure there are structures for collective learning as well as that they themselves take part in the development effort. Although the Lean concept is described as conceptually simple, it nevertheless requires considerable hands-on involvement and practice to grasp (Emiliani and Emiliani, 2013). This is a further argument that managerial participation and involvement are needed to support a Lean transformation.

Since organizational learning means learning together collectively through practical experience, structures such as target-setting processes or *hoshin-kanryu*, as described by Liker (2010), are vital in supporting organizational learning both in the acquisition of new knowledge and the utilization of knowledge. This entails the balancing of transactional and transformational behaviors (Vera and Crossan, 2004). Tools and processes are thus not sufficient; managerial behaviors that support the processes are required.

Managerial participation and interaction or the ability to lead by shared action and experimentation is valuable. With an organizational learning perspective, managerial participation in the development of these processes and behaviors may be considered central in order to generate a shared understanding of and managerial competence regarding desired ways of working in a Lean implementation.

Based on the purpose of this thesis, which is to explore senior management's ability to implement and sustain a Lean-based enterprise system, the following points were found to be central.

Definition of the Lean concept and how local managers interpret it affects its implementation. If Lean is considered a tool-box to be used for waste reduction, senior management may not perceive its importance as a management system. As pointed out in paper A, however, the initial definition or understanding of the Lean concept may change as the organization starts the implementation. An altered or developed perception of Lean may reveal previously unseen or unrecognized organizational shortcomings or needs. This brings with it a new awareness regarding what the prerequisites for an implementation are and what the organizational needs are.

If senior management were to devote time to translating and defining Lean, they would strengthen their ability to promote the desired development and also establish a shared understanding regarding its implications. As described by Emiliani and Emiliani (2013), the Lean concept requires hands-on experience if it is to be understood. Whether Lean is to be considered a toolbox for use in production or an enabler for the organization's strategy implementation and realization entails different organizational requirements and also different requirements regarding the involvement of senior management. If real Lean as it is presented by Emiliani et al. (2007) is what is desired, then it is essential to understand Lean as a continuous process aimed at improvements and waste elimination and its implementation as the initiation of that process, not as a project with an end-date. This brings with it managerial demands directly connected to the requirements of organizational learning. As previously mentioned, generating shared understanding in a group is not achieved just by communication. Since the comprehension of language is complicated by cognitive maps that act as individually unique filters on communication, people tend to see and hear what they believe rather than believe what they see and hear.

The learning perspective as described by Crossan et al. (1999) suggests that *leading with action* rather than just focusing on cognition may provide an alternate way to shared understanding as action provides an opportunity for shared common experience, which may aid in the development of shared understanding. For novel ideas such as the Lean concept, shared understanding may thus not evolve unless shared action and experimentation is attempted. This description of collective interpretation of a new concept or way of working from an organizational learning

perspective has much in common with needed requirements for understanding the Lean concept as described by Emiliani and Emiliani (2013).

To define and understand the managerial and leadership related requirements of a Lean way of working is also found to be central to senior management's ability to support a Lean implementation. Leadership and management have different but complementary functions in a Lean system. Since Lean may be considered a dualistic system, as described in paper B, a dualistic approach to management is required. This dualistic approach can also be found in descriptions of organizational learning where the balancing of feed-forward and feedback processes and transactional and transformational leadership can be considered crucial (Vera and Crossan 2004).

The initial competence level regarding Lean within senior management may be considered central, since it will most likely influence both how managers will understand and translate the concept in regard to company requirements and how they will implement it. This is in line with Pettersen (2009), who states that due to the weak inscriptions regarding the Lean concept the concept itself cannot be directly implemented without significant translation efforts and that potential communication difficulties may occur due to the weak inscriptions. Whether Lean is to be considered solely a shop-floor tool-box or also as an enabler for company strategy, thereby existing on two levels as described by Hines et al. (2004), will greatly affect the way it is implemented. As shown in paper A, however, the Lean definition may evolve during implementation and thereby affect perceptions of how Lean should be understood and what the managerial implications are. This interpretation took several years and generated frustration within the organization due to perceived fragmentation and conflicting priorities. The use of consultants, both external and internal, can be said to have contributed to this fragmentation since it involved by-passing managerial levels and functions. Senior management assigned the consultants or Lean experts to work directly with key production areas. Front-line managers thus ended up with demands from consultants, line management and support functions such as HR which at times became contradictory.

The tendency to rely on consultants for major change initiatives, leaving out local management and organizational functions, can thus be considered counterproductive when it comes to Lean implementations. In this case it clearly undermined the interplay between organizational functions and levels, described by Vera and Crossan (2004) as central for organizational learning. Nor did senior management get the opportunity to lead with action in order to generate a shared

understanding and shared common experience of the Lean concept. Starting with managerial self-development and competence enhancement is something Liker (2010) advocates, as opposed to the not uncommon but unsustainable attempt to skip initial competence development and go straight to major improvement initiatives.

For organizational learning to take place, a more appropriate way to ensure an organization improves may instead be by initially developing the company's own managerial competence, followed by the coaching and development of employees and then aligning the organization's vision and goals to support the development. This way desired improvements can be inherent in management and organizational structure. As described by Schein (1996), however, it is not uncommon that change initiatives die out due to lack of management support, which may be a result of the tendency to initiate major improvements without considering managerial competence and ownership. The operator group typically becomes the target of change programs and organizational learning efforts (ibid.). But findings indicate that the innovations and more effective operations generated in these operator groups do not diffuse upward in the organization, nor do they last. Apparently even though operations change and develop corresponding adaptations in management do not occur to support the development, something that most likely affects sustainability. Hence, competence development within senior management can be considered vital in order to initially shape organizational processes in accordance with the desired Lean implementation and to also along the way sustain the development of organizational learning. Senior managers must learn to become Lean practitioners by engaging in collective experiential or experimental learning and by testing and analyzing together with others. Neglecting this, likely caused by a lack of understanding of the concept and its managerial requirements, will handicap senior management's ability to implement and support a Lean way of working (Emiliani and Emiliani, 2013).

Organizational structures that support organizational learning need to be recognized and understood if a Lean way of working is to be developed. Senior managers must be able to influence processes and structures for target setting or *hoshin-kanry*, KPI follow-ups, problem-solving, and reward-systems. To facilitate and enable the types of processes described by Vera and Crossan (2004), there is a need for both specific structures and behaviors as enablers. Structures such as regular cross-functional meetings focused on improvement, SOPs, target-setting processes linked to company strategy, and performance management systems and reward systems are all needed to enable the feed-forward and feedback processes.

The *hoshin-kanryu* structure as used by Toyota and described by Liker (2010) is one example of a structure contributing to enabling organizational learning.

Structure, however, is not enough; leadership behavior supporting learning is also required. The ability to balance transactional and transformational leadership (Vera and Crossan, 2004; Emiliani, 2003) appears to be central in order to enable organizational learning. Leading with action and participating in developmental activities such as problem solving generates a shared understanding of desired ways of working. Becoming a practitioner supports the development. Learning together with others is what signifies organizational learning, so the way of working within senior management is key for the competence development of senior managers. Hence, the necessary path for senior managers is to learn to become Lean practitioners and not merely to learn about Lean practice. As described in paper B, the dualistic nature of Lean needs to be reflected in the management-system of the company where it is to be implemented. Thus, understanding leadership and management as two different but complementary systems of action needs to be present in order to shape a system where organizational learning is possible.

It can be argued that due to the dominating financial focus within senior management as described in the interviews in paper C, the senior management level of the organization is both under-managed and under-led from a Lean perspective. Whereas on middle and lower management levels the focus is on Lean tools and structure and an inability is perceived regarding how to influence culture and behaviors on the senior management level, neither Lean tools or behaviors are being addressed. This may well originate in an initial perception that Lean primarily concerns production and that the implementation of it can be delegated to consultants or experts. The dilemma of both delivering results and simultaneously developing and improving the ability to generate these results is therefore more apparent at middle and lower levels.

This discussion further clarifies the need for senior management to initially define the Lean concept and to understand the managerial consequences it brings with it. A lack of both knowledge and ability, due to the lack of practicing a Lean way of working among senior management, will clearly handicap their ability to support a Lean implementation. The dominating focus on financial reporting and quarterly financial results is clearly a significant factor impacting senior managers' ability and willingness to engage in Lean practices. This needs to be understood and addressed in order to generate the ability to support an organization in implementing Lean.

6 Conclusions

This chapter describes the main conclusions and contributions of this work and provides suggestions for possible future research.

6.1 Main conclusions and future research

The purpose of this work was to explore senior management's ability to implement and sustain a Lean-based enterprise system. The results show that the initial definition of the Lean concept is important. Even though the definition may evolve over time, an understanding of the aims of a Lean implementation and what the ensuing implications for the organization are is central in order to be able to support the development. The main influence on senior management's ability to implement a Lean-based enterprise system was found in the third study to be initial competence evaluation and development regarding the Lean concept.

From an organizational learning perspective it is indicated that leading with action provides an opportunity for both competence development and shared common experience of new concepts. Leading with action may thus aid in the development of a shared understanding of Lean. Hence, for management to lead with action rather than relying on communication and cognition may from a learning perspective be considered essential to generating this shared understanding.

This study indicates the importance of an understanding of the implications for management and leadership related to a Lean implementation. In order to support organizational learning, both managerial structures and behaviors need to be adjusted to a Lean way of working. A central managerial implication from the study is that senior managers need to learn to be Lean practitioners by engaging in collective experiential or experimental learning and by testing and analyzing together with others, something which may be considered a central but often neglected part of Lean implementations.

Initial senior management competence evaluation and further competence development were shown to be vital in order to ensure the ability to understand the organizational and managerial implications brought on by a Lean implementation. Competence in Lean affects concept's implementation, its connection to company strategy, and the shaping of organizational structures and processes to support the development effort. The use of consultants for implementation work appears to deprive management of required hands-on competence development. If consultants

are to be used it may be better to use them to coach senior managers in driving the development.

6.2 Managerial implications

Necessary first steps are initial concept definition and competence evaluation among senior management. Hands on collective experience and training in order to generate in-depth understanding of the Lean concept and the desired way of working is essential in order to build a shared understanding of the management approach. Furthermore, reward systems that affect managerial competence evaluation and training need to be addressed prior to initiating an implementation. In order to accommodate both the reinforcement of institutionalized learning and the development of new learning, structures promoting both mechanistic and organic features need to be developed and promoted by senior management. A lack of understanding of managerial implications may well be a reason for poor leadership, which Hines et al. (2008, p. 46) identify as the main reason for poor sustainability of Lean change.

6.3 Contributions and future research

This thesis addresses a gap in the literature on Lean regarding management. It contributes to the knowledge regarding senior management's ability to implement and sustain a Toyota-based Lean way of working by approaching the Lean concept through an organizational learning perspective. In doing so this work highlights the importance of senior management participation and practice in a Lean implementation, as well as creation of the structures and organizational support needed for organizational learning. The study emphasizes that the delegation of Lean implementation to consultants, leaving senior management out, is counterproductive and causes a lack of managerial competence development.

Managerial ability has been identified in other research as a key factor for successful Lean implementations. This work contributes to a deeper understanding of what affects managerial ability to support Lean implementations, the requirements for organizational learning, and the inferable managerial implications. The results and findings may be of use for organizations considering implementing Lean or those in the process of implementing or developing a Lean way of working.

Suggestions for future research:

- Study carrying out a comprehensive competence evaluation and instituting competence development for senior management prior to a Lean implementation.
- Study the effect of senior management's active participation in Lean implementation work, in line with the requirements for organizational learning.

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