A Lean transformation journey focusing on leadership

- *For first line managers*

MALIN KORNELIUSSON

PARASTO MOHAMMADI

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Supervisor & Examiner, Chalmers: Lars Medbo
Supervisor, Company: Christian Hedlund

Department of Technology Management and Economics
Division of Supply and Operation Management
CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2018

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MALIN KORNELIUSSON

PARASTO MOHAMMADI

Department of Technology Management and Economics
Division of Supply and Operation Management
Chalmers University of Technology
SE-412 96 Gothenburg, Sweden
Telephone: + 46 (0)31-772 1000

Abstract

The majority of organisations that tries to transform and implement lean fails with achieving a successful transformation. One reason for this is not focusing enough on leadership and developing leaders. Further, for the hierarchy level first line managers there exist little research regarding how to develop their leadership. Currently, the manufacturing organisation which this thesis is conducted at undergoes a lean transformation where one focus area is on developing their first line managers i.e. supervisors. Therefore, in this thesis a framework, i.e. The Lean Leadership Framework, consisting of 54 guidelines for how to develop the leadership of first line managers is presented. The framework is based on an extensive literature review and interviews with lean experts. Further, a gap analysis based on the current state at the organisation is determined through interviews with top management at the organisation, a workshop with the supervisors, analysis of the organisation's internal documentation regarding the role of a supervisor and structured- and unstructured observations. Which was then compared with the developed framework, this to identify the potential gap between the current leadership of the supervisors at the organisation and the Lean Leadership Framework. From this an action plan was developed to address the identified gap and contribute to developing the supervisors to become lean leaders. However, two factors were identified as important prerequisites for the action plan i.e. to reduce the team sizes and have the SVs own their process. In order to sustain the lean transformation at the organisation several means and prerequisites was identified to support the supervisors. Among these prerequisites one of the most important ones identified was having superiors and a top management that was both engaged and involved in the lean transformation.

Acknowledgement

There have been many people involved in making this thesis possible. First, we would like to thank our supervisor and examiner Lars Medbo at Chalmers for being an excellent supervisor. For always coming with great inputs, advice and guidance and helping us get in touch with people that can contribute to this thesis. We would also like to thank our supervisor Christian Hedlund from the company, who always had a positive mind and helped us with get in contact with persons of interest at the organisation.

To all the supervisors at the final assembly plant at the company that participated and that we got to follow we would like to say a big thank you, because this thesis would not have been possible without you guys. We would also like to thank all the participants in the interviews for taking their time to meet with us and giving great inputs and recommendations. Without you, the level of outcome would not have been possible. Lastly, we would like to thank Simon Algesten at Scania Engine and Joacim Cederlund at Rejmes Bil for letting us come and visit your organisation to see how you work and getting good advice.

Abbreviations

BMS – Business Management Strategy

LLA – Lean Learning Academy

LLF – Lean Leadership Framework

M&L – Manufacturing & Logistic

QDFIPS – Quality Delivery Financials Improvement Productivity Sustainability

RTB – Real Time Behaviour

SI – Superintendent (second line manager)

SV – Supervisor (first line manager)

SQD – Safety Quality Delivery

TIA – Information system about working environment (Teknikföretagens Informationssystem om Arbetsmiljö)

TL – Team Leader

Contents

1. Introduction

This chapter aims to define and give the reader a clear understanding to the purpose and relevance of the subject and thesis. First, is the background which discuss why this research is relevant and past research within the subject followed by a brief history of the subject and ends with giving a short introduction to the organisations where the thesis will be carried out. The second part is where the purpose, research questions and problem analysis is presented which is then followed by the third part, the scope of the research and then the last part which is the outline of the report.

1.1 Background

In today's environment and society things move and change in a rapid pace which make it crucial for organisations to keep up in order to stay competitive (Bhasin, 2012; Hussain et. al, 2016; Schein, 2007; Steiber and Alänge, 2015). In order to do this, companies have to be adaptable and have a leadership and culture that allows this (Hofstede, 1980).

A commonly used organisational innovation providing competitive advantages is Lean Production (Liker and Convis, 2011; Liker and Hoseus, 2008; Krafcik, 1988). Lean Production is a concept developed from Toyota and The Toyota Production System (TPS) and can according to Shah and Ward (2007) be described as "[...] an integrated socio-technical system whose main objective is to eliminate waste by concurrently reducing or minimizing supplier, customer, and internal variability". Lean is often associated with eliminating waste, just-in-time (JIT) production system, kaizen and increasing value-adding time. For an organisation to be lean it is vital to have a long-term perspective, work with continuous improvements and teamwork, tools and methods that work together and have a pull initiated flow production (Liker and Hoseus, 2008).

However, Liker and Convis (2011) emphasises the importance of organisational culture in lean and its impact on business result and people. Every organisation has its own history and

must build and develop a culture adapted to their own context. To become lean is about building a strong culture based on continuous improvement which is a continuous journey of improvements and problem-solving and cannot be achieved by only implementing various lean tools. Lean unlike other programs or innovations do not have a start or an end, it is a journey if done correctly, that will never end. Therefore, it is very important to have strong and committed leaders, especially for making the lean journey last, creating a long-term lean culture and to develop and continuously improve the organisation (Liker and Convis, 2011; Liker and Hoseus, 2008). According to Testani and Ramakrishnan (2011) one of the most common reason organisations fail to sustain their lean transformation is due to lack of commitment of the organisation's leadership and that there is little focus on the organisational culture. Further, organisations that have a strong leadership will enable a more adaptive organisational culture which will make the organisation more successful. According to Byrne and Womack (2011) few people in leading positions can adapt to a lean leadership style, consequently "[...] only 5 to 7 percent of companies are successful with a Lean transformation". Which stresses the important role a leader has, because it is their responsibility to demonstrate and influence behaviour and leadership styles that supports the desired organisational culture and to sustain it.

There are several definitions to leadership (Emiliani, 2008), one of them is Bennis (2003) definition which is widely quoted "Leadership is a function of knowing yourself, having a vision that is well communicated, building trust among colleagues, and taking effective action to realize your own leadership potential". While Fiaz et al. (2017) briefly describe it as a process where a person influence or motivates people to reach the goals of the organisation. Further, that person should enhance and encourage the employees' self-esteem, to achieve the goals and targets of the organisation. At Toyota the perception of leadership is different and considered as personal but it also happens within a system. For Toyota, culture and leadership is considered as two sides of the same coin which constantly must be recreated and reinforced through careful attention and action. Therefore, Toyota has developed a 4-stage model of Lean Leadership Development i.e. Commit to Self-Development, Coach and Develop Others, Support Daily Kaizen and Create Vision and Align Goals (Liker and Convis, 2011). However, today there is little academic research regarding lean leadership, how and what actions is needed to achieve and implement it and especially for first line managers in manufacturing.

This thesis will focus on a manufacturing organisation and one of their engine plants, located

in southern Sweden. The manufacturing organisation have a capacity of producing 565.000 engines a year, in three different models. The plant is 134.000 square meters and there are approximately 2.000 employees whereas 23% women and 77% males.

The parent company to this engine plant is a large automotive manufacturing organisation, that is in a growth phase with new car models and new plants established globally. Their manufacturing is challenged, not only to provide the volumes, but at the same time raise the level of improvements dramatically, in all areas i.e. quality, delivery and efficiency. The organisation's vision is to become the best in class in manufacturing and to do this they have realised that they need to change the angle and focus in their Lean Transformation Journey. Their lean journey has progressed over several years but the focus has been on the hard parts in lean production i.e. lean tools, while the soft parts has been ignored. However, a shift towards focusing more on the soft parts is now ongoing where leadership and culture is the focus.

The first part of their challenge, in reaching their vision, is expressed in targets that should be reached by the end of 2020. Launched under the name of" 2020 targets". Within the frame of the 2020 targets, one of the key focus areas is Leadership where the area has five related targets or objectives that should be reached by year 2020. Therefore, to make their Lean journey possible and reach the objectives they have to adapt the leadership style and organisational culture to Lean management. The organisation's leadership and culture is therefore a vital part in order for this lean transformation to succeed and sustain. They are dependent on their leaders to create a culture which emphasises a strong leadership. Further, the organisation has developed a strategic goal relating to fulfil their vision and become the best in class in manufacturing, which is making it possible for the SVs to be out in production 70-75% of their working hours.

1.2 Purpose and Problem analysis

The purpose of the thesis is to develop an action plan focusing on developing the leadership of the organisation's supervisors (SVs). With regard, to their lean transformation journey in order to reach their 2020 targets related to Leadership and their strategic goal of making it possible for the SVs to be out in production 70-75%. Moreover, to provide means to sustain and continuously improve the SVs leadership.

In order to fulfil the purpose, the first step is to analyse the current state of the SVs regarding

leadership and for the researchers to develop a Lean Leadership Framework (LLF) specifically adapted to the hierarchy level SVs. The LLF has the purpose of explaining what is needed to become and develop as a lean leader. The next step is to investigate the potential gap between the current leadership of the SVs and the LLF. Which leads to the first research question (RQ):

RQ1: How well is the leadership of the SVs currently aligned with Lean Leadership Framework (LLF)?

Secondly, analysing what kind of action that needs to be implemented and behaviours that needs to be changed among the SVs, in order to eliminate the potential gap. Hence, enabling a move in the right direction for reaching the 2020 targets and the strategic goal of being present in production 70-75% of the SVs working hours. This brings us to RQ 2:

RQ2: What actions, in leadership are required from the SVs to fill the gap between the current state and the Lean Leadership Framework (LLF) in relation to the 2020 targets and their strategic goal?

The final problem is to analyse how and what resources the SVs need from one hierarchy level up respectively down, i.e. superintendents (SIs) and team leaders (TLs), to sustain this transformation and continuously build a stronger leadership. So, the final RQ is:

RQ3: What resources and prerequisite does the SVs need in order to sustain a leadership that emphasises the Lean Leadership Framework (LLF)?

1.3 Scope

The thesis is limited to a time period of 20 weeks. Focus for the thesis will be on one big manufacturing organisation. Only the assembly area of the production site will be investigated. The main focus will be on the leadership of the SVs, i.e. first line managers, working in the assembly area.

1.4 Outline

In this subchapter, a brief description of what is covered in each chapter will be presented.

- In the first chapter of the thesis an introduction to the subject, the company and the

purpose of the theses will be presented.

- In the second chapter, the theoretical framework used for this thesis will be covered. The second chapter will both act as a base for the analysis but also give a more detailed introduction to the subject.

- In the third chapter, the design and strategy used for the study together with the methods used will be presented. The chapter will also include how the data was collected and analysed, a description of what aspects that has been considered to achieve a high quality of the research and what ethical aspects that has been considered throughout the thesis.

- In the fourth chapter, the current state at the company will be presented. The current state includes a general description of the company and their goals, the role description of a SV, the results obtained from observations, the interviews with top management at the organisation and the result obtained from the workshop.

- In the fifth chapter, empirical findings, the result obtained from interviews with people with deep knowledge in the subject will be presented together with the result obtained from the benchmarking at Scania and Rejmes Bil. Both the fourth and fifth chapter will act as a fundament for the analysis.

- In the sixth chapter, the analysis of the collected data will be presented. Initially the developed framework, i.e. LLF, will be presented. After that the current state at the company will be compared with the developed framework to enable the authors to identify a potential gap. This gap will later be addressed in an action plan in relation to the 2020 targets and their strategic goal mentioned earlier. Lastly in the analysis chapter, the prerequisites needed to implement the actions and make them a part of the everyday is presented.

- In the seventh chapter, the result obtained and the validity of the result obtained will be discussed.

- In the last chapter, the conclusions are stated together with possibilities for future research and what the thesis can contribute with.

2. Theoretical framework

This chapter will act as a base for the analysis, see figure 1. The chapter is further divided into seven subchapters, where an introduction to how Toyota is working, their methods and tools is first presented. Followed by how the concept lean production came to life, what is significant for lean production and the identified lean principles. These two parts will give an introduction to lean production and give a better understanding to what lean means and how it can be applied. The third part is about culture, the importance of it and the differences in cultures in different countries. This will contribute to understanding the importance the location of the organisation has on leadership due to national differences. Further, the fourth subchapter is regarding leadership, especially lean leadership and different behaviours and styles that is needed and works well in a lean organisation. The fifth part is regarding coaching and what competences is valuable to a coach, the coaching methodology and coaching in organisations. All of the above mentioned subchapters will contribute as an input to the Lean Leadership Framework (LLF) developed by the authors and thereby answer RQ 1 and RQ 2. Then, different motivational theories will be highlighted and lastly there will be a subchapter about how to drive and sustain change and what common pitfalls and barriers can be found in a lean transformation. These two parts will act as input when answering RQ 3.
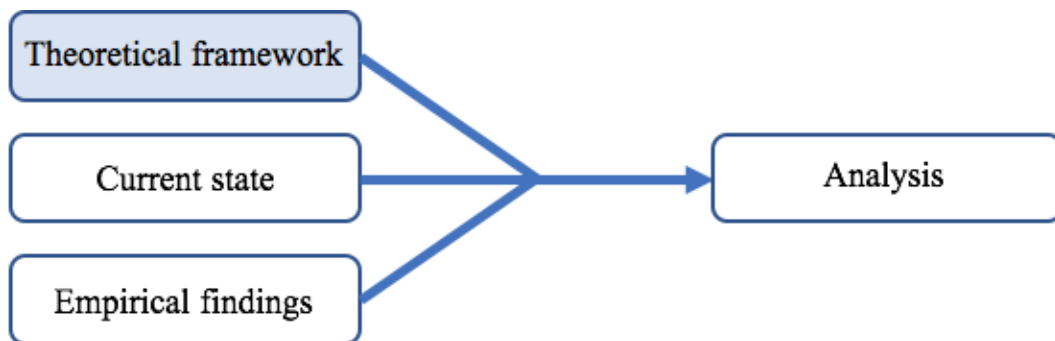
Figure 1 - The three elements acting as base and input for the analysis

2.1 The Toyota way

After the Second World War the Japanese manufactures had less resources in form of human, material and finance and needed to rebuild their industry. As a consequence of these shortcomings and other factors they had a lot of problems to deal with in manufacturing, which compared to their Western counterparts was very different (Womack et al., 1990). In order for Japanese manufacturers to survive in the competitive world, they developed a new, lower cost, manufacturing philosophy and practice. Toyota Motor Co. and their first leaders Eiji Toyoda, Taiichi Ohno and Shigeo Shingo, played a big role in developing a new manufacturing approach, which is today known as the "Toyota Production System" (TPS). Which according to Ohno and Shingo (1988) can be described as a disciplined process-focused production system. Further, Ohno (1988) describes the basis of TPS as "[...] the absolute elimination of waste. The two pillars needed to support the TPS are JIT and automation".

Over the years Toyota have developed a model that acts as an internal training document and is called *The Toyota Way 2001* which is illustrated as a house with two basic values, Respect for People and Continuous Improvement. Further, the five elements, challenge, kaizen, genchi genbutsu, respect and teamwork, represent the foundation of the house (Liker and Hoseus, 2008). Based on this document Liker (2004) developed the 4P model which is a pyramid with Problem-solving (continuous improvement) on top, followed by People and partners (respect, challenge and grow them), Process (eliminate waste) and in the bottom Philosophy (long-term thinking). The purpose with both models is to represent a system, where all the parts are interrelated. However, much focus is often put on the process e.g. eliminate waste by using one-piece flow and standardized work at most organisations while the other three P of lean is neglected (Dombrowski and Mielke, 2013).

Several problem-solving and waste eliminating tools has been developed by Toyota which are used to identify and highlight problems, and are used by organisations worldwide e.g. 5S and kanban. Problem-solving is an important area for Toyota which Liker and Hoseus (2008) stresses by "The key to success is to have a production system that highlights problems and a human system that produces people who are able and willing to identify and solve them". Toyota views itself as a learning organisation and base this on that they thrive on its people engaging together in identifying and solving problems, developing and improving the

organisation and reaching results that will benefit all. Further, Toyota view errors as opportunities for learning instead of finding someone to blame it on.

2.1.1 Standardised work task

According to Liker and Hoseus (2008) "Standardized work is the foundation for creating a repeatable process that reliably produces the desired result." Moreover, they emphasise that standardised work is dependent on three requirements. First, that there is a tact time which explains how often a product is produced. Second, that there exists a standard sequence explaining the steps to take and in what order. Third, a standard for the level of inventory between the steps in the process.

Massaki Imai (1986) said "There can be no improvement where there are no standards", which emphasises the importance standardised task have for the foundation of continuous improvements. A big and central part of Toyota's culture is built upon continuous improvement which makes standardised work a vital part of their way of working and training people. Standardised work is viewed by Toyota as the best way we currently know to do the job, until a way that is better is identified and proven and everyone is expected to follow the standard (Liker and Hoseus, 2008). However, standardised work is too often used incorrectly which according to Emiliani (2008) mean that many use and view it as a coercive and set-in-stone way of working.

2.1.2 Visual management

To facilitate communication and information sharing and to drive action is the main purpose with visual management tools at Toyota. Visual tools aid to provide real-time information which is vital in order to understand how things are going and how things can be improved. Toyota uses e.g. andon, Kanban, charts, graphs and A-3 reporting as visual tools. The A-3 tool is developed by Toyota both as a problem-solving and communication tool, were the purpose is to gather important information regarding the problem in an A-3 and then get feedback on from co-workers (Liker and Hoseus, 2008). Daily control is very important as a visual tool and method at Toyota which means that you on a daily basis as a e.g. SV or TL gather your team at their board and review yesterday's outcome e.g. safety issues and quality issues. Further, the board can look differently for different areas or teams but the purpose with

daily control is to highlight and communicate deviations and how things are going for everyone to see (Liker and Hoseus, 2008).

2.1.3 Gemba

In the Toyota culture great value is placed on learning by doing or as expressed by Liker and Hoseus (2008) "[...] get their hands dirty" when training and developing. Gemba means going to the source to see the actual problem in order to deeply understand. Liker and Hoseus (2008) stresses that gemba projects is a great way to understand and develop real skills because it is not enough with classroom training. This only provides the whys and partly a theoretical understanding but not real skills and learning. Therefore, they combine both classroom training with gemba project to maximise learning. Further, gemba walks and projects are something that all employees, from the top managers to the operators, of the organisation should practice in order to understand processes and to find root causes of the problem at the source (Liker and Hoseus, 2008).

2.1.4 Continuous improvement – Kaizen

At Toyota kaizen is an integral part of leadership and not a set of projects or special events, however, a majority of organisations misunderstand kaizen and see it as a one-off activity. Kaizen is about relentlessly working on trying to find and eliminate waste in the processes and operations and thereby increase the value-adding activities. Therefore, a big part of the leader's responsibility and role is to support daily kaizen. Two types of kaizen exist within Toyota that requires daily activity, maintenance kaizen and improvement kaizen. The first one is related to not being able to prevent the unexpected from occurring which means reacting urgent and immediate to the unpredictable e.g. mistakes, breakdowns or variations. After the problem have been addressed, work groups select the most common and serious problems to find the root-cause to. The latter, improvement kaizen, is related to raising the bar and not just to uphold the standards. Having everyone involved is crucial in order for kaizen and continuous improvement to happen and become a mind-set among the people. Because there will always be waste in a process even though multiple improvements have been implemented and this way of thinking is reflected in Toyota's culture, which have made them so successful and hard to beat. However, in order to enable making and implementing improvements the employees directly involved in the process needs to have ownership of the process i.e. a mandate to implement changes (Liker and Convis, 2011; Liker and Hoseus, 2008).

2.1.5 Teamwork

Teamwork is an important matter and one of Toyota's competitive weapons, because they believe that the sum of individuals is not as effective and efficient as teams are. Working in teams means developing team members, maintaining discipline and working collectively toward a common goal. Toyota distinguish between two types of groups, work groups and problem-solving groups, were work groups has the role to support individuals to do their job and work with continually finding better ways to perform the work. While problem-solving groups are temporary and have the task of solving particular problems e.g. quality circles or cross-functional teams (Liker and Hoseus, 2008).

To be able to work effectively in groups and solve problems it is important to have the right group size and Toyota claims that a group size of 5-7 with one team-leader is the ideal span and that one group leader is responsible for four teams and four team-leaders. Further, having teams and a right group size is vital for Toyota because they aim for a relatively flat organisation. The purpose of this is so that the team members feel that they are the ones to solve the problems and can avoid to cause waste by having to go up a level or two. Further, a flat organisation leads to a better and more accurate flow of information throughout the organisation, whereas otherwise a lot of important information get lost in different hierarchical levels (Liker and Hoseus, 2008).

2.1.6 Hoshin Kanri

Hoshin kanri can be translated as Direction Management and is a strategic management framework developed by Toyota (Liker and Hoseus, 2008). This framework links the business strategy with the day-to-day actions (da Silverira et al., 2017) and has the aim of getting the whole organisation on the same page which leads to a big competitive advantage. To connect people both vertically and horizontally in the organisation is the focus of the hoshin process, from divisions to the individual. Compared to other strategic management frameworks hoshin kanri is more participative and is concerned with both result and the process of getting those results.

Hoshin kanri helps in creating a transparency by breaking down the problem and goals from the top management and cascading it down in the organisation into targets which facilitates the interpretation and the improvements needed to be performed for the team members. It is

common that other strategic management frameworks like Management by Objectives (MBO) is more concentrated on short-term gains and has a linear way of working. Which differs a lot with hoshin kanri, were a long-term perspective exist and were people get to the goal by working in a circular or spiral way. Working in such a circular way can be resembled to a set of cascading PDCA-cycles looped at all levels, in order to improve and achieve the targets (Liker and Hoseus, 2008).

For the hoshin kanri process to work the "Catch-ball process" plays an important role because it is this process that enables people to participate and to get an input and buy-in regarding how much the involved people or divisions can handle in relation to the goal. The catch-ball process can be described as an iterative process were mutual adjustments between managerial levels and functional areas is the goal. This by looking over how the priorities and resources are allocated and if there is a need for reshuffling in order to reach a particular goal (Liker and Hoseus, 2008).

However, Liker and Hoseus (2008) stresses the importance of having a culture that allows hoshin kanri and this way of working to flourish. Meaning that the organisation need to have some basic prerequisites in place for it to work e.g. visual management, a safe and secure environment, a sense of mutual prosperity, trust, skilled employees in problem-solving and a strong group leader system.

2.1.7 Improvement kata and Coaching kata

Kata can be described as a form, pattern or practised skill (Soltero and Boutier, 2012). Rother (2013) distinguish between the Improvement kata and the Coaching kata, where the first describes a routine of continuous improvements and is a part of Toyota's way of leading people on a daily basis. In short Rother (2013) describe the improvement kata as an iterative process where you based on a vision, a direction or a goal and with information about the current state, define the target state on the road towards the vision and when we strive step-by-step to reach the target state we encounter obstacles that defines what we need to work on and which we will learn of. The latter, coaching kata, has the purpose of teaching the improvement kata and incorporate it in the organisation.

For a leader at Toyota their primary task is to increase the employee's improvement capacity and this is performed by guiding them in doing actual improvements in real processes.

Because it is when you work with actual improvement challenges that you learn and not in a classroom looking at a PowerPoint presentation (Liker and Hoseus, 2008; Rother, 2013). At Toyota they emphasise that classroom training can only create awareness and not secure change and skills. However, when "doing" you can view how the person actually is thinking, what the person is learning and what he/she needs to learn and practice next (Rother, 2013).

The coaching kata which as mentioned means teaching of the improvement kata, which is a dialogue between the mentor and adept. At all levels at Toyota you practise on the pattern of the coaching kata and every employee is allocated a more experienced employee i.e. a mentor. To become a mentor does not happen over a night, it easily takes ten years of practice of the coaching kata to become so skilled to handle being a mentor. The task of the mentor is to guide the adept in applying the improvement kata through a dialogue back and forth between them over a timespan. The mentor should ask questions and observe how the adept answers in order to understand how the adept thinks, however, the power of teaching by asking questions is a hard skill to learn. One crucial part to keep in mind for the mentor is to let the adept figure out things on their own during the coaching. This means that the mentor should avoid asking question that leads to a specific solution but instead the important part for the mentor is to learn how the adept thinks and how he/she takes on the task. So, the adept is responsible for doing and the mentor for the result and this overlapping of responsibility creates a bond between the mentor and adept. However, in order for the mentor to guide and coach he/she needs to observe the situation and think one step ahead of the adept but only one step (Rother, 2013).

Another important part of the dialogue is that it is not just about learning or teaching but also letting people make mistakes so that they can learn from them. Therefore, the mentor expects the adept to make small mistakes in application of the improvement kata, so that the mentor can see what sort of coaching this person needs. There can be times when the mentor might have a better solution than the adapt suggest but they have to accept the adapts solution. Because the goal for Toyota is not necessarily to find the best solution today, it is about developing the problem-solving skills among the organisations employees (Rother, 2013).

2.1.8 Four-stage Model of Lean Leadership Development

Toyota has developed the four-stage model of lean leadership development also known as the Diamond model, see figure 2. The model is a multistage leadership model that captures what

it means to be a leader at Toyota and how to work with developing leaders. The two first stages are more focused on individual leadership while the last two stages are more about keeping groups of people focused on and pointed toward what Toyota calls True North i.e. institutional leadership. True North is a vision which provide an insight to where the organisation is headed and is based on the values of the Toyota way (Liker and Convis, 2011).

The first stage, self-development, which means that leaders are actively looking to improve themselves and their skills. According to Toyota this is a quality that distinguish potential leaders from everyone else. However, to self-develop is hard to do by your own, it is therefore important to first be given an opportunity to do so and to get support from others. That leaders self-develop by themselves is rare which means finding the right challenges for self-development i.e. that space for self-development is there and that you allow coaching in the process at the right times. The next stage, coach and develop others, means that all leaders are expected to actively engage in coaching and developing their whole staff and not just favourites or star performers. Because they believe that the best way to learn something is to teach it. Further, at Toyota the success of a leader is measured by what is accomplished by those the leader trained (Liker and Convis, 2011).

The third stage, support daily kaizen, emphasises that leaders make sure that maintenance kaizen and improvement kaizen can be performed by their teams and that they are capable. Further, Liker and Convis (2011) emphasises that the key at this stage is "[…] not that the leader is forcing kaizen from the top down, but rather that he is enabling, encouraging and coaching kaizen from the bottom up". The last stage of the model is create a vision and align goals, which is where all the kaizen efforts are aligned to make sure the correct big-picture goals are accomplished i.e. bottom-up meets top-down. At Toyota they are engaged in breaking down these goals, plans and targets and align their daily efforts so that each work group comprehends what it means for them i.e. their portion of the big-picture goals and that they have a plan for how to take on and achieve the goal, plan or target (Liker and Convis, 2011).
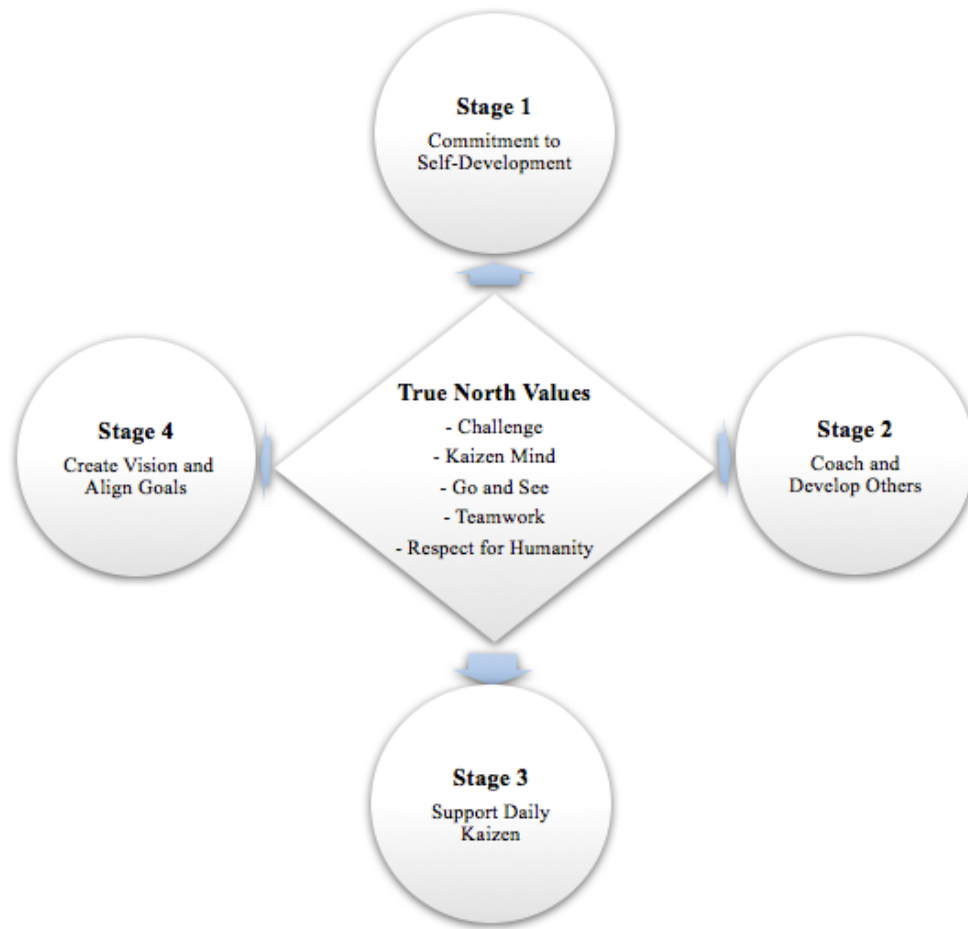
Figure 2 – Toyota's Four-stage Model of Lean Leadership Development (Liker and Convis, 2011)

2.2 Lean Production System

It was from the International Motor Vehicle Program (IMVP) result that the term "Lean" was emerged by John Krafcik (1988). However, many authors agree that it was not until the publication of book *The Machine That Changed the World* that the phenomenon Lean was established (Bhasin and Burcher, 2006; Karlsson and Åhlström, 1996; Shah and Ward, 2007). Lean production is a concept which to a large extend is based upon TPS (Liker, 2004) and has over time developed from a common description of TPS to a certain organisational and management intervention concentrated on best practices and process improvement methodologies (Found et al., 2015). The popularity of lean can be reflected in that the Lean Production Database (LPD) include 4,130 publications on lean (Found et al., 2015). As can be noted in the paragraphs below there are much research within the area lean which consequently have lead to multiple definitions and lean principles.

Generally lean production has two views it can be described from, the first view is from a philosophical perspective related to guiding principles and overarching goals. The other is a practical perspective which can be observed directly from a set of tools, management practises or techniques (Shah and Ward, 2007). Womack et al. (1996) emphasises five basic principles that enable lean production and define lean thinking; specify and identification of customer value, identify the value stream, developing the capability to flow production, to support flow of materials apply pull mechanisms and the pursuit of perfection.

Hines et al. (2004) stresses that lean exists at two levels, strategic and operational. Understanding this distinction is vital in order to comprehend a holistic view of lean and applying the right tools and strategies to deliver customer value. The lean concept and lean production lacks a universal and precise definition (Karlsson and Åhlström, 1996; Shah and Ward, 2003). Karlsson and Åhlström (1996) claims that a distinction between the determinants, i.e. the action taken and implemented principles, and the performance e.g. increased productivity and reduced lead times of a lean production system is important to assess when changing to lean production. Therefore, they performed a literature study regarding lean production and a case study to develop a model for which the vital principles are identified within lean production. They identified nine important principles; elimination of waste, continuous improvement, multifunctional teams, zero defect, JIT, vertical information systems, integrated functions and pull instead of push. Further, determinants for each principle that would have an impact and reflect the direction of change towards lean production were concluded and then operationalized in a measurable format.

Modig and Åhlström (2012) emphasises that the main goal with a lean operating strategy is to create flow efficiency by eliminating, reducing and managing variation. To make this possible different means can be used and looking at Toyota they divide this into different categories i.e. values, principles, methods and tools, see figure 3.
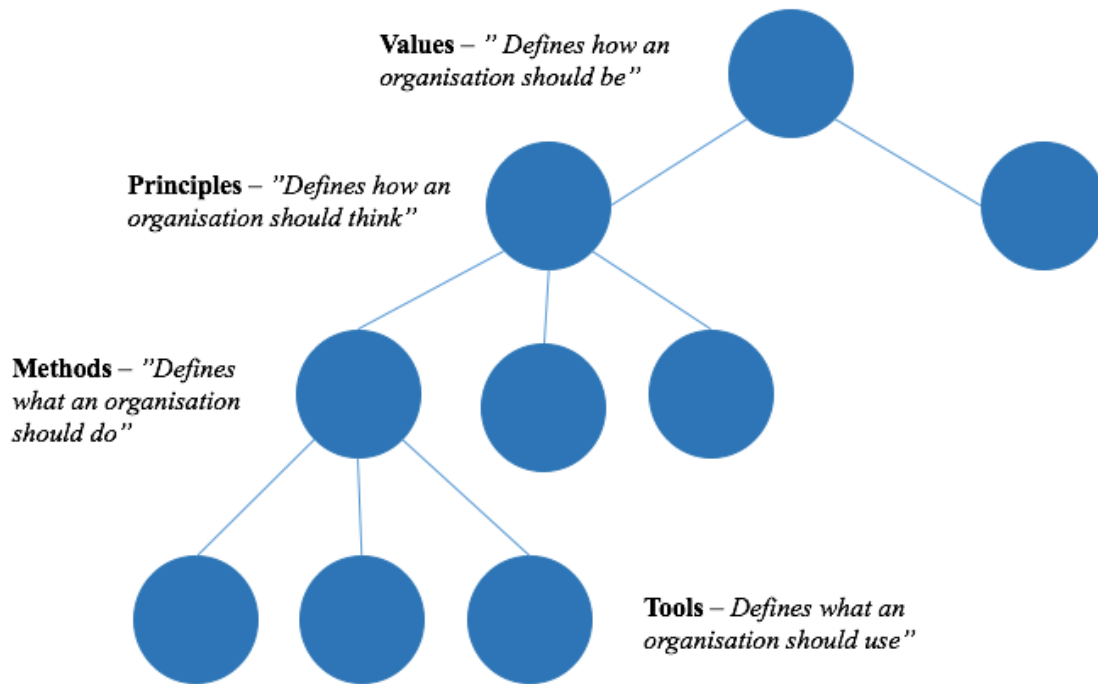
Figure 3 – Toyota operations strategy (Modig and Åhlström, 2012)

Shah and Ward (2007) conducted an extensive literature review with the purpose to clarify the confusion related to lean production. They performed this by identifying a key set of measurement items to represent lean production, i.e. 48 items, which they then narrowed down to ten underlying components. These are: supplier feedback, JIT delivery by suppliers, supplier development, customer involvement, JIT production, continuous flow, set-up time reduction, TPM, statistical process control and employee involvement.

Kodali et al. (2016) performed an extensive literature review within the field of lean production system to develop a lean production system framework. From the literature review they collected 131 lean production system-related frameworks and then by using validity and reliability analysis they narrowed this down and identified 39 frameworks. Together with help from experts within the field and comparative analysis a proposed framework consisting of 11 pillars and 83 elements was developed. The pillars were: continuous improvements, JIT production, standardisation, Total Quality Management (TQM), elimination of waste, concurrent engineering, supplier relationship management, customer relationship management, information technology system, human resources management and top management commitment.

Spear and Bowen (1999) performed an extensive four-year study of the TPS of more than 40 plants located in United States, Europe and Japan, where they investigated the inner workings

of these plants. The authors emphasise that the key is to understand that TPS creates a community of scientist. This because Toyota uses scientific methods and tries to eliminate the root cause of the problem at all times. The article describes four rules to lay out how Toyota's system works and how to decode the TPS. These rules describe the importance of standardisation, customer focus, simplification and teaching and mentoring (Woehl, 2011). Lewis (2000) performed case-study interviews and had three companies of similar size surveyed and concluded that becoming lean equates to becoming less innovative and not improving financial performance. Further, how to implement lean must be adapted and found by each organisation.

As mentioned earlier there exist split views regarding what lean is and what the most important principles are, however, it can be seen that many of the principles derived from the presented studies above are quite similar. Some of the principles emphasised by several of the researchers was continuous improvements, customer focus and elimination of waste and variation.

2.3 Lean culture

According to Schein (1984) organisational culture can be described as "[...] the pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems". Further, Schein (1984) argues that organisational culture can be divided into three different levels namely; artifacts and behaviour, norms and values and underlying assumptions. In a cultural context artifacts and behaviour refers to the things that can be observed in an organisation, on the surface, for instance the layout of a plant or the way people behave. Norms and behaviour does on the other hand relate to how people within an organization behaves and the principles they live by. The underlying assumptions reflects what people within the organisation deeply believe (Liker and Hoseus, 2008).
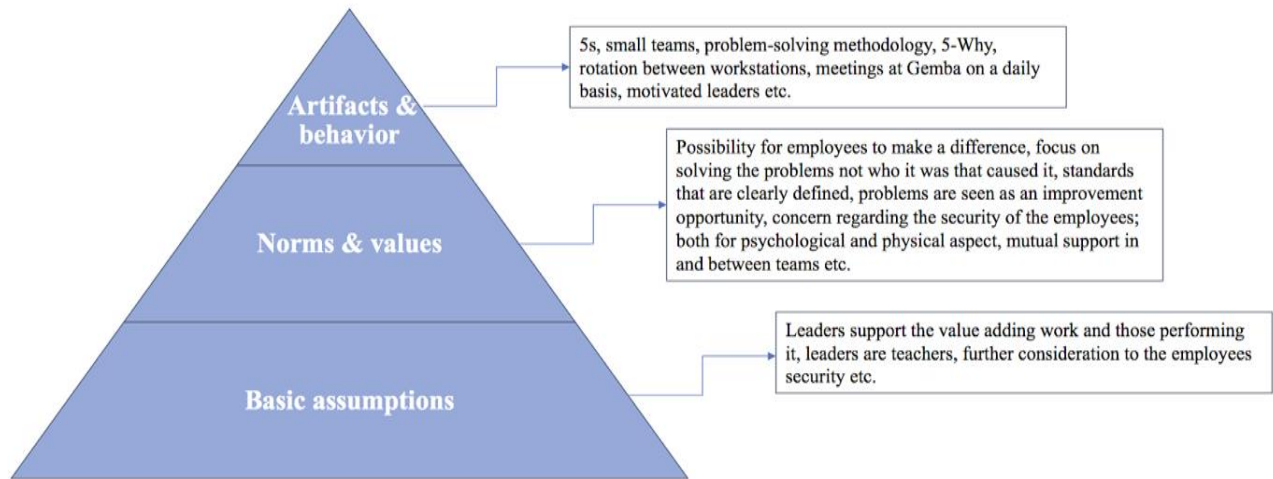
Figure 4 – Organisational culture at different levels (Schein, 1984) in relation to a lean context.

In a lean context the first level, artifacts and behaviours, represent what can be seen e.g. the use of small teams and tools such as 5S, that they have daily meetings at gemba, rotation of workstations etc. In the second level, norms and values, we can find behaviours related to e.g. giving possibility for employees to make a difference, a focus on solving the problems instead of focusing on who it was that caused it, that the standards are clearly defined and followed, identified problems are seen as an improvement opportunity, there is a systematic approach concerning the security of the employees, both for psychological and physical aspect, mutual support in and between teams. For the last level, basic assumptions, it should be possible to identify that leaders support the value-adding work and those performing it, that leaders also play a role as teachers, there is also further consideration to the employee's security, see figure 4 (Paro and Gerolamo, 2017).

A common reason why companies fail to successfully implement lean is that they do not manage to adapt their tools and methods to the culture (Liker and Hoseus, 2008; Hines et.al, 2004; Liker and Convis, 2011). The founder of the lean culture, Toyota, is known for having a strong culture. In this context a strong culture suggests that the employees have common behaviours and share the same norms, values and assumptions and work towards a common goal. Toyota's strong culture is according to Liker and Houses (2008) "[...] a unique blend of Japanese culture, the special conditions of Aichi prefecture where Toyota was founded, the influence of the Toyoda family and the great leaders in Toyota's history, and particular characteristics of the auto industry". Hence, for Toyota one key factor in creating and

sustaining the culture, have been to adapt the organisational culture to the local and national culture (Liker and Convis, 2011).

Differences in culture can be noticed in nations, regions, industries, organisation, and even in subcultures within an organisation. A given plant is therefore influenced by both the organisation's culture, the national culture, and the local and regional culture where they operate (Liker and Hoseus, 2008). According to Lacksonen et al. (2010) differences in societal culture can cause obstacles when implementing lean. They further argue that due to the differences in societal culture and other contextual variable, e.g. rules and regulation in specific countries, the implementation of a lean organisational culture will differ depending on where it is performed. Furthermore, Hofstede's (2004) dimensions of societal culture can be used in order to understand potential issues of an organisational culture change. Hofstede (2004) have identified five main dimensions in which the national cultures differs; Power distance, Individualism, Uncertainty avoidance, Masculinity and Long-term orientation. In figure 5, a comparison between Swedish and Japanese national culture is presented.
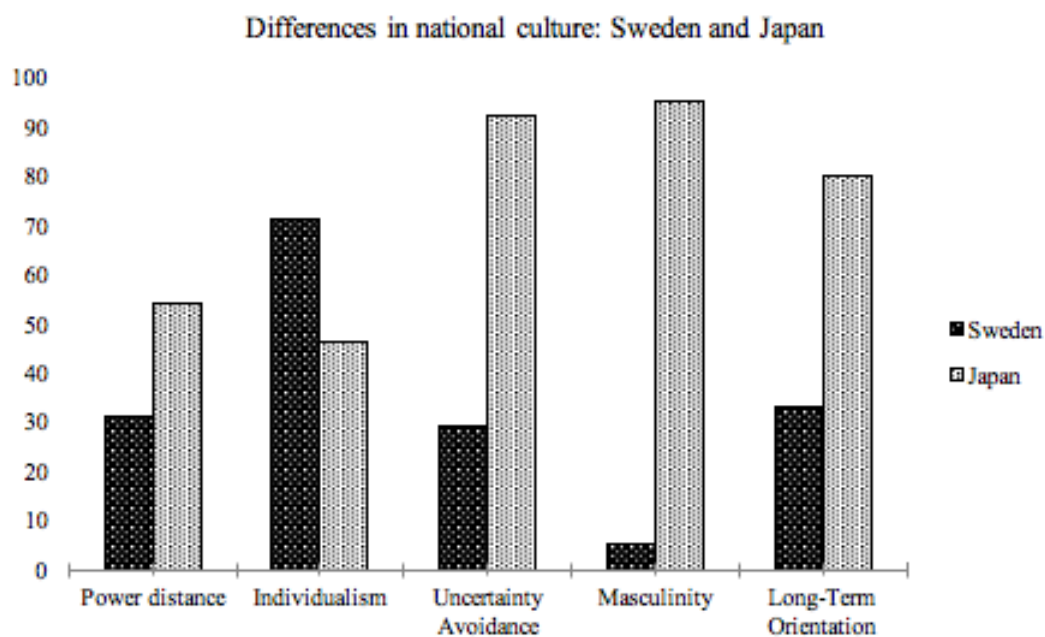
Figure 5 –Differences in national culture between Sweden and Japan (Hofstede, 2004)

The first dimension, power distance, indicates whether the power distribution is perceived as equal or not equal, from the perspective of the less powerful citizens. In particular, a low power distance indicates that the people do not accept inequalities, while those with high power distribution do accept inequalities. The second, dimension individualism, describe to

what degree the citizen within a nation generally are integrated in groups. High individualism corresponds to not integrated and indicates that each individual to a high degree looks after himself. A low level, on the other hand, corresponds to the citizens being integrated in groups. This means that individual belongs to a group in which the members look after each other. The third dimension, uncertainty avoidance explains the nation's overall acceptance of uncertainty. In this dimension a high score relates to that people feel the need of having for instance strict rules and laws. While those who score low prefer unstructured situations. The fourth dimension, masculinity, refers to whether the society's values are typically masculine or feminine (Liker and Hoseus, 2008). The first means that having a masculine society there is a clear distinction between the genders i.e. men are supposed to be tough and assertive while the women should be tender and modest. While the latter, feminine, means that the gender roles overlap (Hofstede, 2004). The last dimension, long-term orientation, reflects for instance the general ability to take long-term decision instead of short-term (Liker and Hoseus, 2008).

From figure 5 it is evident that in Sweden we are less prone to accept inequalities compared to Japan and prefer to work more individually. Further, it was a clear distinction between the uncertainty avoidance, where in Sweden they prefer unstructured situations where strict rules and laws do not control everything. Regarding the masculinity, it is clear that in Sweden they lean more towards a feminine society while it is the opposite for Japan. Lastly, it is evident that having a long-term thinking was more common in Japan than in Sweden. Although Toyota emphasises that there should be an adaption to the local culture where lean is implemented there is one thing within their organisational culture that they won't alter. That is, respect for people and continuous improvement (Liker and Hoseus, 2008).

2.4 Leadership

Bass and Avolio (1997) describes leadership as "[…] one of the world's oldest preoccupation". However, there is no joint definition of leadership, as Stogdill (1974) puts it "There are almost as many different definitions of leadership as there are persons who have attempted to define the concept". The different definitions focus on different aspects e.g. the persona of the leader, the process or conduct of leadership or in terms of its effects (Glynn and DeJordy, 2010).

When implementing lean, leadership plays a vital role and is needed to support the lean implementation, however, leadership is often the missing link (Lucey, 2005; Mann, 2009; Liker and Convis, 2011; Liker and Hoseus, 2008; Dombrowski and Mielke, 2013; Orr, 2005). However, there is little academic research on what kind of leadership style that is recommended to implement in lean organisations. Therefore, this subchapter will present different lean leadership models and behaviours that support lean production and different leadership theories i.e. transformational, transactional and servant leadership.

2.4.1 Lean Leadership

Having a strong leadership is a reason and a fact for why Toyota produce exceptional results, they focus on a leadership where the leaders are constant aware and dedicated. According to Liker and Convis (2011) leaders at Toyota distinguish themselves from other leaders by striving for continuous improvement in every aspect of the business and they understand that to achieve this they require the help and involvement from everyone i.e. from top executives to the people at the shop floor to work together. For them as long as you train, develop and work in all the four steps in their 4-stage model, mentioned in section 2.1.8, you will become a lean leader (Liker and Convis, 2011). If an activity is value-adding or not is decided by the customer and a customer does not pay for the organisational activities, which makes leadership not value-adding. Therefore, a leader has to understand that it is the shop-floor worker that adds value and not him/her (Dombrowski and Mielke, 2013; Liker and Hoseus, 2008; Liker and Convis, 2011).

Dombrowski and Mielke (2013) define lean leadership as "[...] a methodical system for the sustainable implementation and continuous improvement of Lean Production System (LPS). It describes the cooperation of employees and leaders in their mutual striving for perfection. This includes the customer focus of all processes as well as the long-term development of employees and leaders". Further, they have derived five basic principles that describe LPS; improvement culture, self-development, qualification, gemba and hoshin kanri. An international survey was conducted among 91 organisations to evaluate the application of these five principles. They concluded that organisations in general comprehend the importance of lean leadership but have problems with its application. From the result of the survey it was evident that both hoshin kanri and self-development was not applied properly in most organisations.

Further, Dombrowski and Mielke (2014) used the five principles they derived (Dombrowski and Mielke, 2013) as a base in a new study to identify indicators for successful leadership. By using successful lean leadership indicators that they derived from the literature, study results and practical experiences of lean implementation, they turned the indicators into requirements for leaders, resulting in 15 rules for a sustainable lean implementation, see table 1.

Table 1 - 15 rules of a sustainable lean implementation (Dombrowski and Mielke, 2014)

Lean principle	Requirements for leaders (15 rules)
1. Improvement Culture	**1. Continuous improvement demands leader's continuity:** *This requires that executives develop themselves over the years and that they get to know the company very well. Which leads to deep knowledge regarding the organisations processes and evolving the problem-solving routine. The leader has time to learn about the individual learning needs to enhance employee development.*
	2. Leaders have to promote the continuous improvement process, but may not intervene directly in the problem-solving: *This means that the leaders should not name the solution. The focus should be on the promotion of the problem-solving process and not to find the solution themselves. Because this behaviour leads to a negative impact on employees' problem-solving creativity. Instead they should embrace their roles as coaches and lead through questions. Which leads to openness and this is an important requirement for a successful Continuous Improvement Process (CIP).*
	3. Errors will always occur - their consequences should be avoided: *Managers have a crucial role here, by setting an example in respect to dealing with errors. Errors will always occur but the key is to quickly identify the root cause and learn from them.*
2. Self-development	**4. Self-awareness is the first step toward (self-) improvement:** *For further training, leaders have to identify their potential. Which requires self-assessment and willingness for self-reflection.*
	5. After a promotion, the status quo has to be internalized: *Lean leadership requires deep process knowledge due to being the basis for coaching others. This then requires that leaders should work their way up and not be promoted before they master all processes on that special level or respectively in their team.*
	6. Lean leadership requires different abilities and behaviours: *To care and hold the customer's view is important for leaders to learn. Every organisation has it own problem-solving routine and for the leader to master it is vital due to being able to pass this knowledge during coaching of employees. Further to learn the cooperative leadership styles is something leaders need to focus on and to involve their employees to participate in problem solving. Which requires learning how to delegate tasks.*
3. Qualification	**7. Leaders have to make themselves in their actual job superfluous:** *By doing this leaders show that they succeeded in stabilizing their processes and developing their employees' problem-solving skills*
	8. All employees need to be developed individually: *Comparing LPS to other production approaches one thing that differs and is central to LPS is the long-term development of employees, at his or her individual level. To just implement a employee suggestion system is not enough because they need support and daily development by coaching. To achieve this, autonomous problem solving is needed but this is also very hard and requires long-term employee development.*
	9. Learning has to take place in short cycles:

	By having short cycles this leads to quick feedback and quick successes in learning. Which contributes to employees' motivation and their autonomous and continuous improvement. To perform problem-solving and learning in a standardized way it should be based on the PDCA. It is vital to perform several regular repetitions and have a scientific experimental approach.
4. Gemba	**10. Decisions are based on facts:** *To take decisions on the shop-floor instead from in a conference room is a change that is needed. Because it is only when you are present where the work is done i.e. at the gemba where you can gain facts. Doing this helps leaders put themselves in the employee's shoes and understand the problem and their root-cause better. Meaning having the leader's office located closely to the gemba.*
	11. The gemba is the place of action and learning: *Leaders do not need training material or exemplary tasks because developing employees at the gemba works well. Learning should take place close to the process and with realistic scenarios. Coaching is an important part to develop others, so leaders are not just present at the gemba for their own sake but to develop and support the problem-solving skills of their employees. However, this can be a problem among leaders because they have a habit of already having a solution in mind.*
	12. Leading at the gemba only works with a small leader-to-employee ratio: *It is optimal in order to pay attention to each single employee at a operational level to have a ratio of 1:5 employees and at higher levels a ratio up to 1:10. So, in general a leader-to-employee ratio from 5 to 9 is recommended.*
5. Hoshin Kanri	**13. Long-term goals are never abandoned in favour of short-term goals:** *It is crucial to not let more urgent and short-term goals impact important long-term goals.*
	14. The target system is also used to assess the employee development: *Employee development is an important matter for Toyota which is illustrated by this proverb "Before we build cars, we build people". So, the process and people need to develop equally because the process can only be as good as the employee.*
	15. In the striving for perfection the formulation of precise intermediate goals is indispensable: *That the leaders live the vision of the company is vital and to do that they have targets to reach. However, these targets need to be adapted to the special department and its process and to be translated into precise requirements for the process and personal goals for every single employee.*

Alefari et al (2017) performed a survey with 48 companies with the focus being on the critical success factors for lean manufacturing and which barriers they face when trying to increase their maturity. The responses indicated that "top management" i.e. senior management and middle management is a critical factor for the introduction of lean manufacturing. Further, they grouped the barriers into four groups; top management related barriers, workforce related barriers, financial barriers and others. It was identified that workforce related barriers were most critical, i.e. lack of understanding and commitment to lean by the workforce, followed by top management related barriers i.e. low commitment, poor knowledge and belief on the approach from top management. Moreover, the five principles for lean leadership developed by Dumbrowski and Mielke (2013) was used in the survey by Alefari et al. (2017) where their findings are similar to what was found by Dumbrowski and Mielke (2013).

Ballé and Bouthillon (2011) emphasises the importance that CEO: s and managers ask questions regarding how people plan to handle things and where their own priorities are and that the golden rule is "you need to develop people in order to develop products". From this they defined three dimensions of people development; Autonomy in problem solving i.e. "The ability to distinguish important problems from futile ones and to solve problems according to company policies without help"; Self-direction i.e. "The ability to understand the company's aims and formulate their own plans to how they want to evolve their teams and departments to contribute to improvement" and Teamwork i.e. "The ability to get teams working together and to solve problems across functions with experts from other parts of the firm or from outside".

2.4.2 Lean leadership values, behaviours and competences

Smith and Bond (1998) describe behaviours as "[...] specific actions which occur in a particular setting at a particular time". Dun et al. (2017) define values as "[...] desirable notions a person carries with him/her at all times as a guide for his/her behaviour". Dun et al. (2017) conducted a systematic literature review and two empirical studies of the content of effective lean managers' values and behaviours. From the literature review seven key values was identified by using relevant publications; continuous improvement, teamwork, customer focus, respect for people, information sharing, management by facts and management commitment. Further, Dun et al. (2017) identified 19 common behaviours among lean

leaders, whereas five of them were cited more; designing and coaching teams; visiting the work floor, getting and giving information, celebrating and recognizing success and engaging employees. The first empirical study i.e. a Delphi study among lean experts, they identified 21 work values associated with effective lean managers. Of these 21 work values six of them were ranked higher; customer focus, potential of ordinary employees, open mindedness, participation and teamwork, trust in people, continuous improvement. Regarding behaviours, the lean experts could agree on 14 behaviours; using the capabilities of people, engaging employees, providing feedback; recognizing, communicating and celebrating success, being on the work floor, listening, building trust, creating time for improvements, taking real action to implement lean, remaining focused on improvement, asking for ideas, training people in lean principles, task monitoring and evaluating and setting and prioritizing goals for improvements (Dun et al., 2017).

The second study was a field study with effective lean middle managers, were they ranked the following values the highest; honesty, participation and teamwork, responsibility, continuous improvement and candor. These were highest ranked because lean focus on fact-based management and transparency, effective lean managers that encourage participation of employees in the identification and implementation of ideas, delegation of responsibilities among lower levels in the organisation and being open about your feelings and work views (Dun et al., 2017). Further, behaviours of lean middle managers compared to non-lean middle managers was that they engaged more often in actively listening to and agreeing with their employees, monitored the tasks of subordinated more less, was less defensive and gave less counterproductive negative feedback.

Emiliani (1998) claims that an essential element for producing healthy work environments that could lead to economic growth but also help to sustain attempts to become lean is the practise of lean behaviours. The author distinguishes between lean behaviours and fat behaviours, where the first can be defined as behaviours that add value e.g. honesty, patience, respect and listening. Whilst the latter is defined as behaviours that add no value and can therefore be removed e.g. uncertainty, negativity, selfishness and pride. Further, Emiliani (1998) stresses that lack of employee commitment is often a consequence of fat behaviours which results in reduced participation in the business. The lifespan of a business can also be limited to about 30 years as a consequence of lacking disciplined behaviour between individuals or between the company and its stakeholders. Emiliani (1998) emphasises that for

a well-established organisation it can take five to ten years to develop even the most basic capabilities for sustained practise of lean behaviours. However, the journey starts with the managers and that they recognize and improve their own behaviours and to deeply understand the lean behaviours before helping others and on a personal level this transformation will take two to four years.

Often methods and tools are the focus for lean production system (LPS), however, they are just the visible part of LPS. It is the employees that are the key factor for sustainable success. Therefore, implementing methods and tools are not the big challenge, it is the change in behaviour and mind-set of employees and leaders that is. To benefit the tacit knowledge among the employees regarding operative issues, decentralising the task of optimising processes is vital. Because the ones who encounter the deviations and problem at first hand is the employees and they have the best knowledge regarding common defects and disturbances. Further, to make this possible, time and trained employees need to be provided by the organisational structure (Dumbrowski and Mielke, 2013).

Mann (2009) stresses the critical role of the leader in implementing lean and especially in the introduction phase. Further, that a common reason for failure of most lean initiatives is related to failure to change leadership practices and behaviours. That lean is considered as a cost-reduction system needs to change among people and instead they should view it as the improvement system it actually is, if applied correctly (Mann, 2009). Seidel et al. (2017) identified 16 leadership competencies; identify what adds value to internal and external clients, identify and solve problems with their teams using the PDCA principles (coaching), use continuously lean practices and principles, manage with emphasis on value flow rather than on isolated operations, see the problems with your own eyes (based on data and facts), lead through example, stabilise processes, provide value-added information clearly and objectively, put the group's interest above the individual ones, develop and implement points, plans and policies aiming at people's development, practise self-development as well as professional and personal continuous evolution, identify and manage barriers during lean production journey, practise lean as an interrelated system of principles and practices, develop actions based on long-term views, develop actions that, based on ethical principles, respect the community, the environment and the workers' safety and develop innovative and challenging actions. These competencies were identified by performing a literature review of

lean competencies, interviewing 4 lean experts and conducting a survey with 91 respondents.

2.4.3 Leadership styles

Burns (1978) developed the concept of two leadership theories called transactional leadership and transformational leadership, which are two leadership styles that are contrasting. The first can be described as a contract or relationship between a leader and a follower, where punishment or rewards are used by the leader as a consequence of the outcome of their transaction (Burns, 1978; Bass, 1985a). Whilst, the latter can be described by having leaders that develop trust and confidence in their followers (Bass, 1985a). "Transforming" employees to help and look out for each other, to be encouraging and supportive and to have the whole organisations best interest in mind is what a transformational leader focuses on (Testani and Ramakrihnan, 2011). Further, when it comes to the motivation, morale and performance of the organisation's employees this leadership style has a positive effect by enhancing them. Burns (1978) puts it as a process where "leaders and followers help each other to advance to a higher level of morale and motivation". Transactional leadership is based on a "give and take" relationship while this is not the case in transformational leadership. Instead it is based on the leader's qualities, skills and ability to make a change with the help of a shared vision.

Transactional leaders often initiate contact with subordinated when something goes wrong or a failure occurs which is why the feedback they provide is often negative. Consequently, prohibiting growth of the person and their problem-solving skills. In a business transformation to achieve meaningful change and sustainable result the employee's autonomy, empowerment and engagement is needed, however, the transactional approach as a primary style cannot fulfil this. For a lean transformation to be successful the transformational leader is critical, because a transformational leader communicates the reason for the change. Further, for the employees to be motivated and put great effort in their work this leadership style is vital (Testani and Ramakrihnan, 2011).

Bass and Avolio (1990) emphasises that transformational leaders shifts the focus from concerns for existence to concerns for achievement, development and growth among their followers. This is translated to four basic components or "I's" of transformational leadership; Idealised influence, Individually considerate, Intellectually stimulating and Inspirational. That

transformational leaders are more effective than transactional leaders are supported by research, however, Bass and Avolio (1990) claims that optimal leadership behaviour is achieved with a combination of both and not exclusion of one of them. This is shared by van Dun et al. (2016) that claims that to be a lean leader both transformational and transactional leadership behaviours are needed. Because transactional leaders put great focus on eliminating waste i.e. efficient use of resources while transformational leaders focus on creating mutual trust and cooperation among members and are positive towards changes and improvements in processes, products or services and can more easily adapt to external changes.

Woehl (2011) concludes in his research that transformational leaders are needed if organisations want to transit to lean manufacturing because they are more successful in implementing lean practices. Further, the author emphasises that struggling with implementing lean practises can be connected to the leadership styles of the leaders.

Toyota views leadership in its own way which can differ from how other view leadership. A big difference between Toyota and other organisations is that for Toyota it is not about managing and controlling the team members, their focus is on "confirming the process" and not catching people making mistakes. Which is also known as "Servant Leadership" which in short means that focus should be on others and not on the person itself and to understand the role of the leader as a servant (Stone et al., 2004). At Toyota they describe and visualise servant leadership as an upside-down pyramid where the further someone is from the value stream e.g. upper management, the less impact it has on directly adding value. Therefore, leaders are at the bottom at the pyramid to act as support for the people at the top of the pyramid i.e. team members in what they need. So, the closer you are to the bottom of the pyramid the more responsibility you have to support. Ohno (2007) explain that if you are out observing at the gemba but just stand there and do not do anything for the workers, the worker will think "[...] there he is again just standing there. He must have a lot of time on his hands. He never does anything for us" and this results in that when the workers have problem they will not come to you (Liker and Hoseus, 2008).

Stone et al. (2004) examines the possible similarities and differences between transformational leadership and servant leadership. They conclude that the key difference is the focus of the leader, the transformational leaders focus more on organisational objectives

while servant leaders focus more on their followers. However, they had similarities in that both theories emphasised individualised consideration, appreciation of followers, listening, employee empowerment and mentoring or teaching.

The literature review concludes that the involvement of the top management and the managers is vital in order to be a lean leader. It was also found that self-development and hoshin kanri was two areas lacking among the majority of organisations. Further, in the literature review it was stressed that certain values, behaviours and competences is required to become a lean leader, however, which values, behaviours and competences that was identified as most important differed in the literature review. Regarding the leadership style it was concluded in the literature review that leaders with a transformational leadership style is required when implementing lean. However, it was stressed that the transactional leaders are also needed and that the two styles should not exclude the other instead there should be a coexistence of both.

2.5 Coaching

The purpose with coaching is that people should take advantage of their potential, develop, learn and achieve result. Further it is about creating awareness and responsibility of the one being coached (Viva coaching, 2011). According to John Whitmore (2003) coaching can be defined as "[...] unlocking a person's potential to maximize their growth" while Tony Stoltzfus (2005) define coaching as "[...] practicing the disciplines of believing in people in order to empower them to change". This can be translated to that coaching is based on that each individual has its own resources to manage challenges and with extra support these possibilities are enhanced and can be utilised in a greater way (Viva coaching, 2011).

To coach you need a positive perspective on people because how we act is based on the perspective we have on people, which control our values, attitudes and behaviour. Whitmore et al. (2003) emphasises that coaching is a certain way to think, to treat people on, to lead and relate to. Except from having a positive perspective on people other characteristics is also valuable to be a good coach such as; curious, emotional intelligence, competence to learn, result- and action oriented and to enjoy being a coach. Further, Liker and Convis (2011) stresses that coaching and helping other potential leaders to get the right way of thinking regarding problems and mind-set is a key aspect of leadership development at Toyota.

2.5.1 Techniques and competences in coaching

The Art of Questioning is another name for coaching (Viva coaching, 2011), because an important competence for a coach is to ask powerful questions and especially for managers in a lean organisation (Liker and Convis, 2011; Rother, 2013). The purpose with asking questions is to lead the process forward, indicate sign of active listening, reflection, new perspective, increased awareness, give insight and create plans and actions. To ask question that include words like *What* and *How* should be prioritized before *Why*-questions. Because a why-question can cause the person to become defensive and thereby locking. Further, coaching requires the competence of being able to ask explorative, open and follow-up questions instead of informative, closed and leading questions because this only gives some basic information and does not develop the coachee (Viva coaching, 2011).

Another important competence is active listening e.g. body language, being present and interested and asking follow-up questions, because this is when you really "see" the coachee and can capture important signals and messages (Rother, 2013). Tools to do this can be to; repeat/reflect, reformulation/clarification, summarize what the coachee sais and to "hear" what is not said e.g. words that reappears, narrow or restricted thinking. Each individual has its own view of the world and a vital part in coaching is to help the coachee to become aware of their interpretation of reality and open new perspectives. To avoid making assumptions that hinders people from developing and thinking differently, several tools can be used e.g. brainstorming, asking hypothetical and exception question and "as if" formulations (Viva coaching, 2011).

A central part in coaching is setting goals, this increases employee involvement and efficiency, which makes this an important competence. Creating and setting appropriate goals gives direction, inspiration, focus, satisfaction, better prioritising and an opportunity to evaluate and thereby learning. However, how to create appropriate goals can be challenging but some tips can be to formulate the goal in a positive and motivating manner, that the goal is accepted and self-elected, is within its own control, leading towards the vision and is SMART (Specific, Measurable, Achievable/attractive, Realistic, Timely). Further, when working and setting goals motivation plays a vital role in order to reach the goal, so to increase motivation the coach needs to emphasise to the coachee the value of creating an inner picture i.e. a visual picture of the goal (Viva coaching, 2011).

Further, to give feedback and to follow-up is a crucial part in coaching and therefore an important competence to have. The purpose with coaching feedback is based on having conversations where focus is on getting the coachee to realize their potential. The feedback should be constructive, aims to increase learning and development and emanates from the coachee i.e. his/her needs and learning style (Viva coaching, 2011; Savén, 2014).

Liker and Hoseus (2008) and Liker and Convis (2011) emphasises similar competences as mentioned above needed of a first line manager in a lean organisation. Because lean is about being a learning and teaching organisation and this can only be achieved with leaders that are dedicated to help and develop other through coaching and mentoring.

2.5.2 Coaching Methodology

To create a good coaching relationship, trust and confidence is required, which is why coaching is something that often is done over time with regular and recurring dialogues/conversations. However, it can also be done more spontaneously as a tool in your daily work. A common time-period for a longer coaching process is often six months with a frequency of two conversations per month. Having a model as a help or support for the conversations is good but it is important to remember that a model is only a rough structure that cannot be followed exactly. Whitmore (2003) is one of the coaches that developed the GROW-model which is a coaching model, with four phases or steps; Goal, Reality, Options and What/Will. The model has the purpose of increasing the awareness level in the coachee and often during the conversations you are moving between all the steps but primarily between step 1 and 2 (Viva coaching, 2011).

2.5.3 Coaching in organisations

In recent years coaching has expanded and is no longer only seen as a form of conversation for executives but as an approach and a methodology that benefits the whole organisation. Which means creating a coaching culture where coaching is used as a tool to drive the organisation forward and facilitate continuous learning, where focus is not only on improving "production" but also communication, relationships and results. To have both internal and external coaches is needed and was supported in a survey conducted by International Coach Federation where they asked about 4000 organisations (Viva coaching, 2011).

Today organisations operate in a more complex and changeable world which affects the leadership role and requires that employees see the whole picture, take decisions and responsibility for their own development. Coaching can be applied in several situations e.g. problem-solving, evaluation, teamwork, planning, delegation and personnel development. Further, coaching impacts motivation by giving the employees prerequisites to become motivated and finds natural driving forces among the employees.

Insight Lab (2010) reported that people who are being coached has a better ability to prioritize activities, enhances the ability to set up challenging goals and actually reach them, increases motivation and engagement at work, increases general satisfaction and well-being and have a better ability to coach others. However, there are common pitfalls that should be avoided as a new coaching chief or manager:

- Unclear/fuzzy goals
- Unclear/vague expectations
- Talk about nothing i.e. a lot of small talk that leads nowhere
- Take over responsibility

Team coaching is similar to individual coaching because you use the same competences but add a "system- and helicopter perspective". This means that at team meetings focus is not only on the "matter of issue" but on the interaction between the team members i.e. what happens in the interaction. Important competencies in team coaching is to first create the foundation because a solid and good foundation leads to a good platform for the team work and creates a feeling of safety. Next is to communicate effectively, which includes e.g. get everyone active and engaged, help the team become more self-going and explore their ideas and solution. The last competence is to facilitate learning and result, which means setting clear goals and to follow-up and give feedback (Viva coaching, 2011).

To summarize the literature review concludes that coaching is vital and has changed to become an approach that should benefit the whole organisation. Four competences were identified when as important when coaching, i.e. asking questions, active listening, setting appropriate goals and giving feedback. Further, coaching can be performed both spontaneously and in a more organised manner. The literature review also emphasises that

coaching should be performed both in teams and individually due to understanding the interaction and group dynamics but also the individual.

2.6 Motivational theories

There are a great number of definitions on motivation (Kleinginna and Kleinginna, 1981). However, according to Ryan and Deci (2000) being "[...] motivated means to be moved to do something. A person who feels no impetus or inspiration to act is thus characterized as unmotivated, whereas someone who is energized or activated toward an end is considered motivated". Within motivational theory it is common to distinguish between different sources of motivation where the most classic distinction is between intrinsic and extrinsic motivation (Deci and Ryan, 2000). According to Oxford dictionaries (2018a, 2018b) intrinsic motivation can be described as an "[...] incentive to do something that arises from factors within the individual, such as a need to feel useful or to seek self-actualization". While, extrinsic can be described as a "[..] incentive to do something that arises from factors outside the individual, such as rewards or penalties. The promise of a bonus if one meets agreed performance targets is an obvious example of such motivation."

Hackman and Oldham (1976) suggested a model for how to design work in order to achieve high internal motivation, high growth satisfaction, high general satisfaction and high work effectiveness, see figure 6. They further argue that one of the key points in the model is to create high motivational potential. Tasks with high motivational potential is characterised by that the person performing the task feel strongly about the result. If the outcome is good the reaction often leads to positive feelings while if the outcome is bad, vice versa. However, to reach this, three critical psychological states needs to be fulfilled: the employee experiences meaningfulness of the work, responsibility of the work and have knowledge about the actual result of the work. The authors further argue that in order to achieve a high motivational potential the three psychological states need to interact with each other. This means that if for instance the work design fails to provide the worker with a high degree of experienced meaningfulness although there is a high degree on fulfilment of the other two states the overall motivational potential will still be quite low (Hackman and Oldham, 1976).
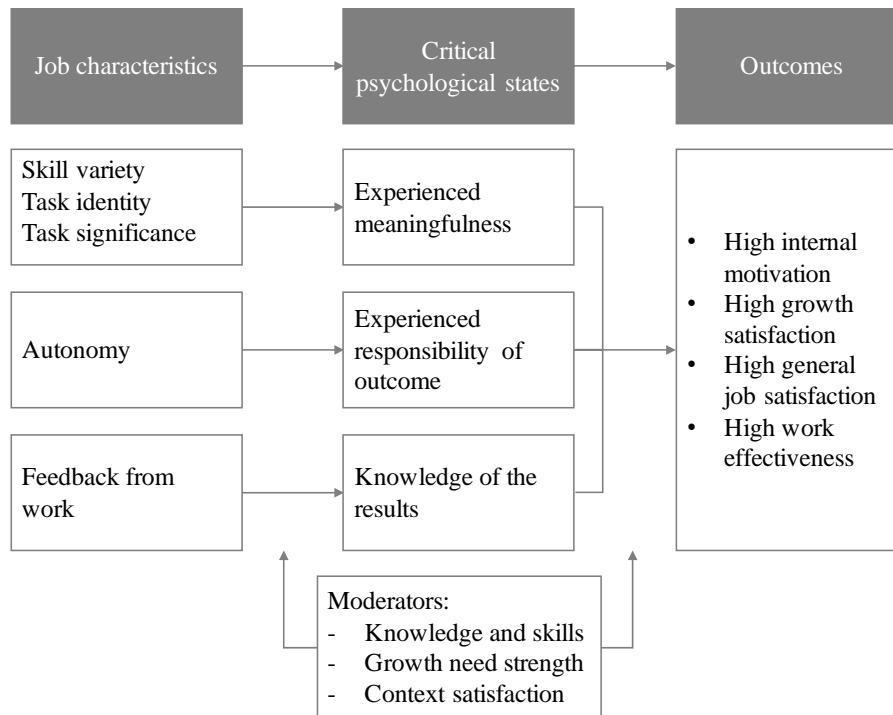
Figure 6 – A model developed by Hackman and Oldham (1976) of how to design work to achieve high internal motivation

To enable that a high motivational potential is reached it is therefore important to design the work in a way so that the psychological states are fulfilled. In order to design the work such as the worker experience a high degree of experienced meaningfulness there are three additional factors to consider namely providing the work with high skill variety, the task identity and the tasks significance. First, skill variety, represents to what degree the employee performs a broad spectrum of activities and therefore gets to use many of their skills and talents. This because, it is more likely that people experience their work as more meaningful if they are challenged to use and stretch their skills. Second, task identity represents to what degree an employee is doing a big part of the job. The reason for this is that people in that case easier can identify why their job is important. Third, task significance, reflects how important the employees see the task as. If it is a matter of life and death it is easier for a person to experience it as important. Although all three components are important it is possible for a person to find the work meaningful even if all components are not fulfilled e.g. if there is a lack of task significance and the other two have a high fulfilment (Hackman and Oldham, 1976).

In order, to design the work such as that an employee finds that they are responsible for the outcome, the work should be included by a large degree of autonomy. If the employees experience that the outcome is a consequence of their actions, choices and way of working it

is also more likely that they experience having responsibility for the result. Further, to design the work so that the employees are knowledgeable about the actual result of the work. To enable that, the work should give the employee immediate job feedback. This leads to the definition motivational potential, see figure 7. The motivation potential is as can be noticed from figure 7, dependent on the the interaction between the fulfilment of the psychological states. Hence, if one is very low it will have a big impact on the total motivational potential It is, although, important to notice that although the work is designed to have a high potential it does not ensure that the inner motivation will be high. This because the design principles only reinforce the motivation if it is already there.

$$Motivational\ potential = \left[\frac{\frac{Skill}{vaiarity} + \frac{Task}{identity} + \frac{Tasks}{significance}}{3} \right] \cdot Autonomy \cdot Job\ feedback$$

Figure 7 – Formula to calculate motivational potential (Hackman and Oldham, 1976)

As can be noticed in figure 6, Hackman and Oldham (1976) further suggests a couple of moderators in their model. These moderators are what determines whether high motivational potential will result in high internal motivation or not. First, knowledge and skills, if a person performing a task with high motivational potential fail to perform it well, it will, as described earlier result in very unpleasant feelings. If this pattern keeps on repeating itself due to lack of knowledge and skills the person will in the extension give up. However, if the the person has enough knowledge and skills they will despite failing once or twice keep trying if the outcome in the extensions will cause positive feelings. Second, growth need strength, reflects to what degree a person has a need of personal accomplishments, learn new things and develop themselves. A person having this will to a large extent experience both the psychological potential more and respond more positively when they are present. A person lacking this need will on the other hand perhaps not recognise them, not value it or feel threatened when they are put in a challenging situation. Lastly, satisfaction with the work context, reflects to what degree an employee feels fairly satisfied with the work context such as pay, job security, their colleagues and boss. In order for a person to be motivated this must at least be fairly satisfied.

2.7 Change management

It is crucial for organisations to be adaptable and keep up with the fast-changing and challenging market environment in order to survive and succeed because the life cycle of a product keeps getting shorter and the customer demand is increasing (Schein, 2007; Kotter, 2007; Bhasin, 2012). As a leader you have a great responsibility to handle this, therefore, this subchapter will bring up how to drive or lead a change process based on Kotters eight step-model. Further, it will bring up common pitfalls and mistakes when managing a lean implementation, a change process and how to sustain a change and avoid falling back to old work- and mind-set.

2.7.1 Leading change

Kotter (2007) emphasises that a change process consists of a series of steps or phases and that it is important to not skip steps and to give the process an appropriate length of time in order to have a successful change process. Kotter (2007) summarise how to transform your organisation in eight steps, see figure 8.

Step 1: *Establishing a Sense of Urgency*

Step 2: *Forming a Powerful Guiding Coalition*

Step 3: *Creating a Vision*

Step 4: *Communicating the Vision*

Step 5: *Empowering Others to Act on the Vision*

Step 6: *Planning for and Creating Short-Term Wins*

Step 7: *Consolidating Improvements and Producing Still More Change*

Step 8: *Institutionalizing New Approaches*
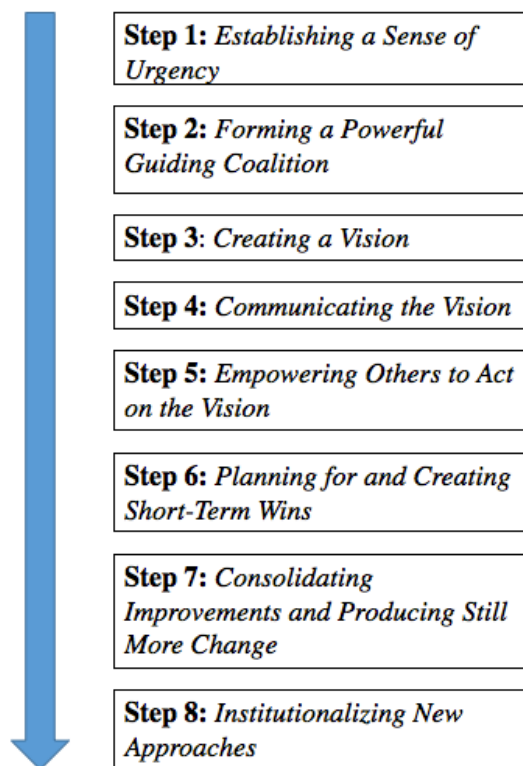
Figure 8 - Kotter's eight step model (Kotter, 2007)

It is in the first step that more than 50% of organisations fails, this because e.g. underestimating how hard it can be get people out of their comfort zone, lack of patience and overestimating their accomplishment in already creating an urgency. Creating an urgency is vital in order to boost and keep the transformation alive and this requires about 75% of the organisations management convinced that how we run things today, i.e. business-as-usual, is not sustainable. The second step stresses the importance of having a powerful guiding coalition so that the opposition never has the chance to stop the change. This often needs the head of the organisation as driver and supporter and according to Kotter (2007) in successful transformations "[…] the chairman or president or division general manager, plus 5 or 15 or 50 people, come together and develop a shared commitment to excellent performance through renewal". To develop a vision that describes the future direction and that can be easily communicated and is appealable is the third step. Successful organisation that have managed transformations in a great way often have a sensible vision that facilitates the direction the organisation needs to move in and avoids multiple plans, directives and programs which is commonly found in failed transformations. The fourth step stresses the role communication have and that without proper communication and utilisation of existing communication channels, the vision will never be understood nor captured by the people. Further, communication is often done in words but it is when it comes in deeds that it is powerful (Kotter, 2007).

The next step is to confront and get rid of big obstacles or blockers e.g. a person that does not believe in the change or expects others to change and embrace the new vision but not themselves. Therefore, communication itself is not enough, action need to be taken to empower others and maintain the credibility of the change effort as a whole. A transformation takes time, so to keep people motivated and not to give up makes having short-term goals vital, which is the sixth step. Further, this pressure to produce short-term wins keeps the urgency up and helps. Kotter (2007) emphasises that in successful transformation managers are active i.e. create short-term wins instead of being passive i.e. hoping for short-term wins. The seventh step is about managers that declares a victory to soon e.g. after the first performance improvement. To make this mistake can be catastrophic because it often takes five to ten years for a change to get rooted in an organisation's culture. Managers need to continually tackle bigger problems, evaluate systems and structures that are not in line with the transformation vision and keep a close eye on how people are developed, who is hired and promoted. The last step is about sustaining the change and make it "the way we do things

here". Kotter (2007) identified two important factors that has an impact in this step, the first factor is visualise and show people how the new approaches, attitudes and behaviours have helped improve performance i.e. help people see the right connections. If people are not provided with the right facts and information they draw own conclusion to outcomes which often is incorrect. The second factor is to take time to secure that the next generation of top management fits and personifies with the change and transformation. That wrong decision is taken regarding new candidates are very common and the consequence of this is that they mess up a decade of hard work or hire a person that is not a change champion.

2.7.2 Common pitfalls and failures for lean implementations

There are plenty of reasons and barriers to why the majority organisations fail to successfully implement lean. According to literature the barriers can be e.g. overlooking the role of internal communication system, culture, backsliding to old methods, traditional cost accounting systems, view lean as a business proposition, fail to view lean as a continuous and never-ending process, staff attitudes and operative resistance (Bhasin, 2012).

In a detailed survey questionnaire that was completed by 68 organisations the respondents got to rank potential barriers from one to ten, where ten meant it was a major barrier. From this Bhasin (2012) found the barriers presented in table 2 and how common they were in percentage. Further, Bhasin (2012) split up the answers in regard to the size of the organisation i.e. small, medium and large. In the table below the result for large organisations are presented.

Table 2 - Barriers in large organisations

Barrier	Percentage
Insufficient supervisory skills to implement lean	64 per cent
Insufficient workforce skills to implement lean	60 per cent
Employee attitudes/resistance to change	60 per cent
Insufficient senior management skills to implement lean	55 per cent
Cultural issues	53 per cent
Insufficient management time	52 per cent
Insufficient understanding of the potential benefits	45 per cent
Cost of the investment	45 per cent
Insufficient internal funding	39 per cent
Insufficient external funding	35 per cent
Need to convince shareholders/owners	22 per cent

Further, Bhasin (2012) conducted seven case studies at two small sized organisations, one medium sized organisation and four large organisations to validate the answers from the questionnaire. Eight informants were used in each case study i.e. two managers and two shop floor operatives was interviewed and two different managers and two different shop floor operatives were asked to complete a questionnaire. The answers from the questionnaire and interviews with the managers in the case studies are presented in table 3 and 4.

Table 3 - Lean barriers from case studies, questioners.

Barriers – Questionnaire	Percentage
Cost of investment	90.0 per cent
Insufficient internal funding	82.1 per cent
Cultural issues	82.1 per cent
Insufficient workforce skills to implement lean	80.7 per cent
Insufficient supervisory skills to implement lean	79.3 per cent
Employee attitudes/resistance to change	75.0 per cent
Insufficient senior management skills to implement lean	67.1 per cent
Insufficient management time	67.1 per cent
Insufficient understanding of the potential benefits	54.3 per cent
Insufficient external funding	52.1 per cent
Need to convince shareholders/owners	42.1 per cent

Table 4 - Lean barriers from case studies, interviews

Barriers - Interviews	Percentage
Cost of investment	81.4 per cent
Cultural issues	77.9 per cent
Insufficient supervisory skills to implement lean	75.7 per cent
Insufficient workforce skills to implement lean	75.0 per cent
Insufficient internal funding	74.3 per cent
Employee attitudes/resistance to change	74.3 per cent
Insufficient senior management skills to implement lean	65.7 per cent
Insufficient management time	61.4 per cent
Insufficient external funding	52.1 per cent
Insufficient understanding of the potential benefits	51.4 per cent
Need to convince shareholders/owners	40.0 per cent

The result from both the survey questionnaire and case studies indicates that culture and change has an important role in order for organisations to achieve a successful lean implementation. In more detail the difference for the main barriers between the survey respondents and those within the case studies was that cost, culture and insufficient internal funding was most reiterated in the case studies. While for the survey it was insufficient supervisory skills, employee attitudes and insufficient workforce skills that was highest. Moreover, the research emphasises that a lean journey needs both a human and financial commitment and that each organisation is unique and has its own limitations and problems.

Bhasin (2012) stresses that "lean needs to be witnessed as a business philosophy, the more you believe in its doctrine, the easier it is to transform the business and to reap the benefits".

Lucey (2005) used three groups of professionals i.e. consultants, academics and writers/authors that work almost solely with change to identify if they had common or contrasting view on reasons for failure in a change process. The consultants and academics were interviewed while for the writers/authors a literature review was conducted. The top ten reasons for failure found was: Lack of clear executive vision and leadership, lack of an effective communication strategy, failure to create and communicate strategy, failure to create and communicate a sense of urgency, poor consultations with stakeholders, lack of a structured methodology and project management, failure to monitor and evaluate the outcome, failure to fully mobilise "change champions", failure to engage employees absence of a dedicated and fully resourced implementation team and lack of sympathetic and supportive HR policies.

2.7.3 Sustain a lean change/transformation

For organisations to be able to mange to live and operate in a complex, faster and more diverse future, leaders have a great responsibility. They need to continuously learn and adapt to this ever-changing environment (Schein, 2007). This is not easy and to sustain change is as mentioned often a reason to why organisations fail with transformations and implementing change. However, there are several actions organisations can make in order to avoid failure and going back to old mind-set and behaviours. In table 5, important actions and factors to sustain a transformation are identified and why they are important are explained but also how the actions can be addressed and managed.

Table 5- A summarise of what to consider, why to considerate it and how to address sustaining change

Action/Factor	Description/why	How	Reference
Foster a teaching organisation	• To be able to learn and develop to the fast-changing market and environment	• Leaders need to be connected to the external environment to continuously learn • Self-develop and train to be able to educate others	Schein (2007)
Active engagement of employees	• Strong correlation between employee engagement and lean sustainability. Because engaged employees consistently produce better results.	• Use of regular measure of employment engagement	Lucey (2005)
Change should be led by the right person or persons	• Will enhance and be supportive of a regular measure of employment engagement • Increased the probability for a sustainable change or transformation	• By analysing that the leaders are really committed, have a long-term perspective, challenge the status quo, focus on people and inspire trust and wants to lead • Continually training	Liker and Convis (2011); Lucey (2005) Kotter (2007)
Strong culture	• Needed in a rapidly changing world to promote excellent performance that contain norms and values that help to adapt to a shifting competitive environment • To support and make the vision possible • To move in the direction the organisation requires	• Measure employee engagement • Involve and delegate responsibility to employees • Empowerment of employees • Respect for people • Work with continuous improvement and problem-solving • Training and coaching • Make sure that everybody is aware of the goals and mission of the organisation • People are held accountable for their performance	Kotter (2007); Liker and Hoseus (2008); Bhasin (2012); Hofstede (1980)
Training	• Is a preventive cost which helps the overall lean implementation and continue to reduce the time to implement lean • Increases knowledge and self-development	• Combine both theoretical and practical training • Gemba walks • Get coached and coach others	Bhasin (2012); Liker and Hoseus (2008); Liker and Convis (2011)

Top management commitment	• Lean requires effort, time and to believe in the philosophy and this needs to be cascaded down in the organisation starting at the top.	• Management need show interest and be present at the shop-floor level • Start by making changes yourself before asking it of others • Show engagement and act as a role model • To not overburden managers with additional duties and responsibility to implement lean • Give people time to understand and get on-board	Bhasin (2012); Liker and Hoseus (2008); Liker and Convis (2011)
Avoid focus on only tools, techniques and practices	• Lean is not solely about the "hard stuff" or only applicable on the operational level	• Make sure that the whole organisation is involved and especially the top management • Top management needs to show support and engagement • Invest and create a top-down and bottom-up approach	Liker and Hosues (2008); Liker and Convis (2011); Bhasin (2012)
Avoid copy-and-paste instead adapt to the context of the organisation	• There is no map or standard formula for implementing lean. The important thing is to adapt it to your organisations context and look over your strengths and weaknesses.	• Investigate and understand your organisation and processes to understand the constraints and what is important • Which areas are your organisation mature in and not mature in. • Have a clear vison and direction to prioritise what and when things should be done	Bhasin (2012); Liker and Hoseus (2008)
Communication	• To explain "why" this change is required • To avoid making assumptions and start to hesitate and resist • To create an urgency and getting people to feel involved and engaged	• Use different ways to communicate • Face-to-face can be recommended • Be prepared and invite others to express their ideas and thoughts • Use coaching as a way to communicate and give feedback	Liker and Hoseus (2008); Liker and Convis (2011); Viva coaching (2011); Savén (2014)

Long-term perspective	• Lean is a never-ending journey that has no end point	• Set a clear vision • Avoid shifting to a fire fighting mode when things get difficult • Have a holistic perspective by understanding the process and the direction of the organisation	Liker and Hosues (2008); Liker and Convis (2011); Savén (2014)
Coaching and mentoring	• Essential in order to develop others and develop the organisation • Plays a key role to develop problem solvers and to work with continuous improvements	• Make time for coaching • Understand the process • Ask question that are open and explorative • Avoid giving the answer • Use a model as support when coaching • Give feedback and follow up continuously	Liker and Convis (2011); Viva Coaching (2011); Savén (2014)
Strong leadership	• Sustained change is dependent on strong leadership	• To have a mix between a transformational and transactional leadership style • That they are good coaches • The leaders/managers need to be well-trained so they can cascade training and knowledge to their staff • Work on behaviours that support lean • Use an objective evaluation system • Always strive for perfection	Bass (1985a); Liker and Convis (2011); Liker and Hoseus (2008); Studer (2013); Womack (1996); Testani and Ramakrishnan (2011); Savén (2014)
Teamwork	• Without having the whole group on the same page, a change will never sustain	• Teamwork activities and workshops • Right sizes of groups • Provide good coaches and support	Liker and Hoseus (2008); Liker and Convis (2011)

3. Methodology

This chapter describes how the thesis was designed and performed. First, a description of the research strategy and its design is presented including a subchapter explaining the research execution. This followed by, how the data was collected, i.e. which methods has been used, and then how the data was analysed in relation to each RQ is described. This is followed by a part about the quality of the research where certain criteria need to be considered i.e. validity and reliability of the research. Lastly, a subchapter regarding the aspects related to ethics will be described.

3.1 Research strategy and design

In this thesis, the research was based on an empirical study, consisting of observations of first line managers i.e. SVs in the assembly area at the organisation and interviews with people of interest at the organisation and with people outside the organisation that has a deep knowledge within the subject.

There are three ways scientific research can be performed, inductive, deductive and abductive. The difference among the three research approaches is that inductive research is used when the researchers starts by investigating and observing the reality and based on their findings formulates a theory. While deductive research is based on available theory and literature and then proceeds with observations to confirms the theory. Lastly, abductive is a combination of inductive research and deductive research (Patel and Davidson, 2011). This research used a mix of deductive approach and abductive approach due to being the best fit for being be able to answer the RQs.

Another aspect to consider when designing a study is the research strategy, this thesis was based on a qualitative research strategy and case study strategy. According to Bryman and

Bell (2011) qualitative research "emphasises words rather than quantification in the collection and analysis of data". Further, for an empirical study that consists of interactions, observations and interviews a qualitative research approach is better due to getting a more in-depth and rich knowledge (Bryman and Bell, 2011). While the purpose with a case study research is according to Denscombe (2014) "Understand the complex relationship between factors as they operate within a particular social setting."

3.1.1 Research execution

The research is divided into four main parts in which data collection and data analysis is performed in parallel. In figure 9 an illustration of the research execution steps is presented and the outcome. The first part was a literature study where the main focus was on lean leadership, motivational theory, organisational culture and change management theory. The search engines IEEE, Google scholar and Scopus was primarily used for the literature study and search strings such as Lean leadership, Lean behaviours, Lean production, Leadership, Change and Motivation was used. However, little research has been conducted in the domain of lean leadership and especially for first line managers. The literature study acted as a fundament for the theoretical framework where the theoretical framework then acted as a base for analysing the organisations current state and as input to the developing LLF. Moreover, the literature study widened the knowledge base and gave an insight to what current research has claimed and concluded within the area.

As figure 9 shows the findings from part one acted as an input to the other three parts i.e. observations, interviews and study visits and workshop. The aim with the second step, which was observing mainly SVs but also TLs and team members, was to get a picture of their everyday work e.g. how they were working and what they spent time on. In the third step i.e. the interviews and study visits, the aim was to get an understanding of what lean experts and people with a deep knowledge within the area of lean leadership, change management and organisational culture thought was important and their experience and recommendations. The output from the interviews was further used as input to the developing LLF. When grasping an understanding of the bigger picture it was then used as an input to the workshop which is the fourth part. The purpose with the workshop was both to present to the SVs what had been identified during the observations and to discuss their current work tasks and how to structure them in order to fulfil the strategy and goals. Lastly, the data collection and analysis is concluded into a Lean Leadership Framework and Action Plan adapted for the organisation.
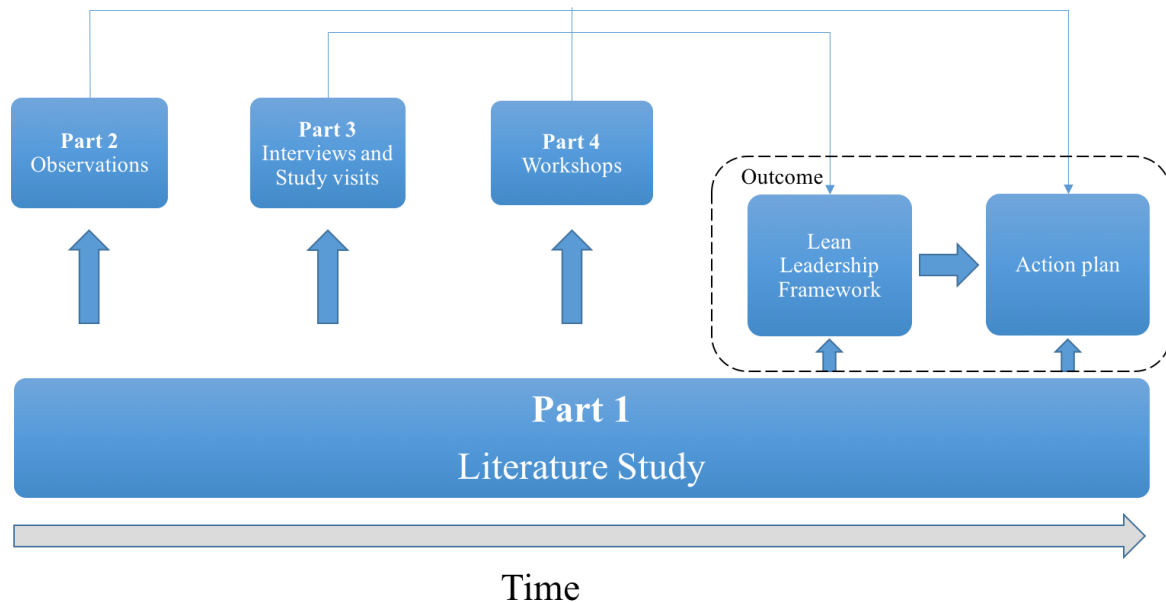
Figure 9 - A rough illustration of how the research was executed i.e. the four different parts and the outcome

3.2 Data collection

The data collection consisted of both a qualitative and a quantitative part. The collected data can either be primary or secondary, the first means that data is collected directly by the researchers from e.g. observations or surveys. The latter means that the data is collected and possible analysed by someone else (Denscombe, 2014). Both the qualitative and quantitative part of this thesis will consist of primary data i.e. observations (unstructured and structured), interviews and workshop.

3.2.1 Observations

One of the methods used for gathering qualitative data was through observing the daily work of SVs, TLs and team members. However, the main part of the observations was on SVs. The observations were both structured and unstructured, where the aim with structured observations is to gain an understanding of behaviours related to specific tasks. While the latter is to gain an understanding of the tasks and behaviours that is unprovoked in general (Marshall and Rossman, 2014). It was decided to perform both structured and unstructured observations in order to both gain an understanding of their everyday work and behaviours and to get a measured time allocation for the different work tasks in order to focus on the right areas in the action plan. Further, the structured observations were designed as a frequency study which is a statistical method that unlike a time study is based on random samples (Almström, 2014).

The unstructured observations consisted of first observing the TLs and team members for three days in the assembly area at the organisation. This was followed by observing four SVs working the day-shift during a two weeks' period, in total four days of observation were spent on each SV, where three of the days were dedicated to unstructured observations and one to structured. There were two observers which observed each SV individually for two days and then swapped with the other observer. During the observation the observers followed the SVs from when they started their shift to when it ended and participated in most activities except more sensitive personnel errands. Further, structured observations were conducted on three SVs on the evening-shift as well (two of the SVs were the same as the unstructured observations while one was new). Before conducting the structured observations, a template developed by Swerea IF was modified and thereafter used during the structured observations. The modified template consisted of six different categories with respective subcategories, see figure 10 or Appendix A. Every fifth minute the observer made a mark in the template of what the SV was doing. The purpose with the structured observations was to gain an understanding regarding where and on what the SVs spent their time on. Further, all the observed SVs swap between working day and evening shift, so to observe both shifts to identify potential differences on what time was spent on, i.e. work tasks between the shifts, was the reason for observing both.

Figure 10 - The template used for the structured observations

3.2.2 Interviews and study visits

In qualitative research it is more common to use semi-structured interviews while in a quantitative research, structured interviews are more common. With semi-structured

interviews there is a possibility to change the questions and ask follow-up questions i.e. higher flexibility, the interviews do not need to be the same each time (Denscombe, 2014). Further, Bryman and Bell (2011) emphasises that "in qualitative interviewing, there is much greater interest in the interviewee's point of view". While quantitative interviews are more structured and has the purpose to produce measurable and standardised data. This thesis is based upon qualitative research which made choosing the semi-structured interview approach the best fit. The drawbacks with the semi structured interview approach is that consistency is hard to achieve because the data collected to some level is affected by the specific individuals involved and the specific context which affects the reliability. Further, this approach is very time-consuming due to the amount of analysing that is required and to be able to extract useful information (Denscombe, 2014).

Two interview guides were created where certain aspects needed to be considered, such as that the questions asked was formed to answer the research questions, asking open-ended question and avoiding leading questions. The first interview guide was divided into three parts, the first part followed a standard form with questions about the name, age, education. This was followed by general question regarding lean behaviours, leadership and change. The last part of the guide consists of question related to Toyota's four-stage model of lean leadership development, see Appendix B for the interview guide. The second interview guide was created for asking the top management at the organisations more organisational related questions. The guide was divided into three sections, first asking about the role and purpose of a SV according to interviewee, the organisations goal setting and cascading process for SVs and how their strategy affected the work tasks of the SVs (see Appendix C).

In total 18 interviews was conducted, six of them were conducted with people from the organisation. For four of the participants from the organisation the second interview guide was applied and for the other two the first guide was used. For the remaining interviewees, i.e. lean experts and people with deep knowledge within the area, the first interview guide was used, see Appendix B. Further, two study visits were conducted at two organisations that has successfully implemented lean, this in order to see how they worked and benchmark. These study visits were conducted in an unstructured manner, meaning that no interview guides were developed in advance of the study visits. The reason for this was to avoid to shape the discussion in a certain way but rather to get insight to how they worked and what they view as important.

3.2.3 Workshop

The purpose of the conducted workshop was twofold, the first reason was to validate the result and analysis obtained from the observations. The second reason for conducting the workshop was to get the SVs view on how their role description could be developed in order to fulfil the organisations strategic goals for a SV. In total seven SVs from the assembly plant participated in the workshop, among these four had been observed and the remaining not. The workshop was divided into three parts whereas the first part of the workshop consisted of two assignments for the SVs. The first assignment in the first part was performed individually and related to the activities currently performed, where the SVs were asked to validate the activities identified by the observers in a template, add activities to the template if missing, estimate time for each activity and state whether they currently performed the activity in production or in the office. In the second assignment of the first part the SVs were asked to use the result obtained from the first assignment to discuss in two groups, which activities that was suitable to perform in production versus in the office and present their result for the group.

One of the organisation's strategic goals relates to the amount of time a SV spend in production versus in the office. Therefore, in the second part of the workshop, the SVs were asked to in the same group as before, use the result obtained in the first part to evaluate what activities/tasks that needed to be removed, rearranged, i.e. from production to office and vice versa, or changed in order to reach the strategic goal. They were further asked to visualise the result, see figure 11. The third part of the workshop related to potential improvements areas identified by the observers. The participating SVs were in this part asked to determine whether the identified improvement areas were valid or not. The SVs were then asked to come up with improvement suggestions for the identified areas.
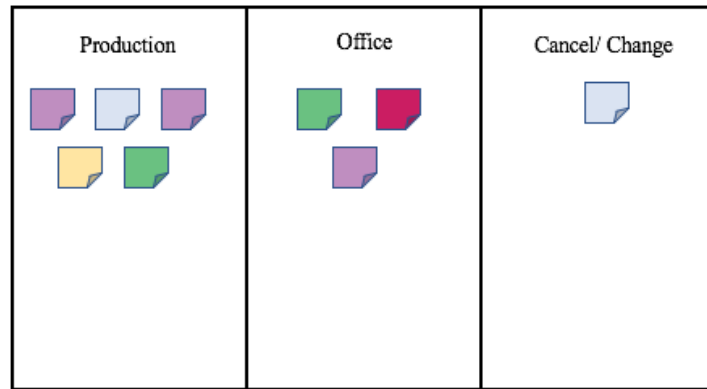
Figure 11 - A visualisation of how the SVs was asked to structure their tasks at the workshop

3.3 Data analysis

In this study four parts were analysed in order to answer the RQs i.e. literature review, observations, interviews and study visits and the workshop. Further, the analysis procedure is divided per RQ into three sections, where a description of the analysis procedure to answer each RQ is described.

3.3.1 Analysis procedure for Research question 1

Question 1: *How well is the leadership of the SVs currently aligned with the developed Lean Leadership Framework?*

The procedure of answering the first RQ was divided into three parts. First, creating the LLF which design was based on Toyotas four stage model, i.e. consisting of the four stages: commit to self-development, coach and develop others, support daily kaizen and create a vision and align goals. Further, the LLF was based on both an extensive literature review and answers obtained from interviews with lean experts that was later merged together. Second, the current state at the company was analysed. Third, the current state was compared with the LLF to understand how the leadership of the SVs currently is aligned with the LLF.

In order to develop the LLF, the first part was to analyse the literature. The literature was conducted by reviewing the number of citations for the publication, the publication year and the validity and reliability of the research performed in the articles and books found. From this important findings and recommendations were identified and summarised in Excel, see Appendix D. The sheets in Excel were divided in different areas i.e. self-development, coaching and developing others, support daily kaizen, create a vision and align goals. Each

area was then divided into several categories e.g. for coaching two categories could be how to coach and what support a SV need in order to coach.

The second part in developing the LLF was to develop the first interview guide, where careful consideration was needed in order to analyse and ensure that the questions in the interview contributes with enough information about what is important for a lean leader. Because the quality of the outcome data was highly affected by the quality of the input data. The answers received from the interviews was then analysed, where important aspects and thoughts identified by the researcher was documented in the same manner as done for the literature, see Appendix E.

The third part in to developing the LLF was to merge the findings from literature and interviews together. To do so, the identified data from each area of the literature and interviews was analysed, compared and lastly merged into the LLF. The LLF was decided to be structured with having a clear *why* to the importance of development of the leadership at the top, followed by *how* to ensure and develop the leadership to become a lean leader and *what* the outcome from this will be, see figure 12 and subchapter 6.1. To select what data from the literature and interviews to include in the how part of the framework before merging the following step procedure was used:

1. Identify factors that are both mentioned in the literature and interviews
2. Prioritise factors that are mentioned by several of the interviewees
3. Evaluate areas or factors that according to the researchers are important but not brought up or mentioned in the interviews but emphasised in the literature and vice versa

Why

How

What
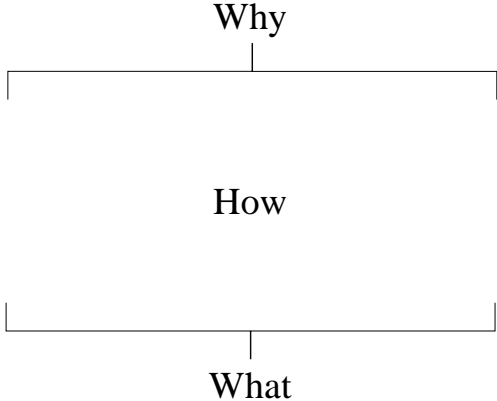
Figure 12 - The structure used for developing the Lean Leadership Framework, consisting of three phases

From this 11-16 vital aspects for the areas: self-development, coach and develop others, support daily kaizen and create a vision and align goals was chosen and included in the framework.

Lastly, to answer the RQ the LLF was compared with the current state. In order to identify the current state internal documentation for the SVs such as their main tasks and responsibilities were analysed. Further, both the structured and unstructured observations were analysed to grasp a picture of how the current state regarding the SVs leadership style looked and to see if there existed any patterns or differences between the leadership style of the SVs. To validate the current state a workshop was held. Based on this the LLF was compared with the current state for the SVs by using a scale that goes from *"not fulfilled"* to *"fulfilled"* in each of the four areas. This to identify the potential gap that exist and to further analyse in which areas the SVs at the organisation are good respective not so good in.

3.3.2 Analysis procedure for Research question 2

Question 2: *What actions, in leadership style are required from the SVs to fill the gap between the current state and the 2020 targets in relation to the developed Lean Leadership Framework?*

In order to answer the second RQ the following procedure was performed. First, interviews with top management at the organisation was analysed with the purpose of identifying what their expectations was on the SVs, how their goal setting and cascading process looked like, what it meant for the SVs and how to fulfil the stated strategy concerning the SVs. The answers from the top management was further analysed to identify common views or differences.

Second, the output from the workshop was used to analyse and identify potential actions and changes to implement in their current role description and work tasks. In more detail, the time estimation performed by the participating SV were used to calculate an average of the activities they performed and then compared with the time-allocation obtained from the structured observations. The information obtained was used together with the information regarding what activities they wanted to change or remove.

Third, the output from the study visits such as new potential actions and activities were used as an input for the action plan. Lastly, the findings from the interviews, workshop and the study visits acted as an input together with the outcome from RQ 1 to answering RQ 2, consequently developing an action plan with activities for a SV to fulfil the 2020 targets and their strategic goal. Further, the activities in the action plan is developed and adapted to address the gap between the current leadership of the SV and the LLF.

3.3.3 Analysis procedure for Research question 3

Question 3: *What resources and prerequisite does the SVs need in order to sustain a leadership that emphasises the Lean Leadership Framework?*

First, previous research and literature was analysed to understand the role of leadership and how to develop it. Moreover, what factors that impacted the leadership at an organisation was deducted from the literature review and analysed. The change management literature study consisted of analysing how to create and sustain a change transformation. In more detail Kotter's eight steps and common barriers and obstacles previous research had identified in lean transformation were analysed. Kotter's eight steps is used due to being as mentioned in the theoretical framework a well-established model applied in change processes. Further, aspects such as common obstacles, key aspects to succeed with a lean transformation and required support and prerequisites was included in the first interview guide and analysed. Furthermore, aspects such as how the SIs could make sure that the SVs was motivated was considered when answering this question. Also used as an input to answer this RQ was what support the top management at the organisation thought the SVs need, this information was obtained by using the second interview guide. The outcome from the literature review and interviews was compiled, where the most important factors according to the authors, most cited factors and important aspects to consider from the LLF was selected for answering this RQ.

3.4 Research quality

To secure that the quality and credibility of the research is high certain aspects related to the validity and reliability needs to be considered (Denscombe, 2014). Denscombe (2014) emphasises two reasons to why it is hard to judge the credibility of qualitative research, the first being that it is not possible to virtually replicate a social setting. Second is that "[...] the

researcher tends to be intimately involved in the collection and analysis of qualitative data". Which makes it impossible for another researcher to produce identical data and conclude same conclusion as you.

To validate the data and convince the readers of the research that the data are with high possibility accurate and appropriate Denscombe (2014) recommends the researchers to return to the participant with the data and finding to ensure the validity of the findings, also known as member checking (Buchbinder, 2011). This allows for the researchers understanding to be confirmed by those being interviewed or studied. Further, grounded data is recommended because the data is based and build on long times spent "on location" conducting the study. This makes your data more trustworthy and adds to the credibility of the research. For this research quite a lot of time has been spent on site together with the SVs, in order to grasp an understanding of the SVs situation and work tasks. Further, a workshop was held where one of the purposes was for the SVs to validate what the researchers identified when observing them and the main findings found by the researchers. The information gathered during the study visit was summarized and mailed to the person the authors meet at respective organisation to validate and make sure that it was fine to include in the thesis.

Further, in qualitative research the researcher works very close with the research instruments and can even be an integral part of it. This raises the question of reliability and instead of asking whether different researchers can produce the same result with the same research instrument to instead asking if a different researcher performed the research would he/she get the same result and come to the same conclusion (Denscombe, 2014). This is a hard question to answer and in this research the researchers used a template when performing the structured interviews in order to be consistent and increase the reliability.

3.5 Ethical aspects

According to Denscombe (2014) there are four principles that should be considered when performing research. The principles are that *participants'* "[...] interest should be protected, that participation should be voluntary and based on informed consent, that researchers should operate in an open and honest manner with respect to the investigation and that research should comply with the laws of the land" (Denscombe, 2014). In this thesis, all principles

were considered. However, the fourth will not further explained further due to not being relevant for this thesis.

The first principle, i.e. *participants' interest should be protected*, reflects that no one should suffer as a result of participating in the research. To ensure that this principle is considered there are five additional aspects to consider when designing the study. First, the study must be designed in such a manner that no one comes to physical harm. Second, that the study is designed in such a manner so that the participants do not come to any psychological harm. Third, to design the study so the participants will not be harmed by the information shared with the researchers. Forth, the study should be designed such as the participant's benefits from the results of the study. Fifth, all participants have to be treated in an equal and fair way (Denscombe, 2014). Due to the nature of this study no consideration needed to be taken to the first two and the last aspects. However, to ensure that no one was harmed by the information shared by the participants the SVs will not be mentioned by name in the thesis, they are instead referred to as SV 1, SV 2 etc. Further, SV 1, SV 2 etc. does not correlate to the same SV in the different parts of the thesis. Looking at the forth aspect it is evident from the RQs that all participants can benefit from the thesis. The interviewees external from of the organisation if they have similar problems and the participants from the organisation's because they received a current sate analysis, and suggestions relating to how to improve in order to reach their goals.

In the second principle, i.e. *participation should be voluntary and based on informed consent*, there are three aspects to consider. First, the researchers need to make it clear that it is voluntary to participate in the study. Second, before the data collection starts the researchers should inform the participants about necessary information regarding the research. Third, the researchers should provide the participants with information regarding what is expected from them (Denscombe, 2014). Looking at the first aspect, the SVs participating in the study were chosen by the company. Therefore, whether it was voluntary or not is hard to determine. However, the participating SVs was informed about the research, its purpose what and what was expected from them. Regarding the interviews, before the interviews started the researchers ensured that the interviewees were aware that they had possibility to call off the interview, pause it or not answering specific questions. The participants were also informed that all the collected data was handled confidentially, see Appendix B and C.

In the third principle, i.e. *the researchers should operate in an open and honest manner with respect to the investigation,* relates to that the researchers should be clear about what the research will investigate (Denscombe, 2014). To make sure that this was the case the researcher did as mentioned above make sure that the SVs was informed about the purpose and what the outcome were to be used for. Further, the SVs was informed that it was important that they acted as usual during the observations to avoid bias. Moreover, to ensure that the interviewees knew what the purpose with the research was the participants were when asked if they wanted to participate sent a copy of the planning report. In addition to this the researchers gave the interviewees a brief summary including the purpose of the study and further what the collected data would be used to. Moreover, the researchers were clear about that the thesis were to be published and that the results could be accessed fro**m there.**

4. Current state

In this chapter, the results obtained from the organisation will be presented. The chapter is divided into six subchapters i.e. the manufacturing strategy and objectives for the organisation, role description of the SV, unstructured observations, structured observations, interviews with top management at the organisation *and workshop with SVs. As can be noticed in figure 13 the current state is one out of three parts used as an input to the analysis.*
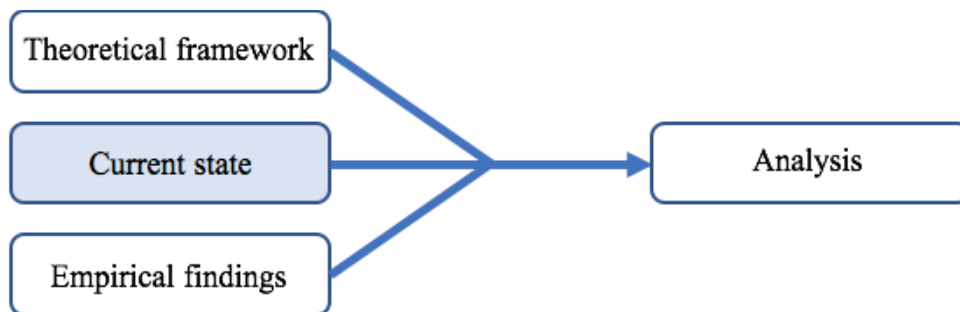
Figure 13 - The three elements acting as base and input for the analysis

4.1 The Manufacturing Strategy and Objectives

The vision of all manufacturing units to the parent company is to "Become best in class in manufacturing" and this was translated to an internal vision for the organisation "World class manufacturing of propulsion systems and components in lean system designed around people produced where consumed". In order to achieve this, certain objectives have been developed called 2020 targets, which consists of five objectives that should be reached by 2020. Further, top management for the assembly area have broken down these objectives to realise and state what it means for them. This has resulted in specific goals that should be reached in 2018 with KPIs related to each objective to measure the progress. Both the 2020 targets and the 2018 targets are presented in figure 14.
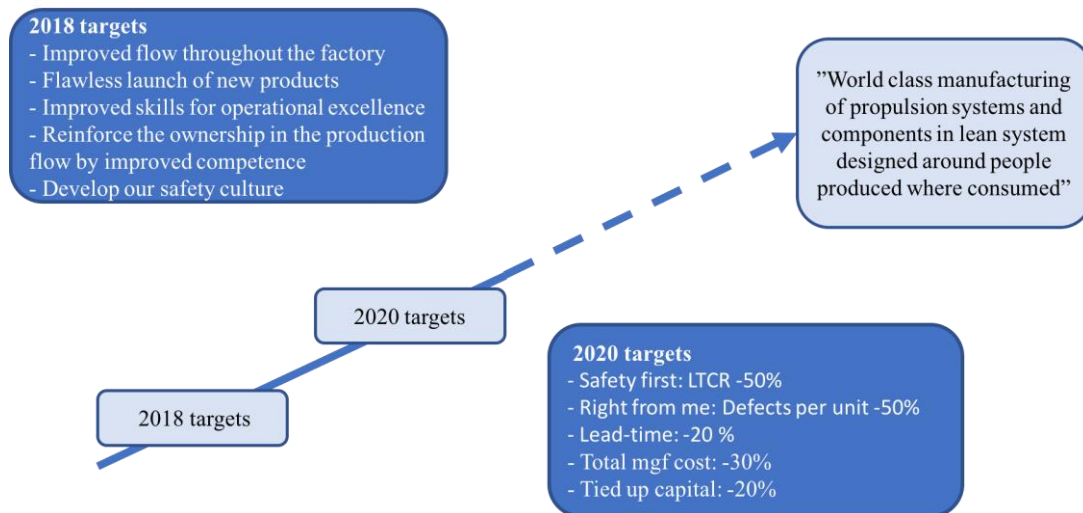
A part of the manufacturing strategy is to achieve Operational Excellence and for production certain goals has been developed:

- SI and SV have full mandate to prioritize and decide on activities in their area. They are present in the shop-floor 70-75% of the time. Acting as a trainer, coach and facilitator with a balanced approach of support/challenge

- SV is managing/leading 3-5 teams in a production area, follow their team's shift, securing shift deliveries and performance development

- Team size direction is 5-8 people led in a daily production by a TL

- Team members in the production flow are seen as the greatest assets in improvement work

- Specialists are experts on advanced tools and skills to support the team and production with solving advanced problems and act as a trainer

- Experts functions focus the production flow, production team and their result

4.2 Role description of the supervisor

The organisation has described the role of a SV in two documents, the first being in the document Main tasks in production and the second in the organisation's Business Management Strategy (BMS) routine. From these two documents three main areas describing their role was identified. First, the SVs responsibilities with an included time allocation, second the competence requirements for a SV and third the main tasks of a SV. In the BMS routine it is stated that the purpose of a SV within Manufacturing and Logistics (M&L) is to

be "[...] responsible to give teams prerequisites to do their work and achieve targets by using coaching approach". In the first area their responsibility is divided into generic and specific responsibility, see table 6 and 7. The SVs have the authority according to the BMS routine to appoint needed resources e.g. personnel, infrastructure and competence and to make necessary changes within their own area to secure that they can fulfil the listed responsibilities in table 6 and 7.

Table 6: Internal documentation related to the SVs generic responsibilities at the organisation

Generic responsibility
Business targets and results within his/her responsibility area
Secure that teams deliver the required activities to ensure that products and services are delivered on time according to described standards
Give training e.g. during gemba and in classroom
Continuously develop the competence of your teams through training, on-the-job coaching and one-to-one development
Provide timely feedback on improvement areas to the team and team members
Ensure the usage of the correct amount of resources i.e. machines, material and personnel
Undertake all relevant people planning and management including resource planning (short and long-term), holiday planning, sickness management and individual performance management
To act, communicate and role model the ████████████ values and company philosophy in line with M&L's principles and Lean Leadership behaviours

Table 7: Internal documentation related to the SVs specific responsibilities at the organisation

Specific responsibility
Actively drive self-assessment step development and implementation of ██████ within your responsibility area
Provide the right environment for your teams to work together effectively
Secure the backup of the TL activities in case of absenteeism or their requirement to participate in other activities
Secures that teamwork success factors are in place
Stimulates working with QDFIPS (Quality, Delivery, Financial, Improvement, Productivity and Sustainability)
Ensure your teams understand their responsibility toward the customer, both regarding quality and delivery
Encourage your teams to highlight problems, deviations, opportunities to improve and potential solutions
Ensure that the teams own the progress of the actions required to resolve issues
Provide your teams the necessary support to drive corrective and improvement actions by ensuring the required competence are available
Work proactively with a cross functional team
Focus on reducing bottlenecks, minimising losses in order to maintain a high level of stability, flow and cost control
Actively spread good working practices to others and learn practices from others
Secure that relevant laws, regulations and procedures are followed by all
Use standards in your daily work and challenge and coach others when standards are not applied appropriately
SVs should decide TL, QDFIPS roles and sub area responsibilities
Support TL to secure QDFIPS deliveries (short and long-term perspective)

Coordinate and prioritize activities and resources between team areas together with TL
Responsible for escalations from TLs and team members and escalations to SI
Get the SIs sign off of the Time management

The BMS routine is also included by a time allocation for the SVs. In this time allocation, it is stated how much time a SVs should focus on different activities, see figure 16. As can be noticed from figure 15, the SVs are expected to allocate 70% of their time to coaching i.e. 50% coaching at gemba and 20% coaching individual/people planning. The remaining time is supposed to be allocated to scheduled meetings not at gemba (20%) and other activities (10%).
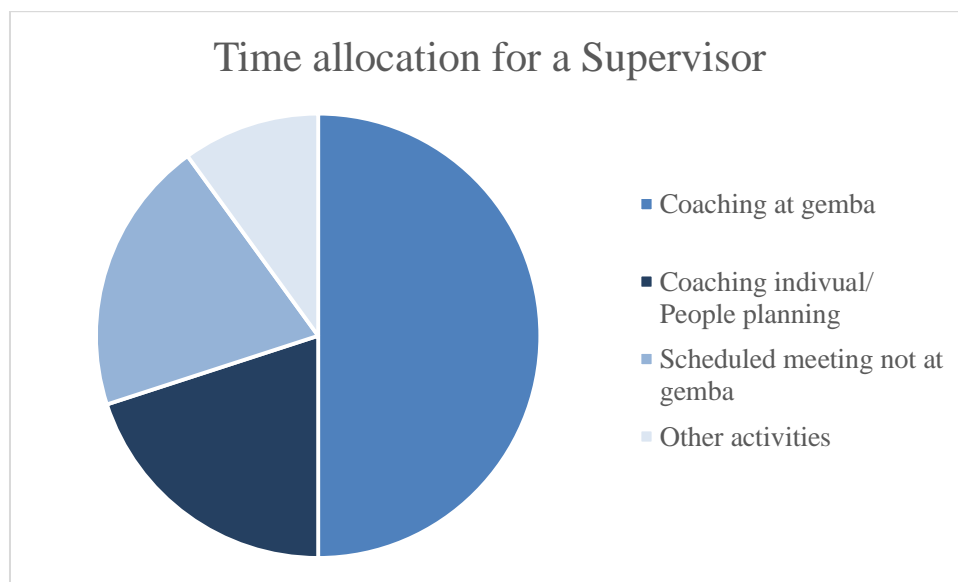
Figure 15 – How a supervisor should allocate their time for their activities according to the organisation's internal documentation

The second identified area, competence requirements for a SV, is divided into three different categories in the BMS routine i.e. behaviours, personal characteristics and skills, see table 8. Looking at table 8 and the first category, it can be noticed that the SV were expected to have behaviours such as create meaning, customer focus, show courage, challenge and support etc. They are also supposed to have personal characteristics such as being empathic, flexible, performance driven etc. Moreover, the SVs were expected to have skills such as change management, business acumen etc. The specified requirements did however lack any further explanations.

Table 8: Competence requirements for SVs according to internal documentation at the organisation

Categories	Requirements
Behaviours	Create meaning Customer focus Show courage Make things happen and innovate Believe in people Challenge and support
Personal characteristics	Empathetic Analytic Flexible Holistic view Team member Performance driven High integrity Inclusiveness
Skills	Change management Coaching (ALL) ████ Planning and organizing Business acumen Pedagogical skills (Training skills) Performance management (maximizing engagement, motivation and productivity) Influencing skills (communication and rhetoric) Fluent in English (oral and writing) Yellow belt certified or 6-Sigma Level 1 certified

The third area describing the role of a SV, i.e. the main tasks of a SV, consisted of six categories namely quality, delivery, financials, improvements, people and safety (QDFIPS). Within these areas the tasks were further divided into how frequently they should be performed, see table 9. The main tasks demonstrated in table 9 include a wide spread of activities with varying clarity, ranging from activities such as working towards perfect attendance on a monthly basis to perform one environment inspection per week.

Table 9: Main tasks for a SV at the organisation, for the six categories Quality, Delivery, Financial, Improvement and People

Category	Frequency	Tasks
Quality	Daily	Work with 5S (set the standard), ensure that everyone follows the standards and complete the standardisation of countermeasures, communicate all alarms and assist analysis and identification of containment and permanent corrective action.
	As required	Review proposed changes to standardised work documentation and advises team and secure TLs knowledge of new, updated and completed instructions relating to the team.
Delivery	Daily	Make sure that the teams is tracking disturbances both short stoppages and breakdowns
	Weekly	Review line stoppages, mean down time and mean cycles between failure trends with engineer and team and track that preventive maintenance activities are managed by the team.
	Monthly	Perform bottleneck analysis with engineer/ maintenance
Financial	Weekly	Control scrap cost performance and industrial materials usage with their team
	As required	Support TLs and teams in rebalancing work across his/her whole area.
Improvement	Daily	Support TLs and teams in PSS, drive self-assessment step plan within their teams and visit the production team board.
	Weekly	Review CI proposals with their team, follow up on the execution of the non-operational activities according to time-management, screen KPIs and take appropriate actions, review and support the andon report and other issues on the team board and conduct the confirmation process.
	Yearly	Carry out the strategy and target deployment process with their teams
	As required	Initiate and drive kaizen workshops and initiate the audit step plan.
People	Daily	Give direct support to TLs, coordinate and support team manning requirements, cooperate with other SVs, ensures holiday planning meets production requirements, give feedback on good performance or behaviours, recognise team efforts and achievements, ensures effective communication.
	Monthly	Work towards perfect attendance
	Yearly	Conduct minimum one development talk and salary talk with each team member and communicate and analyse OHI results
	As required	Follow up and securing competence gaps are closed, participate and solve team related matters and reacting on harassments
Sustainability	Daily	Work according to health and safety rules and regulations, promote reporting and solving of risk observations, assure analyse of the root cause by using the method 5-why and PSS and minimize energy consumption within work area by making sure that teams contribute as well.
	Weekly	Perform work environment inspections
	As required	Drive and support risk assessments and monitor action plans, drive identification of containment and permanent corrective action and secure that teams follow the waste handling procedures.

4.3 Unstructured observations

This subchapter includes a summary of the unstructured observations with the SVs, TLs and team members (operators). First, a general overview from the assembly plant will be presented. Second, a brief summary of the observations of the TLs and team members. This, followed by a more detailed description of each SV and how they worked and what activities they performed during the observations.
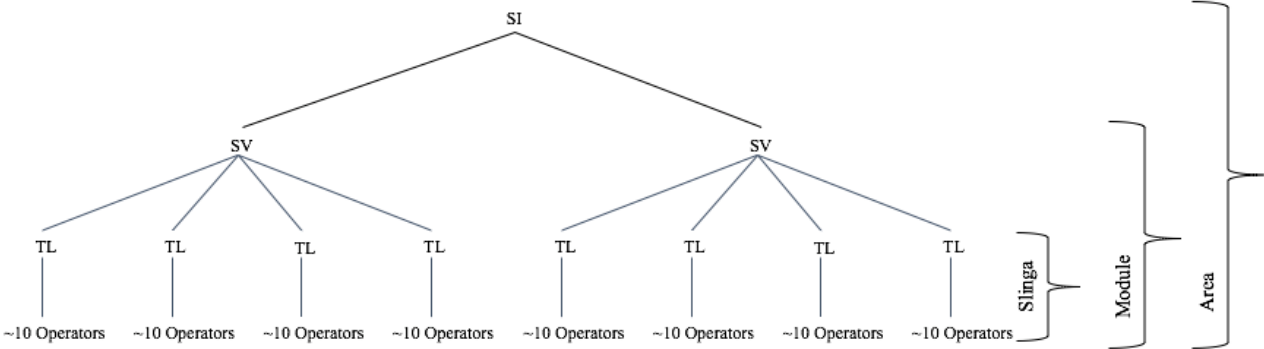
Figure 16 – Hierarchy levels for one of two areas in the final assembly at the organisation

The assembly plant consisted of an inner and a final assembly, which further was divided into two areas, area 1 and area 2, with one SI in charge of each area, see figure 16. Moreover, all of the observed SVs, TLs, and team members worked in the final assembly. Each SV was responsible for one manufacturing area, also called a module, see figure 16. Further, the modules consisted of four assembly sections called "slingor" with approximately ten team members and one TL in each "slinga". In addition to this there was also a quality checkpoint station called "zipen" in the end of each module, see figure 17. When the engines had left the modules, there was an additional quality checkpoint station shared between all modules called "firewall", see figure 17.
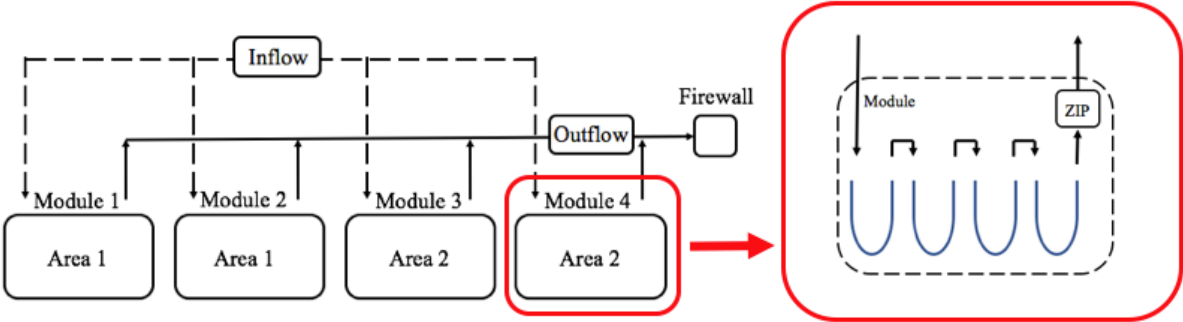
Figure 17 – The layout of the organisation's final assembly area and how a module is designed

4.3.1 Unstructured observations of team leaders and team members

All the TLs and team members were assigned to one "slinga". Further each team had a daily control whiteboard where they stated the outcome of the week, relevant KPIs, their vision etc. One of the TLs described their role as supporting and coaching the team members. Except for coaching and supporting the team members the TL described that they also helped out in production with building engines in case they could not deliver in accordance to the plan. Further, it was described that the TL covered up for the team member if they for instance needed to attend a meeting. Another of the TLs agreed that a big part of their job was to coach the team members. However, that TL expressed that the work as a TL was very stressful with pressure from both team members and superior managers. One of the things that was expressed as stressful was according to one TLs the manning situation, that in general was poor due to e.g. sick-leave. Another thing contributing to the stress level was according to the TLs all the andon calls they needed to handle and also that they needed to help build engines when they did not deliver according to the plan which often was the case.

The TLs explained that a team member were responsible for one station and had an area assigned related to the QDFIPS activities. Further, one of the TLs explained that the team members once to twice a week performed "Förebyggande Underhåll (FU)" that can be translated to preventive maintenance, at their assigned assembly stations. However, the main part during FU was dedicated to cleaning and filling up material but if the team members came up with improvement suggestions during FU they had to involve the engineering organisation to get their approval. The procedure of involving the engineering organisation was according to the majority of the TLs described as both time consuming and pointless. The reason why they thought it was pointless was mainly because nothing usually happened when involving the engineering organisation, because they often shut down their suggestions. This view was also shared with the team members when communicating with them. Further, when asking the team members about lean and the improvement work being done at the plant it was evident that a majority of the team members was not familiar with what lean was. However, the team members were familiar with some lean tools such as 5S.

4.3.2 Unstructured observations of supervisors

The observed SVs ranged between having a couple months of experience from working as a SV to three years of experience. Before being promoted to SVs all of the observed SVs had

previous experiences from working both as TLs and as team members. When observing the SVs it was evident that their working tasks was quite unstructured, the activities was different each day and included a wide range of activities. There was however, a few activities frequently occurring each week. One of those activities were the so called SQD-meeting, i.e. safety, quality and delivery meeting, which took place every morning where the outcome of the previous day e.g. quality defects and assembled engines was stated. Another frequently occurring activity was the morning meeting with the TLs and team members with the purpose of informing them about the outcome and other important information. Further, the SVs participated in a management team meeting once a week, where each area, i.e. area 1 and area 2, had separate management meetings. Moreover, the SVs spent a lot of their time dealing with matters concerning their personnel. These matters ranged from annual performance reviews to distribution of working clothes, discussions regarding behaviour problems (such as employees rolling their eyes at each other) to dealing with rehabilitation for employees that has been on long-term sick leave.

All SV experience that their job was stressful. One of the reasons for the stress was according to the SVs the nature of their role. In their role they had to both handle unexpected events and at the same time be responsible for 40-50 employees. Another reason for feeling stressed was according to the SVs all the meetings they were supposed to attend. According to the SVs a vast majority of the meeting was too long and lacked in both structure and purpose. The SVs further argued that managers higher up in the hierarchy tended to add additional work task to their role without any consideration that time needs to be allocated to enable performing the tasks. Moreover, a vast majority of the SVs expressed that ownership of the process was a prerequisite for being able to work with improvements in production, which they at the time for the observations lacked having. There was also a split view regarding how much time that was possible to spend in production to enabling the improvement work. One SV emphasised that as a SV it is of high importance to be present on the shop-floor to support the subordinates and create awareness of the process to enabling improvement work. This SV currently spend most of time there, while the others could not see how it would be possible for them to spend more time on the shop-floor due to the time consumption of the other tasks assigned. Further, from the observations it was observed that the SVs mainly initiated contact with subordinates when they needed a favour and when something was wrong e.g. production breakdowns.

Supervisor 1

The first day of observations started with the SV informing his/her TLs about a change in how to handle the outcome of the day with regard to safety, quality and delivery. This was followed by the SV instructing some of the TLs in how to measure the cycle time at the assembly stations and how to calculate variance etc. This because the SV currently was working on mapping the assembly stations occupancy as a foundation for enabling improvement work. However, after instructing the TLs in how to perform the mapping and asking the TLs to finalise it, the SV moved on to inspecting a pre-assembly solution that was developed by the engineering organisation. The SV made sure that all assembly workers concerned by the new solution got a chance to try it and give feedback on it. Further, the SV performed a 5-why analysis based on a forklift driver's exposition of an accident. The forklift driver had by accident hit one of the team members with a forklift. The SV expressed that in case an accident happened he/she always made sure a 5-why analysis was performed together with the team member. However, the involved forklift driver only stated the sequence of events and was not involved in finding the root-cause or potential solutions to the problem. The remaining part of the day was spent in production making sure everything was running as it should.

The second day of observations started with the SV making sure there was enough employees on the shop-floor. After this the SV gathered the TLs to follow up on the progress of the mapping, which the TLs had completed. Simultaneously, the SV was informed about and forced to handle a quality error detected at the firewall. The error could be traced back to "zipen" where the person performing the quality inspection forgot to check one of the assigned points, according to the SV a very serious problem. This, lead to that the SV decided to not allow that person to perform quality checks. On the afternoon the SV participated in the management team meeting, one of the subjects on the agenda for the meeting was material shortages. The participants of the meeting concluded that the material shortages could be traced back to the team members failing to order new material in time. Another subject on the agenda was to look at footage picturing team members at one of the quality inspection stations. The footage consisted of both good and bad examples of team members performing inspections. This footage was later evaluated and discussed among the participants. Moreover, during the day the SV was partly occupied with handling a personnel-errand with a

subordinate that did not work in her module nor in the same assembly area. However, the person had worked for the SV in the past.

The supervisor started the day by ensuring that they have enough of people to cover the shift and deliver according to plan. Then he/she participates in the SQD-meeting which was followed by approving the team members and TLs working hour for the previous week. Then the SV was present in production until lunch and discussed different issues with the TLs such as how the balancing of the stations had turned out. During this time, he/she had a planned meeting with his/her SI to have Visual leadership. Where the SV have certain points he/she needs to go through and show the SI e.g. that everything is clean in their module and their board for daily control. After lunch the SV had to talk to one of the team members because of complaints and concerns from other team members. The SV was then informed about detecting several engines that leaked oil and due to being at the shop-floor the SV goes to one of the "slingor" and stands in one of the stations and examines several engines to understand where the oil was coming from. Certain assumptions and findings are made by the SV which he/she then communicated to the person who informed the SV about the problem. The rest of the day was spent in production controlling that things are running smoothly and supporting the TLs.

Supervisor 2

The first day of observation started with the SV having a meeting where the subordinates were informed about the outcome from yesterday and important general information. The next activity was attending a meeting with the purpose of discussing the outcome of a project relating to removing the firewall and instead keeping one quality check point i.e. "zipen". The reason for wanting to remove the firewall was to decentralise the responsibility to each module so that they would own and be responsible for their quality outcome. However, the quality problems still occurred. Therefore, they decided to take footage of the team members in "zipen" to enable understanding the reasons for the quality errors occurring. The remaining part of the day was spent on the shop floor dealing with various problems for instance inspecting incoming material that was scratched and discussing improvement solutions with the engineering organization. Lastly, the SV participated in another meeting regarding quality issues.

During the SQD-meeting the second day of the observations some quality errors was discussed which lead to a containment meeting being initiated. Until lunch the SV mainly spend the time handling a personnel-errand. When that was finished the next thing on the agenda was the weekly management team meeting that lasted for five hours. During the first hour of the meeting the participants managed to check off the main part of the agenda. The remaining four hours was spent on a gemba walk where they observed progress of the value stream mapping that the SVs was assigned to do and test their new products.

On the last day of the unstructured observations with the SV much time was spent on the shop-floor, quite passively but handling some problems. In more detail, the SV started the day with making sure that there is the right amount work force in each "slinga" due to having many of the team members calling in sick. The SV supports the TLs with how to solve the situation and who to call in in order to make it through the day and deliver according to plan. The SV later participates in the daily SQD-meeting followed by a meeting that was regarding a follow-up on an accident that happened the week before. Then the SV is present in production until lunch, where he/she answers mails, approves or declines application or request for leave and controls that production is running according to plan. After lunch the SV has agreed to participate in an interview together with a colleague at the organisation that works a lot with coaching. The purpose with the interview is that the interviewer wants to know how the SV works regarding coaching of new team members and overall how he/she works. The remaining time of the shift is dedicated to being present in production and managing small issues with the TLs such as personnel problems and controlling that everyone is working to deliver according to plan.

Supervisor 3

During the first day when SV 3 was observed the SV spent most of the time in the office dealing with administrative work such as assigning subordinates to different courses and responding to mail. Moreover, the SV was present at the shop-floor a couple of times during the day, this to discuss the courses he/she had assigned the subordinates to. During the day the SV also attend a containment meeting concerning quality issues that was detected the week before. During the meeting the participants went through an action plan and further added some points to the action plan to be solved until next time. Further, when talking to the SV he/she expressed that all of the SVs was in need of more coaching and leadership training.

He/she also described that the upper management at the organisation had an idea of providing the SVs with a coach. This was however cancelled due to financial reasons.

The second day of the observations started as the day before with administrative work in the office. This was followed by spending a bit of time on the shop-floor talking to a couple of the team members. After this the SV participated in a quality walk. This was followed by a meeting regarding one of the "slingor". During this meeting they went through an action plan for each assembly station in the "slinga". Some of the matters that was discussed during the meeting was related to material supply for the assembly stations. The SV was quite passive during the meeting. The remaining part of the day was dedicated to the weekly management team meeting where similar matters as described for the other SVs management team meetings was discussed. However, during this management team meeting the participants spent one and a half hour to discuss the long-term manning situations. One of the reasons for taking such a long time was that several of the participants came unprepared to the meeting and had errors in their calculations leading to that they had to recalculate the numbers during the meeting.

The day started with administrative work by the computer in the office which was followed by the SQD-meeting. The time until lunch was spent mostly in the office handling personnel errands and answering mails. After lunch the SV visited the shop floor and talked to some of the TLs regarding issues about holiday planning and other general issues and fetched a t-shirt for one of the team members. Further, much did not happen during the after-noon.

Supervisor 4

During the first day SV 4 spent most of the time dealing with personnel-errands where in one of the errands the SI also participated in the meeting to be supportive to the SV. However, the SV did except from dealing with personnel-errands and attending the SQD-meeting spend a great deal of the first day's observations performing administrative work. One of the activities during the day included a conversation with a team member that made a quality error at "zipen". The SV had as a rule that if you make an error at "zipen" you get another chance but if that happens again you are suspended from the station for several months. Therefore, the SV gave the team member another chance as this was his first mistake at "zipen". Further, the SV attended a containment meeting and led a meeting with the TLs at the assigned module. Another activity performed by the SV the first day of observations was filling a 5-why.

However, he/she struggled with the tool and did therefore need to contact the quality department to get support and help.

For the second day, it started with working on some administrative work such as reading mails etc. This is followed by the SQD-meeting where problems from the day before is highlighted. Then the SV has a planned meeting with one person in the quality department to get some support and help with filling out containment reports and the tool 5 why. Later the SV participate in a gemba walk together with their SI, one TL and several production technicians. During the walk the production technicians showed different things they are working on and problems identified, both the SV and TL are quite passive while the SI talks more and asks questions. After lunch the SV is in the office and looks over his/her errands in their work tools ICA and ERP. The rest of the day is dedicated to being at the management meeting that is made shorter this week due to different reasons.

During the third day of observations the SV initially spent time documenting what was said at a performance appraisal that the SV held during the week. This followed by the daily SQD-meeting where this SV brought a TL with him/her. The meeting was followed by a yet another personnel-errand. After this the SV went to HR to discuss some personnel-errands. After lunch the SV performed a QPS-coaching session at the shop-floor at two different "slingor". The QPS-coaching consisted of taking time for each employee to perform the work tasks at a specific station in one of the "slingor". While working the SV asked the team member what the key activities are for that station. If the team member performs the work within the cycle time and knows all the key activities, the team member passes otherwise they get a red mark. The remaining time of the day included activities such as meetings, documentation, going back and forth to the HR office to make some corrections in contracts and searching for a key to fix the stamp clock. One difference that was noticed between this SV and the other observed SVs was that she/he regularly brought the TLs to meetings. According to the SV this was both to help them develop and become more knowledgeable and also so they could step in for him/her if he/she was for instance sick.

4.4 Structured observations

In this subchapter the result obtained from the structured observations will be presented. The first result presented will reflect how much time the supervisors spent at gemba vs. not at

gemba. After this an overview of the result obtained from the structured observations will be shown followed by a more detailed description of the results.

Figure 18 shows the amount of time each SV spent at gemba vs. not at gemba during the day when the structured observations was performed. From figure 18 it is noticeable that there is a big variation between how much time is spent at gemba vs. not at gemba if comparing area 1 (SV1- 4) and area 2 (SV 5-7) area. If separating area 1 and area 2 it is also noticeable that the SVs within the same area spent roughly the same amount of time at gemba vs. not on gemba, see figure 18.
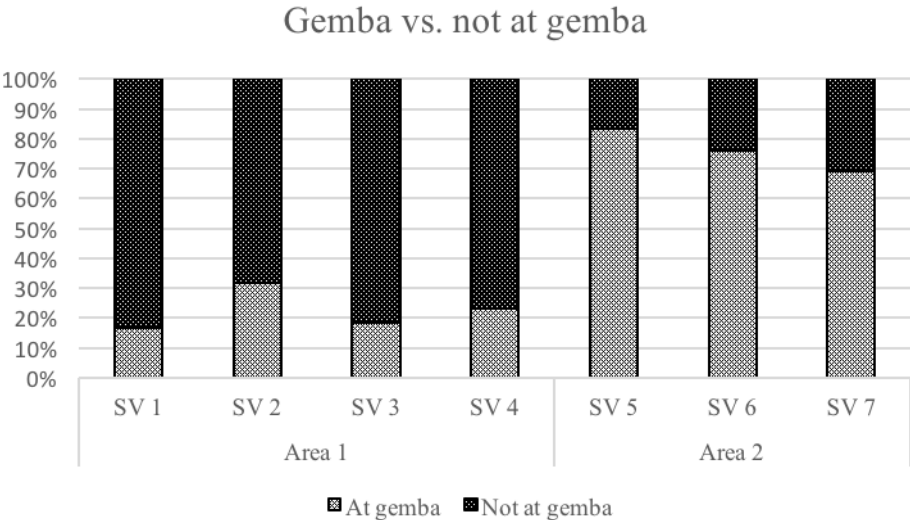
Figure 18 - Time spent on gemba versus not on gemba among the SVs for the two areas

In table 10, a summary of the results from the structured observations is presented in relation to the main categories used during the observations i.e. learning, communication, administration, meetings, other and operation related. Common for all the SVs was as can be noticed in table 10 that only a small amount of time was spent on the categories learning and operation related activities.

Table 10: The result of the time allocated in percentage for the SVs from the structured observations

	Day-shift				Evening-shift		
	SV 1	SV 2	SV 3	SV 4	SV 5	SV 6	SV 7
Learning	6%	0%	0%	2%	0%	0%	0%
Communication	22%	24%	10%	12%	8%	17%	16%
Administration	16%	29%	14%	15%	18%	23%	17%
Meetings	43%	16%	34%	20%	52%	37%	3%
Other	13%	32%	42%	39%	22%	23%	60%
Operation related	0%	0%	0%	12%	0%	0%	4%

Figure 19-22 shows the share of observations of each SV in the four different categories and the distribution in percentage of the observations in the sub categories. The categories learning and operation related activities is excluded due to low activity level, see table 10. For the first category, communication, the time spent during day of observations varied between 8-24%, see figure 19. Moreover, from figure 19 it is noticeable that two of the SVs from the day-shift (SV 1-2) spent almost twice as much time as their colleges on the day shift (SV3-4). It is also noticeable that the SVs on the evening shift (SV 5-7) in general spent less time on communication than the SVs on the day-shift. Furthermore, for all SVs except two (SV1-2) a majority of the time spent in the category communication could be traced to dialogues followed by taking or making phone calls.
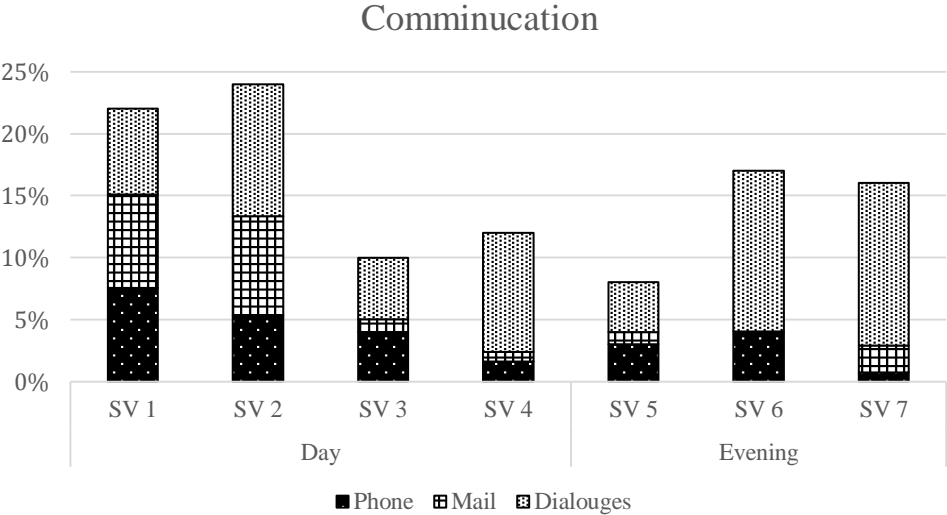
Figure 19 - Observations of the seven supervisors for the category Communication

The SVs spent between 14-29% on administrative work. Looking at how the SVs distributed their time it is noticeable that a majority of the SVs (all except SV 2 and SV 6) spent around 15% on administration, see figure 20. Moreover, if comparing the subcategories from figure 20 it is possible to notice a wide spread between the share of time spent on each subcategory. Further, no clear pattern regarding differences in amount of administration between the evening shift and the day shift can be noticed from figure 20.
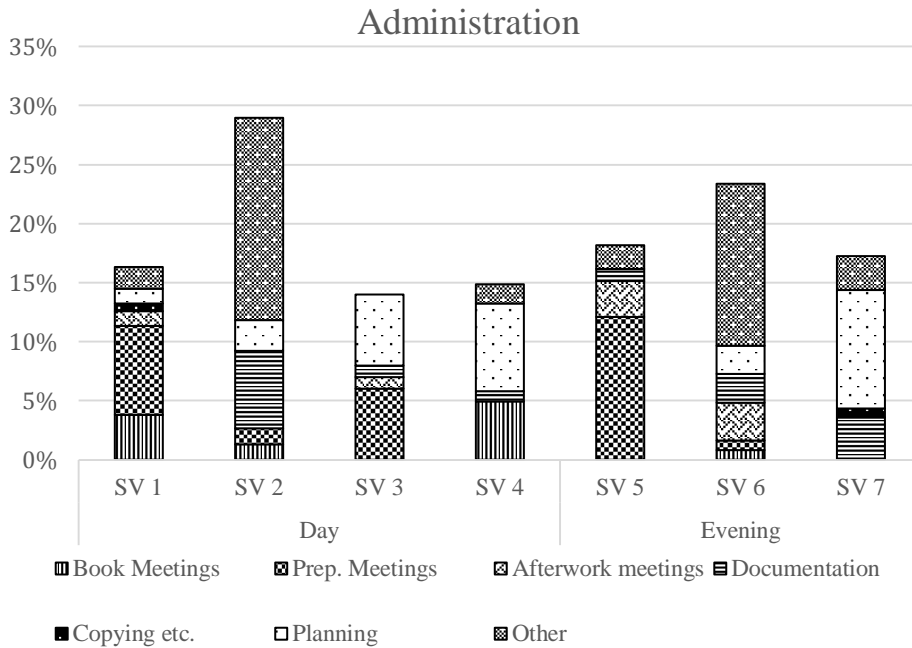
Figure 20 - Observations of the seven supervisors for the category Administration

As can be noticed from figure 21 the share of observations differed quite much between the SVs in this category i.e. 52% for SV 5 and 3% for SV 7. Looking at the subcategories and the amount of time spent in them, it is noticeable that the SVs on the day-shift spent more time on daily control then the SVs on the evening-shift. Further, the figure suggests that two of the SVs on the evening-shift (SV 5-6) spent quite much time on performance appraisals, see figure 21.
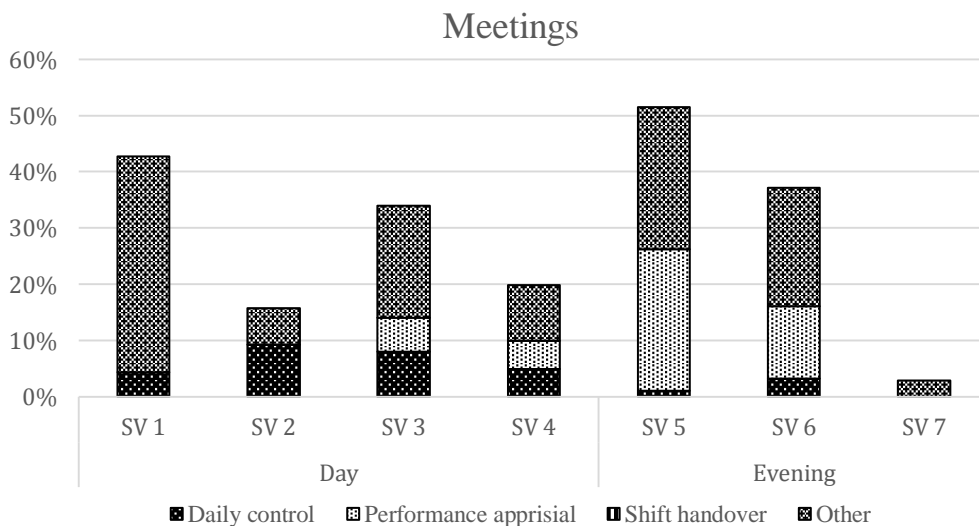
Figure 21 - Observations of the seven supervisors for the category Meetings

In the category, other, the amount of time spent differed a lot, ranging from 60% to 13%, see figure 22. Looking at the evening-shift it can be noticed that all of the SVs on the evening

shift spend most of this time allocated to the subcategory on the shop-floor. On the day-shift no patterns regarding the distribution between the subcategories can be noticed, see figure 22.

Figure 22 - Observations of the seven supervisors for the category Other

From figure 19-22 it is evident that there is no clear difference or patterns identified between what the SVs allocate their time to during the day and evening shift. It is apparent that what categories the SVs allocate their on is very individual and independent on the shift. However, during the day shift the SVs attends more meetings that they are obligated to go to while during the evening shift it was more common to fill this time with having performance appraisals. For this reason, the aspect of potential differences between the day and evening shift will not be further analysed or considered.

4.5 Interviews

In this sub chapter the results from the interviews conducted with the plant manager, assembly manager, the assembly plants change leader and one of the SI of the assembly area is presented. The answers from the interviews are divided into three sections namely the role of the SV, their goal cascading process and their new strategy concerning SVs in production.

4.5.1 The role of the supervisor

The SVs did according to the plant manager serve two main purposes. First, to meet every tact i.e. make sure that the team members delivers in accordance to a predefined time. Second, to improve their manufacturing area (module) in relation to the goals. For a SV this meant being present in production to make sure that each engine leaves the plant with high quality and to

understand what their role was in reaching the goals. This was accomplished through the subordinates and their development, which requires an understanding from the SV. A similar view was shared by the assembly manager, change leader and SI, however the assembly manager expressed that in the past their main purpose was to make sure that there was enough people in production but today it is changing to instead focus on delivery and being present at the shop-floor. Moreover, they all agree that currently the SVs did not fulfil this purpose due to different reasons e.g. too much administrative work, responsibility and time limitations.

According to the plant manager the main tasks of a SV is to be out in the flow, to ensure that the delivery requirements are fulfilled and to work with improvements. The assembly manager shared this view and further emphasised that in order achieve this their responsibility is to create good conditions for the team members and the TLs by actively participate, control or direct and lead. Further, working with recruitments, performance appraisals, driving quality issues is a part of their main tasks. One of the SI stressed that the most important task of SV is to motivate and teach their team member in order to ensure the development of the team members. To develop the production line is what the change leader viewed as their main task and to do this the SVs need good knowledge and great team members.

4.5.2 Goal setting process

The SI described that the goal setting process started with a meeting initiated and hosted by the plant manager with all the SIs and the assembly manager present. During this meeting the participants developed a vision for the plant. This was followed by a meeting with the purpose to concretise the vision and goals for the assembly area. The last step was for the SI to sit down with all his SVs to discuss and develop a master plan which resulted in different goals. However, they all stated that there was no process for breaking down and cascading the goals to an individual level for each SV. Regarding whether the SVs had a buy-in or input on the goals and their role in the fulfilment, the assembly managers explained that the SVs are allowed to express their thoughts and ideas, however, the direction and goals set by the top management was not able to be changed or impacted.

The role a SV plays in the goal achievement process was according to the SI, to work with the master plan and coach the team members to ensure their development. The SI further stated that it should be an integrated part of the way the SV work. Moreover, the plant manager said that each year the SVs perform a Value Stream Mapping (VSM) to identify where the

problems and bottlenecks are and what they can contribute with to address them. However, she emphasised that certain aspects are harder for SVs working in the assembly area to understand, e.g. lead time, instead they are more concerned with quality issues and to always have zero quality defects. The change leader stressed the importance of SVs to take responsibility and own initiatives for achieving their goals and that when encountering a problem to talk to their SI and have a dialog in order to solve or get help to address the issue. The change leader also stressed that each employee every year are supposed to set own goals in a system called performance work-book. These goals should be based on their individual challenges in relation to what they are able to affect. These goals should be followed up by their manager so that they have a buy-in when they are set.

4.5.3 Strategy

All of the interviewees agreed that the purpose of being at the shop-floor 70-75% of the time, was because it is where the value was added to the products. However, the change leader stressed that as a SV you have a responsibility to use the time in a good way when you are present at the shop-floor. This view was shared by the assembly manager and in addition to that he argued for the importance of ownership i.e. take responsibility for the outcome and have mandate to implement improvements. He explained that in the past the SVs did not have mandate to change anything but they have realised that in order to change and make improvements the SVs need to own their process which means having the authority to make improvements. However, regarding whether the SVs currently were able to implement improvements they had split thoughts, the change leader did not agree that as the situation was today the SVs had full mandate while the SI thought they could implement different improvements at least to some extent.

The answers to what the SVs main tasks should be when being out in production 70-75 % of the time, the SI answered that the TL should solve the smaller problems and when they escalade the SV should step in and solve them. He gave an example that if they had 15 andon alarms with the same problem then the SV should be informed and involved in the problem. The plant manager stressed that the task for the SV should be to focus on improvements and think how can I make today better than yesterday and work with real time management i.e. address problem that occur quickly to have a smooth flow.

In order to make the strategy of being out 70-75% of the time, all of them agree that some work tasks needs to be taken of the SVs plate and responsibility area. Further, all of them agreed that administration work is a big part of where they spend their time and this has to change in order to be present in production which requires that top management supports and changes this. How other parts of the organisation work e.g. HR and the engineering organisation needs to change in order to act as support functions to the SV, TL and team members instead of handing over the problem or task without offering any support.

That the SVs need support and guidance from their SIs and higher up in the hierarchy was agreed upon by all four of them. The change manager explained that it is two things the SVs need from their SI, first it is that you use you SI as an enabler to help and support you. Second, your SI should be clear and provide a direction regarding where we are going. Because it is more difficult and stressful to not know what to do than having a lot to do but you know how and what you should do. The assembly manager stresses that it is his task to lead and support that things happened and to challenge the support functions so that the SVs get the support they require and need.

4.6 Workshop with the supervisors

The subchapter is divided into three sections where the results obtained from the workshop with the SVs will be presented. In the first section, the results obtained from first part of the workshop will be presented i.e. the current state according to the SVs. In the second section, a explanation of the results from the second part of the workshop, i.e. the SVs view on what activities that needed to be changed/removed in order to enable the strategic goal of them being in production 70-75% of their working time is presented. In the third section, a presentation of the results from the third part of the workshop i.e. improvements that could be made to address eliminating non-value adding tasks will be presented.

4.6.1 Current state according to the supervisors

In this section, the results obtained from the first part of the work shop will be presented. Initially, the result from a time estimation performed by the participating SVs of time spent in production vs. not in production will be shown. This, followed by the SVs view on activities best suited to perform in production vs. at the office. In figure 23, the result from the time estimation in the two categories "production" and "office" is shown. Note that all SVs

estimated that they spent over 40 hours/week dedicated to work. From figure 23 it is also noticeable that the supervisors working in area 2 (SV 5-7) in general spent a bigger share of the time in production compared to the SVs at area 1 (SV 1-4).
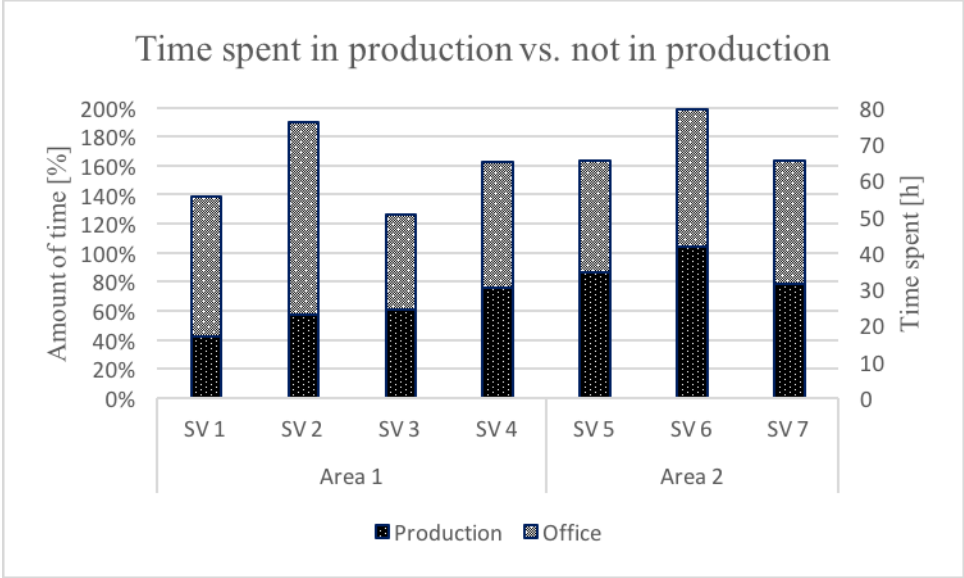
Figure 23 – Estimation of time spent in production vs. at the office, according to the SVs

The result obtained from when the SVs discussed which activities that was most suitable to perform in production vs. at the office in small groups is presented in figure 24. The blue post-its represent activities that the SVs in each group found to be best suited to perform in the office. The orange post-its corresponded to activities they thought were best suited to be performed in both production and the office or at least partly in production or in the office. The green post-its represents the activities best suited to perform in production. As can be noticed from figure 24 group 1 thought that eleven of the activities was best suited to be performed in the office, three in both and ten in production. Group 2 on the other hand thought that nine activities was best suited to be performed in the office, five in both and seven in production, see figure 24. Further, in figure 24 the activity TIA stands for Teknikföretagets Informationssystem om Arbetsmiljö, SQD for Safety, Quality and Delivery, MT meeting for Management Team meeting, LT for long-term and ST for short-term.
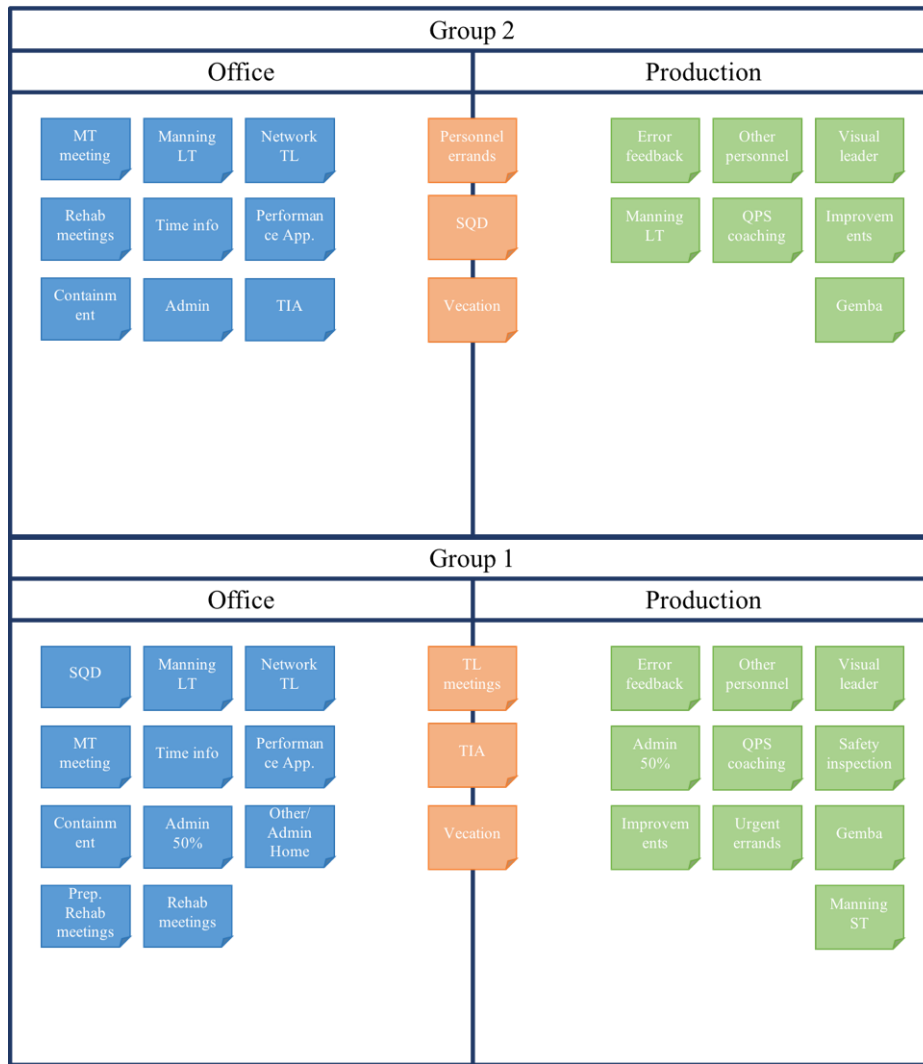
Figure 24 - The supervisors view on what activities that was best suited to perform in production vs. the office.

4.6.2 Strategic goals

In this section the results obtained from part two of the workshop will be presented. In this part of the workshop the participating SVs were asked to, in groups, discuss what activities they thought needed to be removed in order to fulfil the strategic goal of being in production 70-75% of the time. When bringing this strategic goal up it was evident that some of the SVs was not aware of this goal, one commented that last he/she heard was that they should be out in production 50% of their time. However, the result from which activities they should remove is shown in figure 25. In figure 25, the blue post it corresponds to activities the group preferred/found most suitable to perform in the office, the green in production and the purple the activities they wanted to be removed.

Looking at the activities in the category office, it can be noticed that the SVs commonly agreed that the management team meetings, 50% of the vacation planning, time info, performance appraisals and QDFIPS master plan was best suited to perform in the office, see figure 25. Further, group 1 thought that the SQD-meetings was best to perform in the office while group 2 thought that it was best to do it in the office as the situation looked today. However, group 2 argued that if for instance big TV screens were available it would be suitable to have the SQD-meetings in production. In the category production, it can be noticed that the groups agreed that 50% of vacation planning, urgent errands, visual leader, error feedback, gemba walks and safety inspections was best suited to be performed in production, see figure 25. In addition to the activities agreed upon there were certain differences regarding what activities to perform in production, see figure 25.

The only activity both groups completely agreed should be removed, was visual leadership for SVs, see figure 25. However, there was some other similarities between the post-its for removing although they were not exact the same e.g. group 1 wanted to remove both the standings meetings during the evening shift, i.e. 16.45 and 22.00, while group two only wanted to remove one of them, see figure 25. Further, group 1 wanted to remove preparation for rehab meetings, the rehab meetings themselves and the documentation of the rehab meetings while group 2 was satisfied with only removing the long rehab meetings. Further, from figure 25 it is noticeable that the suggestions for the activities they wanted to remove varied between the groups.

Group 1

Office			Production			Change/Remove		
MT meeting	Manning 50%	Vacation 50%	Vacation 50 %	Urgent errands	Visual leader	Rehab meetings	Visual for SV	QPS 1/day
SQD	Time info	Performance App.	Manning 50%	QPS coaching 1/week	Error feedback	Prep Rehab meetings	Documentation Rehab	Sight/hearing test
Containment	Documentation (ordinary)	QDFIPS masterplan	TIA	Network TL	Gemba	Drive containment	16.45 & 22.00 meeting	Work from home
			Safety inspection					

Group 2

Office			Production			Change/Remove		
MT meeting	TIA 50%	Vacation 50%	Vacation 50 %	Urgent errands	Visual leader	Rehab long	Home visits	PQR problem solving
SQD (if not changed)	Time info	Performance App.	TIA 50%	QPS coaching	Error feedback	Drug test	Parental leave, fill forms	E-cars long leave
Rehab - short	Personnel meeting	QDFIPS - masterplan	Improvement M3MU	SQO – if changed	Gemba	Visual for SV	22.00 meeting	Salary long-term leave
			Safety inspection					

Figure 25 –Group 1 and 2 preferences of activities to perform in production vs. office, and those activities they wanted to change/ remove.

4.6.3 Improvements

In this section, the result obtained from the third and last part of the workshop will be presented. The participating SVs agreed that a large amount of their time was put on non-value adding activities such as small errands (getting clothes for team members, going to HR etc.), vacation planning and participating in meetings. To address the problems one SV suggested to hire a person that managed and worked solely with administrative assignments the SVs currently was busy with. They further argued that this would in addition to free up

time for the SVs also make the administrative work more efficient. The reason for why the emphasised that it would be more efficient was that as it is right now, the SVs are not very familiar with for instance how to fill out certain forms.

However, if they were not provided with a person performing the administrative work they initially did not have any suggestions to how their work could be improved. However, one SVs suggested that two SVs could perhaps be in charge of all the employees in two modules and then split the work assignments among the two SVs so they could be performed a bit more efficient. However, two SVs disagreed and thought that it would be complicated since some of the team members prefer only talking to one of the SVs and further because it would take time to get to know all employees. The remaining SVs did however agree that it was an interesting thought.

Further, one of the SVs argued that the problem was not related to how the work was done but rather that they had too much on their plate. The only thing that the SVs could see as an opportunity for them to improve was if some activities were removed. This was something that all the SVs agreed on. According to the SVs, their superiors and other support functions within the organisation tended to add things to their role description, while never removing tasks which contributed to much stress. Further, one of the main issues with having too many assignments was according to the SVs that they do not have time to perform the assignments in a proper way e.g. they only have time with the employees that misbehaves.

5. Empirical findings

In this chapter the empirical findings from the interviews with the lean experts and people with deep knowledge within the area will be presented followed by the conducted study visits to Scania and Rejmes Bil. As figure 26 indicates this chapter will act as an input to the analysis, in more detail section 5.1.1-5.1.4 will act as an input for the Lean Leadership Framework (LLF). Further, section 5.1.5 will act as an input to RQ 3 while subchapter 5.2 will act as an input for RQ 2.
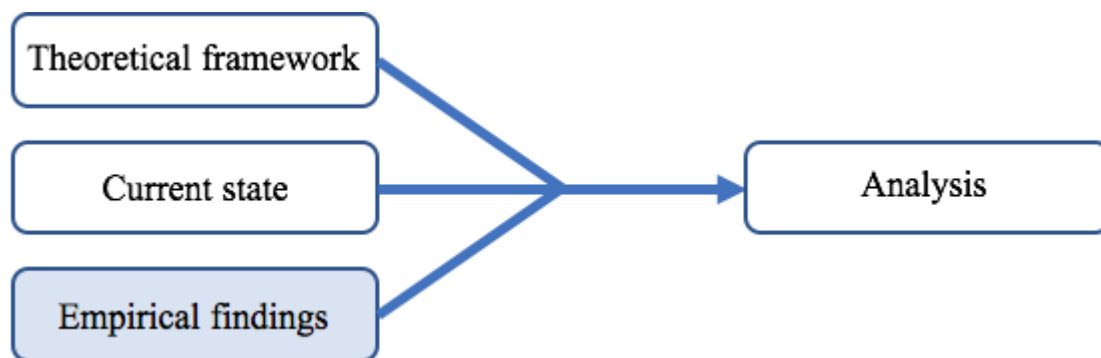
Figure 26 - The three elements acting as base and input for the analysis

5.1 Interviews

The answers from the interviews are divided into five sections: self-development, coach and develop others, support daily kaizen, create a vision and align goals and leadership and sustaining change. This because the interview guide was structured into two parts where one part of the interview guide consisted of more general question related to lean, leadership and change and the other part was divided in four parts as Toyotas four stage model, see section 2.1.8 and Appendix B and C. The answers found in the sections are based on either that several of the interviewees had the similar answer on the questions or that the authors found that a specific answer was important.

5.1.1 Self-development

During the interviews, the researchers related and described self-development as the aspect of how leaders actively work with looking to improve themselves and their skills. The majority of the interviewees agreed that self-development is about wanting to change and develop, i.e. having a driving force to self-develop, but also to reflect because without reflection there is no learning. How to support self-development for SVs resulted in different answers from the interviewees, however six of them thought that sending the SVs to courses that alternates between theory and practise, i.e. lean thinking and lean doing, was most beneficial. Further, they thought that working with more real-life cases would increase awareness and help develop real skills. To get coached by a more experienced person or colleague was mentioned by several of the interviewees, this to discuss and exchange ideas to get help with what to work on and prioritise. Requesting and giving feedback was also mentioned as an important factor to self-develop for a SV and some emphasised using different tools as means to give feedback e.g. engagement tool and self-assessment tool. Two of the interviewees stressed the importance to "bottna" in your role which can be translated to that as a SV you really need to understand your role and how you can become a better leader. Moreover, creating forums such as a lean forum where the SVs meet once a week to discuss, share knowledge and reflect together can support self-development.

In order to self-develop several of the interviewees agreed that as a SV you need support from your superiors to reserve time to self-develop and certain prerequisites such as trust and coaching is essential. For a SV to be out in the flow was also mentioned as important because this will lead to a better understanding of the process and thereby supporting self-development. One interviewer stressed that a SVs superior need to provide steadily increasing challenges and push the SV to boost self-develop. Further, to coach and to get coached as a SV was seen as essential by two of the interviewees in order to provide the means to help reflect and develop. One of the interviewees recommended to create a standard to get a structure and to have something that you can improve and develop over time. Sending people to training was an aspect two interviews found important due to gaining insight to themselves and getting to know each other on a deeper level.

5.1.2 Coach and develop others

Seven of the interviewees thought coaching was important since it contributes to a persons' self-development. Further, nine of the interviewees mentioned that one important aspect of coaching is asking questions to guide a person to find an answer while another important aspect stressed by six of the interviewees was to find answers through reflection. One interviewee said that they have a program where the SV gets coaching and feedback from a lean expert to make the SVs coaching skills better. Another interviewee mentioned that their SVs try to coach based on what can be noticed from e.g. daily control meetings and visual planning boards.

To coach during daily control was emphasised by two of the interviewees while others thought that coaching can be performed on gemba walks or at improvement meetings. However, the majority of the interviewees argued that to be able to coach certain prerequisites are needed, four mentioned being patient, three thought knowing your process was important, knowing the person being coached was mentioned by two interviewees and two thought that having a holistic view was vital. Being able to relate the coaching to the goals and being able to restrain yourself was emphasised by only one interviewee each.

To have obstacles that hinders coaching is common and was shared by many of the interviewees and three of them stressed that there is not enough time to coach and two thought that the potential power imbalance between the SV and the TL or team members can be an obstacle. Further, two of the interviewees mentioned that people might not always want to be coached but instead just want the answers and another two emphasised that SVs might lack knowledge regarding how to ask the right question i.e. they do not know how to coach.

One interviewee recommends to have an open house where SVs can come and discuss problems and difficulties related to coaching, another interviewee emphasises the importance to work with the A3-tool and to coach SVs in how to work with them. Further, giving feedback is an important part in coaching that the interviewees stated.

5.1.3 Support daily kaizen

Some of the interviewees did not directly work with finding and implementing improvements, some worked with developing the means and structures for working with continuous

improvement. For those of the interviewees that worked with improvements in production the structure and way of working differed. However, three of the interviewees stated that one way of working with improvements is to divide improvements into different categories. Among the three interviewees stating that they divide the improvements, two worked with catching both small operative deviations and larger (kaizen projects). The third stated that they worked with daily improvements, tactical improvements and structural improvements. The first means making changes on a reactive basis, the second means gathering the team and having meetings where improvements are discussed and the last is larger changes e.g. change the computer system. Moreover, one interviewee stated that they worked with mapping the value flows and systematise the value flows. Further, one of the interviewees stated that they had moved pass working with suggestion boxes and price for best idea, everyone was expected to contribute. Another aspect brought up by one of the interviewees was that in order to enable the employees to work with improvements the leaders must allocate time for it.

All of the interviewees agreed that ownership was an important aspect to regard in order to enable improvement work. However, the authority the SVs had in regard to implementing and driving improvement work varied. One of the interviewees did for instance state that they had the authority to implement changes as long as the change did not impact or affect the end product and another that they only had the authority to implement minor changes. Moreover, regarding whether the SVs needed any prerequisites in place when working with improvements the interviewees had split views, some thought the mind-set was most important while others argued for theoretical knowledge.

Looking at what the interviewees argued as common obstacles for a SV when it came to improvement work, three stated that one common obstacle was related to not being present at the shop-floor. Another obstacle was according to four of the interviewees not allocating enough time for it. Two of the interviewees further stated that a common obstacle was that you gather people to generate ideas with no clear purpose consequently leading to no improvement suggestions. Further, frequently mentioned comments on common obstacles was lack of coaches, not the right dynamic or not understanding the goal, not owning your process and uncertainty regarding what improvements to make.

The role a SV played in the improvement work was according to the vast majority of the interviewees not to intervene directly in the improvement work but rather for instance support

the employees, to coach and not provide the solution, to request improvements and to help prioritise. Looking into what support the SVs in their turn needed, four of the interviewees stated that they needed time and encouragement and two others that their superiors needed to request improvements from them.

Some recommendations from the interviewees was to go on study visits to see how other works, avoid copying how other works with improvement work, be clear and give good arguments about improvement suggestions because then people will listen and keep coming up with improvements, to not value the manager's improvement suggestions over the team members and to always request improvements. Further, developing a checklist to use when deviations are detected is beneficial and keep in mind that it is hard to count home the gains in the beginning and this requires patience from the SVs.

5.1.4 Create a vision and align goals

When it comes to the organisation's goals and the role a SV has to achieve and communicate them, three of the interviewees thought that the SV need to understand and be able to communicate the vision and two interviewees mentioned that the SV should have a holistic view. Further, three of the interviewees emphasised that the SV should identify what is possible to influence in their situation and take responsibility to identify what the goals means for them.

There were three interviewees that at their organisation worked with breaking down their goals by using a catch-ball process, which meant adjusting and balancing the goals depending on what was possible to achieve in all levels. While another interviewee explained that they avoid to be so result oriented. To translate the organisation goals to a SVs own goals was argued by several of the interviewees as difficult. However, four interviewees emphasised that to involve the SV and give them the possibility to evaluate the goals set by the senior management was crucial. This would lead to feeling a greater responsibility, motivation and involvement. Further, making the long-term goals clear for the SV was regarded as an important matter by one of the interviewees.

One common obstacle stressed by three of the interviewees was that often SVs do not know the goals, why they exist and how they contribute to the organisation. Further, other obstacles

that was mentioned was that SVs can focus on things not possible to influence, lacks support and discipline from the SVs superiors and devoting little time to work with the goals.

5.1.5 Leadership and sustaining change

The interviewees had split view regarding what it meant by being a leader, however, some similarities were identified which was to enable and coach other people to grow and develop in their task, be a servant for other people, customer oriented, being present and act as a role model, know your organisation and to guide your subordinates.

For the question if they saw potential differences between lean leadership and other management styles four of the interviewees answered that lean leadership is more about asking questions and not providing the answers. Further, coaching and supporting the employees was viewed as more important in lean leadership compared to other management styles by six interviewees and that you are more present and base decision on facts when having a lean leadership style. Other aspects were that as a lean leader you have a better knowledge about the process and the area you work in, you make things more visual and are more concerned with developing problem solvers.

Regarding lean behaviours for SVs the majority of the interviewees emphasised that the following behaviours was important; being present and close to your team members, develop and support your team members, to have the ability to ask questions in a way that leads to lean thinking, have a clear goal direction, know your process, have a customer focus, listen to the team members and apply a coaching approach. However, one of the interviewees stressed that it is "not about behaviours, more about being able to handle environments and people and restraining yourself".

One interviewee recommended that you should standardize parts of the SVs tasks like they do in Japan and another interviewee thought that in order for SVs to be out in production the top management needs to reconsider how much time the SV spend on attending meetings and change that. As a leader one of the interviewee expressed that you have to communicate a clear reason to why the changes have to take place and what the employees part is in reaching the goals. Further, one interviewee believes that to build prerequisites where the employees can take personal responsibility and manage or pursue improvements should be among the

first steps a lean leader should take. Moreover, competence and engagement is considered by two interviewees as important factors to a succeed with your leadership.

The key in creating a sustainable change was according to four of the interviewees to get the whole organisation involved and engaged in the change, this was mainly because it will not last if not everybody is involved and working with it. Two of the interviewees thought the key was to know why the principles and values was important and then relate the methods and tools to support the values and principles. Another important aspect was according to three of the interviewees to challenge people in a tough way and communicate why it is important to reach the goals. Moreover, two stated that it was important to have respect for that changes takes time when transforming from one state to another. Lastly, one of the interviewees mentioned that it was important to make the changes a natural part of the every-day.

A majority of the respondents thought that the best way of handling resistance from employees was to be tough and challenging but at the same time show respect. One of the interviewees also mentioned that it was best to not focus on those that are most negative. Looking at reasons why changes fail, in this case lean transformation, four of the interviewees thought one reason was seeing lean as a method rather than an approach relating to both how to work and lead. Another reason why changes fail was according to one of the interviewees that it is common to send employees to courses but not emphasising the importance of it when they are back from the course. Further one argued the its common to appoint a few persons as change agents but do not include the whole organisation. Lastly, one stated that it is common that managers see the change as something that is good for the "others" but not themselves.

5.2 Benchmarking and study visits

In this subchapter the results from the conducted study visits will be presented the subchapter further consists of two sections. In the first section the study visit conducted at Rejmes Bil will be presented followed by the study visit to Scania.

5.2.1 Rejmes bil

Rejmes Bil AB is an organisation that offers an overall concept where they sell both used and new cars and trucks. Further, they provide both repair shops and service services, sales of spare parts, propellant and fixtures (Rejmes bil, 2018). The organisation has over the years

done a big transformation which has lifted and made the organisation very successful. They have gone from being among the bottom performers for retail and service to today be Volvo cars number one retailer. The study visit was at Rejmes Bil in Halmstad, which is also their head quarter.

In order to become the best retailer and service provider of Volvo Cars, Rejmes Bil have done several changes and implemented new methods and structures in the organisation. Before they had multiple levels in the hierarchy which today only consists of two levels i.e. the top management and remaining employees. One of the reasons for flattening out the organisations was to create a multi-skilled work force by removing the silos and make each employee take responsibility for the whole process i.e. from customer contact to delivery of the product and/or service. The change has however also facilitated communication and decision are made more frequently and quickly.

There are no conference rooms at the facility in Halmstad, there is only one big screen with small tables and no chairs located in the middle of the facility surrounded by the cars. This is where all the meetings and other gatherings are held, the reason for this is to be more present and make things visible. Further, they have digitalized the majority of how they work and report because they want to visualise as much as possible. They use a certain structure to visualise their work schedule to everyone in the organisation, the work schedule is planned every third week. Different colours are used to distinguish between different activities and to make the interpretation and visualisation more clear, see figure 27. Further, they used a program for measuring, following up and evaluating each employee, they could measure e.g. how satisfied the customers the employee served was, how busy that person is, their productivity and work done in time. Each employee is then supposed to present and explain how their measurements looks for them and are responsible and held accountable for their result.

Moreover, top management conduct gemba walks on Mondays, Tuesdays and Thursdays and take decisions on spot i.e. in real time and avoid to have direct meetings to take decisions, this is possible because employees own their process. To develop the sellers at Rejmes bil, external consultants are brought in to talk and listen in to the them in order to view if the focus is on the right area and that they are developing in the right direction. This is then followed up with the involvement of the top management. Rejmes Bil put a lot of effort and

focus on developing people and the leadership at the organisation by working with making things more visible, evaluation and measuring performance and giving responsibility to the employees.
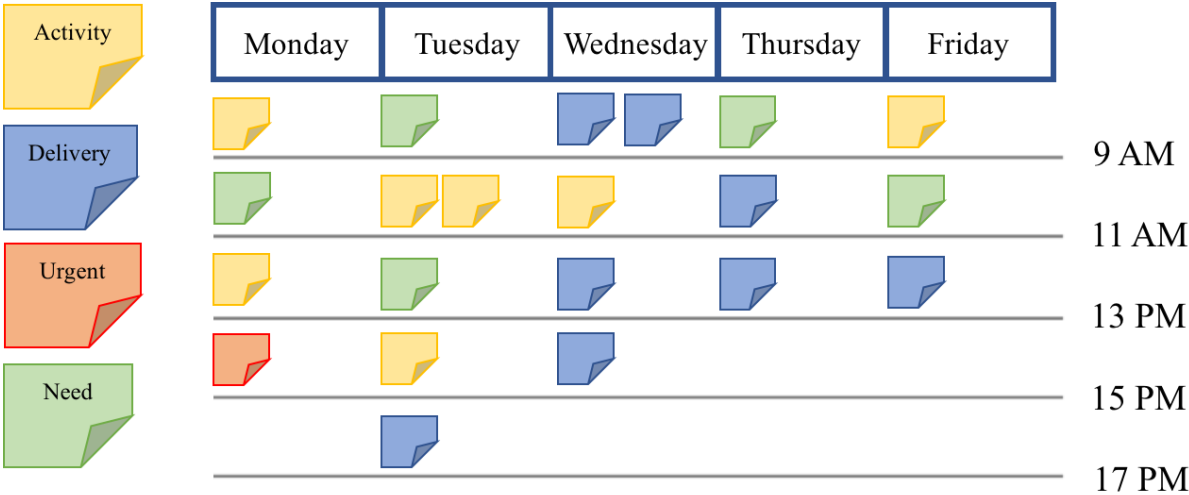
Figure 27 - A similar planning schedule that was used at Rejmes Bil

5.2.2 Scania

The study visit was at Scania's engine factory in Södertälje, Sweden where they work two-shifts and had a tact time of two minutes per engine. Scania has developed in collaboration with Toyota a production system i.e. Scania Production System (SPS) that is often assimilated with lean production. Scania has been very successful in their implementation and work with lean and is benchmarked by many organisations. A SV at Scania is responsible for around 25-30 persons which translates to around four groups. They call the groups small teams which means one TL and five team members, according to them five is best because then even the more quiet persons can be noticed and contribute. For Scania adding leadership, structure and engagement (heart) is key to get result. Further, to start following result is an important matter and to work on incidents that already has occurred in order to get started with making improvements is recommended. Therefore, Scania puts a responsibility and expects their first line managers to frequently follow up and work with measures to continuously improve. Every week 30 minutes is to be set aside for improvement work or activities where the SVs are supposed to be involved together with the TLs and team members.

To be able to act directly Scania has developed Real Time Behaviour, that means following up every second hour how things are going in production and if identified problems have been

addressed. In the past Scania worked with having a person in each team responsible for e.g. quality, safety or delivery, however, this has changed to instead giving each team member a station or position to be responsible for. So, each position owner is "responsible" for everything including quality, safety etc. and at Scania they strive for that each position owner is involved in everything that affects their position e.g. accidents, quality, changes, stop time and incidents. For some stations or positions there are more than one team member responsible. To change from a role owner to a position/station owner was made due to being to dependent on one person regarding an area e.g. quality or safety. This caused problem because when they were sick or on vacation things got delayed and moved while instead having a station or position to be responsible is easier to cover for. However, the main responsibility for everything, i.e. all the stations, is with the SV.

Further, at Scania they work hard with finding time to free up so that e.g. a person can be released from the line and instead work with improvements. A TL is supposed to work 50 % with andon and 50 % with coaching and a SV is not expected to deal with strategic questions only operational. When problems or deviation occur, Scania has developed specific checklists to address the problem in a structured way and avoid making mistakes such as missing to check something. The checklist is divided into two parts i.e. short-term actions and a long-term actions, where each part has several questions that requires a yes or no answer. The checklists can be used by all employees, however, the SV has the main responsibility for his/her area. To close the incident, the SV together with his/her other SV colleagues and superior decide whether the implemented countermeasures are enough and then go to gemba to further ensure that.

When it comes to setting goals the top management level at Scania look three months ahead and work in groups together with people at different hierarchy levels and every quarter they break down the goals to a team member level. Overall, Scania has a very structured way of working by focusing on the people in the organisation and supporting the SVs by providing different means.

6. Analysis

In this chapter, the findings from previous chapters, i.e. the theoretical framework, current state and empirical findings, will be analysed and is divided into four subchapters where the Lean Leadership Framework (LLF) will first be presented and analysed, this is followed by an analysis of the three RQs. In the first part, the findings from the literature study and interviews are merged according to the analysis procedure explained in section 3.3.1, this is translated into the LLF. The next part is then to answer RQ 1, where analysis of how well the current leadership of the SVs at the organisation is aligned with the LLF, this to identify a potential gap. The third part consists of analysis of the interviews with top management at the organisation and the workshop with the SVs. This together with the answer from RQ 1 will lead to an action plan developed for the SVs. The last part is an analysis of what support and prerequisites the SVs will need and how to sustain the change, which will answer RQ 3.

6.1 Lean Leadership Framework

The developed framework is illustrated in figure 28 and as described in section 3.3.1, the framework was based upon and developed by conducting an extensive literature review and interviews with lean experts. The framework consists of three phases i.e. *why, how* and *what*. The first phase, *why*, i.e. to create a competitive advantage, is the reason for applying this framework. The second phase explains *how* SVs can achieve this, i.e. what guidelines to follow and consider. The *how* phase was divided in the same manner as Toyotas four-stage model of lean leadership development i.e. commit to self-development, coach and develop other, support daily kaizen and create a vision and align goals. The third phase, the *what* phase, is what the outcome will be from the how phase.

Create a competitive advantage

COMMIT TO SELF-DEVELOPMENT

- To have a driving force to self-develop i.e. a desire and passion and request
- Create self-awareness through reflection
- Daily experience at the gemba because the most important development comes from there
- Identified potential should be translated into actions which is worked on and developed
- Create natural forums for self-development where knowledge can be shared or developed such as a lean forum
- Send people to training that combines classroom training with gemba projects and more real life cases
- Coaching and support from a more experienced person or colleagues
- Give and seek feedback by using different types of tools
- Standardize tasks
- Reserve time to self-develop
- Your boss provide steadily increasing challenges and push you
- Be out in the flow to a higher degree to increases the learning curve and grasp a better understanding of the work and process
- Support and help others prioritize to put time on value adding tasks
- Have an approach that allows for self-development rather than having mandated development

COACH AND DEVELOP OTHERS

- Encourage the coachee to self-develop and self-awareness
- The coach needs to create and set appropriate goals
- The coach needs to be able to restrain themselves and be patient and accept the adepts solution even if they have a better one
- Think one step ahead to not guide the coachee towards a specific solution
- Avoid asking questions that leads to a specific solution i.e. ask more open and explorative questions instead of closed, informative and leading questions
- Give feedback and follow up
- Coach at the source i.e. gemba, for instance during daily control or when using A3
- Coaching can be performed both in teams and individually
- Active listening
- Know the people and process
- The coach is responsible for the result
- Ask questions that leads to reflection and thinking outside the box. No reflection, no learning
- Have a positive perspective on people

SUPPORT DAILY KAIZEN

- Work with both small operative deviations and larger deviation (kaizen projects)
- It is important to connect the improvement work to the result, not just gather people and and brainstorm randomly.
- Reserve time for improvement work
- Work with developing the standards
- Have a certain level of ownership of your area or process in order to make and implement improvements
- Base decisions on facts. Which means to deeply understand and gather facts you must be present at gemba
- As a leader you are responsible for the improvement work. However, as a leader, you need to be able to delegate the responsibility to those directly involved in the processes
- Have knowledge about the organisations processes and problem solving methods and to lead others in them
- Be clear about the purpose of making improvements e.g. not jeopardise peoples jobs but instead save time and eliminate waste
- Create a structured and systematic way of working by viewing kaizen as an integral part of the leadership
- Make sure that everyone is involved and capable
- Distinguish important problems from less important ones
- Promote improvement work but not intervene directly in the problem-solving process. Instead support those performing the work
- Culture takes time to build and as a leader you should build a culture that emphasises CI and adapt it to the organisations context. This requires time, encouragement and patience from the leaders.
- Create teams that is of appropriate size i.e. 5-7 team members per team
- As a leader you should always request improvements

CREATE A VISON AND ALIGN GOALS

- Have a holistic view and make sure that the correct big-picture goals are accomplished i.e. bottom-up meet top-down
- The goals that are set at a senior management level must be evaluated from lower management with a possibility for a buy-in i.e. catch-ball process
- Connect people both vertically and horizontally in the organisation, from divisions to the individual
- Have well communicated long-term goals so that everybody you are responsible for is aware of and understand them
- The short term goals should never be prioritized in front of the long term goals
- Get the whole organisation on the same page and secure that your subordinates are aware of their responsibility to know what the goals mean for them
- Facilitate the interpretation of the goals for team members by having a process that enables transparency
- Help create a culture that allows hoshin kanri which requires certain prerequisites i.e. visual management, mutual prosperity, skilled employees and a strong leadership system is in place
- In order to set and achieve the goals you need to know the values, principles, methods and tools of the organisation
- To take responsibility for what the goals means for you as a leader and identify what is possible to influence and achieve
- Involve the team members by communicating and discussing the goals and why the they exist

∴Strong leadership   ∴Engaged employees   ∴Strong culture   ∴Learning organisation   ∴ Better performance

Figure 28 – The Lean Leadership Framework, which consists of three phases, i.e. why, how, what, and 54 guidelines in total

6.1.1 Why-phase

The reason for having a why-phase in the framework is to explain the purpose for organisations to apply this framework. In general, the reason for applying the framework is as can be seen in figure 28, to create a competitive advantage. The organisation's vision is as mentioned in the chapter 4 to become a "World class manufacturing of propulsion systems and components in lean system designed around people produced where consumed". In order to achieve this one part is to develop the leaders at the organisation with a lean approach, which means starting with applying this framework.

6.1.2 How-phase

In this section, the four areas within the how phase is described i.e. commit to self-development, coach and develop others, support daily kaizen and create a vision and align goals. By using the procedure described in section 3.3.1 for analysing the result and answers gathered from the literature review and interviews, 54 guidelines in total were identified, see figure 28. These guidelines are spilt up between the four areas and will be analysed and described below.

Commit to Self-development

It is important for a SV to self-develop because it has a huge impact on the learner's actual patterns of thinking and behaviour. For self-development 14 guidelines were identified regarding how SVs can develop in this area to become lean leaders and what they need, see figure 28. The first guideline emphasises that leaders need to actively look for ways to improve themselves and their skills i.e. have a driving force to self-develop. The second guideline is about reflection and that as a SV you cannot self-develop without reflection because you need to look back and pick apart what went well and what did not and then encourage others to reflect as well. Reflection is also important in order to create self-awareness and understand your strengths and weaknesses as a SV. Training to detect problems and muda as a SV you need to be present which leads to the third guideline which is that daily experience at the gemba is where the most important development for a SV is created. This is followed by the next guideline which is to understand your potential as a SV in order for you to translate it into actions and then further work on and develop.

The fifth guideline is to create natural forums for self-development such as a lean forum to increase and share learning. Training was a crucial part for being able to self-develop, however, this requires a combination of classroom training and gemba projects i.e. lean thinking and lean doing, which is emphasised in the sixth guideline. To get support and coaching from a more experienced person is a great way to boost self-development and help the SV to go in the right direction. The eight guideline is for a SV to give feedback and make it as relevant as possible by using different types of tools as support but also that you as a SV seek feedback and are open for it. The next guideline is that standardising tasks can act as a help for you as a SV to self-develop because you can more easily follow-up where you put time and eliminate mistakes, structure your work tasks and work more effectively. To reserve time to self-develop is a vital guideline in the list and is necessary for SV to make. This is followed by the guideline that stresses that the SV has a superior manager that provides steadily increasing challenges and push you to e.g. be out in the flow to a higher degree. The twelfth guideline stresses the importance of being out in the flow in order to get a better understanding of the work and process, which is important in self-development. The thirteenth guideline is that a SV have the responsibility to support and help others, i.e. TL and team members, prioritise to put time on value adding tasks which will contribute to the self-development of the SV and help them grow in their role as a leader. The last guideline regarding how to self-develop as a SV is to make sure that there exists an approach that allows self-development rather than having mandated development.

Coach and develop others

For the second area, coach and develop others, 13 guidelines were identified, see figure 28. The first guideline is that the SV needs to encourage the coachee to self-develop and self-awareness which can be done by giving the employee more responsibility and being present. This is followed by the second guideline, that as a coach the SV creates and sets appropriate goals, this is important due to enabling having something to compare with to evaluate the progress and having a structure for the coaching session. Guideline three relates to the importance of providing good coaching and developing in the role as a coach for the SV. In order to do this, they need to restrain themselves and be patient but also accept the coachees solution even if they have a better one. This guideline is important because in the long run this will lead to more well-educated employees that learns to think for themselves and become better problem-solvers as well, but also that the organisation becomes a learning organisation leading to improved performance. The fourth guideline is that the SV should only think one

step ahead to avoid guiding the coachee towards a specific solution because this is a common problem. By doing this the coachee will not learn nor develop in a good way and will instead rely on the SV to guide them to the solution instead of needing to think and reflect for themselves. The fifth guideline stresses the importance of how the SV asks questions when coaching and that focus should be on asking open and explorative questions instead of closed, informative and leading questions. This is followed by the next guideline which is the importance of giving feedback when coaching and to follow up after the coaching in order to ensure that the coachee develop and learn.

The seventh guideline is that the SV should coach at the source which can be during daily control or when doing a 5-whys. Further, coaching can be done more spontaneously or in a more planned manner. The next guideline to keep in mind is that coaching can be performed both in teams or individually by the SV. However, how you coach and the purpose with the coaching differs, because when coaching in teams you need to have a more "helicopter perspective" and focus on the interaction between the team members. Active listening is another important guideline to consider when coaching without carefully listening you will not comprehend nor understand where the coachee struggles and what they need help with. Further, by actively listening you show interest and increase the coachees confidence. To be able to coach and help develop others the SV needs to understand and know the people and process. Otherwise the risk for misunderstandings or lack of knowledge regarding what type of coaching the coachee needs is high. The eleventh guideline is that the SV when acting as a coach take responsibility for the result and not blame the coachee if things do not turn out as wanted. This will otherwise impact future coaching sessions or exercises in a negative manner because the coachee will be afraid to get blamed if giving the wrong answer or idea. The twelfth guideline relates to asking questions that leads to reflection and thinking outside the box due to when there is no reflection there is no learning. The last guideline relates to that it is important to have a positive perspective on people, this because if you do not trust the employees you will not be able to delegate responsibility or help them develop.

Support daily Kaizen

The third area is to support daily kaizen and here 16 guidelines were found, see figure 28. The first is that a SV need to work with both small operative deviations and larger deviations which can be kaizen projects. This requires that the SV connects the improvement work to the result and goals of the organisation and not to just gather people and brainstorm randomly

which is an important aspect for lean leaders. The next guideline is to reserve time and plan for improvement work, however, the SV often felt that they had to deliver in other areas and therefore did not prioritise improvement work. To be a lean leader improvement work has to be prioritised in order to develop the organisation and the people. The fourth guideline is work with developing the standards over time rather than viewing a standard as a set in stone way of working. In lean organisations the employees own their process which makes having a certain level of ownership of your area or process as a SV crucial and therefore stressed in the fifth guideline. Because not owning your process as a SV often means that you do not have mandate to directly implement improvements, e.g. not being able to rebalance the stations for the SVs area, this results in that the decision process takes too long and over time the improvement suggestions will reduce as a consequence.

The sixth guideline is to base decision on facts and to become a lean leader this is very important because to assume or guess things will not make you one. Instead the SV needs to be present at gemba to deeply understand and gather correct facts because there are no shortcuts. The following guideline is that as the leader you are directly responsible for the improvement work but you need to be able to delegate responsibility to those directly involved in the processes. This to give the employees the opportunity to feel a part of the improvement work and help them develop which will lead to better solutions since the team members know the process best, but also that to demand firefighting is not something you find in a lean leader. Further, the less involved the SV needs to be in the improvement work means that the employees can handle it good by themselves. The eight guideline is that the SV needs to know the organisations processes and problem-solving methods in order to be able to lead others in them. Lean can in some cases be associated with firing people when it is used as an efficiency project for achieving short-term gains. Therefore, it is of outermost importance that the top management and in the extension the SVs, is clear about the purpose of making improvements and that making improvements will not jeopardise people's jobs but instead help both the employees and organisation save time and eliminate waste. In the next guideline it is emphasised that the SV needs to create a structured and systematic way of working with improvements by viewing kaizen as an integral part of their leadership. This can mean to plan certain time slots to work with improvement in the SVs weekly schedule. Without it things will be e.g. forgotten or ignored and this will hinder the lean transformation. The eleventh guideline is for the SV to make sure that everyone is involved in the improvement work and capable which means that each team member has two tasks, i.e.

perform their work and make improvements. This leads to making sure that people are well-trained and educated and avoid to only consider the superior manager's suggestions.

The twelfth guideline is for the SV to be able to distinguish important problems from less important ones and to be a lean leader this ability is very important in order to prioritise correctly. Further, the ability to solve problems according to the organisations policies is important and to do this a checklist of some sort can be required. The thirteenth guideline is that SV should promote improvement work but not intervene directly in the problem-solving process. Instead they should support the employees to find improvements by themselves and become great problem-solvers. This can be done by giving the employees more responsibility and trusting them, however, this requires that the SVs, TLs and team members own their process in order to be able to implement improvements such as to rebalance. The next guideline is related to building a culture that emphasises continuous improvement and this is something many organisations and leaders struggle with but is very important. To do this requires time, encouragement and patience from a leader. To create teams of appropriate size is the next guideline stressed and 5-7 team members per team can be recommended. Having larger groups leads to increased risk that the SV miss to "see" all the team members and coach them with their needs to develop but it is also harder to create the right dynamic in a large group. The last guideline is to always request improvements and challenge the employees in order to strive for perfection which is a vital aspect in a lean leader.

Create a vision and align goals

In the area create a vision and align goals, 11 guidelines were found and listed in figure 28. The first guideline, is for a leader to make sure to have a holistic view and ensure that the correct big picture goals are accomplished which means bottom-up meets top-down. The second guideline is to involve the lower management in the goal setting process by giving them the opportunity to evaluate the goals set by the senior management and give their input. In a lean organisation this is important to consider in order to make everyone feel involved and to set goals that are realistic. Next is that the SV need to connect people both vertically and horizontally in the organisation i.e. from divisions to the individual in order break the silos and create cross-functional teams. The fourth guideline is to have well communicated long-term goals so that everyone you are responsible for are aware of and understand them. Otherwise, the goals are impossible to reach and the risk for driving the organisation in a different direction than what is stated is high. Therefore, the SV needs to consider and be able

to match competence and talent with task, which requires them to know their people in order fulfil and move in the direction of stated goals. Further, the fifth guideline is about not letting the short-term goals be prioritised in front of the long-term goals which means that the SV should avoid firefighting to be lean leader. Because, otherwise the possibility to reach the goals of an organisation and develop over time will be impossible due to only prioritising the short-term gains.

The sixth guideline is to get the whole organisation on the same page which means ensuring that your subordinates knows what is expected from them and their responsibility to know their role in reaching the goal. Which means that the SV continuously needs to communicate with the employees and follow up so that they are still on track, this could be done by having a catch-ball process and/or similar approach as Rejmes Bil with their scheduling, see figure 27. Moreover, the next guideline is to facilitate the interpretation of the goals for the team members by having a process that enables transparency e.g. using whiteboards or newsletters. The eight guideline is to help creating a culture that allows hoshin kanri and this requires having certain prerequisites in place such as visual management, mutual prosperity, skilled employees and a strong leadership system. To know and apply the values, principles, methods and tools of the organisation is stressed in the next guideline in order to achieve the organisations goal and vision. The tenth guideline is that if you expect others to take responsibility for their involvement in the goals you as a SV also need to take responsibility for what the goals means for you and identify what is possible to influence and achieve. The last guideline in the list is to involve the team members by communicating and discussing the goals and why they exist preferably face-to-face to promote follow-up question and eliminate misunderstandings.

6.1.3 What-phase

The potential outcomes of using the LLF are a learning organisation, engaged employees, strong culture, strong leadership and better performance, see figure 28. The four areas in the framework can be divided into two parts where commit to self-development and coach and develop others relates to developing the people within the organisation and the other part of the framework relates to developing the organisation by consciously making improvements and aligning goals. A long-term consequence of focusing on developing both the organisation and the people within it should lead to becoming a learning organisation and being able to get better performance. Becoming a learning organisation means that the organisation and

especially the leaders will become better at reflecting and improving for each step they take and spread this knowledge. In a learning organisation people will strive to continuously develop and learn which leads to a competitive advantage by having people who continuously seeks to become better, develop their capabilities and help others in their learning process. Better performance will over time lead to benefits such as increased business for the organisation, higher quality and productivity and becoming a world class organisation (Liker and Hoseus, 2008).

Further, by applying a coaching approach, involving people in the improvement work, giving them responsibility and making them feel involved in setting the goals, the result will be that people become more engaged and feel a greater belonging to the organisation. Leading to knowing your processes to a higher extend instead of only focusing on numbers and making PowerPoint presentations. It will also result in benefits such as more well-trained employees and problem-solvers but also better performance in the organisations processes. This will over time lead to a stronger culture where people have a common mind-set, principles and values, which will enhance the possibility of having an organisation where everyone is going in the same direction. The last outcome is that a stronger leadership will evolve due to committing to self-development i.e. working on yourself, applying a more coaching approach and working with improvements and goals in the daily work to a higher degree. By having strong leaders, they can take the organisation to new levels and help fulfil the goals of the organisation to a higher extend. A strong leadership will also contribute to impacting and supporting the rest of the organisation to a higher degree. Further, by applying this approach it will lead to developing lean leaders that are well-trained and has the right mind-set and way of working, which leads to a competitive advantage that is hard for their competitors to copy.

6.2 Analysis Research question 1

This subchapter is divided into five sections, in the first four sections the areas and its corresponding guidelines from the *how* phase in LLF will be compared with the current state at the organisation. In the last section of this subchapter the identified gap will be presented for the four areas, which will lead to answering RQ 1: *How well is the leadership of the SVs currently aligned with Lean Leadership Framework (LLF)?*

6.2.1 Commit self-development

Analysing a SVs role description at the organisation, see subchapter 4.2, nothing related to self-development was found. Therefore, it can be assumed that it is not expected from a SV to put time and effort on self-development. Although no documentation regarding self-development could be found, some guidelines from the LLF in the area commit to self-development was to some extend fulfilled. However, the majority was not which is described below. From the conducted observations it was evident that the SVs had a driving force and desire to self-develop, however, the SVs claimed during the workshop that they have a high workload which makes this hard to achieve. The SVs did in general give an impression of being quite self-aware of the possibilities and limitations in their work, e.g. most of the SV expressed that they often avoid being present at the shop floor due to getting so much questions from the subordinates but they know that it is important for them to be present. However, during the workshop when asked what they can do to improve, the SVs answered that they thought that the problem was that they had too many activities and not that they needed to develop. This reflects to some extend that the SVs believes they do not need to self-develop and become better. Regarding how much time the SV spend at the gemba differed between the area 1 and 2, however, just because some SVs were more at gemba did not secure more development. As mentioned in the current state the SVs present at gemba were quite passive and mainly controlled the outcome of the engines instead of focusing on their development and learning. Hence, in order to achieve self-development when being present at gemba the SVs also need to have some sort of structure and plan. At the organisation they combined both class-room training with gemba projects e.g. the Lean Learning Academy (LLA) and real-life cases e.g. their improvement workshop called M3MU.

The change leader mentioned in the interview that each employee has their own performance workbook where they state their potential and goals and how they should be achieved. So, for guideline three in the list they have a structured way of working with it, however, the observers have not analysed the SVs performance workbooks and what actions they take to achieve their goals and use their potential and can therefore not determine if this guideline is fulfilled. Currently, there exists no forums for self-development for the SVs at the organisation. Further, from the observations and the workshop the SVs do not reserve time to self-develop and have difficulties with standardising their tasks due to the nature of their work which was emphasised by the SVs themselves. The SVs did not have access to an experienced

coach or colleague from what could be noticed during the observations except from the support and coaching they received from their SI. Further, during both the observations and the workshop the SVs requested more support and coaching in order to self-develop. For the area feedback the observers did not detect that the SV gave much feedback due to lack of time and much administrative work. Further, no tools were available to use as support when giving feedback. The SVs themselves could seek feedback both from other SVs and from their SI when having a problem or planning for a meeting. To know whether the SVs superior manager, i.e. SI, provided steadily increasing challenges and pushed the SV was difficult for the observer to determine and judge due to shortage of time.

The organisation has a strategic goal, which has been mentioned earlier, that emphasises that the SVs should be out in the flow 70-75% of their time, however, from the observations, interviews with top management at the organisation and workshop this was not possible. This because the SVs have too many tasks, responsibilities and employees to manage. Further, this hinders the SV from understanding the process and to self-develop and this was also a problem for the SVs that were present a bit more in production. As observed and mentioned the SVs expressed shortage of time and a high workload which made it difficult for them to support and help subordinates prioritise to put time on value-adding tasks. From what was visible during the observations and said during the interviews with people from the organisation they do not have an approach for self-development because this is not prioritised in their daily work nor in their role description. Which indicates that this is an area where no one expects you to put time on and can explain why the SVs prioritise other tasks. In summary, for this area the SVs at the organisation fulfilled some of the guidelines for the area commit to self-development in the LLF. However, the majority of the guidelines were not addressed which explains their positioning in figure 29 and indicates a gap in this area.

Commit to self-development				
Not fulfilled	Fulfilled to low extent	Fulfilled to some extent	Fulfilled to high extent	Fulfilled

Figure 29 - The degree of fulfilment for the SVs in the area Commit to self-development

6.2.2 Coach and develop others

In the documentation regarding the role description for a SV it is stated that a SV is "[...] responsible to give teams prerequisites to do their work and achieve targets by using a

coaching approach". From the documentation it can further be noticed that the SVs are expected to spend 50% of their time dedicated to coach at gemba and in addition to that another 20% of their time dedicated to individual coaching of employees. Which means that a SV in total should spend 70% of their time with coaching their employees. However, from the observations this could not be validated due to first not spending that much time at the gemba and second when being present at gemba focus was on controlling and inspecting the employees work rather than coaching.

Analysing the guidelines in the framework related to the area coach and develop others, some guidelines were fulfilled while the majority was not, which will be described below. For the first guideline encourage the subordinates to self-develop and self-awareness this was done seldom by the SV from what was observed during the observations. Further, the SVs emphasised that they lack time to coach and communicate with the subordinates. This was shared by several of the TL who also stressed that the SV was only present in production when problems emerged that affected the possibility to deliver engines according to plan or when they needed to talk to a TL or team member regarding an issue. To create and set appropriate goals when coaching was not visible during the observation, an example is their QPS-coaching mentioned earlier (see section 4.3.2.4), where the SV selects a station and asks each team member in the team what the key activities are and measures the time it takes for the team member to perform the work at that station to compare it with the allocated cycle time. Either the team members pass or fail which is documented in a binder but he/she does not receive any proper feedback. From this it can be concluded that they have a systematic way of documenting the results from the QPS-coaching. However, no goals are set and no feedback are given neither during nor after the so called coaching session. Therefore, whether it can be called coaching or just assessing is up for discussion. Moreover, the observers did not recognise any sign of following up the outcome from the QPS-coaching with the TLs or team members.

As mentioned the SV did not perform as much coaching besides the QPS coaching which made it difficult during the observations to analyse their behaviour and approach e.g. restraining themselves, asking questions that lead to reflection and only thinking one step ahead. One example is the accident described in the current state with the forklift driver, where the SV did most of the work with filling out the 5-whys and the solution to address the

problem rather than coaching the team member to figure it out. Further, it was noticeable that the SV was several steps ahead in finding the solution instead of trying to understand the root cause of the problem. This behaviour and way of working could be found with another SV as well. Where that SV was supposed to fill out a 5-whys regarding a quality issue that had been detected, however, due to not being present when the problem occurred the SV had difficulties with filling out the form and before understanding the problem the SV started to discuss the solution. The QPS-coaching was performed at the source i.e. at gemba however the 5-whys were not performed at gemba, based on the observations.

In the current state it was mentioned that each team had their own daily control whiteboard were things like improvements or quality defects were presented in addition to the delivery outcomes. Here the SV performed coaching by themselves and together with the TL, both in teams and individually. However, if this can be called coaching can once again be discussed. From the observer's point of view, it was more of questioning and controlling the knowledge of the team members or TLs rather than asking questions that leads to reflection and thinking outside the box, that was identified as a guideline in the framework. During the workshop the SVs mentioned that due to lack of time and having responsibility for many employees they did not have enough time for all employees. This resulted in an unfair time allocation among the employees were misbehaving employees got all the attention which consequently resulted in that there was no time for coaching the remaining employees. Therefore, they gave attention and knew some of the employees better than others. Looking at how well the SVs knew their processes and stations differed, where some had very good knowledge and could jump in to help while others did not. This could be a reason for why some of the SVs avoided to be present at the shop floor and coach. As emphasised there was a lack of coaching which affected the observer's ability to determine factors such as active listening and taking responsibility for the result.

Looking at the last guideline in the LLF related to that the leaders have a positive perspective on people it was noticed during the observations that this differed among the SVs. For instance, as mentioned in the current state it was decided during a meeting that they were going to take footage of team members working at a quality check-point station. The reasoning for this was that the participants in the meeting thought that coaching would not help. They stressed that when coaching the team members, the team members expressed that

they are performing and have been performing the quality control the way they are supposed to and therefore the participants argued that it is better to put up a camera to see how they perform at the quality check-point. Another example relating to the perspective they have on people was during one of the management team meetings when the participants of the meeting were discussing why they had material shortages and they traced the problem to the operators not being able to order new material in time. A third example was that some of the SVs during the observations said that they were going to go out in production to give them the evil eye in hopes that the team members would work a bit harder and faster. However, except for the three matters described the SVs seemed to in general have a positive perspective on people. To summarise, the organisation has an ambition that the SVs should coach a lot, however, as their situation and workload currently looks this was not fulfilled, resulting in a gap and only "fulfilled to low extent" in figure 30.

Coach and develop others				
Not fulfilled	Fulfilled to low extent	Fulfilled to some extent	Fulfilled to high extent	Fulfilled

Figure 30 - The degree of fulfilment for the SVs in the area Coach and develop others

6.2.3 Support daily kaizen

During the interviews with the top management at the organisation the interviewees stated that a SV had two main purposes, whereas one of them related to working with improvements and developing the organisation. However, during all the observations it was noticed that only two of the SVs performed improvement work and the amount of time they spent corresponded to 4% and 12% (the day of the structured observations). Looking into the SVs role description and specifically their generic and specific responsibilities there is only one point that emphasises improvement work while the other 26 does not. Therefore, it is hard to grasp what they actually expect from the SVs within this area.

One important guideline in the LLF related to this area is to as a SV always request improvements from your subordinates. This could be noticed at some occasions during the observations of the SVs e.g. when one of the SVs asked the TLs to complete a mapping of the assembly stations within the SVs module. However, during the majority of time the SVs just confirmed that things was as usual instead of demanding and requesting the subordinates to challenge themselves and come up with improvements. Currently, they have around ten team

members per team and a SV is responsible for four teams and respective TLs, which means that each SV is responsible for around 45-50 persons. Which is quite a lot for one SV and this was agreed upon with the SV during the workshop. This increases their workload and all the personnel issues such as performance appraisals which draws attention and time from working with improvements. Further, this affects the possibility to secure that everyone is involved in the improvement work and knowing if they are capable.

To reserve time for improvement work was as mentioned not very common instead the focus of the SVs was elsewhere e.g. managing HR issues and attending meetings. As a leader you are responsible for improvement work as emphasised in one of the guidelines in the framework. However, it is important to as a SV be able to delegate responsibility and to some extend the observed SVs delegated responsibility to their TLs to handle e.g. certain personnel errands. This could be hard because to delegate responsibility to the TLs they have to have mandate to take decisions and/or make changes, which the TLs did not have to a high extent. Further, as mentioned and seen in figure 18 some SVs were more out in the flow i.e. at gemba which probably gave the SVs a better understanding of their process. To be able to base decision on facts were also facilitated when being present rather than sitting in the office or at a meeting and reading about incidents or problems. Therefore, some SVs were better in this aspect and could base their decisions on facts rather than assumption or guesses. An example is that one of the SVs that was often in production received information regarding oil leaks in several engines and due to being present in production and knowing the processes he/she could step in and examine the engines and see where and why it leaked. While for one of the SVs that were present less often in production received a quality defect during one of the days of observations but did not know why and what had happened but was expected to do a 5-whys.

It was evident that the SVs easily could intervene or was expected by the superiors, TLs and team members to intervene in the problem-solving process instead of supporting the TL or team member to solve it by themselves. This as the subordinates was used to and felt comfortable with handing over the responsibility to the SV or that the SV had difficulties with saying no and instead said yes. In order to instead lead and support the employees in the problem-solving methods or processes the SV need to have knowledge about them and some SVs had a better understanding of the methods and processes while other SVs did not. This

can depend on that one of the SVs was new and had only worked a couple of months as a SV and that not being present at the shop-floor impacted how well those SVs understood their processes. The SVs worked both with small deviations and larger ones, however, it was more common with a firefighting mode and this was validated by the SVs themselves and the top management at the organisation. To work with firefighting is not what it means to be a lean leader and this affects how the SVs view problems and prioritise. Which means that the SVs have difficulties with distinguishing important problems from less important ones and this was identified during the observations.

As mentioned there was a small amount of time spent on improvement work among the SVs due to time limitations and a high workload which indicates that the SVs did not view improvement work as an integral part of their leadership. Further, the role description does not stress improvement work either as an integral part of leadership which need to be changed because during the interviewees top management emphasises improvement work as an integral part of their role. From the observations it was clear that the SVs did understand that standards were the best way we know how to perform the work currently but that it could be changed when finding a better way. However, in order to make changes to the standards or the processes the SVs need to have a level of ownership of their process or area as emphasised in the framework. This was not so visible during the observations and when talking to the SVs and TLs regarding if they had ownership of their process, they expressed a certain level of ownership but not fully. They expressed that they often do not have mandate to implement improvements or changes because other people e.g. the engineering organisation needs to be involved and approve the change because they are responsible for investigating the improvement and then deciding whether it should be implemented. During the interviews with top management at the organisation the majority of them knew that this was a problem and they expressed that they are working with shifting the ownership to the SVs and those directly involved in the process.

Whether the SVs were clear about the guideline in the framework regarding the purpose of making improvements and that it will not jeopardize people's job is hard for the observers to claim. However, that the purpose with the improvements was to improve their six main KPI: s, i.e. quality, delivery, improvement, financial, sustainability and people, was communicated through notes and papers on the team's daily control boards. As a leader in a lean

transformation you have a responsibility to build a culture that emphasises continuous improvement and as the guideline claims in the framework this requires time, patience and encouragement from the leaders. For the SVs this is hard to fulfil because they have other responsibilities that are expected from them and documented which affects continuous improvement negatively. This was agreed upon with all the SVs and the top management at the organisation.

In summary, SVs are expected to work with improvements in a high extend, however, this is not found in their role description. Further, due to having a high workload and needing to prioritise other tasks and responsibilities the SVs find it hard to work with improvements and therefore many of the guidelines in the framework for this area is not fulfilled. Consequently, leading to a gap and landing between "fulfilled to low extend" and "fulfilled to some extend" in figure 31 below.

Support daily kaizen				
Not fulfilled	Fulfilled to low extent	Fulfilled to some extent	Fulfilled to high extent	Fulfilled

Figure 31 - The degree of fulfilment for the SVs in the area Support daily kaizen

6.2.4 Create a vision and align goals

According to plant manager one of the purposes of the SVs was to improve their assigned area in relation to the goals. Looking at the SVs generic responsibilities it can further be noticed that they are responsible for business targets and results within their area and in their main tasks it is stated that they should on a yearly basis carry out a strategy- and target deployment process with their team. However, other than that there are no more specifications regarding the SVs role in reaching and setting goals.

During the interviews one of the SIs described that the way the SVs worked with the goals was through working with activities stated in a master plan, which the SI and SVs had developed together. The base and direction of the master plan was decided in advance by the SIs and top management at the organisation (see section 4.5.2). It can therefore be assumed that they fulfil the guideline related to having a holistic view where they try to meet the top-down goals from the bottom-up. Further, during the interviews the change leader stressed that

it was important that each employee took responsibility for the goals and identified what they could do to contribute, which also corresponds to one of the guidelines in the LLF. From this it can be assumed that they at least seem to have an ambition that all leaders should take responsibility. However, whether they do or not, or if the SVs role and responsibility in reaching the goals is well communicated is hard to determine for the observers.

One of the guidelines from the LLF was related to having well-communicated goals so that everybody is aware of them and understands the goals. Whether all subordinates knew the goals and understood them is hard to determine due to not explicitly asking if they knew the goals. However, looking at the SVs main task in production they are obligated to as mentioned above on a yearly basis "Carry out strategy and target deployment process with their teams". Based on the frequency in which they are supposed to communicate the goals it can be assumed that there is a big risk for the subordinates to not be aware nor understand the goals. It can therefore cause misunderstandings among subordinates due to not being communicated in a proper way. However, whether the SVs communicate the goals more than they are supposed to, cannot be determined and therefore the level of understanding can neither be determined. During the time of the observations no activity related to communication of the goals were identified among the SVs. Further, due to the low expected frequency of communicating the goals the following guidelines in the framework "Get the whole organisation on the same page and secure that your subordinates are aware of their responsibility to know what the goals mean for them and their role" and "Involve the team members by communicating and discussing the goals and why the they exist" can be hard to achieve.

In the interviews with the managers at the organisation the assembly manager explained that the SVs had an opportunity to express their thoughts and ideas in how they are supposed to reach the targets that are set. However, the SVs did not have a buy-in nor impact regarding the goal direction decided by the top management. Looking at the LLF one guideline relates to that the goals must be evaluated from a lower management level with a possibility for a buy-in i.e. catch-ball process, it can therefore be determined that this is not fulfilled. To set appropriate goals the SVs needs to have good knowledge regarding the values, principles, methods and tools of the organisation, however, this was hard to determine due to the time limitation of the observations. However, it was clear that they had a basic knowledge

regarding the methods and tools needed to perform their tasks, where some of the SVs were better than others. Moreover, one of the guidelines relates to connecting people both vertically and horizontally in the organisation, from divisions to the individual. This was fulfilled to a certain degree but it was evident that there existed silos and that people handed over tasks rather than finding ways to work together on solving them and learning from each other.

Over to the guideline relating to that short-term goals should never be prioritised in front of the long-term goals. It was evident that the short-term goals were prioritised at least to some extent in front of the long-term goals. It could for instance be noticed that if they had problems to deliver according to the plan the TLs and in some cases even the SVs helped out to build engines. This could perhaps be seen as having a good team spirit where everyone helps out when needed, but the long-term way of thinking would perhaps benefit of working to a higher extend with finding the root-cause of the problem and trying to solve it. Further, it could be noticed that the interviewed managers emphasised that the SVs were responsible for making sure that the team members were able to deliver in accordance to every tact i.e. deliver the exact anumberof engines that they were supposed to on a predefined time, not faster not slower. From what could be noticed this was not the case, as mentioned above the TLs jumped in if needed and further when it was possible it was noticed that the SVs requested the team members to build more engines than what was expected. This could for instance be seen when the SVs increased the numbers of engines to produce on the visual boards, or let the team members go home early from work when they were done in advance of what was planned due to working faster than the tact time. This sort of behaviour signals to the team members that they do not prioritise the long-term goals but instead only the short-term gains. Working faster than the tact can for instance affect the health and safety of the team members, it is also easier to make mistakes leading to quality defects and is therefore in conflict with the 2020 goal "safety first" and "right from me". However, this is only if they actually work faster than they are supposed to, it is also possible that previous improvements have led to that that there is a possibility to work faster. Further, one reason for that the SVs focuses mainly on delivering as many engines as possible can be that this is demanded from the top and other aspects such as improvement work are not requested to the same extend.

Another guideline in the LLF relates to that certain prerequisites needs to be in place in order to create a culture that allows hoshin kanri. These prerequisites are visual management,

mutual prosperity, skilled employees and a strong leadership system. From the observations it could be noticed that visual management was used at the organisation which facilitates being more transparent and helping the team members to interpret the current situation and what the goal of day was. Every team had a whiteboard where they filled in the outcome of the day and they also had boards at each module stating the current situation e.g. number of engines produced in relation to what was expected that day. Looking at the second prerequisite mutual prosperity which means to create a partnership between the employees and organisation, this was a difficult aspect to identify if it was fulfilled or not due to time limitations. Further, during the observations it could be noticed that the SVs worked with assigning the team members to different courses, it can therefore be assumed that they work with trying to develop their team members to become more skilled. However, as mentioned before due to lack of time the SVs did mainly have time for the subordinates that misbehaved and they did therefore not have as much time as they would want to develop all subordinates. Which can be a consequence of the culture of the organisation and the leadership style of the SVs. Therefore, the efforts to develop the team members into becoming skilled could mainly be referred to sending them to different courses from what could be noticed. Lastly, they had a certain level of strong leadership among the SVs, however, there are many possibilities e.g. less subordinates to be responsible for and taking away some of the tasks and responsibility from the SV to make it even stronger. In summary, the fulfilment was quite low for this area, see figure 32, resulting in a gap.

Create a vision and align goals				
Not fulfilled	Fulfilled to low extent	Fulfilled to some extent	Fulfilled to high extent	Fulfilled

Figure 32 – The degree of fulfilment for the SVs in the area Create a vision and align goals

6.2.5 The gap

From the subsections above it is clear that there exists a gap in all four areas which indicates that several of the guidelines from the LLF is not fulfilled. In more detail which guidelines they fulfil, do not fulfil and cannot be determined is presented in figure 33. Further, it is evident from the figure that the minus-column which represent the guidelines that are not fulfilled contains most guidelines i.e. 31 guidelines compared to 10 guidelines that are fulfilled, indicating that overall there exist a gap. Notice that the guidelines in figure 33 have

been shortened a bit and does not come in the exact same order from how the guidelines are stated in the framework in figure 28, however, the have the same meaning.

	+	**-**	**Could not be determined**
A) Commit to self-development	1. Driving force to self develop 2. Training both in classroom and gemba 3. Seek feedback using different tools	4. Little time spent at gemba 5. Little time for reflection 6. Poor at giving feedback 7. No natural forums for self-development 8. Received no coaching 9. No standardized tasks 10. No reserved time to self-develop 11. Little support in helping others 12. Lacks an approach for self-development	13. Potential not translated to actions 14. Your boss provides increased challenges
B) Coach and develop others	15. Coach at the source 16. Some have a positive perspective on people	17. Lack of encouragement to the coachee to self-awareness and self-development 18. Does not create and set appropriate goals 19. Little feedback and follow-up 20. Varying level of knowledge about the people and processes	21. Restrain themselves 22. Accept the adapts solution 23. Guiding towards a specific solution 24. The way the questions was asked 25. In teams and individually 26. Active listening 27. Takes responsibility for the result 28. Ask questions leading to reflection
C) Support daily kaizen	29. Some level of knowledge about problem-solving methods and how to lead others in them 30. Do not view standards as a set in stone way of working	31. Not enough time reserved for improvement work 32. Low level of ownership 33. Decisions are based on facts to a varying degree 34. Delegates responsibility of improvement work to those involved in the process to a low extent 35. No clear structure and systematic way of working 36. Little time spent on making sure that everyone is involved and capable 37. Difficulties with distinguishing important from less important problems 38. Intervened in the problem-solving process rather than supporting it 39. There was no focus on building a culture emphasizing CI 40. The team-sizes are too big 41. Requesting improvements a to low extent 42. Works with small and large deviations to a low extent	43. Clear about the purpose of making improvements
D) Create a vision and align goals	44. Bottom up meets top down 45. Facilitating the interpretation by being transparent 46. Some prerequisites needed for hoshin karnri	47. No catch-ball process i.e. no buy-in 48. Working in silos 49. Short-term goals are prioritized over long-term goals 50. Lack of awareness regarding responsibility and their role in fulfilling the goals among the subordinates 51. Low involvement of team-members 52. The long-term goals was not well communicated	53. Knowledge of values and principles 54. Awareness regarding their responsibility and their role in fulfilling the goals

Figure 33- Indicates which guidelines from the LLF that are fulfilled (+), not fulfilled (-) or could not be determined

6.3 Analysis Research question 2

The subchapter is divided into two sections whereas the first will present a time estimation for the current activities performed by the SVs. The second section will show a new time estimation including the required actions that needs to be taken in order to address the gap in the four areas, mentioned in the previous chapter. Further, their relation to the LLF, 2020 targets and fulfilment of the strategic goal relating to the SVs being in production 70-75% of their time will be analysed. Which will enable to answer RQ 2: *What actions, in leadership are required from the SVs to fill the gap between the current state and the Lean Leadership Framework (LLF) in relation to the 2020 targets and their strategic goal?*

6.3.1 Current activities performed with a time estimation

Some of activities in table 11 are identified from analysing what the SVs did during the structured and unstructured observations while other activities were added from the workshop. The time allocated for each task was calculated by adding the participating SVs time estimation for each task from the workshop and then dividing it by the number of SVs that participated. However, as presented in table 11 the total time estimation for a work week was 61 hours which exceed 48 hours, that otherwise according to 8 § Lag *(2011:740)* is a normal work week including the maximum limit for overtime. Further, the activities are divided in the categories office, production and removed. The activities in the three categories was based upon what the SVs concluded during the workshop, however, some adjustments have made when it comes to where the activities took place and which activities to remove. This because the two groups had split views regarding where and if the activity should be removed. For some of the activities the SVs did not state any time, see table 11, therefore these activities are left blank without a time estimation.

Table 11: Time estimations for the current activities performed by the supervisors and which activities are performed in the office and production and which activities to remove

Location	Activity	Time [h]	Tot [%]
Office	Rehab short session	0,5	46%
	Other personnel related errands	9,5	
	Management team meeting	4	
	Manning: long-term	2,25	
	Time info	1	
	Performance appraisals	4,5	
	Work from home (e.g. answering calls)	2	
	Overall documentation	4,5	
Production	Urgent errands	7	50%
	Manning: short-term	2,25	
	SQD-meetings	2,5	
	QDFIPS- master plan	2	
	Visual leadership team leader	1	
	TIA	1	
	Network meeting	1	
	Gemba walk	1	
	Quality and delivery related issues (containment, error-feedback and problem solving)	7,5	
	Improvement kaizen	3,5	
	Team leader meeting	1	
	Safety inspection	0,5	
Removed	Visual leader for SV	-	4%
	Rehab (long session and documentation preparation)	1,5	
	QPS-coaching	1	
	Sight and hearing test	-	
	Meetings at the evening 4:45 PM and 10:00 PM	-	
	Home visits	-	
	Filling forms (long-term leave and parental leave etc.)	-	
	Salary meeting long-term leave	-	

6.3.2 Action plan

To achieve the organisation's strategic goal, that a SV is supposed to be out in production 70-75% of their time, the time allocated to each activity needed to be reconsidered from table 11 and also where the activity took place i.e. in production or the office. It is also important to keep in mind that the time estimation in table 11 exceeds 40 hours which must be addressed in the action plan and kept to 40 hours per week. Further, to fulfil the 2020 targets and develop the leadership of the SVs and organisation, it was clear that certain activities needed to be removed from the SVs responsibilities and new ones added instead.

So, in table 12 the action plan can be found for how to achieve this. In the column action, the actions taken can be found where 'NC' = No Change, 'C'= Change and IA= Implement

Activity. Further explanation for each activity/action in table 12 and the cancelled activities from table 11 is described below. However, in order to be able to conduct these activities during the allocated time slots in table 12, two actions needed to be set in place in advance. The first is to reduce the number of subordinates one SV is responsible for to 25-30, because keeping it as it is today with being responsible for 40-45 subordinates the SVs will be swamped with administrative work and other personnel errands instead of other more important activities. The next action is to make sure that the SV own their process and have mandate to implement changes but also to delegate responsibility to TLs and team members to do this. Because if they do not own their process they cannot work with improvements to a high extend and changes will only take longer time to implement.

Table 12: The Action plan including activities that are changed, i.e. C, not changed, i.e. NC, and new activities that should be implemented, i.e. IA

Location	Activity	Action	Time [h]	Tot [%]
Office	Rehab short session	NC	0,5	**26 %**
	Other personnel related errands	C	3	
	Management team meeting	C	2,5	
	Manning: Long-term	C	1	
	Time info	C	0,5	
	Performance appraisals	C	1,5	
	Overall documentation	C	1	
	Preparation for lean forum	IA	0,5	
Production	Urgent errands	C	3	**74 %**
	QDFIPS- master plan	C	2	
	Visual leadership: team leaders	C	1	
	TIA	NC	1	
	Network meeting	NC	1	
	Gemba walk	NC	1	
	Quality and delivery related issues (containment, problem solving)	C	5,5	
	Improvement kaizen	C	2	
	Team leader-meeting	NC	1	
	Safety inspection	NC	0,5	
	Team coaching	IA	0,5	
	Individual coaching	IA	1	
	Daily control meetings using Real Time Behaviour	IA	2,5	
	Check-in with team leader (short-term manning)	IA	2,5	
	Check-in with team members including error-feedback	IA	2,5	
	Check-out	IA	1,5	
	Reflection of previous week	IA	0,5	
	Lean forum	IA	0,5	

Removed activities

There were eight activities removed, see table 11. The first was, *visual leader for SV*, which according to SVs did not provide any learning or development, which was agreed upon with the authors from what they could be see during the observations and was therefore decided to be removed. The next activity removed was *rehab meetings (long session and the documentation)* where much time was spent and this took important time from working with improvements and being present at the shop-floor. Further, they felt that the meetings did not give anything and was non-value adding and that it was enough for them to only participate in the shorter rehab session, this view was shared by the authors after the observations. Whether their *QPS-coaching* can be called coaching was mentioned in the previous subchapter 6.1 and this view was shared with the SVs, due to this the QPS-coaching was removed. The five remaining activities is removed because they are done quite seldom, which requires much time to understand the task every time when needed to perform it, e.g. filling out certain forms, and that it does not contribute to what is expected from a SV to work with.

Further, from the interviews with top management at the organisation it was evident that agreed upon that certain activities needed to be removed in order for the SVs to be able to be out in production and work with improvements. However, exactly which activities was not asked but they mentioned that they have a lot of administrative tasks that maybe needs to be removed.

New activities: Team coaching and Individual coaching

For most of the activities the time estimation from table 11 has been changed which is indicated by a C in table 12 and nine new activities has been added in the action plan stated by the mark IA. The QPS-coaching as mentioned was removed and instead coaching should be performed in a different manner. Which leads to two of the new activities which are related to coaching, i.e. *Team coaching and Individual coaching*. Coaching was something that was not done so often by the SVs while expected from them. First, it should be done in teams in order to get to know your team, how they interact and to create well-functioning teams (Liker and Hoseus, 2008; Viva Coaching, 2011). Second, it should be done with each individual and here the focus for the SV should be on the TLs so that they can learn and develop in order to support the team members. The coaching session can be related to a problem that just occurred or something else but the aim should be to understand how the person thinks and for

the SV to ask questions and provide feedback (Rother, 2013; Viva Coaching, 2011). By doing this every week for one hour it will help develop and improve the coaching skills of the SV over time and address point 21-28 in figure 33, e.g. being able to restrain yourself, avoiding asking questions that lead to a specific solution, active listening and being patient, but also help the TLs and team members to become better problem-solvers.

Further, by being out more and coaching in production the SV will enhance their knowledge of both the people and the process, the ability to set appropriate goals and challenge the subordinates, provide feedback and following up but also their perspective on people (Liker and Hoseus, 2008; Liker and Convis, 2011; Savén, 2014; Viva Coaching, 2011), which addresses guideline 4, 6, 14 and 15-20 in figure 33. Because when spending more time with the TLs and team members and getting to understand how they work and think, the SVs perspective can shift and become more positive and they feel more comfortable with delegating responsibility. They can also provide more accurate feedback and can follow up to a higher extend which leads to setting more appropriate goals. These two new activities will further contribute to the self-development of the SV and will increase the role a SV has to help others, which addresses guideline 10-11 in figure 33. By being at gemba and coaching guideline 35-36, 38-39, 41 and 43 are addressed, this because the SVs gets a more structured way of coaching, ensuring that people are involved and capable and not directly intervening in the problem-solving process but instead supporting it and making sure the purpose with making improvements are clear when coaching. Further, this leads to building a culture that emphasises continuous improvements and where improvements are requested. Lastly, guideline 50-51 in figure 33 will be addressed in the long run when implementing these two activities because the team members and TLs will feel more involved and will gain a better understanding and awareness regarding their responsibility and role in fulfilling the goals.

New activity: Daily control meetings using Real Time Behaviour

Another new activity is, *Daily control meetings using Real Time Behaviour,* which replaces the current SQD-meeting. The new activity was inspired by the study visit at Scania Engines, and address the activity urgent errands, that was estimated to take 7 hours/week. Moreover, it will facilitate to distinguish important problem from less important ones and building a culture that emphasises continuous improvements by highlighting problems directly and solving them, addressing guideline 37 and 39 in figure 33. By changing the design and frequency of the meeting to instead work with Real Time Behaviour (RTB), the time

allocated to identifying and addressing problems directly and finding the right person would not take as long. To be able to work with RTB, the current SQD-meetings performed each morning for 30 minutes, should be changed to instead having a meeting every other hour in production for 5-10 minutes. Where instead of just stating the outcome and problems of the day before, the meetings are used for an update of the current state. When having the meetings every other hour, problems are detected directly and they can be appointed to a certain person present at the meeting but also they will be present at gemba to a higher extend. The progress of the problem-solving process is followed up in the next meeting, which is only two hours away instead of a whole day or sometimes even forgotten. Which over time will lead to a better knowledge about the process and people due to being more present and taking help from the subordinates for addressing deviations brought up at the meetings, which addresses guideline 20 in figure 33.

Another benefit of implementing this activity is that the SI will be more involved in the process and can support the SVs to a greater extend. If the SI notice that a SV puts too much time and effort on a problem or deviation they can step in and coach them or appoint the problem to someone better fit to address the problem, addressing guideline 8 and 14 in figure 33. Further, by implementing RTB the firefighting mode among the SVs will be decreased and they would not be involved in or responsible for deviations that does not concern them. The stress level for the SVs will also be reduced because they work in a more structured and systematic way which will free up time to put on other activities, e.g. coaching, reflection and most importantly it would reduce the time allocated for the activity urgent errands. The mentioned benefits will lead to addressing guideline 30-31, 33-35 and 41-42 in figure 33, by being able to for example base decision on facts, having a more structured and systematic way of working and requesting improvements to a higher extend. Further, this new activity will lead to fulfilling guideline 48-49 in figure 33 because it enables people to work in different silos and as mentioned the firefighting mode will be decreased which helps with not prioritising short-term goals over long-term goals.

This activity will further help to create and sustain a strong leadership system and mutual prosperity which helps to address guideline 46 in figure 33, by fulfilling two of the prerequisites that was missing in order to use a hoshin kanri approach. Moreover, by having the meeting more frequently the values and principles will over time become more clear and

well-communicated. Problems and deviations will be addressed by the SVs with having the values and principles in mind, which addresses guideline 53 in figure 33.

New activities: Check-in with Team leaders and Team members

The next new activity is, *Check-in with team leaders*, which also can be seen as addressing the activity short-term manning. Because having the SV start their shift by dedicating 30 minutes in total to talk to each of their four TLs about how they are doing both regarding their personal life and work life, how the personnel situation looks and if there is something else the TL wants to bring up is a way of showing interest. The fifth new activity is to *Check-in with the team members*, where the purpose is to ask how the team member is doing regarding their personal life and work life, provide error-feedback if there is any and if they have something else on their mind such as rumours or holiday- or parental leave. The error-feedback, i.e. yesterday's deviations and who is responsible, should however be prepared by the TLs. This activity has been allocated 2,5 hours a week which can be translated to 30 minutes per day. Both the activities will make the SV more present in production and for the employees addressing guideline 4, 6, 11 and 15 in figure 33. It will further lead to better knowledge and awareness about the people and processes and increase the possibility to coach, give feedback and following up, which fulfils guideline 19-20 in figure 33.

Both check-in activities, leads to being present and talking to the TLs and team members which will help the SVs to delegate responsibility for improvement work and by having the SVs do this every morning it will lead to working in a more structured manner, addressing guideline 34-35 in figure 33. Further, this activity will lead to increased communication between the SV and the subordinates. Which over time will result in understanding problems to a higher extend, consequently distinguishing between important and less important problems and demanding improvements to a higher extend, addressing guideline 37 and 41 in figure 33. Both check-in activities will help fulfil some of the prerequisites for enabling a hoshin kanri process. Because by being present and showing interest, it can help create mutual prosperity between the SV and the subordinates and a stronger leadership system (Liker and Hoseus, 2008; Liker and Convis, 2011), which address the prerequisites that was not fulfilled for guideline 46 in figure 33.

That the short-term goals were prioritised over the long-term goals and that the subordinates lacked awareness regarding their responsibility and role for reaching the goals will be addressed by implementing the two check-in activities. Because, as mentioned they will lead to having the SV out in production to a higher extend and fulfilling a purpose and not just standing there and controlling. Instead they will talk to the subordinates about deviations or problems and guiding them in a direction that is aligned with the vision and goals of the organisation, addressing guideline 49-50 in figure 33.

New activities: Check-out with Team leaders and Team members

The fourth activity is the *Check-out*, which has the purpose of getting back to the team members and TLs on the things brought up during the check-in which needs feedback. The time allocated for this activity is 1,5 hours, which is roughly 15-20 minutes per day. However, this can vary depending on the number of issues that needs to be given feedback on each day. By doing this the employees feel seen and the SVs work in a structured manner and do not need to run back and forth but also the employees do not need to worry when or if they are supposed to get an answer. The activity addresses guideline 6 and 11, see figure 33, because the SVs will provide the team members with feedback and the team members will also experience that the SVs to a larger extent support them and help them with their problems. Moreover, the activity will address guideline 19-20 by following-up on the questions or concerns from the check-in thereby getting a more structured and systematic way of working. Further the check-out in combination with the check-in will lead to the SVs will get to know the people and processes better. The people due to spending more time with the team members and TLs and the processes due to getting feedback and following-up on error-feedback. With the same reasoning as for the check-in the check-out will address guideline 35 and 46.

New activity: Reflection of previous week

For the activity, *Reflection of previous week*, the SVs should reflect in the end of every week what activities they have spent time on and time spent in production vs the office, see Appendix F for the template. The reason for this is that it was noticed from the workshop that the SVs estimated that they spent over 60 hours on work tasks per week, which exceeds a normal work week of 40 hours. If they spend that amount of time, it is of high importance to address this problem to prevent potential burnouts and sick leaves of the SVs. Therefore, every week they should fill out and send the template found in Appendix F to their superior,

i.e. SI, so that they are informed about the current work situation of the SVs and if they need to step in to support or help the SV. Further, this activity also enhances self-development and self-awareness regarding how the SVs work and help detect deviations and if things are moving in the right or wrong direction from the organisations vision and stated goals. Moreover, by adding this activity the SI can keep track of the fulfilment of the strategic goal of SVs being out in production 70-75%, and therefore also take corrective action or coach the SVs if moving in the wrong direction and if short-term goals are prioritised over long-term goals.

The activity further facilitates for the SI to understand how to steadily provide the SV with increasing challenges and to push them. Using the reasoning above guideline 3, 5, 8, 10, 12, 14, 35, 45 and 49 will be addressed, see figure 33. Further, using the outcome of template as a foundation for coaching the SVs, the SI can get an indication of whether the SVs can distinguishing important from less important problems, the SVs reserve time for improvement work, the SVs focus is on building a culture emphasising CI and the SVs have awareness regarding their responsibility and role in fulfilling the goals, i.e. working with guideline 31, 37, 39, 50 and 54. Further, implementing the activity should lead to a stronger leadership system, i.e. one of the prerequisites for guideline 46, since the SVs devotes more time to self-development. Devoting more time to self-development should also in the extension lead to a lager driving force to self-develop due to learning new things and getting more support and coaching.

New activities: Preparation for Lean forum and Lean forum

The last two new activities, *Preparation for lean forum* and *Lean forum*, means that 30 minutes each week is allocated to e.g. read a chapter in a book, which is then discussed during 30 minutes in the latter activity, lean forum. This could either be done by deciding to have a standard where the SVs for both areas meet once a week, e.g. Fridays, during a time slot of 30 minutes. It could otherwise be included in the agenda of the management team meeting where the whole group participates in the lean forum. However, the structure of the two activities should be to first prepare by reading what has been decided upon and coming up with one or two questions from the text they have read to discuss, then team-up to discuss and share and the last step is to possibly implement in practise what has been discussed. The reason for doing this is to focus on the self-development of the SVs by broadening their theoretical knowledge which is emphasised in the theoretical framework, i.e. the whys, and to get

practical knowledge by implementing the ideas. Note, that there is just half an hour dedicated to reading, this because learning takes place in small cycles and most of the learning takes place at gemba. Further, it is more motivating to have learning in small cycles due to seeing result faster and being able to implement and experiment.

Looking into the preparation of the of the lean forum the SVs are as mentioned above supposed to read what is decided upon before the lean forum. However, to make sure that the SVs are prepared and have reflected on the material decided upon the SVs should also bring one or two questions to the lean forum that they want to discuss based on the literature that they have read. By doing this guideline 5, 10, 12 will be addressed, see figure 33. Further, assuming that the SVs decides to read appropriate literature it should in the extension be possible to help decrease the gap for guideline 16, 18, 24, 28, 29, 43, 53, see figure 33. Using the same reasoning as for the preparation of the lean forum the lean forum will address the same guidelines. However, in addition to addressing the same guidelines as the activity preparation for the lean forum, it will also address guideline 3 and 7, see figure 33. This because it will create a natural forum where the SVs can get feedback from each other while discussing the material.

Changed activities

For the activity, *Rehab short session*, the time duration is not changed from what the SVs stated and due to eliminating the long rehab session the short session is needed. Because its important for the SV to participate in the first session to make the team member feel comfortable and safe but after that, which is where the longer rehab session comes in, they can hand it over to e.g. HR. The activity, *Other personnel related errands*, was the activity that in total took most time from a SV. As mentioned, by reducing the number of team members one SV is responsible for to 25-30 people instead of 45-50 and implementing the check-in and check-out with the TLs and team members this can be reduced from 9.5 h/week to 3 h/week, as presented in table 12. *The management team meeting* was currently estimated to take around 4 hours and this is much time to spend on non-value activities every week. Therefore, this was reduced to 2.5 h due to noticing from the observation that several of the agenda guidelines could be done in advance of the meeting, e.g. reading up on important information and preparing information they are supposed to present, which will enable shortening the time for this activity. Further, to be able to discuss larger issues this activity can on even weeks be planned for 2 hours and on odd weeks 3 hours.

The fourth activity in the list is, *Manning long-term*, which has been reduced from 2.25 hours that was estimated by the SVs to 1 hour. Because from the observations it was evident that this activity took too much time due to not being performed efficiently by not preparing more in advance. However, this could be addressed to be performed more effectively by delegating some responsibility or preparation work to a support function to prepare before the meeting. *Time info* is the fifth activity in table 12 and for this activity the time was reduced from what was estimated in table 11, because if the SVs performed this task in the office with no disruptions instead of in production it can be done more quickly and effectively. Further, reducing the number of team members that one SV is responsible for will also reduce the time needed to spend on this task. Reducing the team sizes will also affect the time one SV needs to spend on performance appraisals and overall documentation, which explains the reason for reducing the time estimation for both activities. Further, for *overall documentation* more time cannot be allocated if the SVs should fulfil the strategic goal and 2020 targets. Instead the SVs should get support for this e.g. by hiring a person that manages most of the administrative work.

For the activity *QDFIPS-master plan* the time estimation from table 11 has not been changed, it is still 2 hours. This because it is important to take responsibility and allocate time to work with the goals the SVs have set in order to make sure that the correct big-picture goals are accomplished. Further, for the activities: *visual leadership: team leaders, safety walks, TIA, team leader meeting, network meeting* the time estimated for them has not been changed due to needing to perform these tasks and the time allocated for them was according to the SVs and authors appropriate. The activity *gemba walk* is often performed in groups, where the SV is joined by e.g. their SI and production technicians. However, to work on self-development and support and develop the team members this activity should instead be done by the SV themselves once a week and another time where a TL or team member joins the SV in the gemba walk. This because as stated in the literature including the operators in the gemba walks are important to enhance their development and problem-solving skills. Further, for the SVs it will provide more room for reflection and figuring out and understanding things for themselves but also that they can adapt the gemba walk to their preferences and needs in their areas. Rather than just going for random gemba walks that lacks any clear purpose. It could for example be that every Tuesday for 30 minutes the SV goes on their own gemba walk to

enhance self-development and reflect and every Thursday for 30 minutes together with a TL or team member in order to coach. This activity will help by contributing to base decisions on facts by being present and gathering facts directly at gemba.

A lot of time was spent on the activity *quality and delivery related issues* if looking at table 11, where one reason for this can be that the SVs lacked awareness about what was important to do and what was less important. Comparing the categories in table 11 and 12 it is noticeable that the error-feedback has been excluded from this activity in table 12. The error-feedback has as earlier mentioned been changed and included in a new activity, i.e. check-in with team members, instead which is allocated 2,5 h per week. Therefore, the SVs have in total been given one more hour to deal with quality and delivery issues. The reason for this change was twofold, first because their superiors stated that one of the SVs main tasks was to ensure that the tact was kept, which however requires first that the SI and final assembly manager standardise how to keep the tact. The second reason was that they will need time to address the identified problems at the daily control meetings. However, by implementing the new activities, e.g. daily control meetings using RTB and the check-in and check-out, it will probably lead to them having even more time for this, since the work will be more structured. Further, by focusing more on this activity they are working towards viewing improvement work as an integral part of their leadership and continuously requesting improvements.

Improvement kaizen has been reduced from 3,5 hours to 2 hours because improvement work has already been included and integrated in the new activities and that addressing smaller deviations can be seen as more important. Further, when the observations were conducted the time spent on improvement kaizen was much less than what they have estimated in table 11 which raises the question if so much time is allocated for this activity. In fact, it was evident from the observations that only two SVs worked with improvements and looking at the structured observations the amount spent corresponded to 4% vs. 12% (and this was mainly for small improvements). Moreover, in order to not exceed a 40-hour work week some compromises had to be made in this case to reduce the time allocated for this activity.

Standardised activities

In figure 34, a suggestion of a schedule that can be used for the SVs is presented. Common for the nine new activities is that they will lead to being able to standardise the SVs tasks to a

certain extend and will make it possible for the SVs to be out at gemba to a higher extend, addressing guideline 4 and 9 in figure 33. Further, using the suggestion in figure 34, 31% of a SVs week will be standardised, the remaining time of the week can be allocated to the other stated activities in table 12. The thought is that the SVs should use a similar system as Rejmes Bil to colour code their activities, see section 5.2.2. This can for instance be done in their current system Microsoft Outlook by the SVs, in order to work in a more structured manner and to highlight for others that they are busy during these time slots. Another benefit of using this sort of scheduling is that it will enable transparency both up and down in the organisation by making their activities visible. As mentioned on odd weeks their management meetings can be three hours which makes it possible to present and work with this type of scheduling. Where each SV can create an individual long-term plan that covers one month and a more short-term plan consisting of two weeks. Where deliveries and other activities or projects are included and then presented during the management meeting in order to increase awareness and visualise for their colleagues and superiors but also so that the SV know what they should do and creates a structured way of working for themselves.

	Monday	Tuesday	Wednesday	Thursday	Friday
07.00	Check-in team leaders	Check-in team leaders	Check-in team leaders	Check-in team leaders	Check-in team leader
07.30	Check-in team members	Check-in team members	Check-in team members	Check-in team members	Check-in team members
08.00					
08.30	Daily control - RTB	Daily control - RTB	Daily control - RTB	Daily control - RTB	Daily control - RTB
09.00					Lean Forum
09.30					
10.00					
10.30	Daily control - RTB	Daily control - RTB	Daily control - RTB	Daily control - RTB	Daily control - RTB
11.00					
11.30					
12.00		Management team meeting			
12.30	Daily control - RTB	Daily control - RTB	Daily control - RTB	Daily control - RTB	Daily control - RTB
13.00					
13.30		Management team meeting			
14.00					Reflection previous week
14.30	Daily control - RTB	Daily control - RTB	Daily control - RTB	Daily control - RTB	Daily control - RTB
15.00	Check-out	Check-out	Check-out	Check-out	Check-out

Figure 34 – Suggestion of a schedule for a SV which only includes activities that can be standardised for all SVs. The other activities can be standardised as the SV pleases

In summary, all the mentioned activities that needs to be implemented, changed and removed will make the strategic goal of being out in production 70-75% of the time possible for a SV, see table 12. Further, they will affect the fulfilment of the 2020 targets. The first 2020 target

was to reduce Lost Time Case Rate (LTCR) and this is addressed by focusing on creating a better working environment for both SVs, TLs and team members. The new activities such as daily control meetings using RTB, check-in and check-out helps to address and identify problems directly which leads to a safer workplace and reduces possible accident by working more preventive than reactive. The second and third target which was to reduce the defects per unit and the lead time is addressed by having error-feedback every morning, daily control meeting in real time to address deviations and problems, reserving time and changing the design and execution for coaching, improvement kaizen and gemba walks. The last two targets, tied up manufacturing cost and tied up capital will be reduced by having a SV that is more present at the shop-floor and that request improvements from the subordinates. Both in short-term and long-term the activities presented in the action plan in table 12 will lead to moving closer to reaching the 2020 targets.

As mentioned and presented in figure 33 there was several of the guidelines that the SVs at the organisation did not fulfil or could not be determined. In figure 35 the new activities are related to which guidelines they address from figure 33, which also leads to reducing the gap between the LLF and the current leadership of the SVs. Instead of only fulfilling 10 guidelines, 47 guidelines can over time be fulfilled with the implementation of the action plan.

	A) Commit to self-development	B) Coach and develop others	C) Support daily kaizen	D) Create a vision and align goals
Preparation for book circle	5, 9, 10, 12	16, 18, 24, 28	29, 43	53
Book circle	3, 5, 7, 9, 10, 12	16, 18, 24, 28	29, 43	53
Team coaching	4, 6, 10, 11, 14	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28	35, 36, 38, 39, 41, 43	50, 51
Individual coaching	4, 6, 10, 11, 14	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28	35, 36, 38, 39, 41, 43	50, 51
SQD meetings using RTM	4, 5, 8, 9, 14	20	30, 31, 33, 34, 35, 37, 39, 41, 42	46, 48, 49, 53
Check-in team leaders	4, 6, 9, 11	15, 19, 20	34, 35, 37, 41	46, 49, 50
Check-in team members	4, 6, 9, 11	15, 19, 20	34, 35, 37, 41	46, 49, 50
Check-out	4, 6, 9, 11	19, 20	35	46
Reflection of previous week	1, 3, 5, 8, 9, 10, 12, 14		31, 35, 37, 39	45, 46, 49, 54

Figure 35 – The guidelines from the gap analysis which will be addressed if implementing the new activities from the action plan

6.4 Analysis Research question 3

In order to answer RQ3: *What resources and prerequisite does the SVs need in order to sustain a leadership that emphasises the Lean Leadership Framework (LLF)?* the subchapter is divided into two sections. In the first section of the subchapter the prerequisites needed to support the SVs from their superiors, i.e. the SIs, will be analysed. The analysis, that regards the SIs will mainly focus on two aspects namely change management and motivation. In the second part the prerequisites needed to support the SVs from their subordinates, i.e. the TLs, will be analysed.

6.4.1 Support from the superintendents

This section will be divided into two parts, where the first part will address what the role of the SI is in sustaining and supporting the change process. The second part, will address the role the SIs have in motivating the SVs.

The SIs role in sustaining the change

Any change process requires both time and patience and to sustain the organisation's lean transformation where one part is as mentioned to develop and change the leadership of the SVs, the SI plays a key role. This because their support is crucial but also that they provide the necessary means to be able to make this change. Therefore, the SI should follow Kotter's eight step model, see section 2.7.1, to achieve a successful change process and avoid common pitfalls and barriers. For the first step which is to create a sense of urgency it is important for the SI to make sure that the SV get out of their comfort zone which means to clearly show and demand that things should be performed differently. The second step is related to having a powerful guiding coalition which means that the SI cannot sustain this change by themselves but need support in form of a guiding coalition, especially from their superiors, i.e. the assembly plant manager and the plant manager, to send the message that everyone is engaged. The organisation has a stated vision visible for all employees, however, it was evident that the SVs had multiple directives in how they should work and prioritise in their role as a SV to reach the vision. This is common in failed transformation because not knowing what and who to listen to but instead getting mixed signals regarding the direction to move in will lead to failure. Therefore, it is crucial that the SI steps in and clarifies things and continuous with this over time and does not view communicating the vision and the direction the organisation needs to move in as a one-off activity. Further, it is important that the SI continuously

reminds and communicates the vision to the SVs and emphasises that they should have it in mind when they work. This can be done by creating individual goals for each SV and what their role is in relation to reaching the vision, because if they lack clear individual goals they will not know what is expected from them neither what they should focus on and prioritise.

For the fifth step the SI must show in actions that they are serious about reaching the vision to maintain credibility. This can be done by removing work tasks for the SV that does not contribute to reaching the vision and instead encourage and reserve time for activities and tasks that will guide them in the right direction. These activities can be found in table 12, further, making sure that the SVs own their process is vital for reaching their vision. A transformation takes a long time as mentioned which requires that the SI creates short-term wins to motivate the SVs and to make sure they keep delivering. This can for example be to request each SV to decrease each station with 5 seconds within a time frame of one month. The seventh step is to not declare victory too soon, which requires that the SI continuously demands and request improvements even though things are going better. Instead the SI should over time challenge the SVs with bigger problems and push them. The SI could do this by evaluating the development and performance of the SVs subordinates and to which extend the SV are out in production and what they spend time on. This can be ensured by using the templet found in Appendix F, where the SI evaluates the time allocated on performed activities for each SV every week. The last step is to institutionalise new approaches, where the SI needs to visualise for the SVs how their change in behaviour, attitude and leadership has affected the performance. Without proper and accurate information and feedback provided by the SI the SVs will not know how their contribution has made an impact and can therefore slip back to working as before. So, it is vital for the SI to continuously visualise the progress and help them see the right connections instead of having the SVs draw their own, which with high certainty is not correct. Further, the SI needs to ensure that the people being hired or promoted has the right mind-set and personifies with the lean transformation. Which is hard but it is important ensure this, a tip can be to use a balance of both different practical case scenarios to understand how the person thinks and some sort of test to gain an understanding of their theoretical knowledge. Because both the practical and theoretical knowledge and understanding is important to have as stated in literature (Liker and Hoseus, 2008; Liker and Convis, 2011)

That the company culture plays a big role is safe to say when analysing what the literature and the answers from the interviews states. Which makes this an important area for the SI to work with, because he/she needs to continuously emphasise a culture that focuses on continuous improvement and the people, which is what lean is about. Further, the SI needs to ensure that the values, principles, methods and tools are known and used daily in order to sustain and develop the culture of the organisation. Without the SIs engagement and interest, the SV will do the same and the new mind-set, values, principles, methods and tools will never be cascaded down in the organisation to create a strong culture with a lean approach. A barrier that was common among organisations that implement lean is insufficient supervisory and workforce skills to implement lean. Therefore, the SI needs to provide training and coaching in order to address this issue so that the SV can transfer the knowledge down in the organisation. Further, cost of investments and insufficient internal funding was also stressed as barriers and here the SI should make sure that the SV feel that they can bring up or highlight problems or improvements without assuming that it will just be declined due to financial issues.

That people resist or have a bad attitude towards changing is common, therefore, the SI has an important role here to catch not only SVs but also other people that affect the work of SVs and understand their reason for resisting. The SI must be patient but still demand change and challenge the SVs and address their uncertainties or fears. Because fear is common in a change process and talking about it and the reason to why this change is needed is important and contributes to making the SV accept the change over time. The SI must make the change process a part of the daily work of the SV in order to sustain it but also that the SI cannot expect a change from the SVs without making it themselves first. It could be that if they expect the SVs to be out in production to a higher extend they as well have to do this.

From the observations, it was evident that the SVs applied a leadership style that reminded of transactional leadership. This because, they mainly initiated contact with subordinates when something was wrong or due to a failure, it was also noticeable that they in some situations had a bad outlook on the employees i.e. blaming them for the problems. Further, they were more resource orientated and focused more on eliminating waste e.g. increasing the number of engines to produce on the visual boards when having the possibility. According to the literature (Bass and Avolio, 1992; van Dun et al., 2016; Woehl, 201l), for a lean transformation to be successful the transformational leader is critical. The reason for this is

that the transactional leader focuses more on eliminating waste while the transformational leader focuses on creating mutual trust, cooperation among the employees and are better at implementing lean practises. Therefore, the SI needs to make sure to emphasise, request and support having a combination of transactional and transformational leadership as a prerequisite to fulfilling different aspects needed as a lean leader, as stated in the LLF. Further, the SI needs to promote a mind-set that is based upon servant leadership which means that the SVs should focus on confirming the process instead of catching people making mistakes, which is similar to how they work today. The SI also have to ensure that the SVs get the right support and that it is not the other way around meaning that the SVs need to support the top management. Servant leadership is as mentioned similar to transformational leadership which is why this kind of mind-set and focus on followers are important for the SI to stress.

The SIs role in motivating the SVs

One of the prerequisites needed from the SIs is to support the SVs so they are motivated to perform their job. The reason why it is important for the SIs to have the SVs motivated is, as mentioned in subchapter 2.6, that high motivation contributes to creating high internal motivation, high growth satisfaction, high general job satisfaction and high work effectiveness. In order to design the work in such a manner that the SVs are motivated the first step is, as mentioned in subchapter 2.6, to create a high motivational potential by addressing three different critical psychological states. Looking at the first critical psychological state, i.e. experienced meaningfulness, and comparing it to the SVs role in chapter 4 it can be identified that a high skill variety and task significance is fulfilled due to the nature of the SVs role and the activities performed. Hence, the only thing left in order to design the work such as the SVs experience it as meaningful is to create a high task significance. The SI should therefore make sure that the SVs view their task as important where one important aspect in achieving this could be for the SIs to communicate the vision, make sure that every SV are aware of the goals, why they are important to achieve and what their part is in achieving the goals.

The next psychological state that the SIs needs to address in order to make sure that the motivational potential is high is that the SVs experience responsibility of the outcome. Here the SIs needs to support the SVs with the goal cascading process and make sure that it is clear what is expected from the SVs. Further, if the main purpose of an SV is what the management

argued in the interviews, i.e. to keep the tact and improve the processes, the SIs needs to request this and make sure that the SVs are aware and takes responsibility for this. The last psychological state that needs to be addressed if wanting to design the work such as it has a high motivational potential, is creating knowledge of the results. Implementing RTB as mentioned above, the SI have an opportunity of creating knowledge of the result, this because the SIs in that case can provide feedback to the SV every other hour. However, the SIs biggest challenge here will be to make sure that this actually happens, which can be done by requesting and challenging the SVs. Further, by using the template related to the SVs time allocation found in Appendix F, the SIs have an opportunity to give the SVs feedback regarding their performance.

In order to move beyond only creating a high motivational potential of the work, there is as mentioned in subchapter 6.2 three moderators to take into consideration. The first moderator, i.e. knowledge and skills, is addressed in the LLF in the area self-development. However, in order to make sure that the SVs works with developing themselves the SIs must request and challenge the SVs to do that. One way the SIs can make sure of that is by making sure that the SVs allocates time for it by for instance requesting that the SVs participate in the activity lean forum. Further, the suggested activity reflection of previous week can help the SIs grasp whether they put enough time on developing themselves or not. The second moderator, i.e. growth need strength, is more related to a personal attribute and is therefore hard for the SI to address.

The last moderator, i.e. context satisfaction, relates to the context in which the SVs work and whether they are pleased with it or not. Looking at the results from the workshop it can be determined that all SVs estimated that they needed to worked well above what they were expected to in order to be able to complete their working tasks. In addition to that the SVs expressed that they felt stressed about their work and the content of it during the observations. Taking both those factors into consideration it can be assumed that the SVs was not that satisfied with the context of their work. Hence, the SIs needs to address this issue. One way the SIs could address this issue could be to help and support the SVs with prioritising their tasks. If the purpose is that a SV should be out on the shop-floor 70-75% of their work time working with improving the processes and make sure that they deliver engines according to plan, then that is what needs to be prioritised. Hence, the remaining assignments can only be performed in case there is time left to allocate to the remaining tasks. Another important

aspect for the SIs to consider is what the SVs do when being out in production. If they want the SVs to work with improving the process, there are two important prerequisites that needs to be addressed (Liker and Hoseus, 2008). First, that the SIs makes sure that the SVs knows the targets and what their role specifically is in fulfilling them and second that they have a mandate to change things. Note that, making sure that the SVs have a mandate is important because the SIs cannot expect that the process will be improved if the SVs are not allowed to make any changes.

6.4.2. Support from team leaders

The SVs needs some level of support from their TLs, however, it is important to remember that the TLs are working closer to the process and the value-adding and therefore the focus of the SV should always be to support the TLs instead of the other way around. For example, it could be that instead of the TLs learning the SVs tasks to be able to cover for them if they are sick or absent, it should be that the SV learns and knows the tasks of the TL so that they can cover for them. Because they are working directly with adding value, so instead of covering up from the bottom up it should be from the top down instead.

Although the main focus should be for the SV to support and achieve goal alignment by being able and capable to break down and set appropriate goals and communicate them to the TLs. There are some things the TLs should support the SVs with in order to make the change process possible. Firstly, in order to enable the SVs to work closer with the process the TLs needs to pursue an open communication together with the SVs, to let them know of all potential problems in the process and among the team members. One way of achieving this could be for TLs to participate in the daily control meetings and share information regarding the status at their "slinga" or support the SV to address or check up on an issue. Further, the TLs needs to be able to distinguish between small deviations and larger ones so that the SV is not involved in all issues that pops up. This will only take up their time and the TLs must train to solve problems by themselves as well. However, as the SVs are expected to break down and communicate the goals the TLs also have this responsibility towards the team members. This to support the SVs to ensure that people down in the organisation is working in the same direction.

6.4.3 Support and Prerequisites

In summary, the support and prerequisites needed for a SV one level up respective down, i.e. SI and TL, in the hierarchy is summarised and presented in figure 36. The points in figure 36 is based on the analysis from section 6.4.1 and 6.4.2. There was twelve points identified for the SIs to provide the SVs with while five points was identified for the TLs.

Support and prerequisites from Superintendents	• Be patient and supportive towards the supervisors • Demand and request improvement continuously • Provide clear directives for how to work and support the supervisors to prioritise • Challenge and request that the supervisors continuously develop • Continuously communication of the vision and goals • Make sure that the supervisors are aware of the goals • Make sure that the supervisors have individual goals assigned • Ensure that that supervisors have ownership of their processes • Allocate time to enable the supervisors to work with what is expected from them, i.e. work with improvements and being present at gemba. • Provide continuous feedback in relation to both negative and positive events • You should act as a role model i.e. behave and work in the same manner that you expect the supervisors to do • Provide the supervisors with training and coaching
Support and prerequisites from Team leaders	• Pursue an open dialogue • Inform the supervisors of the problems related to the process and people • Be able to distinguish between small and large deviations • Have awareness of when to involve the supervisor when there is a problem or deviation • Communicate and break down goals to the team-members

Figure 36 – Support and prerequisites needed for the SVs, looking at one level up and down from the SVs in the hierarchy

7. Discussion

In this chapter, the findings from the analysis will be discussed both from a theoretical and practical perspective. Further, the validity, reliability and ethical aspects of the thesis will be discussed in order to take important aspects that affected the thesis into consideration. Since the research is a case study some parts are only applicable for the organisation.

7.1 Findings

The purpose of the thesis was to develop an action plan for how to develop the leadership of the SVs at the organisation with regards to their lean transformation journey which is related to reaching their 2020 targets and strategic goal of having the SVs be out in production 70-75% of their work time and to provide means to sustain the transformation. Where one part was to develop the LLF to help identify the gap in leadership for SVs at the organisation compared to what the LLF emphasises to fulfil in order to be a lean leader.

One of the key findings in this thesis is the LLF, which has acted as a foundation for answering the RQs. The LLF addresses important aspects that has been highlighted in both the literature review and interviews with lean experts as vital to have as a lean leader. The LLF consists of three phases, i.e. why, how and what, where 54 guidelines were identified in the how phase related to how to develop and become a lean leader. Further, the four areas in the how phase is from the 4-stage model developed by Toyota. This to have a proper base and areas to relate to when developing the framework. The LLF provides clear guidelines regarding how to become a lean leader and important means and aspects that needs to be considered and set in place. Because as the literature and interviewees states the aspect of lean leadership and how to become one is lacking and especially for lower management levels.

The first RQ was to identify if there existed a gap, and in that case identify and analyse what the gap was between the SVs current leadership at the organisation and the LLF. The gap analysis for the SVs at the organisation confirmed what was found by Dombrowski and Mielke (2013) regarding that leadership is a missing link and what areas organisations commonly performs poor in. These areas were self-development and goal alignment i.e.

hoshin kanri. However, looking at the results from the gap analysis the area in which the SVs at the organisation performed most poorly in was coaching, this could be a consequence of not performing or reserving time for self-development as mentioned in the analysis. Further, performing poorly as coaches and not helping people to develop will also affect the ability to support and work with daily kaizen and therefore the goal alignment. Potential reasons to why the SVs performed so poor in the area coaching can be that they have an inaccurate view of what coaching is, that they do not reserve time for coaching, that they have too many employees and that top management at the organisation expected the SVs to work with other activities.

The literature stresses that coaching plays an important role when it comes to developing the organisation particularly in a lean transformation (Liker and Convis, 2011; Liker and Hoseus, 2008). However, as mentioned in the theoretical framework, the culture within the organisation can act as a hinder for being able to coach. This because some people just wants the answer from their superior instead of being asked questions that requires them to think and reflect for themselves. Further, the literature has split views regarding how to ask questions when coaching, Liker and Convis (2011) and Liker and Hoseus (2008) emphasises to ask questions that starts with why while Viva coaching (2011) emphasises to avoid why and instead ask questions that begins with what and how. In a Swedish context, as seen in figure 5, the factors power distance and individualism were different from the Japanese context where lean emerged from. Therefore, in a Swedish context people can interpret the why questions as intruding and that the coach is questioning their integrity and competence and therefore instead respond better to questions that start with what and how. This relates to what the literature stresses (Hines et.al, 2004; Lewis, 2000; Liker and Convis, 2011; Liker and Hoseus, 2008) regarding not copying Toyota but rather adapting the methods, tools, way to work and leadership to the organisations context.

It was evident from the interviews with top management at the organisation that there was no clear goal cascading process and that the SVs lacked having individual goals related to the organisation's vision and an understanding for them. One reason for this could be traced back to the formulation and content of the organisation's stated vision, i.e. "World class manufacturing of propulsion systems and components in lean system designed around people produced where consumed". Firstly, the vision can be hard to understand especially for the SVs subordinates because as described in the current state some lacked an understanding what

the term lean means when asked during the observations. Further, lean system can have several meanings as the conducted literature review concludes therefore it can be hard to know in which context they mean when using the term lean system. Secondly, the last part of the vision "[...] designed around people produced where consumed" is hard to understand because the products are not produced where consumed, if this should be true the organisation needs to be relocated to where parent company produced their products, e.g. ███████ or ███, or vice versa. As stated in the theoretical framework having a clear and understandable vision is vital both for the employees but also for the customers which makes this an important matter to address. Further, if the SVs are expected to work with reaching the vision they need individual goals which means that the organisation and in particular the SI needs to provide this.

The fact that the SV lacks having clear goals assigned makes it difficult to work with improving the process due to being unaware of what is expected from them and what direction their superior expects them to move in. Both the literature (Ballé and Bouthillon, 2011; Liker and Convis, 2011) and the interviewees stressed that this was of high importance so that improvements address the problems and goals, otherwise it is just changes that lacks purpose. Further, for enabling people to work with improvements coaching is crucial (Liker and Convis, 2011; Liker and Hoseus, 2008; Rother, 2013; Savén, 2014). If they were to coach their subordinates to a higher extent they would develop 50 problem solvers, i.e. their assigned subordinates, instead of only themselves. This can be done by applying the coaching and improvement kata as mentioned in the theoretical framework. However, as mentioned a prerequisite for working with improvements is that they own their process which means having mandate to implement improvements and solutions. There was mixed information given from the top management and the SVs at the organisation, regarding the level of ownership. However, from what was evident from the observations the SVs did not have full ownership and mandate to implement improvements.

Further, to enable working with improvement the literature suggests (Dombrowski and Mielke, 2014; Liker and Convis, 2011; Liker and Hoseus, 2008) that leaders needs to be present at the shop-floor which also was emphasised by the organisation themselves. One effect of not being present in production and not knowing the process and people, is that it can contribute to creating a negative view of the subordinates among the SVs. Which was evident during the observations where SVs blamed the subordinates when there was a failure or

deviation. Further, this has a potential negative impact on the trust between the SVs and their subordinates. In the literature review and interviews trust is stressed as an important factor that needs to be fulfilled in order to be a good lean leader. If top management and the SVs wants people to change they have to change first.

For the second RQ an action plan was developed where eight activities were removed and nine new activities added. The activities were adjusted to fit into a work week of 40 hours, where the aim was for the SVs to be out in production 70-75% of their time. Important to note here is that the developed action plan, found in table 12, only is applicable for the organisation since it is based on the gap analysis for what the SVs at the organisation needs to do in order to work in the direction the 2020 targets and the LLF suggests. Over time the gap will change which will require the organisation to re-evaluate the new potential gap in relation to the LLF and analyse what changes and actions that needs to be taken. However, other organisations having similar problems and challenges can apply the LLF to compare with their current state and identify a potential gap in the four areas. Then apply similar activities emphasised in the action plan and eliminate non-value adding activities to address their potential gap. Because as the literature states one key aspect in becoming lean is having a well-developed leadership, see section 2.4. Therefore, the action plan developed is focused on developing and creating strong leaders for the hierarchy level first line manager with a lean approach by using the LLF. Further, to be able to deliver on the 2020 targets it is of high importance for the SVs to try to fill the identified gap by applying the activities in their daily work and getting support for eliminating the non-value adding activities.

In RQ 3 it was evident that the support from the SI was vital for developing the leadership of the SVs which is similar to what is stated in the theoretical framework and to what the interviewees stated. Without their support and them providing the right prerequisites, e.g. providing coaching and requesting improvements, the SVs cannot move towards becoming lean leaders nor will the organisation improve their performance and become lean. Further, TLs also have an important role in supporting the SVs and proving prerequisites by always highlighting and communicating deviations or problems with the SV, so they can be addressed directly. Further, to sustain and develop the leadership for the SVs their role description should be re-evaluated and the competences required from a SV should be made more relatable, i.e. not just stating words such as being empathic, see table 8. Because as mentioned in the analysis the documentations said one thing while top management said

another thing and the competences required for a SVs is hard to measure. This leads to confusion for the SVs such as that the SVs are not even aware of that they are supposed to be out in production 70-75% of the time and prohibits them from focusing on what they and the organisation needs in order to develop according to what the LLF suggest and reach their vision and goals.

Both the literature (Bahsin, 2011; Byrne and Womack, 2012; Testani and Ramakrishnan, 2011) and the interviewees argued that a low share of organisations manages to accomplish a successful lean transformation. Looking at the leadership dimension it is therefore of outermost importance that the SVs gets support in doing this transformation. Hence, they need support both from the top and bottom to enable this and that the whole organisation is willing to and engaged in making a change by working together. Otherwise, things will slide back to what it was before as emphasised in the literature review. Lean is a never-ending journey and exist at two levels, i.e. operational and strategic, which stresses the importance of that the SVs and others in the organisation continuously review their progress and have a long-term view to identify new gaps to address and to sustain the progress. Because it is not enough to only have lean at the operational level which means using lean tools, it is important to make sure it is also present at the strategic level (Hines et al., 2004). This is an important part in sustaining a change and striving for perfection which is a major aspect in lean.

As the literature (Hofstede, 1980; Liker and Hoseus, 2008) and interviewees claims the culture is highly impacted by the leadership and the other way around. Looking at figure 4, it can be determined that the organisation only fulfilled the first level, i.e. artifacts and behaviour, partly. To reach their 2020 targets to a higher extend and to develop the leadership of the SVs the cultural aspects needs to be addressed by focusing on the other two levels as well, i.e. norms and values and basic assumptions. Where one part of this is to use the LLF and applying the action plan to develop the leadership of the SVs. By changing the mind-set and way to work among the SVs, it can later by cascaded down in the organisation by them, which over time will lead to getting a stronger culture and fulfilling the other two levels in figure 4. However, as stressed in the theoretical framework it takes 5-10 years before a transformation gets rooted in an organisations culture, which requires patience from the SVs but especially from top management.

7.2 Validity and reliability

The articles used to develop the LLF was carefully selected by reviewing what kind of methodology the authors had used for their research, the number of citation and the year of publication. However, some articles used in the thesis lacked a clear or stated methodology which raises the issue of bias but in those cases the publication was well-known and highly cited which compensated that.

The structured observations were conducted for one day which can affect the outcome and time allocated to each category. Because certain activities and events could be specific for just the day of the observation, which can cause misleading outcomes regarding where the SV allocated their time. However, this was partly addressed by having unstructured observations as well, where the observers could compare the time allocated to each category in the structured observations with the unstructured observations. Further, for the observations the two observers followed one SV each and then swapped which can affect what the observers put focus on and took note on. Which can cause bias because the observer could interpret a situation differently and could not discuss it with the other observer. However, performing the observations individually increases the validity and covered a broader spectrum because the observers do not affect each other and the SVs being observed feel more comfortable with only having one observer at a time.

The conducted interviews were semi-structured which can be one reason for why the result and structure from all interviews was not the same. Further, the interviewee could have misunderstood or misinterpreted the question which leads to not answering the question. When analysing the answers and summarising there is a chance that the authors interpreted the answers in a different manner than what the interviewee meant which affects the validity and can cause bias. However, the authors conducted the interviews in pairs and recorded the interview which made it possible to discuss the answers with each other and to go back and listening to what was said during the interviews after.

The time estimations performed by the SVs during the workshop can be biased due to having a poor knowledge and awareness regarding how much time they allocated to each activity and task. If so, this could affect the action plan developed by the authors. However, their time estimations were compared with the structured and unstructured observations in order to

validate and adjust their time estimations to be as accurate as possible. Another potential source of bias is that the SVs when filling out the template regarding the time estimation, see Appendix G, sat together which might have led to some SVs copied the others time estimations. However, this could also have led to estimating the time more accurately e.g. if they lacked awareness or was new as a SV. Further, the discussions during the workshop was done in groups which could have impacted the SVs will and opportunity to express their opinions.

When analysing the data from the interviews, literature and the workshop there is a risk of applying a personal opinion or conclusion which creates bias, affecting the reliability and makes it difficult for other researchers to replicate the research. This is hard to avoid due to conducting mainly a qualitative research. However, the authors recorded each interview to avoid making own assumptions and created a template to use during the structured observations to ensure that both observers complied similar activities/tasks in the same category. For the study visits it was hard to have a clear structure due to not receiving a schedule for the visit and not being able to record. Therefore, to secure that the information was interpreted correctly the authors sent out a summary of the notes from the visit to the organisation, so they could validate.

7.3 Ethical aspects

Regarding the ethics, one aspect that was considered was that no participant should be harmed due to sharing information with the researchers. One of the actions taken in order to prevent this was to anonymise the participants as mentioned in subchapter 3.5. Looking at the SVs, there was a quite low number of participants in the observations and the SVs were observed for a couple a day in a row, which might lead to a risk that other colleagues or superiors might have picked up on some of the activities performed and therefore can trace the activities back to a specific SV. Although, the information to some extent might be traceable to a certain SV, the SVs were aware of that. So, the fact that the SV was aware of that their superiors or colleagues probably would be able identify them, might have contribute to a bias by acting differently than usual. To avoid this a person from the organisation informed the SVs about the purpose of the thesis and that the results were going to be used to help them and that it therefore was of high importance that they acted as they usually did.

The risk that the SVs can be traced and therefore in a worst-case scenario be harmed by the information shared mainly concerns the unstructured observations. Looking at the structured observation the activities are not presented in a chronical order in the figure 19-22 due to minimising the risk for detecting a specific SV. Further, the information given by the SVs participating in the workshop cannot be identified or traced to a specific person that did not participate in the workshop due to how the result is presented. To enable that the SVs would not be harmed or limited by what they said during the workshop, it was clearly communicated before the workshop that only SVs was invited to participate. Regarding the detection for remaining part of the participants, i.e. the interviewees, there is a low risk that the participants that was interviewed using interview guide 1 can be detected. This because the answers were summarised and described for each question and not for each person. Moreover, for the participants interviewed using interview guide 2 it was obvious who had answered the questions due to using their title in the thesis. However, this was something they were aware of and fine with. Further, it was voluntary for all interviewees to choose whether they wanted to participate or not.

8. Conclusion

The purpose of this thesis was to "[...] develop an action plan focusing on developing the leadership of the organisation's supervisors (SVs). With regard, to their lean transformation journey in order to reach their 2020 targets related to Leadership and their strategic goal of making it possible for the SVs to be out in production 70-75%. Moreover, to provide means to sustain and continuously improve the SVs leadership". The findings from RQ 1 showed that there existed a gap when comparing the leadership of the SVs at the organisation to the Lean Leadership Framework developed by the authors. Which consists of 54 guidelines in total, in four areas, i.e. commit to self-development, coach and develop others, support daily kaizen and create a vision and align goals. The framework can be used by the organisation as a tool to continuously follow-up and evaluate which guidelines they fulfil respective do not fulfil to address the current gap. In total 10 guidelines was fulfilled, 31 guidelines were not fulfilled and 13 guidelines could not be determined.

To address the identified gap and thereby address RQ 2, eight activities the SVs currently was performing was removed due to not contributing to addressing the guidelines in the framework thereby not supporting the SVs development. Further, an action plan to address the gap was developed including nine new activities and several changes to the design of the activities currently performed by the SVs, see table 12. However, it is concluded that it is required that the organisation reduces the team sizes and that the SVs have ownership of their processes and/or area to fully benefit from the action plan and develop the leadership of the SVs. Moreover, to address RQ 3 the organisation was provided with different means and prerequisites for sustaining and developing the leadership. It is also concluded that both the involvement and engagement of the SIs and top management is crucial for sustaining this transformation. Which means that the SIs and the top management continuously need to support the SVs by re-evaluating and working with the vision and goals to develop the organisation to perform better. Moreover, the SVs needs to receive clear directions regarding what the top management expects from them both concerning what their role is in the goal fulfilment but also what they expect them to do on a daily basis. One part for doing this is to

change the current role descriptions that is stated in the internal documentations at the organisation.

This thesis main contribution to research is the developed LLF, that can be used by the organisation as well as other organisations as means for identifying a potential gap in leadership with regards to lean. Further, the LLF can be used as a self-assessment tool by SVs to keep track of which guidelines they fulfil or needs to work on and as a base for addressing the gap with actions adjusted to the organisations context. Which in the extension can help create a competitive advantage for the organisation by becoming a learning organisation, increasing the performance, creating a strong culture, creating strong leadership and having engaged employees. The new activities in the action plan can be used by other organisation as well that have similar problems.

The use of the LLF requires a qualitative judgement, however, for future research the LLF can be developed by being able to measure the degree of fulfilment of each guideline based on a scale from one to five. Where the estimation for all guidelines are then summarised per area and then compared with developed guidelines that states how well the SVs fulfils each area. This to get a more accurate and numeric estimation of the potential gap and to facilitate following up the progress. However, in that case one might also have to consider if there are any guidelines that needs to be prioritised higher due to being more important than others. Another possibility for future research is to implement the developed action plan at the organisation and follow-up and analyse the outcome and impact from the activities.

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Appendix A

	Category		Learning		Communication			Administation							Metings				Other		
	Activity		Own learning	Learn others/ coach	Phone	Mail	Dialouges	Schedule meetings	Pre-work meetings inspection etc	After-work meetings, inspections etc.	Documentation	Copying, scanning etc.	Planning e.g. holiday, skick-leve	Other	Daily control	Performance apprisials	Shift handover	Other e.g.TL meeting	Other e.g. small errands	Present in production e.g. review and inspect material and products	Transport walking
Kl	From [min]	To [min]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
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Appendix B

Syftet intervju:

Vi är två studenter, Parasto Mohammadi och Malin Korneliusson, som studerar vår sista termin på vår master inom Produktionsutveckling på Chalmers tekniska högskola. Under våren skriver vi vårt examensarbete hos ████████████████████████████, där vi undersöker hur Lean ledarskap kan utvecklas för deras första linjens chefer dvs Supervisors (SVs). Syftet med avhandlingen är att utveckla en handlingsplan med inriktning på ledarskapet av företagets SVs med avseende på deras "Lean Transformation Journey". Dessutom, för att tillhandahålla medel för att upprätthålla och ständigt förbättra SVs ledarskap och organisationskultur. För att kunna utföra detta, är en del att utveckla ett Lean Leadership Framework, detta kommer göras med hjälp av akademisk litteratur, intervjuer med kunniga inom ledarskap och lean och observationer av första linjens chefer.

All information kommer hanteras konfidentiellt för att sedan analyseras. Du kan avbryta närsomhelst under intervjun eller välja att inte svara på vissa frågor. Intervjun tar ca 45-60 minuter. Vi kommer först att ställa lite generella frågor relaterade till ledarskap och lean och därefter gå in frågor som utgår från Toyotas 4-stage model of Lean Leadership Development.

Intervju frågor:
Introduktion om dig

- Vad har du utbildning?
- Vad är din din nuvarande titel?
- Vad är din erfarenhet av att arbetat med Lean och ledarskap?

Generella frågor

- Kort, hur skulle du beskriva ledarskap och vad tycker du definierar ett bra ledarskap?
- Vad tycker du är de största skillnaderna mellan lean ledarskap och andra typer av ledarskap för en första linjens chef?
- Hur tycker du en lean leader ska bete sig? (och varför är viktigt att bete sig så?)
- Vilka färdigheter och egenskaper tycker du är viktigast att ha som första linjens chef för att kunna bedriva en lean verksamhet?
- Vad tror du är nyckeln till att skapa en hållbar förändring när det kommer till ledarskap. Dvs inom vilka områden och på vilka aktiviteter tycker du man ska lägga störst fokus?
- Hur jobbar ni med att utveckla ert ledarskap av första linjens chefer?
- Hur gör ni/ har gjort för att upprätthålla förändringar av ledarskap så man inte faller tillbaka till gamla arbets- och tankesätt?
- Enligt din erfarenhet, vad är de vanligaste felen eller misstagen som begås när man driver igenom en förändring?.. t.ex lean en transformation

Fourstage model:

Commitment to self-development:

- Vad innebär självutveckling för dig? (Inom vilka områden skall man arbeta med sin självutveckling, har du några tips för hur man gör/arbetar med det?)
- Hur jobbar du/ din organisation för att stötta självutveckling för era första linjens chefer?(Har ni gjort något speciellt för att lyckas med att få era första linjens chefer att arbetamed självutveckling?)
- Vad tror du det finns för hinder för att en första linjens chef ska arbeta med sin självutveckling?
- Om personen är låst/obekant/ovillig att själv-utvecklas, hur hade du/er organisation hanterat de?
- Vilket stöd/förutsättningar tror du man behöver från sin chef för att kunna själv-utvecklas?

Coach and develop others:

- Vad innebär coaching för dig? Vad är syftet med coaching enligt dig?
- Hur jobbar du/ni aktivt med coaching i er organisation för att utveckla era medarbetare?
- I vilka sammanhang/lägen ser du coaching som väsentlig?
- Vilka förkunskaper och förutsättningar behöver man som ledare för att kunna coacha?
- Vad är vanliga hinder/problem hos er när de kommer till coaching?
- Använder du/ni några metoder för att följa upp att coachingen fungerar samt att medarbetarna utvecklas som en konsekvens av coachingen?

Support daily kaizen:

- Hur arbetar ni med förbättringar inom produktion? (dvs hur kommer man igång och hur bedriver/systematiserar man det?)
- Hur ser det ut hos er, äger en första linjens chef ihop med sina medarbetare deras processen? (Låt säga att en montör/första linjens chef kommer med ett förbättringsförslag. Hur hanterar/ tar man det vidare som första linjens chef? Vad för möjligheter har man till att förändra?)
- Tror du man behöver ha några förkunskaper för att kunna driva och arbeta med förbättringar kontinuerligt? (i så fall vad?)
- Vilka är de vanligaste hindren ni stöter på eller råkar ut för vid förbättringsarbete?
- Vad anser du är en första linjens chefs roll i förbättringsarbete? (tex. hur involverade bör personen vara? Hur mycket ansvar bör delegeras?)
- Vilket stöd tycker du man behöver från både upp och ner i hierarkin för att bedriva förbättringsarbete kontinuerligt?

Create vision and align goal:
- Vad tycker du är första linjens chefers roll i att arbeta med företagets mål? (Hur har man lagt upp det i er organisation och tror du att det finns några hinder för att kunna arbeta med att nå målen/vision för en första linjens chef)
- Hur tycker du en första linjens chef ska arbeta med/bryta ner befintliga mål som stödjer företagets vision?
- Hur stort ansvar tycker du en första linjens chef har att kommunicera ut och jobba aktivt med företagets långsiktiga mål?

- Hur kan en första linjens chef involvera underordnade att vara delaktiga i att utveckla och nå målen?

Är det något mer du vill tillägga som vi inte tagit upp eller har du något tips på artikel/bok som är kopplat till detta område?

Tack för att du tagit din tid att svara på frågorna!

Appendix C

Intervjuguide:

Intervjun kommer vara uppdelad i tre delar. I den första delen kommer beröra SV, vad deras roll innebär, vad som anses vara deras viktigaste uppgifter osv. I den andra delen kommer vi gå in på 2020 målen samt 2018 målen och behandla frågeställningar kring vad en supervisor har för roll i måluppfyllnad etc. Den tredje och sista delen kommer behandla frågor kring strategin där man satt som mål att en SV skall vara i produktion 75% av deras arbetstid där vi kommer behandla frågeställningar gällande vad det inebär för dom, om man det finns arbetsuppgifter som behöver bytas ut etc.

All information kommer hanteras konfidentiellt för att sedan analyseras. Du kan avbryta närsomhelst under intervjun eller välja att inte svara på vissa frågor. Intervjun tar ca 25-30 minuter.

Generella frågor:
- Vad tycker du är en supervisors huvudsakliga syfte? Uppfylls de idag?
- Vad tycker du borde vara deras huvudsakliga arbetsuppgifter bör vara/ är?

Mål 2020 och 2018:
- Hur ser er målsättningsprocess ut i stora drag? (Har ni någon process där målen bryts ner på individnivå för varje SV?)
- Har SVs någon buy-in/input när målen sätts?
- Vad anser du är en supervisors roll i att uppfylla dom? Strategi del: I strategin står det att ni vill att en supervisor skall befinna sig i produktion 75% av sin arbetstid. När man är
- Vad är syftet med det?
- Vad för slags arbetsuppgifter tycker du en SV skall utföra när man befinner sig där?
- Tror du det finns arbetsuppgifter som kommer att bli lidande av en omställning av den typen? (finns det delar som kan tas bort ur deras arbetsuppgifter)
- Vad för stöd behöver en SV från er högre upp i hierarkin för att kunna jobba med målen och vara 75 % i produktionen?

Appendix D

Self-development	Answer
Definition and meaning of self-development	A matter of sincere dedicated practise
	Culture has a critical role in shaping the way we approach opportunities for self-development
	A desire and passion for self-development is needed
	You need to give leaders space to self-develop while staying close enough to coach them so that they self-develop in ways that are consistent with the organisations values.
	Self-development has a huge impact on the learner's actual patterns of thinking and behavior
	Leaders are actively looking to improve themselves and their skills.
How to self-development as a first-line manager	The most important development comes from daily experience at the gemba
	Integrate learning-by-doing with the leacture-oriented model
	Develop the leadership skill to have the ability to observe and analyze the actual situation in depth without preconcevied ideas
	Standardize work tasks to eliminate mistakes
	Practice
	Hansei i.e. reflection, look back at oneself, picking apart what went well and what did not go well
	Reflect in a group as well
	Self-awareness by identifing your potential and to train
What prerequisites/support do you as a supervisor need from you superior to self-develop	Steadily increasing challenges
	Time
	Space for self-development and that you allow coaching in the process at the right times

Recommendations for self-development	To have suggestion systems because the guideline with them is not to only improve the process but to give employees a self-development opportunity. It is important to make sure that people do not take advantage of the system to get an incentive
	Combine classroam training with gemba projects
	The only assessment of leadership that matters happens in real-world situations
	One of the key lessons for those who are trying to imitate Toyota is how critical it is to have an approach that allows for self-development rather than having mandated development. Self-development of both thinking and doing is the only thing that ever sticks

Coach and develop others	Answer
Definition	"The purpose with coaching is that the human should take advantage of its potential, develop, learn and reach the result. It is about creating awareness and responsibility for the person being coached Coaching is about bringing forward the best in people and not about repairing non "functioning" team members
	"Within coaching we view people in terms of their future ability and not their past presentations"
	"Coaching is unlocking a person's potential to maximize their growth"
	"Coaching is practicing the disciplines of believing in people in order to empower them to change"
	Detect, clarify and put yourself behind what the coachee what to accomplish
	Encourage the coachee to self-awareness
	Elicit the coachees own solutions and strategies
	To coach the whole staff and not only star performers or favourites
	Creating and setting good goals
	To accept the adepts solution even if you have a better one, this to develop the problem-solving skills among the employees
Role of the Coach	Observe the situation and think one step ahead, but only ONE step

	Responsible for the result
	Keep the coachee responisble and accountable
	Avoid asking questions that leads to a specific solution
Tools as help when coaching	Repeat/reflect what the coachee sais
	Reformulation/clarification
	Summarize what the coachee sais to "hear what is not said
	The "Scale" and "Wheel" to create awareness
	To avoid making assumptions use brainstorming, asking hypothetical and exception question and "as if" formulations
Skills/Prerequisites/characteristic needed when coaching	Explorative
	Supportive
	Interested and have focus on the other person
	See the potential
	Support ownership
	curious
	Emotional intelligence i.e. self-awareness, emphatic and social competence
	Knowledge about learning
	Enjoy being a coach
	coach at the source i.e. at gemba
	Give feedback and follow-up
	The ability to get teams working together and to solve problems across functions with experts from other parts of the firm or from outside
	Active listening
	Power of teaching by asking questions
	Deep process knowledge
	Result- and action oriented
Recommendations	Combine classroom training with gemba projects
	Show that it is ok to make small mistakes so that the adept can learn from them and so that the coach

	can see what sort of coaching the person needs
	Learning has to take place in short cycles
	Quick feedback
	Perform problem-solving and learning in a standardized way using the PDCA
	A common time period for a longer coaching process is often six months with a call frequency of two conversation/month
	Ask questions that start with What and How before asking Why
	Coaching is about asking more explorative questions instead of informative
	Coaching kata which is a dialogue between the mentor and adept. The task of the mentor is to guide the adept in applying the improvement kata through a dialogue back and forth between them over a timespan. The mentor should ask questions and observe how the adept answers in order to understand how the adept thinks
Competences/Techniques	Active listening

Support daily kaizen	Answer
Working with improvements in production	"There can be no improvement where there are no standards", it's the foundation of continuous improvements.
	Going to the source to see the actual problem in order to deeply understand.
	Work with both maintenance kaizen and improvement kaizen
	Decentralizing the task of optimizing processes to the person working in production
Do you need to have certain prerequisites/prior knowledge to drive and work with improvements continuously?	Owning the process in order to enabling support for kaizen
	Get to know the organisations processes and problem-solving routine
	Setting an example in respect to dealing with errors
	promote to finding the root cause and learn from them
	"The ability to distinguish important problems from futile ones and to solve problems according to company policies without help"
What are common obstacles in	You are not at gemba where the action happens

improvement work?	Not owning your process
What is a first line managers role in improvement work?	To be present at the shop-floor i.e. at gemba
	A big part of the leader's responsibility and role is to support daily kaizen
	Make sure that everyone is involved and capable
	Leaders should not force kaizen from the top down, but rather that he is enabling, encouraging and coaching kaizen from the bottom up"
	Demands leader's continuity
	Promote the CI process but not intervene directly in the problem-solving process
Recommendations	Build a culture that is build upon CI
	Do not view standardized work as a set-in-stone way of working
	Gemba walks and projects are something that the all employees should practice in order to understand processes and to find root causes of the problem at the source
	View kaizen an integral part of leadership
	Relentlessly working on trying to find and eliminate waste in the processes and operations and thereby increase the value-adding activities.
	To work effectively in groups to solve problems it is important to have the right group size i.e. group size of five with one TL per group and one GL that is responsible for 4 teams with respective TL
	Create both problem solving groups and work groups

Create a vision and align goals	**Answer**
First line managers role	Make sure that the correct big-picture goals are accomplished i.e. bottom-up meet top-down
Hoshin Kanri process	Important to have a catch-ball process, enables people to participate and to get an input and buy-in regarding how much involving people or divisions can handle in relation to the goal
	To connect people both vertically and horizontally in the organisation is the focus of the hoshin

	process, from divisions to the individual
	a long-term perspective exist and people get to the goal by working in a circular or spiral way. Helps in creating a transparency by breaking down the problem and goals from the top management and cascading it down in the organisation into targets which facilitates the interpretation for the team members.
Recommendation	Aim is to get the whole organisation on the same page, leading to a big competitive advantage having a culture that allows hoshin kanri It is crucial to not let more urgent and short-term goals impact important long-term goals
Prerequisites/ Obstacles	The organisation need to have some basic prerequisites in place for it to work e.g. visual management, a safe and secure environment, a sense of mutual prosperity, trust, skilled employees in problem-solving and a strong group leader system. To know the values, principles, methods and tools of the organisation and how they support each other and are integrated The ability to understand the company's aims and formulate their own plans to how they want to evolve their teams and departments to contribute to improvement

Appendix E

Self- development	Answer	No.
Definition and meaning of self-development	Self-development is important in order to understand your own tasks and goals.	1
	As leader you have to have a driving force to self-develop	1
	First understand what you want to do and why you want to do it after comes what and how	1
	That you want to and have the desire to change and develop.	1
	You take time to change and continuously reflect i.e. without reflection no learning	1
	In logistics and production it is about going out and seeing for myself and changing things by myself. It is also about training to detect muda. It takes time but it is important to study.	1
	Having an openness collectively, that you together have an ongoing dialogue about the future state and how to translate that and what it means for me. So, to have a self-awareness is important	1
	To coach your employees to develop then you will develop as a leader and that you have the right knowledge	1
	To think about your own strengths and weaknesses and how you should develop to handle this responsibility.	1
	We have a Manufacturing Engineering side and a collective side and if you should work with self-development you need to work with both sides	1
	It is about working on your behaviours and thoughts and get a possibility to develop them and highlight which behaviours I have and how I really think	1
	It is about challenging yourself and learning a new behaviour.	1
How to support self-development for first-line managers	You need to "bottna" in your role and translate it to action	2
	Start up a book circle with people at the organisation. In between these meetings the management team/group performs different tasks and reflect once a week together. This gives an opportunity to share what you learnt and learn from talking about it but also learn what others have learnt	2
	Send people to courses that educates about lean and lean leadership but that alternates between theory and practice i.e. lean thinking and lean doing.	6
	Encourage them to both reflect and try out	1
	More real life cases	6
	Coaching from a more experienced person or college to discuss and exchange ideas with is beneficial.	3

	/ "Provide a lean expert to a first line manager during 12 weeks where you train them and try to make lean methods and tools to work because training is crucial"	
	The best tool for self-development is to work with feedback, seek feedback and make it as relevant as possible and be open for it.	1
	Use different assessment tools e.g. self-evaluation where you get feedback	1
	We used communications profiles consisting of four categories; Friendly, Expressive, Analytic, Impeller/prodder. Then we adapted the work tasks to which communication profile you were. By doing this they could talk the same language	1
	Have directed leader education/training and team development in seminar form	1
	Self learning tools e.g. self assessment for managers/leaders which consist of 8 questions where 2-8 areas are identified. These areas are thought to be areas that you work a bit more with during the year. Based on the questions you set individual goals that affect the identified areas.	1
	Expressing that they are not alone and that they are not expected to manage everything alone	1
	Use a model as support to identify what you had done and what more you could do in that area and reflect upon it	1
	First develop yourself within the areas/task you work with and reflect/think about where and what you put time on every week? Do I work with all those tasks? Create a standard for what you do.	1
	Develop an engagement tool where the SVs work in groups to identify strengths by answering a survey	1
What prerequisites/support do you need from your superior to self-develop	That they emphasise the importance to self-develop	1
	That they reserve and plan in time for all to train	2
	Sending people to training/education to gain insight to themselves and get to know each other more on the dept.	2
	That there exists natural forums or groups that run dialogues regarding the ongoing changes. That they break down the sub targets/milestones so that they become more manageable.	1
	To include first line managers in the discussion regarding the definition of the goals and giving them space to break them down to their own level.	1
	Trust is important	1
	That they push you and challenge you and make sure that SVs are out in flow to a higher degree which increases the learning curve	1
	To support and help them prioritize to put time on value adding tasks e.g. give support to decline	1

	meetings and instead put those hours on more important things	
	Receiving individual leadership development	1
	Coaching is essential. With the help from coaching you get feedback and reflection regarding where to develop more	2
	The manager at the next level needs to have understanding for the development that has to be done in order to support it.	2
	Different forms of on the job training	1
	Help and support the manager/leader to think outside the box.	1
	Inspiration and encouragement	1
How do you handle a person that is locked/unwilling to self-develop	You have to respect them and try to understand the reason why they are resisting or are unwilling	2
	If a manager/leader has lost his/her driving force and do not want to become a better manager/leader then that person should not have that job. It is not respectful towards the people. Help that person find a job that they like and are passionate about	1
	Important to not ignore that person, as leaders or HR you have to act to do something about the situation	1
	Have patience to give people time to change	4
	Help people to help themselves and not just give them a ultimatum i.e. get on the train or get off it.	2
	Talk about possibilities for training/education	1
	You should not only view resistance as something negative	1
	It can be a individual- or generation question but if you are clear about the new game rules it is up to them to either play or not play.	1
	In a big company it is often the persons own minds-set that is the biggest barrier so to address this can be to have an own department that focuses on working with helping people get a lean mind-set	1
	You need to adapt to the individual but still make demands and challenge	1
Recommendations	Create a standard so you know when to coach and develop your employees and to not forget any tasks. This standard then is developed over time.	1
	In a change focus on people that are somewhere in between and not very negative	1
	Work in all four quadrants in the Ken Wilbor model i.e. structure, behaviour, thinking and culture to self-develop	1

Coach and develop others	Answer	No.
Definition and meaning	Can be performed in a team and individually	1
	Don't need to know anything regarding the problem	1
	Finding the answer through reflection	6
	Ask questions to guide a person to find an answer	9
	Contributes to a person's self-development	7
Currently working with coaching	A program where the leaders can get help from lean experts which includes coaching from the expert	1
	Theoretical education	1
	The coaching needs to be adjusted to the individual and what they feel comfortable with	2
	Try to coach based on what can be noticed on for instance "daily control" and visual planning boards	2
	Work with tools	1
	Open house where managers can come to be coached in various topics	1
When to coach	If its not a emergency situation	1
	During daily control	2
	Improvement meetings	1
	During goo see (gemba walks)	1
Prerequisites	Know the person	2
	Know the process	3
	See people as a part of the solution not the problem	1
	Knowledgeable about group dynamics	1
	Self- confident	2
	Being able to relate the coaching to the goals	1
	Being patient	4
	Have a holistic view	2
	Equality	1
	Being able to restrain yourself	1
Obstacles	Research relating to coaching is based on individual coaching which often might not be the situation	1

	in companies where collective coaching is more commonly used	
	People don't always want to be coached, they want answers	2
	People don't know how to coach	1
	There is not enough time	3
	The coaching might be affected by the power imbalance between a superior and a subordinate	2
	Lacking commitment to ask the right questions	1
	Not taking leadership seriously enough	1
Recommendation	Something that is very is to work with A3 and coach the co-workers in the A3 they own. Ask questions instead of giving the answer	1
	Follow-up coaching by giving feedback	
	We have an open house where people can come and discuss problems	1

Support daily kaizen	Answer	No.
How to work with improvements in production	We work with catching deviations, both small operative deviations and larger deviations (kazien projects)	2
	Understanding and getting the whole picture and not just a single detail. Then it is about breaking down the problem and understand what area to focus/attack	1
	We divided the organisation in zones/areas, every zone had an improvement meeting every week that was mandatory which included people from the office	1
	Different kind of improvements, smaller and easy improvements that was adressed and fixed imediatly after been written on the board and larger ones that required doing a PDCA.	1
	For every implemented improvement the group in that zone got 50 SEK to do something togheter as a group and not indiviually. Each group was between 5-15 person.	1
	Everyone has two work tasks, the first is to create results and work according to standard and the second is to improve	1
	We have moved pass working with suggestionboxes and price for best idea, everyone is expected to contribute	1
	Emhasise the improtance of making time	1
	At all levels we have improvement boards where initative are taken and followed up on	1
	Often about improving the standard	1

	We worked with value flows and to systematize the value flows, so we developed tools on how you map the flow	1
	You have to get a new way of thinking and behaving which means that you should work in cross-functional teams to develop and improve the process	1
	We used Scanias house (foundation) and a lean model to stabilize the flow e.g. set standards	1
	It is much about culture and that is something that does not come over a night	1
	We have daily improvements, tactical improvements and structural improvements. The first means making changes in a reactive basis, the second means gathering the team and having firm meetings where improvemets are discussed and the last is larger changes e.g. change the computer system.	1
	Every 14:th day the production line is shut down and all sit in their teams and work with improvements and changes.	1
Did a first line manager own his/her process?	Yes, as long as the changes/improvements did not affect the product, then it has to go by production technicians	2
	It is about the mind-set, if I believe i can't change/affect anything then nothing will happen, so focus more on what is possible to affcet and influnce than on things you can't	1
	Yes, they had mandate to implement minor improvements that did not require a big investment	1
	We prioritazed the minor improvements because this is easier to change from and it helped people not lose the desire/will	1
	Ownership is very important and if you do not own your process as a SV then we have a problem.	1
Do you need to have certain prerequistes/prior knowledge to drive and work with improvements continously?	Yes, in order to be a teacher and drive improvement work they have a whole lean toolbox to learn	1
	Yes, becuase in order to understand that an improvement is needed you need to understand. However, a certain mind-set, desire/will and driving force is needed in order to wanting to work with making improvements	1
	You need to believe that it is possible to change	1
	Dare give it a new chance even if it did not work the last time	1
	There is no short cut it is about doing, doing, doing and then going and seeing for yourself.	1
	It is about working with developing and training yourself and taking on larger and larger groups	1
	You need some sort of theoretical knowledge	1
	Everyone is different skilled but we (management) tries to be out and coach first line managers in everything they do	1

	The starting guideline is that you have a interest in people.	1
	Wanting to lead by being engaged and being able to convey joy	1
What are common obstacles in improvement work?	That you gather people to state that there are no ideas	2
	That you feel that you don't have time for it becuase you have to deliver in other areas	2
	Reserving little time	2
	Prioritaizing in the wrong way	1
	Not the right dynamic in the team or not understanding the goal	2
	Not owning you process	2
	Building a support system but it works in the opposite way	1
	You as a SV want to improve but your SI thinks everyting is fine as it is	1
	Not being present on the shop-floor	3
	That they do not know how and what improvements to make	2
	The no-answer on a suggestion is not the big problem it is that you dont get any feedback on a suggestion	1
	There is a uncertainty among those who are expected to contribute	1
	Not wanting to take responsibility for problems but instead handing it over to someone else, the hug factor	1
	Lost of will	1
	Lack of coaches	2
	Having a team where two wants to work with improvements while five do not	1
What is a first line managers role in improvement work?	They have the main responsibility but the more they can delegate the better	1
	To have a ambition to strengthen their TL and employees to manage problems/improvements themselves over time	3
	To be behind their employees and support them and step in when needed to take a decision	3
	The less the SV is involved in improvement work means that their employees can handle it good by themselve	1
	To keep the puls going	
	Inspire, have a will to improve and coach and not provide the solution	4

	They should be involved when prioritizing	1
	To follow up on the daily work and what is going on now and solving things directly	1
	To be clear about that the improvements will not jeopardise peoples jobs but instead save time and not eliminate people	2
	Help others to come up with suggestions	2
	Supervisors should act a bit as a project coordinator	1
	To use and know problem-solving methods and lead others in these methods without needing a lean expert	1
	Engage the employees and being deeply involved	1
	Have the main responsibility for meetings in the beginning but then handing over the responsibility to the TL or employees and instead be present and ask question and show interest.	1
	Give your employees the opportunity to work with improvements and problems and not just demand fire fighting	1
	It is all about request, request, request	3
What kind of support does a first line manager need both up and down in the hierarchy to manage continuous improvements?	Their superiors needs to demand improvements explicitly and it should be an integral part of the everyday life	2
	Their superiors need to appreciate and help to avoid things going back to how it were before	1
	Time and encouragement	4
	Some kaizen resource for smaller improvements	1
	Patience	1
	Long-term thinking	1
Recommendations	You need patience and insight that this is long-term	1
	Go on study visits	1
	Invite someone from other company and let them share their story and what they have done	1
	Participate in regular meeting in the beginning even if it does not give anything	1
	Give good reactions and arguments on improvement suggestion and people will listen and keep finding improvements	1
	Every organisation is their own and to just copy others work is not wise nor beneficial	1
	The ideal is to create change groups that works with improvements and have the main responsibility	1

	Can be hard to count home the gains in the beginning but it is vital to have patience and not give in	1
	Develop a checklist to use when a deviation is detected	1
	The management group often went out to coach and had a team with coaches present at all times and helped with methods and coaching of the employees.	1
	Important to have a growth philosophy in the whole lean approach	1
	To boost people to wanting to free time the management worked with creating "fun" roles/work so that when they could free time and take away waste they could get that "fun" role instead.	1
	Operators view on SV role for CI: " It is about being demanding continuously, you have to be reminded and nagged upon maybe" another sais: " It is about this with controlled demand, it has to exist. Changes has to be on the agenda and it has to come a clear demand from SV:s and that you have the structure. That you talk about it, daily or weekly depending on the circumstances in the organisation. A third sais: "push me" and a fourth sais: "support me and be there so I can do my job".	1
	Do not get hung up or only consider the bosses suggestions	1
	Important to believe in yourself which takes time and have a manager/leader that does the same	1
	To be prepared that in the beginning only minor improvements related to your work environment will be performed but with time when you believe in yourself and can discuss your ideas with others and the way to work is developed then you can see the improvements in a larger scale. You grow into the role with improvements and can generate more advanced ideas and suggestions.	1
	The operators can be responsible for making the improvements while manufacturing takes care of the documentation	1

Create a vision and align goals	Answer	No.
	Make sure that the goals contributes to the goals of the his/her manager	1
	To perform improvement work that helps reaching the goals	1
First line managers role	Need to understand and be able to communicate the vision	3
	Follow the directions guidelineed out by the superiors	1
	Identify what is possible to influence in his/ her situation	2

	Have a holistic view	2
	They need to know they challenges of the company	1
	Responsibility to understand what the goals means for themselves	1
Currently working with aligning goals	Using a survey that examines how well the individual goals aligns with the companies	1
	Possibility to adjust and balance the goals depending on what is possible to achieve i.e. having a catch-ball process	3
	Trying to not be so result controlled	1
Translating the company's goals to own goals	Collective leadership that breaks down the goals at each level	1
	Put own words to what the goals means for me	1
	The goals that are set at a senior management level must be evaluated from lower management with what is possible to achieve (catch-ball)	1
How to communicate long-term goals	Make the long-term goals clear so the first line managers understand them and what they mean to them so they can communicate them to their subordinates	1
	Be clear about what the long-term goals means for them so that they can communicate it to their subordinates	1
How to involve subordinates	Involve the subordinates by communicating the goals	3
	Involve by clearly communicate that this our goals, not something "they want us to do"	1
	Show that you as a leader care about everyone and create a sense of pride for the results	1
	Treat people in a respectful manner	1
Prerequisites/ Obstacles	Superiors must set their goals in the right time	1
	Common that principles are thrown away although a lot of efforts have been used to develop them	1
	Focus on things not possible to influence	1
	Devotes little time	1
	Demotivating with setting too hard or easy goals	1
	It's common that people don't know the goals and why they exists and how they contribute to the development of the organisation	3
	To enable working with goals the leaders need support and discipline from their superiors	1

Appendix F

Name		Fyll i [med en 1]		
Activity	Tid [tot]	50/50	Produktion	Kontor
Daily control using RTB				
Lagledarmöte				
Ledningsgrupps möte				
Rehabsamtal				
Visuellt ledarskap				
Coaching (individuell och grupp)				
Gemba-walks				
Check-in				
Administration (TIA, tidinfo)				
Semester och ledighets ansökan				
Medarbetarsamtal				
Bemanning				
Akuta ärenden				
Övriga personal ärenden				
Förbättrings arbete				
Kvalitetsrelaterat				
Check-ut				
Skyddsrond				
Utanför/ hemma				
Nätverkssamtal				
Bok cirkel				
Reflektion				
Other				
Totalt:	**0**	**1**	**1**	**1**

Appendix G

Identifierade aktivitet	Uppskattad tid [h/vecka]	Utförd [P/K]
SQD – MÖTE		
Lagledarmöte		
Ledningsgruppsmöte		
Rehabsamtal		
Visuellt-ledarskap		
QPS coaching		
Gemba walks		
Tidinfo		
Admin (svara mail, dokumentation etc)		
Semester- och ledighetsansökan		
Medarbetarsamtal (Utveckling/ Lön)		
Bemanning (Se till att det finns personal)		
Akuta ärenden		
Övriga personalärenden (ex. drogtest/ samtal)		
Förbättringsarbete		
Kvalitetsrelaterade (containment, kvalité återföring, övrigt)		