CHALMERS
UNIVERSITY OF TECHNOLOGY

Strategic consensus regarding lean integration into manufacturing strategy

A case study in the automotive industry

Master's thesis in Quality and Operations Management

Georgia Valari

Department of Technology Management and Economics
Division of Operations Management
CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2015
Report No. E2014:105

Report NO. E2014:105

Strategic consensus regarding lean integration into manufacturing strategy

A case study in the automotive industry

Georgia Valari

Department of Technology Management and Economics
CHALMERS UNIVERSITY OF TECHNOLOGY
Göteborg, Sweden 2015

Strategic consensus regarding lean integration into manufacturing strategy

A case study in the automotive industry

Georgia Valari

© Georgia Valari, 2015

Reproservice

Report No. E2014:105
Department of Technology Management and Economics
Chalmers University of Technology
SE-412 96 Göteborg
Sweden
Telephone +46(0)31-772 1000

Abstract

The Top Management at KAG, a first tier supplier in the automotive industry, has identified the need to integrate lean in the company´s strategy and therefore acknowledged a need for change. Global Lean Manager, a middle manager at KAG, initiated during 2014 the change by together with the operating managers formulate a lean vision and a detailed implementation plan in how lean is going to be integrated in the company.

The citation: "How can managers be expected to take action in support of a strategy when they don´t agree with it, or even know about it?" (Floyd &Wooldridge, 1992, p.27) stresses why it is interesting to investigate the strategic consensus among managers. It is interesting since it helps to emphasise strategic issues that are not known or shared among managers. The purpose of this study is to analyse the level of strategic consensus among managers in top, middle and operating level regarding how lean has been and should be integrated in a company´s MS.

The master´s thesis was a single case study about the company KAG. The data has been gathered through interviews with managers among three managerial levels and in addition through focus group, so called workshops, where the lean implementation has been discussed by operating managerial level.

The theoretical framework focuses on describing what strategy is and how it takes its form. Further, it explains in detail manufacturing strategy that is divided into structural and infrastructural decision areas. Thereafter the theoretical framework aims to explain the definition of lean, and its principles and elements. Lean and manufacturing strategy is combined in an operations strategy-matrix, which is used as the foundation of creation of the interview questions. Since the purpose of this study is to analyse the level of strategic consensus do the theoretical framework also includes a description of that term.

The result emphasises each managers´ understandings about the manufacturing strategy decision areas and lean. It also presents how lean has been structured and implemented within KAG. Thereafter follows an analysis that investigates the level of strategic consensus among the three managerial levels. The analysis indicates that the level of strategic consensus varies between the managerial level and the manager´s function. It also shows that the company struggle with integrating lean into manufacturing strategy. The different managerial levels have different view on the strategic decision areas. Further, the managers distinguish between lean thinking and tools, and see it as two separate components instead of a system. In addition the analysis present that it is a missing link between lean and corporate strategy and also a missing link between the managerial levels.

Keywords: *Strategic consensus, manufacturing strategy, lean*

Acknowledgements

This master´s thesis has been performed for the master´s program Quality and Operations Management at Chalmers University of Technology, Department of Technology Management and Economics. The master´s thesis has been performed at a case company KAG that is a first tier supplier in the automotive industry. I would like to take this opportunity to thank my company supervisor, the Global Lean Manager at KAG, which supported and helped me through the master´s thesis. A special gratitude to the stakeholder, the Top Manager Operations at KAG, whose contribution in giving suggestions on how to work further on the master´s thesis have had a major impact.

A special thanks to my Chalmers supervisor Nina Edh Mirzaei who guided and mentored me completing the master´s thesis. I really appreciated her expertise within the research field and the many hours of discussions, which had further enhanced my educational development. In addition, without Mats Winroth´s generous support this study would not have been possible to make.

Finally, deepest appreciations to all the interviewees; Top Managers, Plant Managers, Operations Managers and Lean Managers at KAG, who took the time to help me create this report and enabled me to complete my master´s thesis.

Gothenburg, March 2015

Georgia Valari

Table of contents

1 Introduction 1

1.1 Problem description 1

1.2 Purpose and research questions 2

1.3 Case study – KAG 3

1.4 Delimitations 3

2 Theoretical framework 5

2.1 Strategy 5

2.1.1 The missing link between manufacturing and corporate strategy 6

2.1.2 Manufacturing strategy 6

2.2 Lean 9

2.2.1 Definition, scope and goals of lean 9

2.2.2 Lean Principles – '4P' model 10

2.3 Lean implementation 13

2.3.1 Implementation barriers 14

2.4 Combining Lean and Manufacturing strategy 15

2.5 Analytical framework 16

2.6 Strategic Consensus 18

3 Methodology 19

3.1 Research strategy 19

3.2 Research process 19

3.3 Data collection 20

3.3.1 Interview 20

3.3.2 Focus group – Global lean workshops 23

3.4 Analysing data 23

3.5 Research quality – criticism 24

4 Empirical findings 27

4.1 Different managerial-level views regarding MS content 27

4.1.1 Documented operations strategy 27

4.1.2 Prioritisation regarding competitive priorities 28

4.1.3 Structural decision areas 29

4.1.4 Infrastructural decision areas 33

4.2 Different managerial-level views regarding lean 37

4.2.1 Managers' definition of lean 37

4.2.2 Managers' reasons to implement lean 37

4.2.3 Lean achievements 38

4.2.4 Long-term lean goals 39

4.3 Company vision 40

4.4 The integration of lean into MS 40

4.4.1 How lean has been formulated and implemented 40

4.4.2 Managers' description of the lean implementation 42

4.4.3 Managers´ perception of lean progress 43

5 Analysis ____ *45*

5.1 The level of strategic consensus regarding MS content ____ **45**

5.1.1 The level of strategic consensus among the managerial levels regarding lean ____ 45

5.1.2 The level of strategic consensus among the managerial levels regarding MS ____ 47

5.2 The analysis regarding the MS process ____ **53**

5.3 The missing link to corporate strategy ____ **55**

5.4 Summarising the findings ____ **55**

6 Discussion & Conclusions ____ *57*

7 Reference list ____ *61*

Appendix 1: Interview questions ____ *65*

Appendix 2: Prioritization of performance objectives ____ *67*

Appendix 3: Five implementation steps ____ *68*

Index of Tables

Table 1: Location and number of employees of the plants. 3
Table 2 The manufacturing decision areas in detail (Hayes et al., 2005, p. 41) 8
Table 3. Lean achievements according to managerial level. 39

Index of Figures

Figure 1: Formation of strategies. (Mintzberg, 1978, p. 945) 5
Figure 2. Manufacturing strategy division 6
Figure 3. Definitions of each competitive priority (Dangayach & Deshmukh, 2001) 7
Figure 4. A '4P' model of lean (Liker, 2004, p.6) 10
Figure 5. The TPS house 11
Figure 6 The lean operations strategy-matrix (Slack & Lewis, 2011, p. 95) 15
Figure 7. The analytical framework 17
Figure 8. The blind men and the elephant: metaphor for strategy formation (Mintzberg et al., 1998) 18
Figure 9. A schematic illustration of the research process 20
Figure 10. Overview of the interviewees 22
Figure 11. An illustration of how the analysis was performed 23
Figure 12. Managerial levels informed about the documented operations strategy. 27
Figure 13. KAG's definitions for competitive priorities. 28
Figure 14. The average score of the competitive priorities among the three managerial levels. 28
Figure 15. The workshop process of a lean vision. 41
Figure 16. KAG's lean definition 41
Figure 17. KAG's lean house with eight lean pillars. 42
Figure 18. The managers´ perception of lean progress. 43
Figure 19. Analytical steps based on the analytical framework. 45
Figure 20. Changes based on findings on the analytical framework. 58

1 Introduction

This section presents the problem description, the purpose of the thesis and the research questions. Furthermore, the chapter is concluded with a presentation of the case company, the delimitations of the thesis and the disposition of the report.

For the automotive industry the 21st century is characterised by global competitive markets driven by the customers (Bhamu & Sanhwan, 2014). To stay competitive a company needs to meet the customers´ demand of shorter lead times, higher quality and lower costs (Bergman & Klefsjö, 2010). This creates an increased pressure for the companies to ensure the required flexibility and efficiency of their processes (Slack & Lewis, 2011).

Operations strategy, also referred to as manufacturing strategy (MS), is how the operations function contributes and follows the business direction through create a fit between market requirements and operations capabilities (Slack, Johnston, & Chambers, 2007). The pioneer in MS, Skinner (1969), stresses the importance of using the operations function to strengthen company´s competitiveness. Furthermore, Skinner (1969) argues that few top managers know that the decision making and the routines regarding manufacturing limit the decision options of corporate strategy. It takes years to change decisions in manufacturing regarding for example facilities and equipment. Considering this, it is important to establish a link between manufacturing and corporate strategy so the company will not be in a non-competitive situation (Skinner, 1969). Numerous researchers are emphasising the importance of operations strategy for successful organisational performance (Skinner, 1969; Slack, Johnston, & Chambers, 2007; Hayes et al., 2005).

MS often distinguishes between content and process. Content refers to the strategic choices related to competitive performance priorities and strategic decision areas (Slack & Lewis, 2011) meanwhile process refers to the formulation and the implementation of the strategy (Acur et al., 2003). According to Dangayach and Deshmukh (2001) MS process has gained less attention and it is suggested that future research should focus more on this area. The thesis is going to emphasize both MS content and process.

Bicheno (2004) highlights that future operations research papers should combine operations strategy and lean. Japanese automotive manufacturer Toyota introduced lean in the 1950's. Toyota has focused on faster and flexible production systems and has since then been consistently successful (Womack, Jones, & Roos, 2007; Liker, 2009). Lean is focusing on eliminating non value added activities aiming for establishing smooth processes and work with continuous improvements (Slack & Lewis, 2011). Lean is more than an approach to business improvement; it is a way of thinking aiming to create value for customers. Many industries and companies have adopted lean (Womack, Jones, & Roos, 2007).

1.1 Problem description

Many decisions associated to operations are made every day. It is therefore crucial for effective decision making to have a shared understanding regarding strategic organisational issues (Boyer & McDermott, 1999). A major factor for a successful strategy implementation is that there is high level of strategic consensus among managers (Noble, 1999). Strategic consensus is the level of agreement within a company regarding a strategic issue (Boyer & McDermott, 1999). Low level of agreement among groups in a company may lead to that realised strategy is different from the intended (Boyer & McDermott, 1999). A central assumption regarding strategic consensus according to Kellermann et al. (2005) is that high level may lead to an easier implementation of a strategy and thereby a better performance of

a company. A poor implementation of a strategy may occur when middle and operating-levels are not well informed or do not get support for the strategic direction (Floyd & Wooldridge, 1992). Rapert, Velliquette and Garetsson (2002) suggest that future research should examine how the level of strategic consensus may differ across different levels in an organisation. Strategic consensus in this study is defined as the level of agreement (Boyer & McDermott, 1999) of how lean has been and should be integrated into MS, among managers at top, middle, and operating levels (Kellermanns et al., 2005).

As mentioned has lean been a popular approach in different industries and companies. The lean management concept has been studied in detail, but still there are huge differences and ambiguity of the definition (Pettersen, 2009; Hines, Holweg, & Rich, 2004) since lean has evolved over time (Hines, Holweg, & Rich, 2004). Bhamu and Sangwan (2014) conclude that it is an urgent need of defining lean since the variety of lean definitions makes it hard for managers in companies to implement lean. To avoid conflicting opinions regarding which lean concept that the company is implementing Pettersen (2009) suggests that the company should raise the awareness between the conflicting opinions. A major impact to successful implement lean is that the company adapt the lean concepts by following its own needs (Pettersen, 2009).

1.2 Purpose and research questions

It is interesting both from practitioners and researchers point of view to investigate how the level of strategic consensus is among three managerial levels. It is also interesting to investigate how the level of strategic consensus is regarding lean, since it is hard for practitioners to implement lean due to the differences in its definition. Interesting is also to investigate how lean can be integrated into manufacturing strategy since Bicheno (2004) stressed that future research should combine lean and manufacturing strategy. This results in following purpose:

The purpose of this study is to analyse the level of strategic consensus among managers in top, middle and operating level regarding how lean has been and should be integrated in a company´s MS.

To be able to answer the above stated purpose three research questions are formulated. Research question 1 aims to answer the different understandings the managers may have regarding the MS content, which means the view regarding the competitive priorities and the strategic decision areas. The second research question aims to investigate the differences among managers´ understandings of the lean implementation. To answer research question 3, it is needed to have the answers of research questions 1 and 2 regarding the managers´ understanding of MS content and lean implementation. Research question 3 aims to investigate the level of strategic consensus regarding the link between MS and lean.

Research question 1: How do managers understand MS content?

Research question 2: How do managers understand lean implementation?

Research question 3: What does the level of strategic consensus look like regarding the link between MS and lean?

1.3 Case study – KAG

The master thesis was performed together with KAG, a first tier supplier in the automotive industry. KAG is a global leader in development and manufacturing of a specific product for the automotive industry that of confidential reasons is not explained. The company's goal is to satisfy the customers by ensuring high product quality and functionality, combined with offering customised solutions. KAG has 4 730 employees and has facilities in USA, Mexico, Germany, Czech Republic, China and Russia, see Table 1 below (KAG, 2014).

Table 1: Location and number of employees of the plants.

Facility location	**Number of Employees**
USA	100
Mexico	1200
Germany	1000
Czech Republic	1900
China	500
Russia	30

The company has now reached the point where the pressure from customers and the rapid market development makes an effective operations strategy a necessary step to stay competitive. For this reason did KAG implemented lean tools to improve their operations strategy. During spring 2013 the company has started to structure a lean organisation. The Top Management (TM) at KAG has identified the need for implementing lean at the company and therefore acknowledged a need for change. The lean organisation is implemented by the TMs through hiring a manager responsible for implementing lean globally, the Global Lean Manager, hereinafter referred to as Global LM. At the same time local Lean Managers, referred to as LMs, were also hired and given the responsibility for each plants lean progress.

In the middle of 2013 the Global LM initiated the work of integrating lean in the company, and according to him the company is currently in an initial ramp up phase. The global LM together with the local LMs during 2014 formulated a lean vision and a detailed implementation plan in how lean is going to be integrated in the company.

1.4 Delimitations

This thesis purpose is to analyse the level of strategic consensus among managers in top, middle and operating level regarding how lean has been and should be integrated in a company´s MS. To gain deeper knowledge a narrow scope of theories and the focus in the theoretical framework has therefore been on strategy formation, MS, lean and strategic consensus. However, the time frame of this work delimited the thesis from an in-depth investigation of the different lean tool practices. In addition, the research does not include any follow up on how successful lean integration into the company´s MS has been.

The scope of the master´s thesis is to investigate the shared understanding among three managerial levels. The master´s thesis delimits to only focus on the plants located in China,

Czech Republic, Mexico and Germany. Russia is excluded because the plant opened the spring 2014 and is relatively small compared to the others. USA was also excluded since there is no lean manager at the plant, which would have lead to lacking a point of view from one managerial level.

2 Theoretical framework

This chapter presents the theory needed to understand the research. The first topic is the definition and description of a strategy formation, followed by in more detail explanation of MS. Thereafter is the topic lean definitions, principles and implementation. The chapter also consists of an analytical framework that combines the theory regarding MS and lean. The chapter is concluded with a description of strategic consensus.

2.1 Strategy

The word strategy was popular in business studies in the 1960s and has then become a diverse term (Strannegård & Styhre, 2013). It has its origin from the Greek language meaning 'leading the army', what is a useful metaphor for today's idea of the term (Slack & Lewis, 2011). Mintzberg (1978, p. 935) states that the strategy definition is: '…a deliberate conscious set of guidelines that determines decisions into future.' Mintzberg (1978) argues also that strategy has never been touched and only exists in people's thoughts. Further, strategy can lead behaviours or even describe the pattern of behaviours before it occurs (Mintzberg, 1978). Strategy in this study is defined by handling the total picture of a company. It contains of broad objectives aiming towards fulfilling the company´s overall goals (Slack & Lewis, 2011), over a long-term time perspective (Hayes et al., 2005). A company strategy is the plan have to manage resources and routines, internal factors, and markets and supplier, external factors (Strannegård & Styhre, 2013).

The formation of strategy can be divided into *intended* and *realised* (Mintzberg, 1978), which can be combined in three different ways, see Figure 1 below. Intended strategy can either get realised or unrealised. It is called deliberated strategy when intended strategy gets realised. Further, an intended strategy that gets unrealised can be caused by many reasons for example unreachable expectations or unpredicted environment changes. These reasons are also valid on why for example emergent strategy occurs. An emergent strategy is when realised strategy was never intended (Mintzberg, 1978).

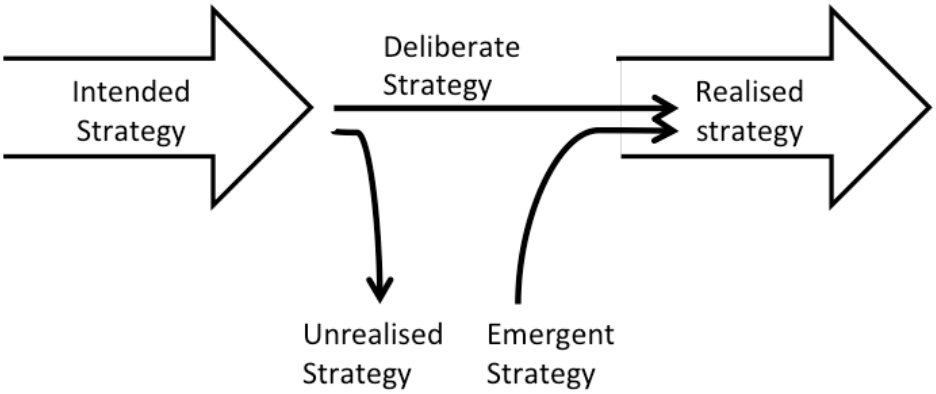

Figure 1: Formation of strategies. (Mintzberg, 1978, p. 945)

2.1.1 The missing link between manufacturing and corporate strategy

There is a distinction among the levels of company strategies: corporate strategy and functional strategy. Corporate strategy is the highest level and refers to decision-making regarding industries and markets, and it also covers how the company decides to allocate the corporate resources (Hayes al., 2005). Moreover, corporate strategy is addressing all issues facing the company for example choosing customers and the needed operations (Miltenburg, 2005). It refers to the decision making of how the company positioning itself to achieve competitive advantage (Hayes et al., 2005). Functional strategy can be sales/marketing, manufacturing, R&D and finance and control strategy. This report focuses on MS, which aims to support a company´s decision making in how to direct resources so it can differentiate from competitors. MS covers decision making for all activities from purchasing to distribution needed to deliver a product (Slack & Lewis, 2011), see further in chapter 2.1.2. Since the terms, MS and operations strategy, are synonymous are they used interchangeable through the whole report.

Hayes et al. (2005) suggest that the foundation of a strategy should be shared and sustainable values among the employees, since when a strategy is set it is difficult to change it. The shared values link the corporate strategy and MS, and companies that strongly held them are often the most ablest to make a competitive advantage by its manufacturing capabilities (Hayes et al., 2005). Skinner stressed also that by utilising the manufacturing the right way, might lead to a competitive advantage. Further, a link between corporate strategy and MS is needed to create a competitive production system (Skinner, 1969).

2.1.2 Manufacturing strategy

MS is a plan how to produce and distribute a product (Skinner, 1969), also defined as the actually pattern of decisions that are made (Hayes et al., 2005). MS often distinguishes between content and process, illustrated in Figure 2 below. Content is about what actual is set into practice and has two main approaches; competitive priorities and strategic decision areas (Slack & Lewis, 2011). Meanwhile process refers to how the strategy has been formulated and implemented (Swink & Way, 1995). Both MS content and process are explained in more detail later in this chapter.

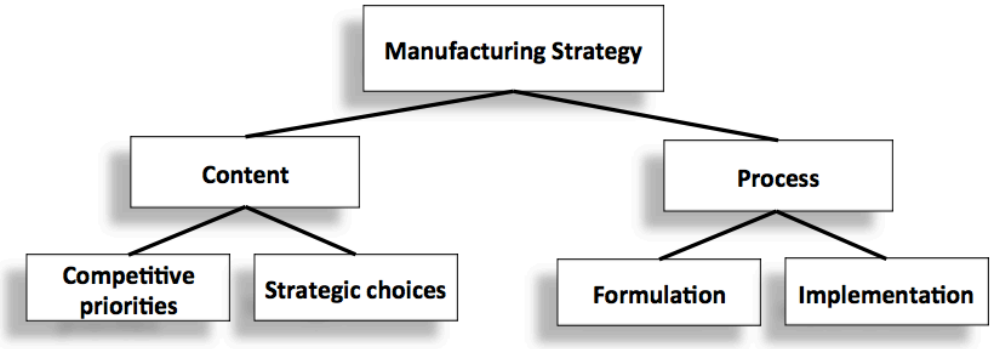

Figure 2. Manufacturing strategy division

The last two decades green MS has been a well-discussed theme (Sarkis, 2012). Stakeholders force companies to be more environmentally efficient (Dangayach & Deshmukh, 2001), but the pressure on companies differ and suppliers lack incentives (Hall, 2001). Not only do companies need to act because of legislations, but also because of creating an environmental

image towards the customers and society. The environmental image is a proactive action enabling a competitive advantage for the company (Sarkis, 2012).

Manufacturing strategy content

As mentioned MS content is distinguished between competitive priorities and strategic decisions. MS is the fit between market requirements and operational resources (Skinner, 1969; Slack & Lewis, 2011). The market requirements are translated into competitive priorities and the decisions regarding operational resources are divided into two main strategic decisions: *structural* and *infrastructural* (Slack & Lewis, 2011). The effectiveness of MS content is measured as the consistency between competitive priorities and the two main strategic decisions (Hayes et al., 2005; Slack & Lewis, 2011).

Different prioritise of competitive priorities or so-called manufacturing capabilities are differentiating a company compared to its competitors. Dangayach and Deshmukh (2001) refer to the definition of Spring and Boaden (1997) regarding the four competitive priorities: *cost, quality, delivery* and *flexibility*. The definition is described in Figure 3 below. The competitive priorities are reflecting and created through knowing the market: what the customers require, the market position, and how the competitors are acting and performing (Slack & Lewis, 2011).

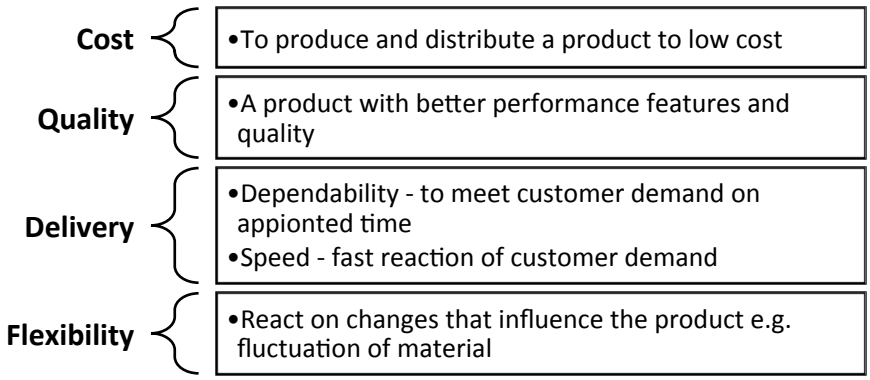

Figure 3. Definitions of each competitive priority (Dangayach & Deshmukh, 2001)

There are two main theories about the competitive priorities. One theory is according to Ferdows and Meyer (1990) that competitive priorities do not need to be of expense of another. Ferdows and Meyer (1990) suggest a cumulative model called 'sand cone', which illustrates that competitive priorities are built upon another and is a long-term approach. Each layer need certain focus and can only be made in a special order with quality as first. Thereafter can the company focus on quality and dependability, and then add flexibility and thereafter cost efficiency (Ferdows & Meyer, 1990). The second theory is that the competitive priorities are always in a trade-off situation (Slack & Lewis, 2011). Slack and Lewis (2011) refers to that achievement of competitive strength can only occur at the expense of the rest. The same prioritisation might threaten the company's competitiveness. If a company ranks the competitive priorities equally important, the company often is the second best on one dimension compared to a competitor that dedicates all investments to develop a specific competitive priority (Hayes et al., 2005).

There is a distinction between *structural*-, and *infrastructural strategic decisions* (Slack & Lewis, 2011; Hayes et al., 2005). The first mentioned refer to organisational physical attributes that require capital investment, which leads to that it is difficult to change or reverse the decision. Infrastructural policies and systems are decisions on how to handle the

structural aspects through systems, policies and practices (Hayes et al., 2005). Table 2 summarises and explains each decision area.

Table 2 The manufacturing decision areas in detail (Hayes et al., 2005, p. 41)

Structural decisions	Capacity	*Amount, type, timing*
	Sourcing and vertical integration	*Direction, extent, balance*
	Facilities	*Size, location, specialization*
	Information and process technology	*Degree of automation, interconnectedness lead versus follow*
Infrastructural decisions	Resource allocation and capital budgeting systems	
	Human resource systems	*Selection, skills, compensation, employment, security*
	Work planning and control systems	*Purchasing, aggregate planning, scheduling, control or inventories and/or waiting time backlog*
	Quality systems	*Defect prevention, monitoring, intervention, and elimination*
	Measurement and reward systems	*Measures, bonuses, promotion policies*
	Product and process development systems	*Leader or follower, project team organisation*
	Organisation	*Centralised versus decentralised, which decisions to delegate, role of staff group*

MS process

MS process is 'the method that is used to make the specific content decision' (Slack, Johnston & & Chambers, 2007, p. 63). MS process is, as already depicted in Figure 2, divided into formulation and implementation (Swink & Way, 1995). Formulation refers to setting the MS content in order to support the corporate goals and ahieve competitive advantage. Implementation refers to that the employees are accepting and sharing the strategy, and by teamwork put the MS content in practice (Marucheck et al., 1990).

Research has been focusing on how the process of corporate strategy impacts strategic actions and decisions within a company (Acur et al., 2003) and compared to this MS process has gained less attention (Dangayach & Deshmukh, 2001; Barnes, 2002). Marucheck et al. (1990) use a top-down approach when illustrating the MS process in different industries, and according to Barnes (2002) are many researchers stuck with Skinner´s approach that corporate strategy leads to a MS.

2.2 Lean

This section gives the reader an overview of the definition, scope and goals of the lean, followed by explaining in detail its principles. It concludes with highlighting how lean can be implemented in a company.

2.2.1 Definition, scope and goals of lean

There is a huge variety of what lean is defined as, some authors state that lean is an approach to production (Hayes et al, 2005) or a conceptual framework (Pérez & Sánchez, 2001) and others define it as an integrated social-technical system (Shah & Ward, 2007). This study uses the definition of lean as a philosophy based on principles and techniques (Bicheno, 2004; Liker, 2004).

Sánchez and Pérez (2001) highlight that lean affects not only the production department, but it also integrates several other company functions. Lean is divided into two levels: strategic and operational. The first mentioned refers to all the departments within the company and focuses on aspects regarding the customers and suppliers. The latter one refers to the lean tools used in the production (Hines et al., 2004). Further, lean is also often referred and divided into two components 'lean thinking' and 'lean tools'. The best way to illustrate the complexity of lean thinking and tools is to use water as a metaphor. A good understanding of water´s properties cannot be done through studying each component oxygen and hydrogen separately. Water is more than the sum of each component and it is therefore important to view it as a system that interplays with the environment (Bicheno, 2004).

The variety of lean definitions leads to difficulties to define overall goals of the concept (Andersson et al., 2006). Pettersen (2009) argues that the focus of the lean goals can be internally and externally. Internally goals concerns cost reduction, while externally goals concerns customer satisfaction improvement. The goal of lean is to achieve fast and flexible flows in all parts of the organisation (Bicheno, 2004). According to Liker (2004) do Ohno (1988) state the goal of lean is to look on the time from when the customer is giving the order until the company is getting paid, and remove all the non-value added wastes.

Many managers perceive lean as only a set of tools and expect that when the tools are implemented should they deliver continuously improvements. These results in that the managers get disappointed of the lean initiatives since it do not deliver their expectations (Mann, 2009). Lean tools are focusing on cutting costs, but do not ensure that this will occur within the short-term. The main benefit in the short-term is the higher availability of capacity by reduction of waste. The capacity, to either grow the business or to increase the product range, is often increased with 15 to 30 percent per year, and it is important for the company to make an competitive advantage of the situation (Maskell & Kennedy, 2007).

2.2.2 Lean Principles – '4P' model

Liker (2004) divides 14 lean principles in a model consisting of four main principle categories '4P'; *Philosophy*, *Process*, *People & Partner* and *Problem solving,* see Figure 4. Each 'P' will be explained in detail in the four following sections. Each 'P' contains of principles that are emphasised by starting with a bullet point.

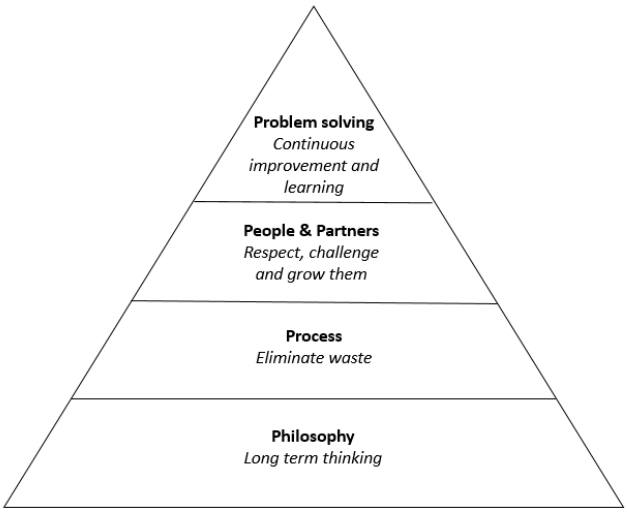

Figure 4. A '4P' model of lean (Liker, 2004, p.6)

Philosophy

- "*Base your management decisions on long-term philosophy, even at the expense of short-term financial goals.*" (Liker, 2004, p. 37)

The philosophy of lean is to base decisions on long term and not be tempted by short-term benefits. It is about building a culture that supports the employees'. The main priority is the health and safety of the employees before fulfilling production goals. Further, when the managers at Toyota were asked why their business existed, were their answers consistent. The managers are convinced and stressed out that the company´s mission is more than only making profit. The company exist to make an economic growth in the country they are located in. In addition, it aims to contribute to stability for their employees. (Liker, 2004)

Process

The Toyota Production system (TPS) is a vital part of the main principle 'Process' and described as a building, see Figure 5. The foundation of the building is the techniques, tools and methods in lean to improve the company. Two pillars hold up the roof that represents the objectives for the production development in the company (Liker, 2004). One of the pillars represents *jidoka*, which refers to the interface between man and machine, an intelligent automation. Jidoka is also about establishing a culture where the employees stop the process to fix a problem, this to enable producing right quality from the first time so it does not lead to repeated defects (Liker, 2004). The second pillar represents *just-in-time* (JIT), which refers to deliver what the customer wants, when the customer wants it and in the right quantity (Liker, 2004).

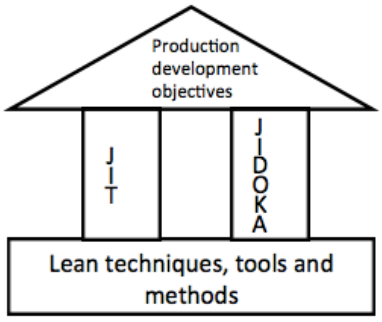

Figure 5. The TPS house

Most companies focus on the level of 'Process' and are not adopting the remaining 3Ps. The effort companies make on the 'Process' will not therefore be sustainable through the company (Liker, 2004).

- "Create *continuous process flow and bring problems to the surface".* (Liker, 2004, p. 37)
- *"Use 'pull' systems to avoid overproduction."* (Liker, 2004, p. 37)
- "*Level out the workload (heijunka)."* (Liker, 2004, p. 37)

The 'Process' refers to eliminating waste and take the problems to the surface (Liker, 2004). A metaphor that is often used is the Japanese sea, where the rocks represent problems and are hidden by the high level of water representing the inventory (Bergman & Klefsjö, 2010). Creating continuous flow leads to lowering the water level and exposes the problems. The company has than two options: deal with the problem or sink (Liker, 2004).

The techniques, tools and methods to eliminate waste and make the process smooth will not be explained in detail, but the most central, in this case pull-system, Kanban, heijunka, TPM and kaizen, are emphasised below. Most authors agree with that *pull-system,* which refers to receiving material on demand, is a part of JIT (Pettersen, 2009). Liker (2004) argues that companies should consider that it is sometimes worth to pay more than getting material pushed to you, since the no demanded material results in inventories and extra work. K*anban* is a method to organise the material flow and is often utilised on pull-systems (Slack, Johnston & Chambers, 2007). According to Pettersen (2009) production leveling, which in Japanese is called *heijunka*, is a central characteristic for lean. It refers to stabilise and create evenness in processes through applying one-piece-flow. It also refers to make an even workload regarding volume and product mix (Liker, 2004). TPM refers to continuous and planned maintenance on the equipment and aims to reduce the risk for unscheduled interruption (Slack, Johnston & Chambers, 2007). Kaizen, which means continuous, step-wise improvement is a vital part of lean (Pettersen, 2009). It refers to guide the employees in improvement work and see the make an advantage of each individual´s knowledge and ideas (Bentley & Davis, 2009).

- *"Build a culture of stopping to fix problems, to get quality right at the first time."* (Liker, 2004, p. 37)

Compared to mass production where the senior line manager had the crucial decision option to stop the line if something needed to be repaired, the decision making is now on teams. If a problem emerges the whole line is stopped and the whole team should work on the problem. The team needs to find the root cause and the method called "the five why´s" is used to fix the problem so it does not occur again (Womack et al., 2007).

- *"Standardize tasks are the foundation for continuous improvement and employee empowerment."* (Liker, 2004, p. 37)

There are two types of standardisations. One type of standardisation is to design a product so it fits the current production system and consists of material and components that are already used in other products (Slack, Johnston & Chambers, 2007). It is to strive to have the same standards worldwide. All Toyotas factories worldwide have almost identical processes, standardised products and equipment (Liker, 2004).

The second type of standardisation is to create a standardised work, through learning from each other and decide the best way to perform the work. To create a work standard and to document it is a precondition for continuous improvements and it also facilitates the learning process when new employees enter the company (Liker, 2009).

- *"Use visual control so no problems are hidden."* (Liker, 2004, p. 37)

According to Liker (2004) the tool 5S (Sort, Straighten, Shine, Standardise and Sustain) deals with organising the waste that is accumulated over time and covering the problems. The first step *sort* refers to sort all unnecessary material that is not needed to perform value-added daily work. Step two, *straighten*, is to label the material in right places. Material that is often utilised should be easy to access. This step is followed by *shine*, which is to clean regular the working place. Thereafter should rules be created to sustain the first 3S´s, to *standardise*. The last step, *sustain*, is about having management audits to stay disciplined. Unfortunately, managers use the tool only in production, but the tool is aimed for all departments within a company (Liker, 2004). Liker (2004) refers to Hirano (1995) that 5S is not only to make production shiny and neat. It should support a smooth flow to tact time and help to make problems visible.

- *"Use only reliable, thoroughly tested technology that serves your people and processes."* (Liker, 2004, p. 37)

From a lean perspective technology is seen as a tool to support people and processes. When changing and acquiring new technologies Toyota lags behind compared to other companies. It is important to move slowly and that the technology is meeting exactly the company´s demand (Liker, 2004). Liker (2004) gives an example that parts of the operation are still using an old technology that is developed in-house.

People and Partners

- *"Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others."* (Liker, 2004, p. 37)
- *"Develop exceptional people and teams who follow your company´s philosophy."* (Liker, 2004, p. 37)

The current information age is characterised by intellectual capital, which put the human capital on the first place. Toyota started to perceive human capital as intangible assets for the company due to that the company gave their employees a lifetime employment. The company can therefore be seen as an early adopter (Fane et al., 2003), started to invest in programs providing the workers and managers with trainings (Liker, 2004) to enhance the value of the employee to the company (Fane et al., 2003). The key behind lean is the management commitment to continuously invest in the employees and not the usage of different lean tools (Liker, 2004).

Toyota did not only focus on educating employees, a vital part is teamwork. The team is given the responsibility for a set of production steps, where the job is housekeeping, minor tool repairing, quality checking and to improve the processes. (Womack et al., 2007)

- *"Respect your extended network of partners and suppliers by challenging them and helping them improve."* (Liker, 2004, p. 37)

Lean is about long-term collaboration, respecting and grow together with the suppliers. That means that the supplier network is seen as an extended 'family' of Toyota, which was also learning about the lean philosophy. For example cost reduction for Toyota can only be achieved if the suppliers also reduce costs, but this was not pushed on them rather Toyota helped the suppliers with such improvement activities (Liker, 2004). Lean also means to have a close relationship to suppliers through equity ownership, technology exchange and coordination of components (Fane et al., 2003). According to Liker (2004) do Toyota focus on the "core competence" and have therefore outsourced 70 percent of the components of the vehicle, but important is still to maintain the internal competency.

Problem Solving

- *"Go and see for yourself to thoroughly understand the situation (genchi genbutsu)."* (Liker, 2004, p. 37)
- *"Make decisions slowly by consensus, thoroughly considering all options; implement decisions rapidly."* (Liker, 2004, p. 37)
- "*Become a learning organization through relentless reflection (hansei) and continuous improvement (kaizen)."* (Liker, 2004, p. 37)

The core for the management culture of lean is g*enchi genbutsu* that refers to managers should go and see, and accomplish to explain the situation in details. Managers should have the ability to understand what is done on the production floor (Liker, 2004). The managers should not only believe in the lean philosophy, they should be able to coach and develop others (Liker & Convis, 2012). The first step in problem solving is g*enchi genbutsu*, to go and see the problem. Managers should solve problems on data that have personal be verified, that means that they go and see the problem and collect information being able to analyse it (Liker, 2004). Many new employees at Toyota are surprised in how time-consuming the decision making process is. A vital approach is to take the time needed to do it right, because it is better to have considered all aspects on beforehand. One vital part in the lean culture is to involve as many as possible for each situation of decision making process, this to establish a high level of consensus so the implementation thereafter will be easier (Liker, 2004). Important in problem solving is the continuous improvement approach. The team should bring problems to the surface and find out the root cause through using e.g. the '5Why' method and 'PDCA' (Liker, 2004).

2.3 Lean implementation

This chapter presents issues regarding lean implementation, which is seen in this study as implementing the whole '4P'-model. Lean has been studied in detail by many researchers and companies have been exposed by it for over two decades, but still no company has been able to implement it with the same results as Toyota (Fane et al., 2003; Liker, 2004). Companies have hard to understand that it requires a deeper and more pervasive cultural transformation (Liker, 2004). Companies also lack the understanding of how lean tools work together in a system (Liker, 2004). The effort in a lean transformation is 20 percent implementing tools and the rest is about changing the leaders' mind-set, how they behave and their practices

(Mann, 2009). To implement single lean tools may lead to good results, but for example to implement the tool kanban regardless the situation may not lead to good result since it requires a situation of levelled customer demand (Bicheno, 2004).

According to Bicheno (2004) there are three ways of implementing lean. One way is to only implement lean tools, called '*mechanical lean*'. Another way is to implement lean tools in an integrated manner, called '*managerial lean*'. The last way is to implement lean so it not only reaches the production floor, but also create new opportunities for the company; this is called '*innovative lean*'. The innovative lean refers to putting the customers first. Waste reduction is not for the company, it is seen as value enhancement for the customers.

Kotter´s eight steps is a transformation plan for organisation that can be used in order to reduce the risk of resistance by avoiding the common mistakes (Kotter, 1995). The first two steps relate to establishing urgency to make the employees open to change, followed by forming a group that would lead the change. Subsequent steps relate to a need of a clear vision and strategies to achieve the vision. The vision should show the direction of the change and should be achievable and communicable within a few minutes. Plans and strategies should be based upon the vision that has created the boundaries and focus (Kotter, 1995, 1996). To create a transformation from functional activities into lean processes a company needs a long-term vision. The vision should consists of lean principles and also address both strategic and operational level, which should be aligned to create a foundation for a lean organisation (Maskell & Kennedy, 2007).

2.3.1 Implementation barriers

According to Hayes et al. (2005) the main reasons why new approaches to operations improvements do not succeed are weak support from top management and that they do not provide enough resources. The low success rate in lean implementation does not only lie on the top managers, but also on the lack of enthusiasm by lower-level managers and workers (Fane et al., 2003; Hayes et al., 2005). Top management leading lean implementation in a functional organisation face resistance by employees in cross-functional initiatives. In functional organisations horisontal processes, value streams, do not exists on the organisational chart. This results in that no one feels responsible for handling the value stream and there is a lack of budget, resources and measures (Mann, 2009).

One barrier for lean implementation is the managers' resistance to accept the new way of thinking. For example lean requires new incentives systems (Fane et al., 2003) and also change of current measurement systems (Maskell & Kennedy, 2007). The new measurement systems should calculate the costs for the whole value stream instead of individual products. In addition should the accounting drive the lean transformation (Maskell & Kennedy, 2007).

Liker (2004) emphasises that the cultural differences between Japan and western companies may have a major impact on how to manage for example the principle about genchi genbutsu, going and seeing. Liker (2004) states that western companies need a greater effort and practice to really get good on it. It is however, important to highlight that lean has not even been successfully implemented in other Japanese automotive companies. For example, Japan´s second largest automotive manufacturer Nissan has struggled for years to make it work. Even Toyota made decisions to not use all key features of lean in some plants e.g. no usage of Kanban system (Hayes et al., 2005). Western companies do not have managers that stay long enough to develop loyal employees. The main problem when managers are not staying long time enough is that they try to implement new cultures and the company have

not time to learn. The company is not capable of building on enduring principles or achievements. (Liker, 2004)

Hayes et al. (2005) state that striving to be lean can be too simplistic and may result in that the company will be as good as and never better than their toughest competitor. A company that want to have a long-term success needs to differentiate it and offers something unique that the customers want to pay for it.

2.4 Combining Lean and Manufacturing strategy

Bicheno (2004) states that future textbooks should combine MS and lean. One of few initiative done by researchers to combine lean and MS is done by Slack and Lewis (2011) through an illustration of lean integration in the operations strategy-matrix, see Figure 6.

The operations strategy-matrix has on the vertical axis the performance objectives and on the horisontal axis the strategic decision areas. Slack and Lewis (2011) use five different performance objectives: quality, speed, dependability, flexibility and cost. In addition, there is four decision areas: capacity, supply network, process technology, and development and organisation. The operations strategy is the intersections between the axis, which tries to link the operational resources and the market requirements. A company should be able to explain exactly how each decision area affects each performance objective and also how each performance objective is affecting each decision area (Slack & Lewis, 2011).

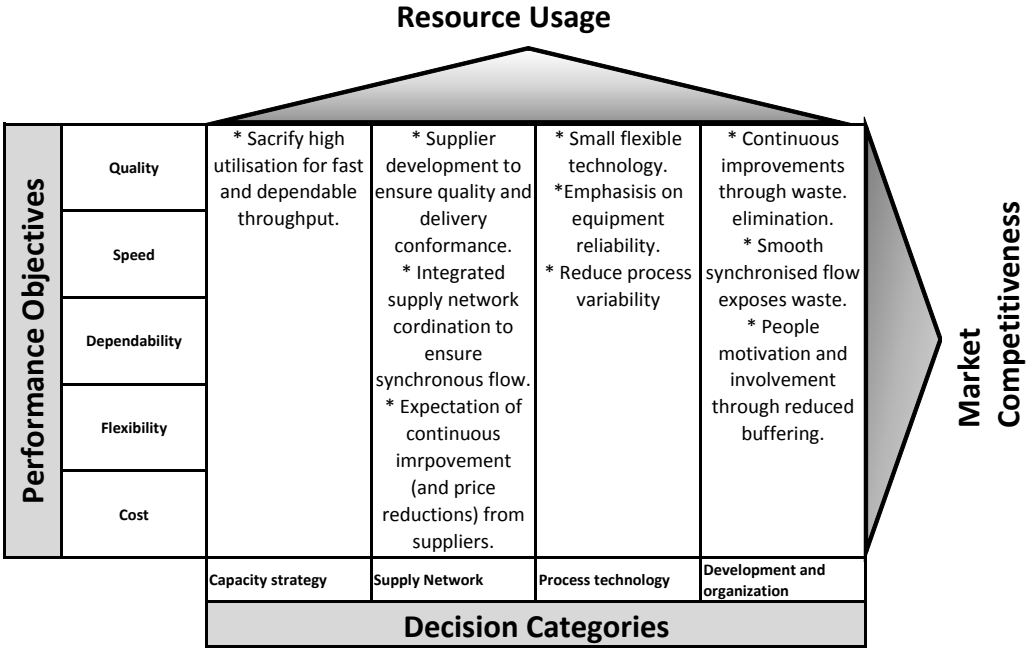

Figure 6 The lean operations strategy-matrix (Slack & Lewis, 2011, p. 95)

According to Slack and Lewis (2011) lean integration in the operations strategy-matrix is the focus of the lean elements on the decision areas 'supply network' and 'development and organisation'. The decision area 'process technology' is to ensure the core lean elements regarding flow in the supply network and waste elimination in the organisation. Even though that the decision area 'capacity' only consists of one lean element Slack and Lewis (2011) highlight that a lean approach emphasises the importance of this decision area. Comparing a traditional approach the lean approach requires more capacity to manage the supply chain throughput since it buffers between each step of the supply chain.

2.5 Analytical framework

The analytical framework, depicted in Figure 7, emphasises that MS is aligned with the corporate strategy. As in the literature the analytical framework distinguishes MS between content and process.

In the analytical framework, MS content is based on the Slack and Lewis (2011) lean operations strategy-matrix, but with some changes. Instead of using the five performance objectives that Slack and Lewis (2011) have in their lean operations strategy-matrix, this study utilises four competitive priorities: *cost, quality, delivery and flexibility* (Dangayash & Deshmukh, 2001). The lean operations strategy-matrix in the analytical framework also emphasises the *structural* and *infrastructural decision areas* by Hayes et al. (2005). Since Hayes et al. (2005) do not explain in detail the decision area of 'Resource allocation and capital budgeting systems' it is excluded from the analytical framework. In addition, the lean points used in this thesis, explained in more detail later, do not cover the decision area regarding 'Facilities', which results in that this strategic decision area is also excluded. As highlighted in chapter 2.4, Slack and Lewis (2011) argue that the main core of lean is the 'Supply network' and 'Organisation', which in this matrix represents by the 'Sourcing and vertical integration' and 'Organisation'. In addition, the analytical framework emphasises the importance from a lean point of view on 'Capacity' and 'Human resource systems'.

The numbers in the intersections of the matrix are the lean points and a detailed explanation of them can be found in Figure 7 the lean operations strategy-matrix. The lean points that are used are a combination between the lean elements by Slack and Lewis (2011) in the lean operations strategy-matrix and the 14 lean principles presented by Liker (2004). Since the lean elements and the principles are overlapping, they are combined and added to each other into 16 lean points. The 16 lean points are using exactly the same sentences as the original ones by Slack & Lewis (2011) and Liker (2004), but in the analytical framework are they not referring to these researchers.

In the analytical framework, MS process has gained less attention in research and does not have a general accepted framework. Therefore, this study includes four different models in the analytical framework in MS process. This study views lean as integrated into MS and therefore two lean models are utilised: Liker (2004) '4P'-model and Bicheno (2004) three ways of lean implementation, which have been explained in detail in chapter 2.2 respectively chapter 2.3. In the analytical framework, MS process includes also two general models used in the literature to explain strategy formation and implementation: Mintzberg (1978). The model of strategy formation and Kotters (1995) eight-step transformation plan.

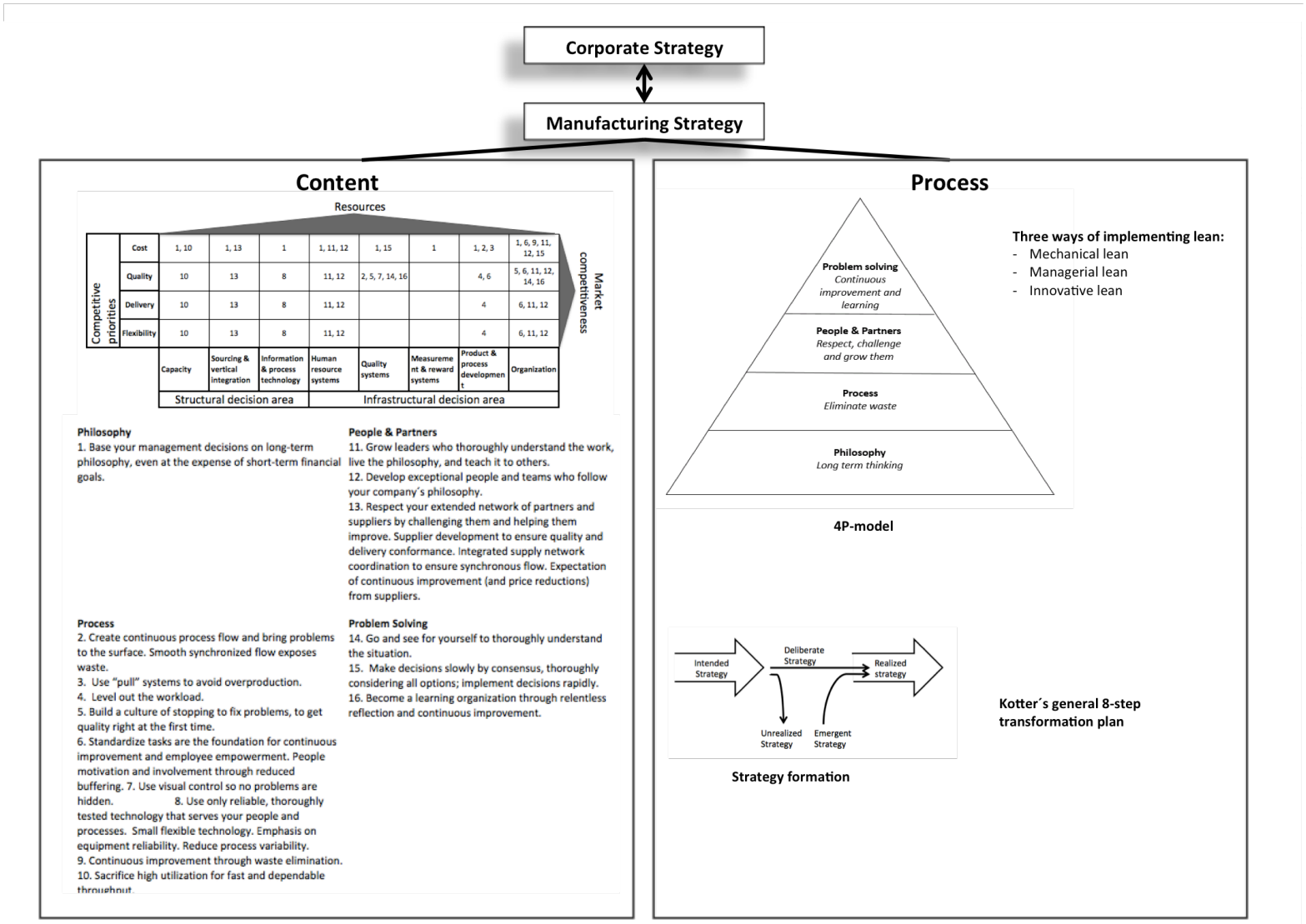

Figure 7. The analytical framework

2.6 Strategic Consensus

Strategic consensus in this study is defined as the level of agreement (Boyer & McDermott, 1999) of how lean has been and should be integrated into MS, among managers at top, middle, and operating levels (Kellermanns et al., 2005). It is the commitment among employees within a company regarding a strategic issue (Noble, 1999). According to Noble (1999) a higher level of strategic consensus may affect the implementation of the strategic issue positive.

The level of agreement can further be divided into two dimensions: cognitive and emotional (Floyd & Wooldridge, 1992). The cognitive refers to the shared understanding between managers. Often do managers have a common perception about broad objectives for example to decrease costs, but have a wide interpretation range in how to actually reach this objective. The emotional dimension on the other hand refers to the commitment managers have towards the strategy, if the strategy e.g. is matching the personal interest.

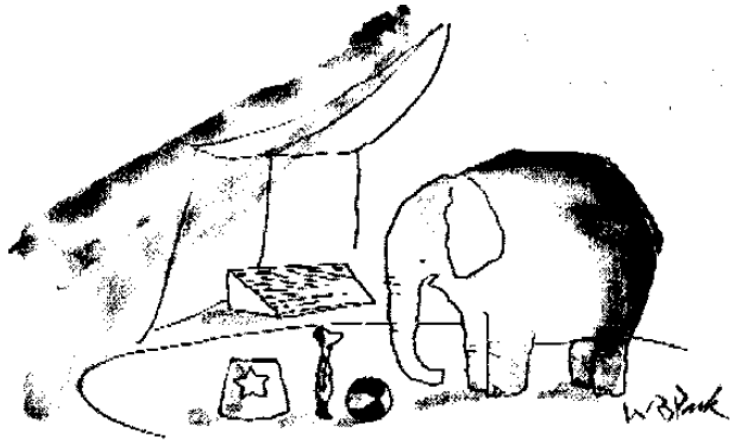

Figure 8. The blind men and the elephant: metaphor for strategy formation (Mintzberg et al., 1998)

The purpose of this study is to analyse the level of strategic consensus among managers in three managerial levels regarding how lean has been and should be integrated in a company´s MS. Due to the complexity of lean and MS it is important to highlight the fact that the answer given by the managers can differ radically, which may influence the level of strategic consensus. Mintzberg et al. (1998) give a clear illustration of this phenomenon through quoting the poem 'The blind men and the elephant' written by John Godrey Saxe. The poem describes blind people who touches only one part of an elephant and ignores the remaining parts of the elephant. The elephant is a metaphor on strategy formation and to add each part that is described by the blind people will not result in a whole elephant. Further, to understand the whole elephant it is needed to understand each part (Mintzberg et al., 1998).

It is interesting to emphasise the citation by Floyd &Wooldridge (1992, p.27):

"How can managers be expected to take action in support of a strategy when they don´t agree with it, or even know about it?"

3 Methodology

This chapter describes the research strategy and design, followed by the research process. Further, the chapter describes how data has been gathered and analysed. The chapter is concluded by a discussion about the trustworthiness of the report.

3.1 Research strategy

The purpose of this study was addressed through a qualitative research strategy designed with a single case study of KAG. The research purpose was to investigate the level of strategic consensus among different managerial levels, which made it important to have a research strategy that enables the participants' point of view. According to Bryman and Bell (2011) a qualitative strategy is emphasising words and is used when the researcher aims to develop an in-depth understanding of people´s behaviour. Furthermore, it acknowledges the point of view of the participants and has rich and deep data. The alternative strategy option is to conduct the business research through a quantitative strategy. The quantitative strategy refers to quantifying the data collection into numbers and amounts, which results in hard and reliable data. In addition, it takes the point of view from the researcher (Bryman & Bell, 2011). The main reason why qualitative research has not been used was that the purpose of the thesis is to investigate the level of strategic consensus between the three managerial levels, which means that it takes the participants point of view and not the researcher´s.

As mentioned earlier, this study addresses the strategic consensus among three managerial levels through a single case study at KAG, which according to Yin (2003) is an investigation of a real-life contemporary phenomenon. A case can be a single organisation or location, a person or a single event (Bryman & Bell, 2011). Since the purpose of the research is to investigate how lean has been and should be integrated into MS, it is important that the strategic issue lean is a discussed within the case company. KAG is an appropriate case company for this research since it is in the beginning of a lean implementation and the managers at the company were creating a lean implementation plan.

A case study design is usable when research questions of how and why are supposed to be answered (Yin, 2003). In addition, the researcher can achieve a deep understanding of a process and how participants' intentions and influences are (Woodside, 2010). This research aimed to answer the questions of how managers understand MS content and lean implementation and requires therefore an in-depth investigation of participants' intentions. However, there are several options for how to collect data for example surveys (Robson, 2011; Yin, 2003). Both surveys and case studies do not require control of the events that are studied and are focusing on events in current time. However, a survey takes the point of view from the researcher (Bryman & Bell, 2011), which would not have been appropriate when answering the research questions.

3.2 Research process

The research process, depicted in Figure 9, started with collecting relevant theory to find a gap in the research where the focus for this thesis could be. This theory created the foundation for the purpose of the thesis, the research questions that are addressed and how data should be conducted. As also illustrated on Figure 9, the researcher went back and forth between theory and empirical study and according to Dubois and Gadde (2002) this is in line with an abductive approach. An abductive approach is a systematic combination of inductive and deductive approaches and allows the researcher new perspectives on the empirical

findings as well as new insights for the theoretical framework (Dubois & Gadde, 2002). The empirical study is conducted by three main sources: interviews, focus groups and observations, and documents. The first two mentioned data collection sources will be in detail explained in chapter 3.3. The third data collection source, documents, was not used since the company actually did not have relevant documents that were needed to fulfil the purpose of this thesis. Further, as the Figure 9 illustrates the empirical study lead to the data analysis, and the research process went back and forth between theoretical study and data analysis.

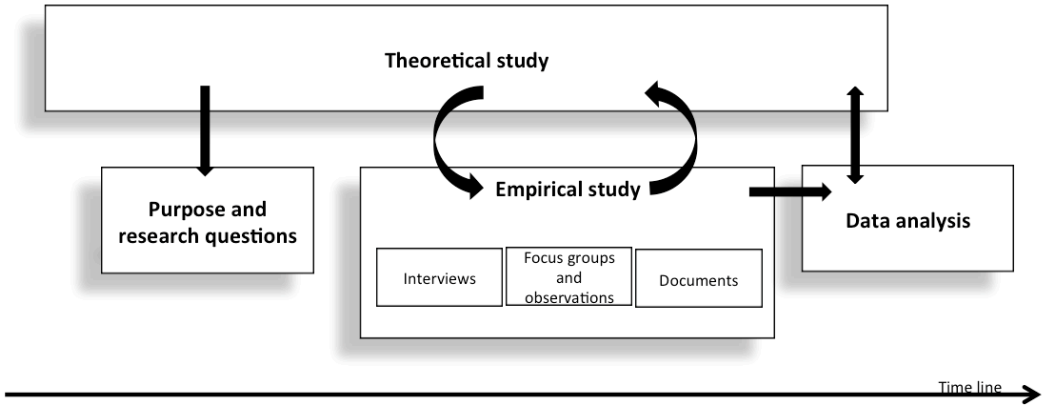

Figure 9. A schematic illustration of the research process

3.3 Data collection

This research has been conducted through two main sources, interviews and focus groups. In the section about the interviews are issues such as which techniques that have been used, how the interview questions were created and how the interviewees' were selected. The section about focus groups highlights how the study has used data from two weeks workshops and how observations have been performed.

3.3.1 Interview

The purpose was to investigate how lean has been and should be integrated into MS and the researcher therefore utilised a semi-structured interview technique to enable gathering deep information from the respondents (Bryman & Bell, 2011). Another reason why semi-structured interview technique was used is the flexibility regarding the questions order and that the interviewer can have follow up questions to go in deep with the answers (Williamson, 2002). The interview questions are created by following the structure of the analytical framework of MS content, described in appendix 1. The questions covers both specific question regarding lean and detail questions of operations strategy.

Further, the majority of the interview questions were open, which enable the respondents to answer in own terms (Bryman & Bell, 2011). A disadvantage with open questions was that it took time to conduct the interviews and the answers may be difficult to analyse. The interviews took long time to conduct. However, since two pre-test interviews ensured that the interview questions were formulated that relevant data could be gathered, and the interviews were record resulted in that the analysis was not difficult to perform. The interview questions also consisted of closed questions, which result in answers that were easy quantify, but limited the respondents´ answer options (Bryman & Bell, 2011). An example of a closed question was the question about how far the company is in the lean progress by using a seven

graded-scale, see appendix 1. The researcher used a seven-graded scale because it enabled the respondent to have a more precise answer compared to a scale with less answer options.

To increase the quality of the interview a pre-test of the interview was performed. It was important to use separate participants in the pre-test interview and the final interview to avoid that the participants cannot prepare their answers (Bryman & Bell, 2011). The pre-test was performed with a middle manager that was not included in the final interview that was used as data in the empirical study. A pre-test interview enabled relevant feedback for the creation of the interview. Furthermore, the elimination of confusing or vague questions lead to a better flow and results in better interview quality. (Bryman & Bell, 2011) The pre-test interview took approximately 1.5 hours and was recorded, transcribed and directly analysed afterwards, this to enable a better investigation if the interview questions were well formulated. Some adjustments were done and a second smaller pre-test was performed. The second pre-test was performed with an operator manager that read the interview questions, followed by giving feedback regarding if the questions were understandable or not. Finally, some questions needed to be modified following the pre-test to fulfil requirements of the TM´s. This resulted in reformulation of some questions and removal of others before the interview questions were finalised.

This study investigated the level of strategic consensus among three managerial levels regarding lean integration to MS. The managers that are interviewed are Top Management (TM), General Manager (GM), Operations Managers (OM) and Lean Managers (LM). From a global business perspective the GMs represent the middle management level, meanwhile the OM and LM represent operating management level, depicted in Figure 10.

The researcher planned to perform 17 interviews, however only 15 interviews completed, since two managers did not want to participate in the research. One manager that did not want to participate was the CEO, who found that the research was too time consuming to participate in. The second manager that did not want to participate was the OM Mexico, who stated: ‘I do not have the same opinion as the other managers regarding this theme and do not want to create a problem area with my opinions’. Operations Germany is marked grey in the Figure 10 due to the fact that the GM Germany is covering this position also, that means that GM and OM Germany is the same person.

The interviews with the TMs, the Global LM and the GM and LM located in Germany were performed face-to-face. The remaining interviews were performed through Lync, which is a program that enables online meetings with video and audio calls. Unfortunately, the limitation in time and costs did not enable face-to-face interviews with all managers. According to Williamson (2002) audio record enables that the respondents own words are documented and not the interpreted answers. For that reason the researcher recorded every interview, followed by transcription of each interview word by word.

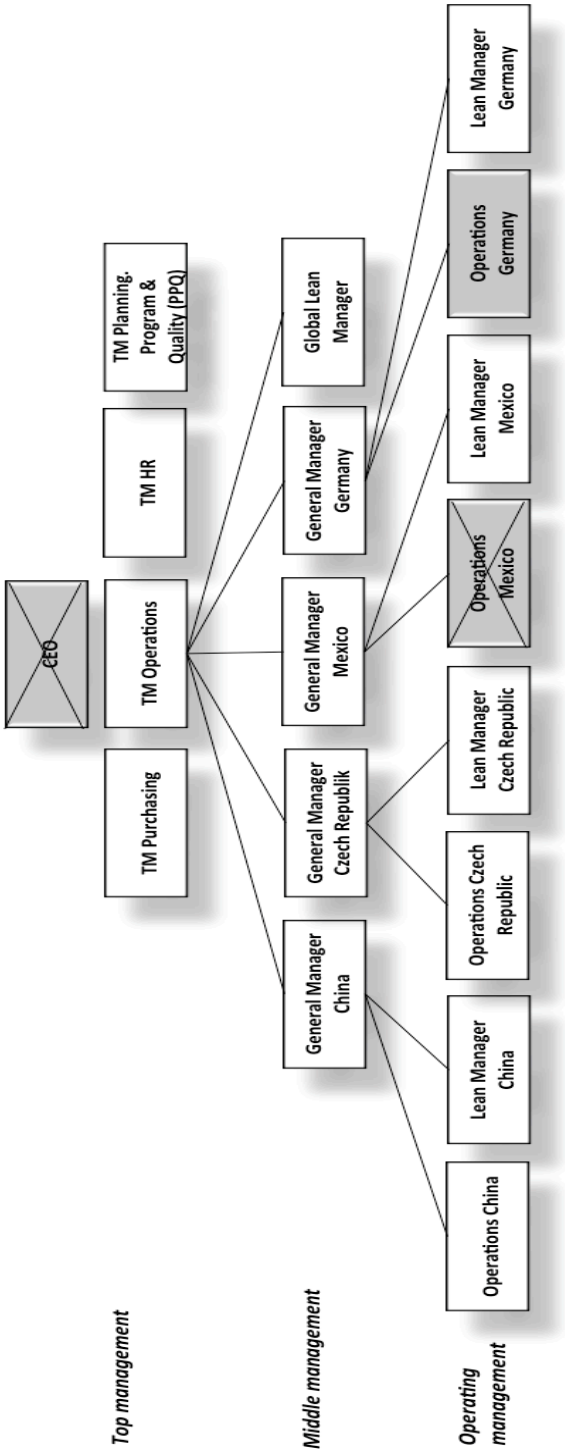

Figure 10. Overview of the interviewees

3.3.2 Focus group – Global lean workshops

The researcher had the opportunity to participate in two global lean workshops, where LMs from each plant discussed the issues about the global lean vision and the implementation. The global lean workshops were similar to what in the literature is called focus groups. According to Bryman and Bell (2011) focus groups are used when experiences are gathered from that the participants are interviewed together in an unstructured way. Furthermore, the result from a focus group is often qualitative and it allows the participants to discuss and share their views and opinions. Together with the Global LM questions were created, which were asked during the workshop. The participants got at least 15 minutes to think for themself and write down their thoughts on a paper regarding each question. Thereafter each participant was given time to present how they thought in each question, followed by summarising on a board. When all thoughts were on the board, the participants together were sorting them out into different categories.

The researcher was participating in both workshops and was also sharing my thoughts regarding the questions. In addition, during the workshops the researcher was observing the participants and wrote down some general comments that they were stating. Observation is a method that is hard to handle, due to the fact that it is difficult to know what maybe relevant from the research point of view. Furthermore, observations are difficult to handle because the observer may have prejudices regarding the results (Bell, 2000). To increase the objectivity of the results from the observations, the researcher´s written comments from the observations were compared with another participating master´s student´s comments.

3.4 Analysing data

The interviews were transcribed and thereafter coded. The coding was performed through creating a matrix were all the answers were divided into each respondent and into each interview question. This enabled a clearer overview of the gathered data. To investigate the level of strategic consensus the study compared first the perceptions among the managers within each managerial level. Secondly was a comparison among TMs, middle management and operating management, showed in Figure 11.

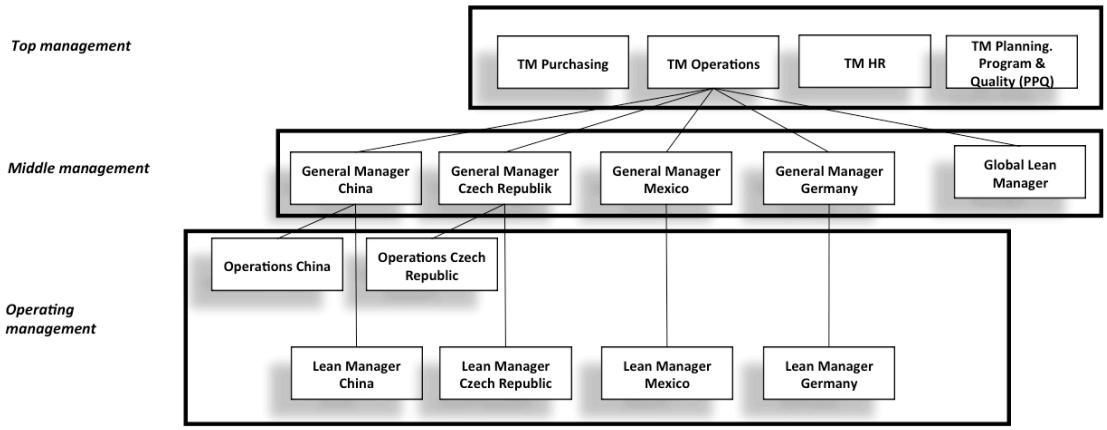

Figure 11. An illustration of how the analysis was performed

3.5 Research quality – criticism

The criticism of the research is discussed from the term of trustworthiness developed by Lincoln and Guba, which is an approach regarding how a researcher can justify that the findings are worth paying attention to. Trustworthiness involves the four criteria of credibility, transferability, dependability and conformability (Halldórsson & Aastrup, 2003).

Credibility

Credibility refers to how well the interviewees' reality is constructed and represented by the researcher; in other words, it is about how believable the results are (Halldórsson & Aastrup, 2003). To ensure that the result match the reality of the interviewees the researcher have recorded the interviews and transcribed it word by word, followed by using exactly the quotes from the interviewees in the research result. However, the true perception of the interviewees would have been better captured if the researcher had performed some follow up sessions with the interviewees. Unfortunately this was not performed due to two factors: the time limitation of this research and of the interviewees'.

An important aspect to highlight when discussing credibility is that all the chosen interviewees did not want to participate in the study. The Operations Manager Mexico did not want to discuss his reality or his opinion due to the fact it may lead to problems within the company. The study guaranteed that the answers are treated anonymous and is therefore hard for a reader outside the company to track back to its source. However, if someone read this study within the company it is not difficult to know which manager stated what. This shows the difficulty of what a researcher is dealing with regarding gathering data that represents the reality.

Transferability

Transferability refers to if the findings can be generalised and are applicable to other contexts (Halldórsson & Aastrup, 2003). The research is conducted through a single case study of a specific company and according to Bell (2000) a negative aspect of a case study´s result is that it is not always generalisable. Further, Bryman and Bell (2011) states that the lack of multiple companies reduces the findings generalisability. The usage of a specific company may limit the transferability of the findings in this study.

Dependability

The research quality can be judged through dependability that refers to if the data is applicable to other times (Halldórsson & Aastrup, 2003). Yin (2003) argues that high dependability is when another researcher can use the same methodology and it leads to the same results and the same conclusions as this study. The main results is based upon interviews, managers´ perception about lean and MS. The perception of the interviewees may change when the same questions are asked again. This because of that the interviewees may be more aware of the dimensions that were asked. The dependability is reached through allowing others take part of the detailed process and the actual data of the results in this study.

Confirmability

Confirmability refers to if the study represents the researcher´s bias or the actually investigated results (Halldórsson & Aastrup, 2003). This study is addressed through interviews, focus groups and observations. It is hard for a researcher to conduct an interview or gathering data from a focus group or observing to not affect the respondents. To enhance

the confirmability of this study the researcher tried to stay neutral in the reaction of the answers from the interviewees. In addition, the result of the research is also containing information from observations. To guarantee that the observations are not too subjective the researcher used the help from another researcher that was observing the same focus groups, which enhanced also the confirmability.

4 Empirical findings

This chapter begins by describing the managers' views on MS content, then presents the results of the interviews as to the managers´ views on lean. The chapter concludes with a description of how lean has been and should be implemented. The findings are based on the interviews, focus groups, and observations at KAG.

4.1 Different managerial-level views regarding MS content

This section presents the top, middle, and operating managerial-level views of MS content. As emphasized in chapter 3.3.1 are the three managerial levels Top Management (TM), middle management are the General Manager (GM), operating management are Operations Managers (OM) and Lean Managers (LM).

4.1.1 Documented operations strategy

TM Operations and all the GMs stated that a documented operations strategy exists, see Figure 12. This operations strategy entails various standards, methods, and processes that should be employed in the plants worldwide. The remaining managers, OMs and LMs in each country, were unaware of the documented operations strategy.

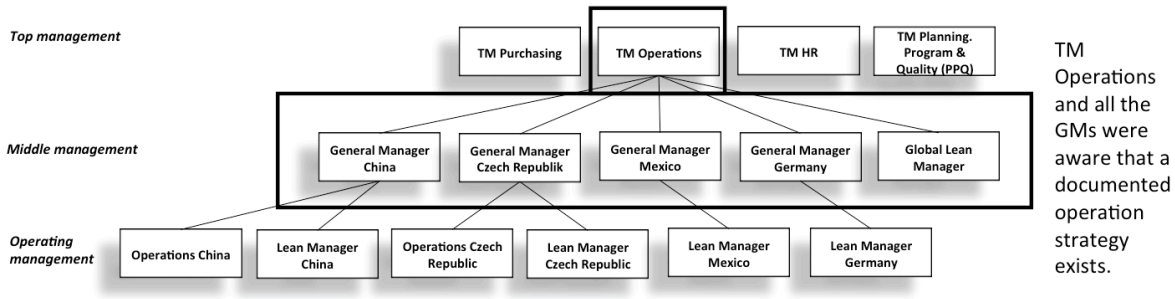

Figure 12. Managerial levels informed about the documented operations strategy.

4.1.2 Prioritisation regarding competitive priorities

The different managerial levels' perceptions of the definition of each competitive priority were consistent. Figure 13 below summarises each competitive priority's definition by the managers at KAG, rather than presenting each manager's view.

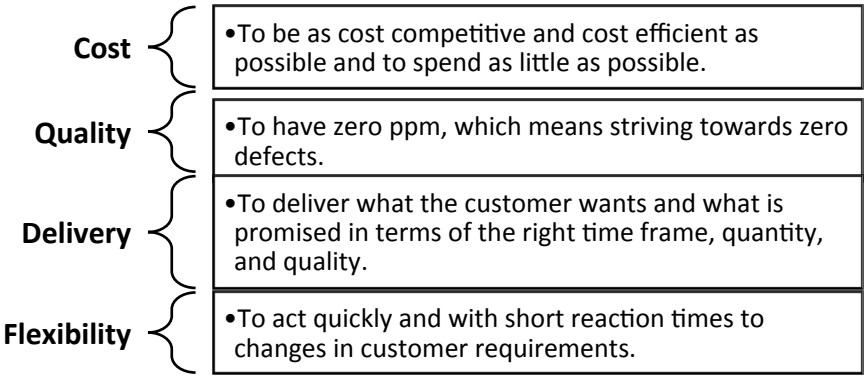

Figure 13. KAG's definitions for competitive priorities.

All the managers found it hard to give a straight answer as to which competitive priority was the most important. The managers justified their opinions by stating that there is always a trade-off between competitive priorities.

Depicted in Figure 14 is the average score for each competitive priority for each managerial level (see calculations in appendix 2). The possible score ranges from minimum 0 to maximum 6. Figure 14 shows that all three managerial levels rank quality and delivery as the most important competitive priorities. Figure 14 shows that the middle and operating management level have ranked costs approximately on the same level, while top management places a higher priority on costs. On the other hand, top and operating managerial level rank quality as approximately equal, though middle management prioritises quality. The figure also shows that the top and operating managerial levels equally prioritise delivery, while middle management ranks it lower. All three managerial levels rank the competitive priority flexibility as low.

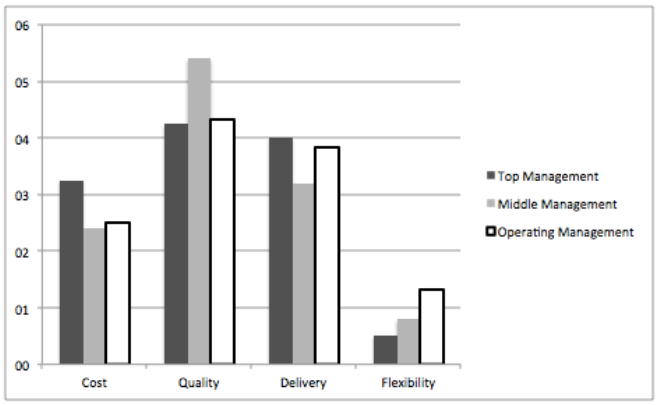

Figure 14. The average score of the competitive priorities among the three managerial levels.

4.1.3 Structural decision areas

This section focuses on three structural decision areas in MS content: capacity; sourcing and vertical integration; and information and process technology.

Capacity

The analysis of changing the capacity level distinguishes between quantity of products, type of products, and change of delivery date.

Changing capacity level regarding quantity of products

All the TMs except TM HR had a consistent opinion about how the company can change the capacity level for the quantity of products. The company can increase production output by changing the work shift model. To meet customer demand, three shifts five days per week are planned, which allows the company to add shifts on weekends. Extra work shifts on weekends enable the company to increase production output by at least 25 per cent. However, suppliers are often unable to deliver components on time, which limits the flexibility of the company to increase production. TM HR was unable to describe how the company works in this strategic decision area.

GM China stated that the plant is flexible to adjust work shifts and days. OM China pointed out that the lines are dedicated to a certain capacity level and are therefore not flexible. The employees are multi-skilled and can work on other lines, which helps to increase quantity of production. LM China mentioned improving assembly time and increasing the automation level of the lines as two ways of increasing production output.

GM Czech Republic answered that the production lines are designed to meet a predicted demand, which makes the quantity of products fixed. OM and LM Czech Republic answered that if there is a radical increase in the quantity of products the company can only meet it by building up new lines, which takes around six months. Otherwise the company can add extra work shifts on weekends to increase production. Further, LM Czech Republic stressed that the production areas are already too overloaded with machines and equipment and therefore the company is limited by lack of space.

GM Mexico stated that the plant has two different kinds of production layout: manufacturing cells and automated lines. The manufacturing cells have more flexibility in changing the capacity level regarding production quantity compared with the automated lines. The automated lines are more productive compared with the manufacturing cells. The company therefore needs to find a balance between flexibility and productivity. LM Mexico stated that the rotation of multiskilled employees among the machines leads to an increase in production output. LM Mexico also emphasised that the suppliers lack the ability to increase their number of components and some suppliers also have huge quality problems, which causes quality problems for production.

GM Germany answered that production output can increase through changes in the work shift model if extra shifts are added on weekends. A decrease in production output results in fewer employees being needed. LM Germany stated that the lines are planned according to customer demand, which means three shifts five days a week. To increase production the company has two alternatives: adding extra work shifts on weekends or building an additional line. The latter alternative requires six months to achieve.

Global LM pointed out that the company is flexible in increasing production quantity since the plants can support each other with their comparable equipment.

Changing capacity level regarding type of products

All the TMs except TM HR had a consistent view of whether the company can change capacity level with regard to product type. The company has high-volume production lines that are dedicated to specific customers, which makes the company inflexible in this regard. TM HR was not able to describe how the company works in this strategic decision area.

GM and LM China emphasised that the production lines are dedicated to specific products, which limits the company´s flexibility in changing capacity level related to product type.

GM Czech Republic responded that each production line is fixed to a specific customer and cannot be used for different customers. According to OM Czech Republic, 'We can sometimes produce on the same line for two different customers, but that depends on the line and on the product, and only if it was planned from the beginning.' LM Czech Republic stated: 'One line for one customer.'

GM and LM Mexico said that it is not possible to produce a product for two different customers on the same line. However, it is possible to produce two different types of products for the same customer, but that is a complex and difficult action.

GM Germany noted that the production lines only handle a certain product range and this makes it complicated and difficult to change the type of product. According to LM Germany, each production line can only produce for one customer, which fits the strategy of having production lines that manufacture high quantities.

Global LM answered that it is possible to produce different products for different customers on the same line if some modifications are made. Currently, however, the company does not do this.

Changing capacity level regarding change of delivery date

All the TMs except TM HR held the view that production is flexible in changing capacity level with regard to change of delivery date. The company maintains a certain stock level to cover such changes. According to TM Operations, the safety stock level of finished goods covers a period of one to two days. In addition, TM PPQ stated that the company receives a forecast for four weeks ahead, which allows the company time to react to delivery date changes. However, the supply chain coordinators still need to make daily adjustments in production planning, which means the forecast only indicates the direction of change. TM HR was not able to describe how the company works in this strategic decision area.

GM China stated that the ability to meet changes in delivery date is connected to changes in the work shift model. In addition, the plant is able to order material from other plants if needed. OM China said: 'We know on a daily and weekly basis what the customer wants. For stable demand we can put by some buffer stock.' LM China emphasised shortening lead times in production and eliminating waste throughout the whole production process.

According to GM Czech Republic, it is easier for the company if the delivery date is moved to later than if it is moved up. The company has two to three days of safety stock of finished goods. OM Czech Republic found the plant to be relatively flexible since the safety stock of finished goods and the stock level for components covers two days. LM Czech Republic mentioned adding extra work shifts in order to meet changed delivery dates.

GM Mexico pointed out that the delivery date is changed almost every day and the company has no problem handling it, and therefore the company is flexible in this regard. In addition, GM Mexico said that the stock of finished goods is calculated in hours. LM Mexico stated

that there is a two-day stock level of finished goods, which makes the company flexible in meeting changes in delivery dates.

GM and LM Germany answered that customers have a specified stock level of two to three days' worth of finished goods, which makes production flexible in the case of delivery date changes.

The Global LM found that the company is flexible regarding changing delivery dates, but without pointing out reasons why it is so.

Sourcing and vertical integration

The result regarding the strategic decision area of sourcing and vertical integration is divided into two aspects. The first aspect is the managers´ views of the lean methods and tools KAG has used together with the suppliers. The second is the managers' descriptions of the responsibility KAG has over the value chain.

Lean methods and tools used together with the supplier

The TMs have diverse views regarding how the company works with lean methods in cooperation with its suppliers. TM Purchasing stated that the company´s relationship to the suppliers is relatively good. Further, the company uses the same methods and tools with the suppliers as it does internally. On the other hand, TM Operations stated: 'Not a lot of methods are used yet with the suppliers.' TM Operations also mentioned that KAG has difficulties in that suppliers have limited capabilities with the single-component supply. TM PPQ said that the company makes little effort in this area. Furthermore, TM PPQ noted that the company works with early involvement of suppliers in product development. TM HR was not able to describe how the company works in this strategic decision area.

GM China stated that the company has a weak strategy regarding supplier involvement. The company checks the suppliers instead of really helping them develop. OM China could not describe how the company works in this strategic decision area. LM China said the lean tool that has been employed is Value Stream Map, but it has only been used by two suppliers.

GM Czech Republic stated: 'The company has a weak strategy regarding improvements with suppliers. We have performed certain audits to identify waste, but with around 14,000 tools and 300 suppliers, it is hard to coordinate the cooperation.' OM and LM Czech Republic stated that the company has just begun improvement activities with the suppliers and that currently the only tool used is Value Stream Maps.

GM Mexico said the company does not use any tools together with the suppliers, but it performs audits. LM Mexico mentioned that some suppliers use Kanban.

GM Germany highlighted Value Stream Map and FMEA as tools that are used in cooperation with suppliers. GM Germany also stated: 'We have dedicated people who work with the supplier, and they perform an audit to see if it is according to the company's or automotive standards. This department does not specialise in helping the supplier get better or in using Value Stream Maps and finding cost-reduction improvements.' LM Germany did not know if the company had implemented supplier development activities.

According to Global LM, KAG has just started to implement lean on the supplier side. Global LM indicated 6S, TPM, communication boards, and VSM as tools and methods that have been used in cooperation with suppliers.

Value chain responsibility

TM Operations described the company´s value chain responsibility: 'We are responsible for obtaining the single components up through bringing the parts to the customers and then ensuring that the parts perform as intended.' TM PPQ characterised the company´s value chain thus: 'We just buy all the parts and put them together, testing and sending. But in the end, for sure, if one of our suppliers makes wrong things, we are responsible as a company.' TM Purchasing stated that KAG is partly responsible for the raw material. The company has developed a supplier pool which aims to negotiate for better raw material prices, for the reason that each of KAG's suppliers orders insufficient amounts and thus raw material is often too expensive. The supplier pool allows the suppliers together to order greater amounts of raw material and therefore negotiate better prices. TM HR did not know which part of the value chain the company is responsible for.

GM and LM in China shared the perception that the company is responsible for the whole value chain. However, LM China stated that the company currently only focuses on 'door to door activities'. OM China had no clear answer as to this strategic decision area.

GM Czech Republic emphasised that the company is responsible for the chain from the suppliers to the company´s plant. The chain from the company´s plant to the customer is the customer's responsibility.

According to GM Czech Republic, the company buys the raw material for its suppliers. This allows the company to buy huge quantities and thereby negotiate a lower price. KAG in the end only pays the suppliers for the production costs and not for the raw material. OM Czech Republic stated: 'We help our suppliers find good raw material.' In addition, OM Czech Republic said: 'Often customers pick up products from us.' LM Czech Republic answered that KAG is responsible for buying parts and assembling them.

GM Mexico stated that the company is responsible for the whole value chain but did not explain further what was meant by responsibility for the whole value chain. LM Mexico stated that the responsibility in the value chain changed depending on the customer. However, LM Mexico did not elaborate further or gave any concrete examples.

GM and LM Germany stated that the company´s responsibility in the value chain is to pick up components from suppliers. The customers pick up their products from the company, which makes them responsible for part of the value chain. Moreover, LM Germany indicated that the responsibility in the value chain depends on the customer and is written in the customer contracts.

Global LM answered: 'We do not control what our suppliers are doing.' Global LM also pointed out the supplier pool that enables negotiation for lower raw material prices.

Information and process technology

All the TMs had a consistent view as to what the company's criteria are when investing in new technologies in production. According to the TMs the company prioritises return on investment and cost as the most important criteria. TM Operations and HR also highlighted improving the quality of the product.

Due to time limitation GM China was not given the opportunity to answer this interview question. OM China stated: 'First is cost, efficiency, and quality. The machines are designed in the plant in Germany.' LM China emphasised the importance of individuals gaining understanding of the technology.

GM Czech Republic mentioned that the most important criterion from the company's point of view is cost. After that, the criteria of timing and quality have a major impact. Quality refers to make good and safe products. OM Czech Republic answered: 'The technology needs to make sense and it must fulfil the requirements.' LM Czech Republic did not know what criteria were important when investing in new technologies.

According to GM Mexico, production technology is the most advanced technology. It is important for the company to have the newest technology that enables visual systems within production. LM Mexico likewise stated that production has the latest technology.

GM Germany stressed cost as the most important criterion. LM Germany emphasised cost as important and further mentioned the safety of employees.

Global LM did not know what criteria are important for KAG when investing in new technologies.

4.1.4 Infrastructural decision areas

This section presents the managers' perceptions regarding the five infrastructural decision areas: human resource systems, quality systems, measurement and reward systems, product and process development, and organisation.

Human resource systems

TM HR indicated several opportunities the employees at KAG have for self-development. TM HR stated: 'We have training, development centres, coaching, and development plans. This year we rolled out the talent identification process. We are also in contact with interns, that are future potentials.' The remaining TMs named some of the same aspects TM HR mentioned. For example, TM Purchasing shared the perception of development plans by mentioning that employees receive once-a-year standardised feedback about their strengths and weaknesses. Further, TM Purchasing pointed to the objectives system for managers that is linked to overall company targets and budgets. If the objectives are reached the managers receive a monetary reward. TM HR and Operations mentioned the talent identification process as an alternative for employee development. TM Operations stated moreover that employees can take different tests, go through various departments, or even change locations. The faster a company grows the more opportunities exist for its employees. In addition, according to TM Operations the company promotes internal talent and works with mentorship and trainee programs. However, TM PPQ stated that the company does not have any formal mentorship or trainee programs. TM PPQ did note that the company has internal training and that currently the Global LM has started to train the employees within lean.

GM China stated that employees can develop through global, internal, and external training. All the managers in China mentioned the aspect of providing employees with lean training.

GM Czech Republic stated that employee development takes place through individual, internal, and external training. The company also focuses on 'training the trainer internally', and in addition employees currently receive education about lean. GM Czech Republic stated: 'We have started to make people aware of lean at the bottom of the pyramid, but the top of the pyramid is still missing.' OM Czech Republic emphasised that employees can grow as the company grows and receive training to develop their knowledge base. According to LM Czech Republic, the company currently provides employees with lean training. However, the company faces the problem that approximately 40 percent of its employees are temporary. It is therefore hard for the company to know how long these employees will stay,

and many are not motivated to develop themselves since they may not see any future with the company.

GM and LM Mexico stated that the company provides employees with training about lean methods and tools. According to GM Mexico, the company only focuses on lean in the production area. An additional aspect for employee development emphasised by GM Mexico was that employees can change departments and work towards a higher position within the company.

GM and LM Germany pointed to lean training as an opportunity for employees to develop. According to GM Germany, the company does not work with mentorship and trainee programs. LM Germany also brought up difficulties the plant currently faces. Because of high labour costs a decision has been made that the plant will close, and obviously it is difficult to motivate employees who have worked there for 20 or 30 years.

Global LM stated: 'We started with the lean training program based on our lean training modules with the aim of bringing all the employees on the production side into our lean boat.' Further, the administration area is currently in the planning phase to roll out the lean tool known as process mapping, which has similarities to value stream map.

Quality systems

The decision area of quality systems focuses on how the managers at KAG understand problem solving within the company.

With regard to how the company works with problem solving, TM Purchasing stated: 'We are doing well in troubleshooting.' In addition, TM Purchasing along with TM Operations described that the most common way to solve problems is to organise cross-functional teams with a project leader. According to TM HR, the first action in problem solving is to identify the problem, and it is important to not escalate the situation. TM HR stated: 'I am not sure that we are using problem-solving methods. In some areas we are, but I do not think we are doing so in an academic way. The problem-solving approach is based more on history and experience.' TM PPQ noted that problems are best solved in groups. Further, TM PPQ addresses a problem by first talking with the employees in the area where the problem actually occurred, and thereafter uses lean tools to solve it. However, no specifics were given as to which lean tools are used.

GM China described problem solving at KAG as open communication. OM China answered that problem solving at KAG consists of the supervisor for each production line making daily reports of quality problems. If the quality problem has a wide scope, the supervisor builds a team to be responsible for solving it. However, if the scope of the problem is too wide for the team to handle, the problem solving escalates to management level. LM China referred to 5 Whys and PDCA in explaining KAG's problem-solving process.

GM Czech Republic stated that KAG works towards preventing problems from reoccurring, but most of the time employees are under time pressure so 'in the end it results in fire-fighting'. OM Czech Republic noted that the most common way of solving problems is to organise a meeting with the departments involved. LM Czech Republic did not answer this question since the time of the interview was limited.

GM Mexico stated that the company uses the problem-solving method 8D when the customer requires it. GM Mexico also said that additional tools such as fishbone analysis and 5 Whys are used. According to LM Mexico, problem solving is typically performed by multidisciplinary teams, which create an action plan to prevent the problem occurring again.

GM Germany said that problem solving is carried out through meetings with all involved departments. LM Germany stated that different kinds of problem solving methods are used depending on the problem. When the problem is relatively small, employees in production are able to solve it by themselves, but if it is larger it is necessary to involve more departments.

Global LM said that problem solving at KAG involves meeting and talking about the problem. Global LM stated: 'We do not use any problem-solving methods. 8D reports are only used when the customer requires it.'

Measurement and reward systems

TM HR and TM PPQ stated that KAG's reward system is based on CIS, which is a system in which employees can make suggestions for improvement that are linked to bonuses. TM Operations and TM HR pointed out that the reward system may differ depending on the country. According to TM PPQ, managers have individual objectives, and by fulfilling these objectives the managers receive a monetary reward. According to TM Operations, operators receive bonuses linked to production output.

All the managers in China described the reward system by explaining CIS. It was also emphasised that lean has no reward system linked to it. GM China stated that there is a bonus system for managers which is based on individual and company objectives. OM China also discussed the managers' bonuses and in addition gave a detailed example of how operators' bonuses are based on production output and company performance.

All the managers in Czech Republic pointed out that the rewards system for operators is linked to production line efficiency. In addition, OM Czech Republic emphasised the rewards linked to managers' targets. LM Czech Republic pointed out that a lack of bonuses between departments leads to problems throughout the whole organisation.

In Mexico the GM stated: 'Yearly salary increases and promotions are applied when somebody outperforms.' GM and LM Mexico pointed to CIS as a reward system. In addition, LM Mexico emphasised the bonuses to operators which are connected to production output.

GM and LM Germany mentioned CIS as a reward system and also noted that managers have targets linked to bonuses. In addition, both managers in Germany pointed out the operators' bonuses that are linked to company performance and production output.

Global LM indicated CIS as a reward system and also the managers' targets that are linked to a bonus system.

Product development system

The decision area of product development focuses on how the managers at KAG view product standardisation.

The TMs emphasised the importance of customisation with regard to product standardisation. The majority of TMs also referred to product platforms and module systems. The company has A and B platforms as standardised products, with the customer thereafter being able to make modifications within the platform. TM Operations also stated: 'Another form of standardisation is that the product goes in various platforms in the car, and the platform has slightly different requirements; therefore we have several modules within this product.'

OM China answered that most customers require customised products; however, no further details about this area were given. GM China and LM China were not able to describe product standardisation within KAG.

GM Czech Republic stated: 'The company´s view on product standardisation is to standardise everything, and therefore we have a high level of standards. The company tries to improve product standards but not to increase the number of standards.' OM Czech Republic said: 'We develop the product with the customers in the early stages.' According to LM Czech Republic, KAG works with platforms. However, LM Czech Republic was not able to explain how the platforms work.

GM Mexico pointed out the need to reduce the variance among different models driven by customers, as product standardisation is overly complex. LM Mexico was not able to describe how product standardisation works at KAG.

Both GM and LM Germany mentioned that the company works with platforms divided into A and B.

Global LM was not able to answer the question of how the company works with product standardisation.

Organisation

The decision area of organisation focuses on how KAG works with improvements.

With regard to how the company works with improvements, TM Purchasing referred to *Continuous Improvement System* (CIS). CIS is a system in which employees can hand in their improvement suggestions. 'The operator can go to his boss, make a proposal, fill out a form, and present his idea. Then an evaluation is made,' TM Purchasing said. According to TM Operations, the company works with improvements in the same way as with problem solving. The employee presents the suggestion for improvement in a meeting, and the suggestion is then checked out as to whether it can be executed or whether it needs to be modified. TM HR stated that the suggestion is first discussed in a group. The group must recognise whether the improvement suggestion is local or global; thereafter a project leader is selected to be responsible for implementing the improvement. TM PPQ discussed various alternatives as to how the company works with improvements. One option is for someone to walk around the company and ask why work is done in a particular way or if it could be performed differently. However, it is important not to blame employees as performing incorrectly. Mistakes happen, but the company needs to discover ways to avoid repeating mistakes. Preventing the reoccurrence of mistakes is, according to TM PPQ, the definition of continuous improvements. The second alternative brought up was for an operator to go to the supervisor, who then assists in filling out a form for CIS. From there a CIS committee judges whether the suggestion is good enough to implement.

GM China stated that an operator can suggest an improvement through his or her supervisor. According to OM China, there are two options for an operator who wants to make an improvement suggestion. One is to propose the idea to the supervisor. If the supervisor finds the idea to be a good one, it is then discussed with the affected departments. The second option is to write an improvement suggestion in CIS. LM China also stated that operators can make improvement suggestions in CIS.

GM Czech Republic mentioned that some improvement suggestions are required to be approved by headquarters in Germany. Approval by headquarters causes the improvement

suggestion procedure to be slow and is a conservative view of globalisation, according to GM Czech Republic. OM and LM Czech Republic emphasised CIS.

According to GM Mexico, it is important to take measurement of the improvement and then create an action plan. LM Mexico pointed to CIS as the option available to the operators for making suggestions for improvement.

GM Germany emphasised the CIS process. LM Germany did not describe how the company works with improvements.

Global LM stated: 'An operator makes proposals through the CIS process with help from the supervisor.'

4.2 Different managerial-level views regarding lean

This section describes managers' perceptions of the definition and implementation of lean. It also describes the managers' views of lean achievements and long-term goals.

4.2.1 Managers' definition of lean

According to TMs at KAG, lean means to optimise, use few resources, and eliminate waste. TM Purchasing was the only manager to mention the customer aspect, saying: 'We need optimised processes...they need to be adapted to customer needs.' TM Purchasing emphasised optimisation throughout the whole organisation, from initial product idea to final step.

GM China stated: 'Lean is simply waste reduction,' which aligns with the OM China view. OM China added that lean involves reducing cost. Lean according to LM China is 'a way of thinking and not only about tools'. It is about 'doing more and more with less', and it needs to be incorporated into both the production and administration areas.

GM Czech Republic stated: 'Lean is not only tools; it is a philosophy for the whole company.' It is important that all departments be involved. OM and LM Czech Republic defined lean as reducing waste and focusing only on value-added activities. However, only LM Czech Republic pointed out the importance of focusing on value-added activities from a customer perspective. LM Czech Republic moreover emphasised that lean should be incorporated in people's minds and behaviour.

The managers in Mexico did not share the same perception of the lean definition. According to GM Mexico, lean is 'only a set of tools that are aligned to diminish waste', while LM Mexico stated: 'Lean is a way of thinking...and executing activities, strategies, and tools.'

GM Germany referred to lean as considering how to improve using small steps in everyday activities at each level and by all employees within the company. GM Germany illustrated this aspect by comparing how people would behave using intelligent technologies at home to the same kind of thinking at work. LM Germany defined lean as eliminating waste in all processes.

Global LM stated: 'Lean is an improvement culture.' Moreover, lean is 'a way of thinking' about how to manage improvement processes and involve people.

4.2.2 Managers' reasons to implement lean

The TMs shared the same perception as to why the company wants to implement lean. All the TMs highlighted external factors as the tougher competitive environment along with

requirements from customer audits. According to TM Operations, customer audits are starting to require information about, for example, the availability of machines. Both TM HR and PPQ stated that customers expect savings each year. TM Purchasing and HR emphasised that the company wants to implement lean for the purpose of getting better internally as a company.

GM China stated that the company had implemented lean before but that there is now a need for a formal lean process in which activities are seen as projects with leaders. OM and LM China highlighted cost reduction. In addition, LM China stated: 'We want to satisfy our customers and survive our competitors.'

GM Czech Republic pointed out the internal aspect of the company's need to change the organisational structure and move from working functionally in 'black boxes' to more cross-functional work with a horisontal cost function. OM and LM Czech Republic indicated almost the same reason: 'to be the best in the market' compared with 'to be competitive in the market'. LM Czech Republic also stressed that cost savings are necessary to enable the company to grow.

According to GM Mexico, the company has been implementing lean, but this is now being done in a more structured way. LM Mexico stated that the reason KAG wants to implement lean is 'to satisfy the customer in a productive way. Lean is now a requirement of the market.'

GM Germany stated that lean has been implemented in the company, but now it is because of the Global LM in 'general lean thinking and setup'. The reason the company implements lean, according to LM Germany, is to eliminate waste in all forms and to reduce costs.

Global LM stated: 'To keep the leader position in the market and to make it easier to assemble and produce the product. To gather our own experience about lean so we can guide our suppliers in lean tools and methods'.

4.2.3 Lean achievements

TM Purchasing stated that with lean the company is able to achieve cost advantages, better processes, and a common mind-set as to time, money, and resources. These achievements should lead to increased efficiency and competitiveness for the company. TM Operations answered that the company can achieve transparency via these processes and also work at a faster pace in a controlled way. TM HR did not know about achievements with lean.

GM China pointed to efficiency, productivity, cost reduction, and improved quality as the main achievements the company can establish. OM China shared the same perception regarding improvements in quality, efficiency, and cost reduction, but added the aspect of standardising each plant's activities for using the same processes.

According to GM Czech Republic the company is able to enhance communication and better connect departments with each other. OM Czech Republic stated: 'With lean we can earn money.' LM Czech Republic said that the board probably wants increased profit but that lean is about the people.

GM Mexico pointed out that the achievement using lean is to reduce costs and improve quality. Better quality will lead to better customer satisfaction. LM Mexico stated: 'We can achieve many important goals such as productivity, training of personnel, and being more competitive and profitable.'

In Germany the GM found that the biggest achievement is to make employees think about what can be improved compared with yesterday. GM Germany continued: 'The after-effect of this is that we are more effective, we have savings, people work better and in easier ways, and working conditions improve, so it is not only about the profit.' According to LM the most important achievement is to have processes that are without waste.

Global LM stated that the achievement for KAG is to make use of all employees' potential and interest to support improvement processes, and also to bring suppliers into the 'lean boat'.

Table 3 below summarises all the perceptions of lean achievements and divides them according to managerial level.

Table 3. Lean achievements according to managerial level.

Managerial level:	**Lean achievements:**
Top managers	* Common mind-set * Cost reduction * Efficiency * Productivity * Transparent processes
Middle managers	* Common mind-set * Cost reduction * Customer satisfaction * Efficiency * Enhancement of communication * Improved quality * Improved employee working conditions * Integrated departments * Productivity * Supplier involvement
Operating managers	* Cost reduction * Efficiency * Focus on people (training) * Improved quality * Processes without waste * Productivity * Profit/earnings * Standardisation of activities

4.2.4 Long-term lean goals

Three out of four TMs stated that they did not know what the long-term goals are for lean. The only TM to declare a long-term lean goal was TM Operations, who said the company follows a plan of steps for introducing lean tools. The current focus is on the lean tool TPM. An additional goal is to save costs.

One long-term lean goal of which GM China was aware is standardisation of reporting. Standardised reporting enables every plant to have the same measurements. GM China also indicated the global lean workshop as another goal. In the global lean workshop decisions are made as to how lean is defined and how it should be rolled out. Currently several lean pillars are defined in the workshop. Each pillar is assigned to a 'pillar leader' who is linked to the

functional departments, GM China stated. OM and LM China were not aware of any long-term lean goals.

GM Czech Republic stated: 'They have only implemented tools and created goals for them in production, but not anywhere else.' OM and LM Czech Republic stated that no long-term lean goals exist. Furthermore, LM Czech Republic said: 'No lean vision means no goals.'

GM and LM Mexico shared the understanding that there is 'a long-term plan which consists of when to implement certain lean tools' and 'different stages from 1 to 5…how to implement lean tools'. In addition, LM Mexico stated that one lean goal is to construct a 'lean vision 2020'.

GM Germany stated that one long-term lean goal is to have plants look the same worldwide. Further, GM Germany said the company is working towards creating 'lean vision 2020'. LM Germany stated that there are no long-term lean goals at the moment.

According to Global LM: 'We have planned workshops about 6S, which should be finished next year. The company plans to implement TPM. We have created a lean audit score and we have goals in cost savings, but these are not announced goals, just communicated to LMs and GMs.'

4.3 Company vision

It is significant that at all three managerial levels the company vision is not known. Two out of four TMs could not answer the question about the company's vision. The remaining TMs stated that the company's vision is to retain market leadership and to be a specialist and technology leader in the product segment.

GM and LM China stated that the vision is to be number one in the market and to strive to be a leader in the specific product segment. Meanwhile OM China had no knowledge of any company vision.

GM and LM Czech Republic did not know the company vision, while OM Czech Republic stated that the company wants to be a market leader.

GM Mexico did not know the company vision. LM Mexico said the vision is to satisfy the customers and produce safe products.

GM and LM Germany stated that the vision is to be a market leader and to produce the best products, which would lead to customer satisfaction.

According to Global LM there is no company vision.

4.4 The integration of lean into MS

This section presents KAG's process and plans for implementing lean. The data has been gathered mainly from observations and results of workshops. The different managerial levels' descriptions of lean implementation follows, based on individual interviews with the managers.

4.4.1 How lean has been formulated and implemented

Global LM has created an overall lean implementation plan, which is divided into five steps (appendix 3). According to Global LM, 6S and 6S Audit were implemented, the various wastes were brought to attention in the company, and currently the focus is on TPM.

Comparing this with the created implementation plan, the company is at the moment focusing on steps 1, 2, and 3.

Parallel to the lean implementation plan, in 2014 a lean vision and structure for KAG was created. According to Global LM the company needed a lean vision that was divided into administration and manufacturing. The statement of Global LM reveals the reason for dividing the lean vision: 'We have more lean awareness in the production area, since the customers requires it. Therefore at the moment we need to have different visions, because we are currently at different levels of lean.'

In 2014 Global LM organised two workshops to gather knowledge from each LM regarding lean and to create a lean vision and structure. At the end of 2014 the Global LM presented the results from the workshops to the TMs. The first workshop aimed to define lean and build a structure for how the workshop group could present it to the company. The second workshop aimed to continue with the lean structure and further discuss the lean tools that should be implemented, see workshop process in Figure 15.

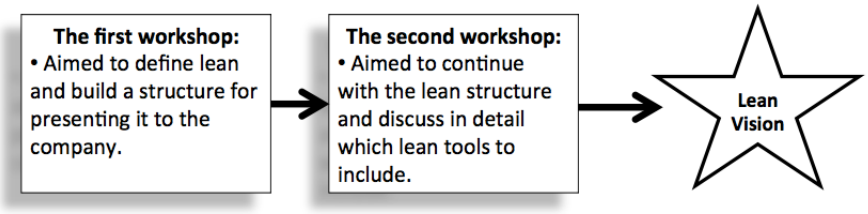

Figure 15. The workshop process of a lean vision

The result of the first workshop was to present the lean definition in five main areas: awareness of waste, standards, all about people, customer/supplier relationship, and doing the right things. Figure 16 below describes each of the five areas in more detail.

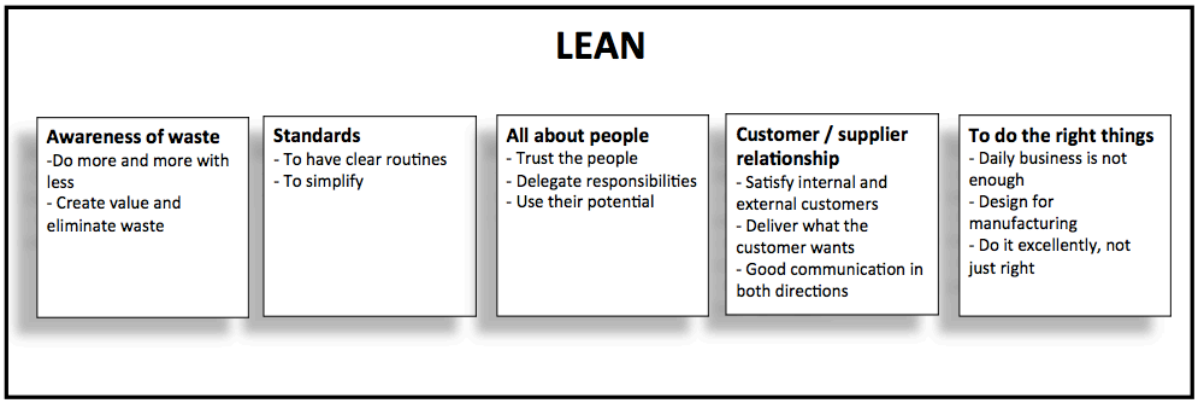

Figure 16. KAG's lean definition

The result of both workshops was a formulation of how lean should be structured. This structure was intended as a foundation for integrating lean into the company. Figure 17 shows an illustration of the lean structure as a house with eight pillars. The roof of the house signifies that the company is striving towards 100 percent value-added activities. The eight pillars represent the areas in which it is necessary to integrate lean.

The pillar 'Focused improvements' aim to create a system where the employees can continuously improve. 'People development' covers the issues related to human resource systems such as educations, development plans for employees etc.. 'Material flow' aims to

make the material flow, from the customer order to finished product, focusing only on value added activities. 'TPM' focuses on the production and aims to avoid breakdowns through maintenance of the equipment. 'Workplace excellence' focuses on creating a workplace excellent for the employees. 'Quality assurance' refers to covering all the quality related issues within all the departments in the company. 'Environment and safety' stress the importance of working towards environmental friendly activities within the company. The first priority within this pillar is to put the safety of the employees on the first place. 'Process excellence' aims to strive towards the best processes within the company.

Each pillar has a manager responsible for it, called the pillar leader. The pillar leader is responsible for developing a plan for implementing that specific pillar into the company. The pillar leaders are managers from KAG´s different departments. In the Figure 17 are the each pillars´ pillar leader not emphasized since the time for the workshop limited this discussion issue. KAG's lean house also emphasises the importance of the involvement of all departments. In addition, the importance of leadership, motivation, TM commitment, teamwork and clear objectives is stressed.

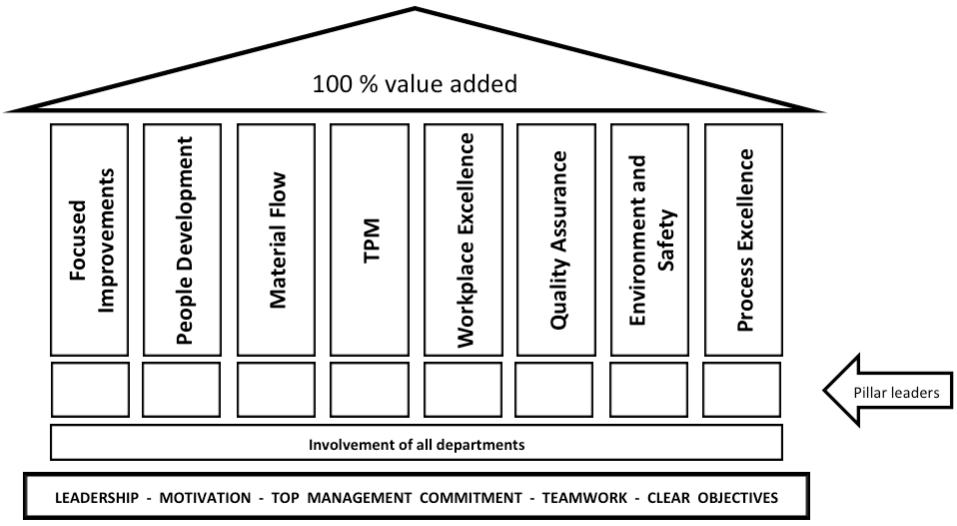

Figure 17. KAG's lean house with eight lean pillars.

The workshops included discussions about how to link lean to corporate strategy. The group at the workshop found it hard to link lean and corporate strategy for two reasons. First, the lack of company vision made it difficult for the group to link the lean vision to a company vision. Second, the group felt that there was no TM commitment to creating a lean vision and structure. The main reason the group did not feel commitment was that they believed it was vital for TMs to participate in the workshops given the direction the company wants to take.

4.4.2 Managers' description of the lean implementation

The TMs gave varied descriptions of how lean has been implemented in the company. TM Purchasing pointed out the importance of having a manager that is global lean responsible to implement lean in a structured way. A global lean responsible manager (Global LM) shows that lean is an important change for the whole company. TM Operations remarked that the company probably focuses too much on training for lean tools and changing people´s mind-sets rather than on cost-saving projects. TM HR was not aware that the lean implementation had started, and the TM PPQ stated: 'Do not talk about it; do it. Start.'

The managers in China gave a similar description of the lean implementation, saying that lean focuses only on production and has not been introduced in other departments. They added that lean implementation is in an early stage with focus on 6S and TPM.

GM and LM Czech Republic emphasised different aspects of the lean implementation. GM Czech Republic found that employee training is too weak. The lean trainer only stays one week and afterwards leaves the plant, which results in impermanent employee training. LM Czech Republic stated that the lean implementation is not sustainable because it starts with the managers and not with the employees' mind-set. In addition, LM Czech Republic said: 'Everybody comes with advice to production, for example, how to save costs, but they don't look in their own mirror at their offices in administration.'

GM Mexico characterised the lean implementation through Global LM as more organised and structured than earlier efforts. According to LM Mexico, lean implementation is based on a framework which currently means training employees in lean workshops.

Both GM and LM Germany described lean implementation through lean tools. However, GM Germany highlighted the introduction of a lean steering committee in the company.

Global LM stated in regard to lean implementation: 'We are just in the beginning. Last year we worked on organisation as having LMs at all plants and a lean steering committee. We just initiated 6S, TPM, and VSM. We started to educate the employees with basic training.'

4.4.3 Managers´ perception of lean progress

The managers' perception of lean progress is depicted in Figure 18. The managers answered the question of how far the company had progressed on lean implementation in a range of 1 (Not Started) to 7 (Completed).

TM HR answered 'just started', while the remaining TMs answered between 3 and 5. Middle management answers varied between 1 and 5.5. Operating management, OMs and LMs, gave more average answers, ranging between 2 and 5. It is interesting that each country did not vary widely in its answers with the exception of China. The answers of the managers in China ranged between 1 and 5, while the answers of the Czech Republic managers ranged from 2 to 4. The answers of the managers in Mexico were between 3 and 4, and the managers' answers in Germany were around 5.

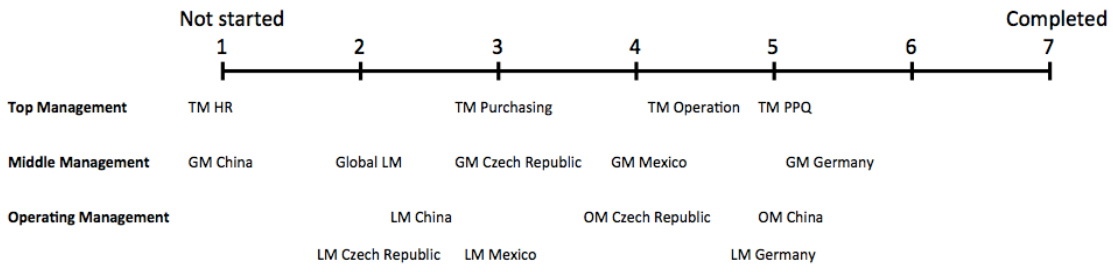

Figure 18. The managers´ perception of lean progress.

5 Analysis

The chapter follows the structure of the analytical framework depicted in Figure 19 *below. It starts with step 1, section 5.1, an analysis of the level of strategic consensus among three managerial levels' view on MS content. Thereafter step 2 is in focus in section 5.2, which is an analysis of the MS process. The chapter concludes with step 3 in section 5.3, which analyses the link between MS and corporate strategy.*

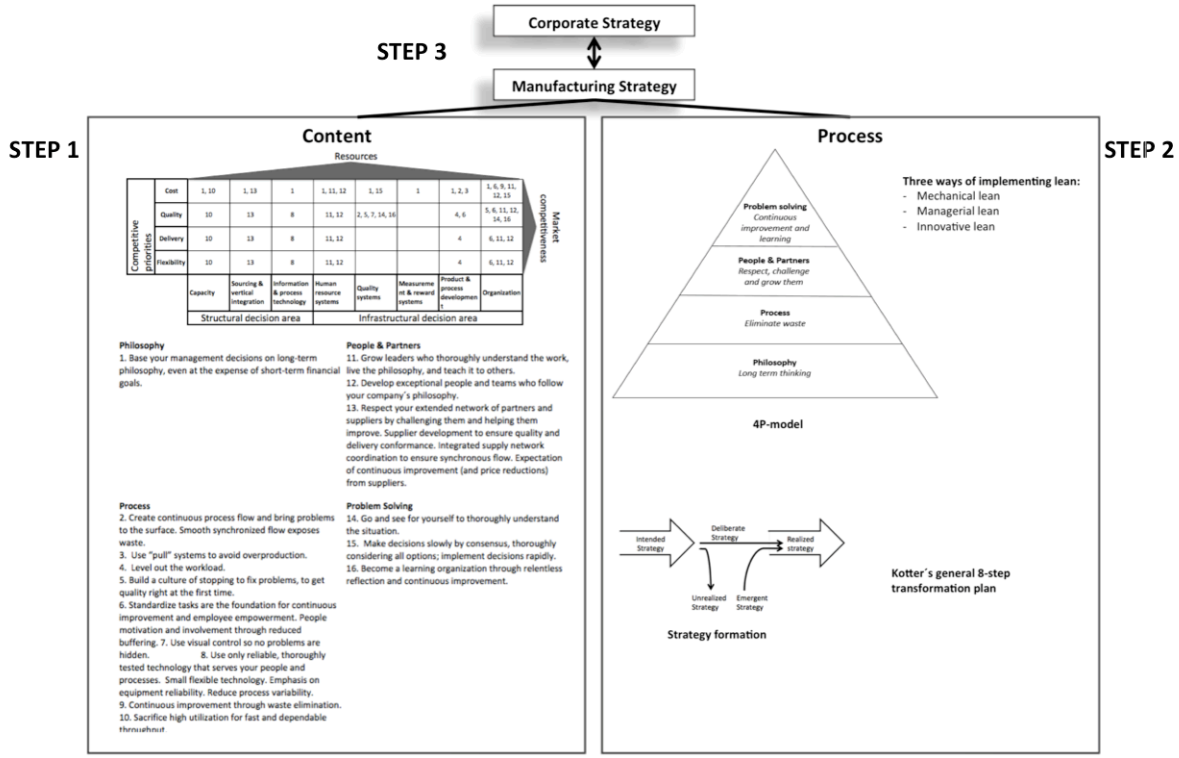

Figure 19. Analytical steps based on the analytical framework.

5.1 The level of strategic consensus regarding MS content

In the analytical framework of MS content is lean and MS combined in an operations strategy matrix. However, since the literature emphasises a huge variety of the lean definition, scope and goal, the section starts to analyse the level of strategic consensus among the three managerial levels regarding lean. Thereafter analyse thelevel of strategic consensus regarding MS as a combination of lean and MS.

5.1.1 The level of strategic consensus among the managerial levels regarding lean

The majority of the managers' views on the definition of lean is to optimise, use few resources and eliminate waste, a definition in line with Slack and Lewis (2011), who state that lean focuses on eliminating non-value-added activities to establish smooth processes. However, when the managers described their views on lean in more detail, there was a wide range of differences but also many similarities. For example, only two managers had similar views emphasising the importance of looking at the whole value chain from the customers' point of view, which is, according to Liker (2004), a central concept of lean. Another central

concept of lean is that lean not only focuses on production but also includes several other departments (Sánchez & Pérez, 2001). Only four managers emphasised this aspect, but can not show that it is a specific managerial level that emphasises this specific aspect. The conclusion is therefore that there is low level of strategic consensus among the managers that the definition of lean includes the customers' point of view and the involvement of the whole organisation. The level of strategic consensus consensus low on two vital concepts in the definition of lean may have a major impact on its implementation (Noble, 1999).

The distinction between lean thinking and tools (Bicheno, 2004) is also evident among the managers at KAG. All the LMs and 50 percent of middle management viewed lean as a way of thinking combined with a set of tools. This understanding is lacking among some middle managers and all top managers. For example, one middle manager stated that lean is only a set of tools to reduce waste. According to Bicheno (2004), lean can be achieved only when it is viewed as a whole system of both components, lean thinking and tools. Since the top managers do not view lean as comprising both components, the level of strategic consensus among all three managerial levels is low and may lead to a poor lean implementation (Noble, 1999).

As depicted in Table 3, the managers at different levels have different expectations of what can be achieved with lean. Pettersen (2009) states that lean goals can be divided into internal and external goals; however, only one middle manager emphasised customer satisfaction, which is an external goal, as an achievement of lean. Improving quality and supplier involvement can be seen as an indirect external achievement, but the remaining achievements stated by the managers can be classified under internal goals.

The level of strategic consensus among all three managerial levels is that lean should reduce costs and create more efficiency. What also can be linked to these achievements are, for example, productivity and processes without waste. According to Mann (2009), many lean initiatives fail to deliver the promised benefits because managers perceive them as cost reduction systems. Further, Maskell and Kennedy (2007) highlight that in the short term, no cost reduction may occur with lean; rather, the main benefits are increasing capacity and reducing waste. Therefore, as the main achievement at all three managerial levels was connected to cost reduction, the lean implementation may disappoint in the short term. Only one manager at the operating level expressed explicitly that processes without waste could be achieved, but no manager mentioned higher availability of capacity.

Different understandings among managers about the reasons why to lean implementation

Only the operating level highlighted the factors of reducing costs and satisfying the customer. Furthermore, few managers at the operating level highlighted that market requirements are pushing for lean integration, though all the TMs emphasised the pressure of more frequent customer audits that include lean aspects. This shows that the operating and top level of managers share an understanding of external factors, but the middle managers lack this understanding. The middle managers, excluding GM Czech Republic, have a shared understanding that the aim is currently for KAG to have a more structured implementation of lean, but that the company implemented lean earlier. The top and operating managerial level did not emphasise this factor. This means that the level of strategic consensus is low among the managerial levels regarding the reasons why to lean implementation.

No long-term lean goals makes it hard to know where the company is in the lean progress

According to lean point 1, it is important to base decisions on long-term thinking. If there is no shared lean vision about the future state, it will be difficult to break down the vision into lean goals, which is in line with what the LM Czech Republic emphasised: 'No lean vision means no goals'. The quote from the Global LM in section 4.2.4 shows that the focus has been on having goals regarding lean tools and cost savings but which were not announced within the company. If goals are not announced, other managers cannot know them, which is also evident in the result of this study. The majority of the top and operating managers stated that there are no lean goals, while the remaining levels pointed out the lean tools as goals. The level of strategic consensus on what direction the company is striving towards is low and may therefore have a major impact on the lean implementation.

One major impact that is evident in this investigation is that there is no consensus among the managers concerning lean progress. The answers both within and among each managerial level vary, and no pattern can be observed. Two managers from the middle and operating level emphasised in chapter 4.4.2 that the lean implementation has focused only on production. This may be the reason why, for example, the TM HR stated that the lean implementation has not started, since TM HR is only indirectly connected to production. However, the managers that believe that the lean implementation is almost complete have different expectations from managers that believe the lean implementation has not started. This will therefore have a major impact on how the lean implementation will continue, since the managers will be disappointed if their expectations are not aligned with reality.

5.1.2 The level of strategic consensus among the managerial levels regarding MS

As highlighted in Figure 12 in section 4.1, the information regarding the documented operations strategy reaches only one of the TMs and all of the middle managers. According to Floyd and Wooldridge (1992), poor implementation of a strategy may occur when managers at the operating level are not well informed. The documented operations strategy at KAG entails standards for the plants worldwide. The decisions made by the operating managers may therefore undermine these standards since the managers are not aware of them, which may result in a poor implementation of the standards in the plants worldwide.

The analytical framework of MS content do each decision area includes lean point 1, since it is the foundation of lean. However, this study could not analyse lean point 1 in all decision areas since the managers' responses did not indicate whether decision-making was based on long-term philosophy. This can be interpreted in two ways: either the company is not aligned with this lean point 1 in the strategic decision area, or the interview question did not allow the managers to emphasise this. The lean point 1 is analysed in the decision area 'Human resource systems' and 'Measurement and reward systems'.

Better competitiveness by common ranking of competitive priorities

The result in section 4.1.1 shows that there is a high level of strategic consensus regarding the definition of each competitive priority. One major difference can be tracked when comparing each competitive priority's definition with the definition emphasised in the theoretical framework: The managers at KAG emphasise that quality means to strive for zero defects, but in the theoretical framework, quality is defined as 'a product with better performance features and quality'. The managers at KAG did not mention 'better performance features' in their quality definition could be interpreted in two ways. One way is that the managers do not recognise this aspect in the quality definition, while the other way is that the managers take this aspect as a granted in the quality definition and therefore not mention it.

Further, as mentioned in section 4.1.1, it was hard for the managers to give a direct answer as to which competitive priority was the most important. The reason why they found it hard is that it always depends on the situation, which is in line with the theory regarding the trade-off between competitive priorities (Slack & Lewis, 2011). Furthermore, if the competitive priorities worked as Ferdows and Meyer (1990) state regarding the sand cone model, then the answers by the managers should have followed the order of quality first, then dependability, followed by flexibility and lastly cost. The answers from the managers did not follow this order of prioritisation, which shows that the sand cone model is not applicable at this case company.

The level of strategic consensus among all three managerial levels regarding the prioritisation of competitive priorities is high. The majority of the managers prioritise quality and delivery as the top two performance objectives. Hayes et al. (2005) state that equal ranking among the competitive priorities often results in that the company being the second best in the market. The result shows that KAG does not have the same prioritisation between competitive priorities and may therefore be in a competitive position. However, to be in a competitive position also depends on that the competitive priorities are aligned with the market requirements (Slack & Lewis, 2011), which is not within the study´s scope to analyse.

Capacity

In all three aspects regarding changing capacity level – amount of products, types of products and delivery date – the level of strategic consensus is high among all three managerial levels, except that the TM HR was not able to describe the company's strategy in this area. Additionally, Global LMs pointed out aspects regarding capacity that were not emphasised by any other manager.

According to the majority of the managers, the amount of products can be increased by changing the work shift model. Building a new production line was highlighted by the half of the operating managers. Further, one manager argued that the production area is overloaded with equipment and machines and therefore limits the ability to build new production lines. This argument indicates that the decision area 'capacity' also includes aspects that are emphasised in the analytical framework under the decision area 'information and process technology'.

Two managers from the middle and operating levels pointed out the degree of automation as an aspect influencing capacity level. Further, two managers emphasised also that the change in capacity level depends on the suppliers' ability to deliver the required components. The strategic decision area 'capacity' presented in the analytical framework does not include suppliers. That two managers emphasised the suppliers in the decision area of capacity indicates that the analytical framework of MS content needs to be reviewed so the theory

better matches the practice. As for changing the capacity level regarding types of products, the level of strategic consensus is high among the managers that emphasised that the company currently utilises high-volume lines, each dedicated to only one specific customer's requirement. Furthermore, KAG is flexible in changing delivery dates since it has safety stocks.

The analytical framework for the decision area 'capacity' contains of lean point 10. The managers' description of the company as working with high-volume lines contradicts lean point 10. Lean point 10 refers to sacrificing high utilisation for fast and dependable throughput. The high-volume lines and the fact that KAG needs to increase the amount of products through the work shift model indicate that the company works with high line utilisation.

As one manager mentioned the overloaded production area, lean point 8 may need to be included under the decision area 'capacity'. Lean point 8 refers to having small and flexible technology, which seems not to be aligned with KAG's current strategy. In addition, two managers emphasised the suppliers in the decision area of capacity, indicating that this decision area may need to include lean point 13, which refers to supplier development to ensure quality and delivery conformance. However, the statements made regarding the suppliers indicate that the company is weak in lean point 13.

Sourcing and vertical integration

The level of strategic consensus varies between the two aspects of using lean methods and tools together with suppliers, and value chain responsibility. Concerning the issue of using lean methods and tools together with suppliers, the managers have a lower level of agreement compared to the issue of value chain responsibility. The TMs have contradicting opinions: some managers stated that the company is weak in developing suppliers, while others stated that the company is doing a lot. In addition, one middle manager emphasised that no tools have been used. On the other hand, the operating level and two respondents from middle management highlighted value stream mapping as one major tool that has been used together with suppliers. This shows that not only are there contradicting opinions about whether the company is weak in this issue but that some managers lack information about the company's effort in this direction.

The strategic consensus among the managers was in line with the statement by TM Operations: 'Not a lot of methods are used yet with the suppliers'. In addition, the common perception among the three managerial levels is that the company is responsible for buying parts, assembly, testing the product and sending it to customers. TM Purchasing and Global LM, which is top and middle managerial level, emphasised that the supplier pool enables negotiation of prices for raw material. The managers at the operating level lack information regarding the company's efforts in this regard; TM HR was not able to describe the company's strategy in this area. That the TM HR was not able to answer either the company´s strategy regarding 'capacity', or 'sourcing and vertical integration' indicates that a TM HR do not need to understand all the MS strategic decision areas.

Slack and Lewis (2011) point out the strategic decision area 'sourcing and vertical integration' as a vital part of lean. According to the analytical framework, lean point 13 is included in this decision area. The previous analysis about 'capacity' indicated that KAG is weak concerning lean point 13. One part of lean point 13 refers to a company ensuring quality and delivery conformance by working with supplier development. The strategic consensus among the managers shows that the company is not putting a lot of effort into supplier development, which suggests that the company's current strategy is not aligned with

this lean point. On the other hand, another part of lean point 13 states that the company should expect continuous improvement and price reductions from suppliers, and the strategic initiative to use supplier pools to reduce the costs of raw materials shows that the company is aligned with this point. Further, this strategic action by the company creates the opportunity to influence the supply chain further back, which is beneficial from a lean point of view.

Information and process technology

The strategic consensus among the three managerial levels regarding the most important criteria when choosing new technology are cost and return on investment. However, some other criteria were also emphasised. Two top managers and one operating manager stressed the importance of improving product quality. Further, only the middle and operating managerial levels argued that safety of the employees and that employees get an understanding of the technology were important criteria when investing in new technology. This was not emphasised by top managers. Top managers did not stress these aspects may have many reasons, which were not investigated in this study.

In the analytical framework, lean point 8 is included in this decision area. Lean point 8 refers to several aspects. One aspect is that the technology should be reliable and serve the employees and processes. That the middle and operating level argued for safety of the employees and that employees get an understanding of the technology indicates that the company is in line with this aspect in lean point 8. Another aspect of lean point 8 refers to small and flexible technologies. As explained in the decision area 'capacity', KAG's current strategy is not aligned with this lean point.

Human resource systems

Except for TM HR, no manager at the top, middle or operating level showed a general understanding of the whole human resource system regarding the possibilities that employees have to develop within the company. This is in line with the poem about the blind men touching only parts of an elephant (Mintzberg, Ahlstrand & Lampel, 2005), described in section 2.6, because the managers at the different levels know and care mostly about their own area. Only TM HR seemed to have the whole picture of the human resource system, the whole elephant, while the remaining managers touched on and described only some parts of it. This shows that the level of strategic consensus is high between TM HR and each managerial level, but the strategic consensus is lower when comparing each managerial level.

There was a high level of strategic consensus among all three managerial levels regarding the lean trainings. However, middle management argued that the lean trainings focus only on the production areas. The talent identification process that was implemented last year and the development plans were highlighted only by top management. According to Floyd and Wooldridge (1992), a poor lean implementation can be caused by middle and operating level managers not being well informed. It may be the company's strategy to have a talent identification process and development plans that are aimed at only TMs. But if that is not the case, the middle and operating managerial level lack information on these strategic initiatives, since no manager in those levels mentioned the identification process or the development plans. This lead to that the implementation of this specific strategic initiative will be affected negative (Noble, 1999).

Two of the operating managers emphasised the problem of unmotivated employees. In the Czech Republic 40 percent of the working staff are temporary employees, and in Germany the plant will close in the near future. Neither top nor middle management emphasised this as

problematic, which indicates that the level of strategic consensus is low among the three managerial levels regarding this issue.

According to the analytical framework, lean points 1, 11 and 12 are included in this decision area. Lean point 1 refers to basing decisions on long-term philosophy even at the expense of short-term goals. Lean is also about perceiving employees as intangible assets for the company (Fane et al., 2003). To have 40 percent temporary employees and to close a plant in near future can be seen as KAG not focusing on providing long-term employment for its people, which goes against lean philosophy. Lean point 11 and 12 refer to developing leaders that understand the philosophy and teach others. The first step may therefore be to provide managers with lean training, which in this case is done by KAG. However, lean point 11 and 12 are also to live the lean philosophy, which is done when every manager has the same definition of lean. However, as the analysis in section 5.1.1 stresses, the definition of lean varies among the managerial levels.

Quality systems

It is hard to conclude whether the level of strategic consensus on how the company does problem solving is high. One top and one middle manager describe problem solving as 'troubleshooting' and 'fire-fighting'. All three managerial levels pointed out the importance of having meetings with all the involved parties or, in other words, creating cross-functional teams. Concerning whether specific problem-solving methods are used, the perception among the managers varies. One manager in each level of top and middle management mentioned that no problem-solving methods are used, but two managers in the middle and operating level emphasised lean methods and tools as common problem-solving resources for KAG.

In the analytical framework, lean points 2, 5, 7, 14, 15 and 16 are included in this decision area. Lean points 2 and 7 refer to continuous flow and using visual controls. However, the interview question focused in general on how the company does problem solving, and therefore these three lean points were not covered since the time limitation of the interview allowed only to focus on one specific strategic issue within the decision area. Lean point 5 refers to building a culture of stopping and fixing problems and getting the right quality first. The respondents' terms 'troubleshooting' and 'fire-fighting' indicate that the company is not getting the right quality first, which means that KAG could improve on lean point 5. The core of lean is *problem solving,* which includes lean points 14, 15 and 16. These lean points emphasise the importance of going and seeing the problem, making the decisions slowly by consensus and becoming a learning organisation (Liker, 2004). It is interesting to note that only one top manager mentioned the importance of talking to employees where the problem actually occurs, which is in line with lean point 14. However, this shows that the remaining managers may not solve problems in this way. It is therefore hard to conclude whether the company is aligned with lean point 14. Unfortunately, with the information that the managers gave about problem solving at KAG, it is hard to analyse whether the company makes decisions slowly by consensus, thereby following lean point 15. No managerial level described problem solving in the company as an opportunity to reflect and learn, which is lean point 16.

Measurement and reward systems

The level of strategic consensus on measurement and reward systems is high among all three managerial levels since most managers emphasise CIS, the managers' individual objectives and/or operators' bonus systems linked to production output.

In the analytical framework, lean point 1 is included in this decision area. To reward employees for suggesting improvements is in line with lean point 1 of thinking long term, since it enhances the motivation for continuous improvement. Having a bonus system for operators linked with production output may lead to operators focusing only on solving quality problems as fast as possible so as to reach a high level of output instead of investigating problems in depth. Lean point 1 refers to basing decisions on long-term instead of short-term achievement. Therefore, it would be better for KAG to review the bonus system for operators and include other dimensions as well. One barrier to lean implementation is that lean requires changing the measurement systems and should cover the whole value stream (Maskell & Kennedy, 2007). According to LM Czech Republic, the current reward systems at KAG do not link departments. This indicates that KAG may have difficulties implementing lean with the current reward system, which does not cover the whole value stream.

Product development systems

The level of strategic consensus regarding how managers view product standardisation was low. This is because it was hard for many managers to describe the product standardisation view in detail, and the middle and operating managerial level were not able to describe this area at all. However, the common aspects pointed out by the managers were product customisation and platforms.

In the analytical framework, lean points 2, 3, 4 and 6 are included in this decision area. This study started to investigate the level strategic consensus for both product and process development systems, but the time limitation of the interviews lead to only product development systems being in focus. As a result, the analysis excludes lean points 2, 3 and 4, which focus mainly on strategic issues linked to process development systems. Lean point 6 refers to standardising tasks that are the basis for continuous improvement. GM Mexico emphasised that the company should strive to reduce product variance. This in combination with the information given in the decision area ‘capacity’ – namely, that only one product can be produced on one line – shows that the company has the potential to further develop product standardisation. To implement lean, the company should strive for product designs that fit current production systems and are identical worldwide (Slack, Johnston & Chambers, 2007; Liker, 2004).

Organisation

The level of strategic consensus regarding how the company works with improvements is high. All three managerial levels emphasised the CIS process as the cornerstone in how the company works with improvements.

The decision area ‘organisation’, according to the analytical framework, contains several lean points. Vital for lean is continuous improvement, and only lean points 5 and 9 cover this. Lean point 5 is to build up a culture to fix problems, ensuring the right quality from the start. According to Womack et al. (2007), decision making should be done by the team that is now working on the production line. From the descriptions given by the managers at KAG, it is not clear whether the operators are allowed to take decisions regarding improvements on the production lines. For a company to be lean, decision making should be delegated to the team nearest the production line and not always to a CIS committee. Lean point 9, which refers to continuous improvement through waste elimination, was hard to analyse with the information given by the managers at KAG. It was hard to judge whether or not the CIS at the company was helping to eliminating waste.

5.2 The analysis regarding the MS process

This chapter focuses on the analysis regarding lean formulation and implementation by comparing the empirical findings with the theoretical models presented under the analytical framework for MS process.

KAG's lean formulation and implementation compared with the 4P model

By analysing the managers' perception of the lean implementation presented in section 4.4.2, it is clear that the current focus of lean is on 'Process', since the majority of managers emphasised lean tools as one major issue in the lean implementation. According to Liker (2004), most companies focus on 'Process' and do not adapt the remaining three Ps.

Further, an analysis of the managers' lean formulation compared to the lean definition described in Figure 16, and the 4P model in Figure 4, shows that KAG does not implement all four Ps. The similarities between the lean definitions are that KAG emphasised 'All about the people' and 'Customer/supplier relationships', which correspond to 'People and Partners' in the 4Ps. The remaining three areas emphasised at KAG – 'Awareness of waste', 'Standards' and 'To do the right things' – are similar to 'Process'. Nevertheless, the area 'To do the right things' may be interpreted as belonging to 'Problem solving', which emphasises the importance of building a culture that solves problems. In KAG's case, the company touches on 'Philosophy' by creating a lean vision, but this is not currently sustainable, since the majority of the managers are not aware of the long-term lean goals, as explained in section 5.1.1. It can therefore be concluded that KAG is not fully aligned with the 4P model in at least two cornerstones of lean, 'Philosophy' and 'Problem solving'.

Lean is partly integrated into MS content

The analysis in the previous chapter 5.1.2 shows that the managers' description of each decision area is not often aligned with the lean points presented in the analytical framework. Lean points 1, 5, 6, 10, 11, 12 and 14 are weak lean issues at KAG and therefore have potential to be improved. The strategic direction of KAG is partly in line with lean points 8 and 13, but these lean points have also potential for further improvement. The remaining lean points were, however, hard to analyse using the data gathered from the managers. As mentioned before, this may be because KAG's strategic initiatives are not aligned with these lean points and therefore no information is available, or because the interview questions were not able to cover all the lean points' aspects. Based on this, it can be concluded that lean is not integrated in the MS content.

Since the eight pillars at KAG, representing how lean should be structured in the company, were not explained detailed in the workshops, it is hard to make an in-depth analysis. However, by comparing KAGs lean house with the eight pillars depicted in Figure 17 with each MS decision area indicates that there are issues were the link between lean and MS can be improved at KAG. The structural decision areas are important since they set the foundation of the infrastructural decision areas and in addition hard to reverse since they often require high capital investments (Hayes et al., 2005). KAGs lean house touches on issues related to structural decision areas by having the pillars 'Material flow', 'Workplace excellence' and 'Process excellence'. However, it is not clear if the pillars cover strategic issues related either to suppliers or technology. The pillar in KAGs lean house covers some infrastructural strategic decision area issues. The pillar 'Focused improvements', 'Material flow', 'Workplace excellence', 'Quality assurance' and 'Process excellence' covers strategic issues in the decision areas 'Quality systems', 'Product and process development systems'

and ‘Organisation’. The pillar ‘People development’ entails issues of the decision area ‘Human resource systems’.

Though, KAGs lean house has two pillars that are not clearly emphasised in the MS infrastructural decision areas. One pillar is ‘TPM’ which is a lean method and probably the main reason that any strategic decision area does not cover it. To have ‘TPM’ as a pillar also indicates that the company may be confused and mixing up a strategic decision area level and a lean method. The second ‘Environment and safety’ pillar, which may be linked to the decision area of ‘Organisation’, but can also indicate that the decision areas needs to be further developed. Sarkis (2012) argued that green manufacturing is well-discussed the last two decades and according to Dangayash and Deshmukh (2001) do companies need to be more environmental efficient. With this as background the decision areas by Hayes et al. (2005) may therefore be reviewed and include decisions associated with environment. The both pillars ‘TPM’ and ‘Environment and safety’ can however be discussed if they are belonging in the infrastructural decision area of ‘Process development’.

Comparing the managers’ responses associated with KAG’s lean implementation with the three ways of implementing lean according to Bicheno (2004), it is clear that KAGs lean implementation is between the ‘mechanical way’ and ‘managerial way’. The reason is that the analysis in section 5.1.1 shows that the top managers focus only on implementing lean tools and that the level of strategic consensus is low concerning the involvement of all departments, which is in line with the mechanical way. On the other hand, the statements in section 4.4.2 show that managers at the top and middle level found the lean implementation to be structured because Global LM leads it. This suggests that the company’s efforts are in line with the managerial way, which means that the tools are implemented in a more integrated manner (Bicheno, 2004).

Operating managers push a lean vision towards TMs

The first step of the eight-step transformation model by Kotter (1995) is to create a sense of urgency. As shown in the analysis in section 5.1.1, there are different perceptions among the managers regarding the reason to implement lean. However, all the managers stress a sense of need to implement lean, in line with the first step by Kotter. The second step in the eight-step transformation model is to create a powerful guiding coalition. KAG has established a coalition by hiring Global and Local LMs worldwide. However, whether this coalition is enough without involvement from TMs is discussed in the next paragraph.

The next step of the eight-step transformation model is to create a vision. The process of creating a lean vision is actually done by the LMs, who are managers at the operating level. At the lean vision workshops, a much-discussed theme was the lack of involvement of TMs. It is interesting to consider whether it is enough for TMs to delegate resources for the lean formulation and implementation process to lower level management or whether they are required to participate in the workshops to show commitment. The analysis of how the lean formulation and implementation might continue at the company may indicate that the lack of TM involvement has a major impact. When the lean vision and structure created by the operating level are presented to the TMs through the Global LM, there are three alternatives that the TMs can choose from. The first alternative is to accept the lean vision and structure as it is. The second alternative is to accept the lean vision and structure with some modification, and the third alternative is to reject it. As mentioned earlier, in chapter 4.2.3, the TMs highlighted fewer achievements with lean than the middle and operating management levels. The different perceptions of lean achievements therefore probably result in the second alternative. When the TMs make some modifications, the operating level that

created the lean vision and structure will probably be disappointed because the result is not what they planned from the beginning. A disappointed operating management level has a major impact on strategy implementation within a company because they are the managers that also need to communicate the lean vision to the rest of the company.

The situation analysed in the above paragraph indicates that the lean formulation intended by the LMs may be realised or unrealised depending on what the TMs decide. This shows that the model by Mintzberg (1978) is applicable. However, this study cannot conclude in this case whether the intended lean formulation by the LMs is being realised or not.

5.3 The missing link to corporate strategy

The result in section 4.3 shows that the majority of the managers at KAG are not informed about the company vision. In addition, the result in section 4.4.1 emphasises that it was hard for managers at the lean vision workshops to link the lean vision with the corporate vision. The analysis in chapter 5.2 shows that the lean integration into MS is weak. That means that there is a gap between lean and MS but also a gap between lean and the corporate strategy.

Furthermore, Skinner (1969) argued that there is a missing link between MS and corporate strategy and that this may lead to a non-competitive situation. An even bigger gap between manufacturing and the rest of the company may occur, since KAG is missing a company vision and, in addition, the lean vision makes a distinction between administration and manufacturing. This may result in different parts of the organisation striving for different long-term goals or not even striving for any goals at all. The foundation of lean, according to the 4P model, is to base decisions on long-term goals instead of short-term achievement. The lack of information about the corporate vision at all three managerial levels indicates that the foundation for lean is missing.

5.4 Summarising the findings

The purpose of this study was to analyse the level of strategic consensus among managers in top, middle and operating level regarding how lean has been and should be integrated in a company´s MS. Three research questions were guiding the way, each being addressed below.

Research question 1: How do managers' understand MS content?

All three managerial levels had a similar definition of each competitive priority. It was also evident that the managers always were in a trade-off situation when choosing a competitive priority. In addition this study shows that the decision area 'capacity' also includes issues related to suppliers and process technology, which is linked to the remaining structural decision areas and therefore indicates that the structural decision areas may overlap.

The study shows that top, middle and operating managerial levels shares the same understanding regarding some strategic issues, but even more often the managers´ understandings are diversified. The diversified understandings among the managers were evident because of contradicting opinions and the lack of specific strategic aspects. In addition, the study shows that some managers can only describe parts of the decision areas. As the poem about the blind people and the elephant emphasises, it was also evident that lower managers sometimes only described the parts that they have been in touched with meanwhile top manager described the whole system. Given this, it can therefore be concluded that the managers´ understandings concerning MS content varies among the managerial levels and the manager's function.

Research question 2: How do managers understand lean implementation?

The shared view among the managers regarding lean is to optimise, use few resources and to eliminate waste. Few managers stressed the importance of including the customer point of view and the involvement of the whole company. In addition, top management did not see lean as a system of the two components lean tools and thinking, which was evident by lower management level.

The major achievement with lean according to all three managerial levels was cost reductions. Further, the factors that drive the lean implementation varies a lot among the managerial levels. According to the top and operating level the company lacks long-term lean goals. It is therefore hard for the managers to have a shared perception regarding the lean progress. The managers´ understanding regarding the lean progress were also diversified. Some stated that the company just started with the lean implementation meanwhile others stated that the company have almost finished. A few managers emphasised that the lean implementation has only been focusing on the production.

Research question 3: What does the level of strategic consensus looks like regarding the link between MS and lean?

The two previous research questions show that the level of strategic consensus among top, middle, and operating managers is varying depending on the MS strategy decision area and regarding lean. In addition, the current MS content described by the managers is not aligned with the lean points in the analytical framework. Consequently, it can be concluded that the different perceptions by the managers regarding lean result in a gap between top and operating managers. The gap between top and operating managers and since lean is partly integrated to MS content result in that the link between MS and lean is missing.

The purpose of this study was to analyse the level of strategic consensus among managers in top, middle and operating level regarding how lean has been and should be integrated in a company´s MS. The three research questions were guiding the way and the answers show that the level of strategic consensus among the three managerial is varying depending on the specific strategic issue. The analysis concerning the different understandings by the managers regarding how lean has been and should be integrated into MS shows also that a high level of strategic consensus regarding was hard to reach.

6 Discussion & Conclusions

The purpose of this study was to analyse the level of strategic consensus among managers in top, middle and operating level regarding how lean has been and should be integrated in a company´s MS. This thesis contributes to the research in two ways. First, it investigates the strategic consensus among three managerial levels, which has been a research area that is not well researched (Rapert, Velliquette and Garetsson, 2002). Second, it contributes to the research by investigating how lean can be integrated into MS and as called for by Bicheno (2004).

As Liker (2004) argued, most companies are focusing on 'Process' and not adopting the remaining three Ps, and this study´s findings show the same. In addition, the findings show that the managers´ understandings regarding the lean definition and scope varies. Some managers view lean as a set of tools, while other managers see it as a system of lean tools and thinking, which is in line with Bicheno (2004). Floyd &Wooldridge (1992, p.27) ask how managers *"can be expected to take action in support of a strategy when they don´t agree with it, or even know about it?"* with this citation they emphasise the importance of knowing the managers' views concerning strategic issues. The thesis contribute that the both researchers and practitioners are aware of the different managers´understanfing of different strategic issues. A higher level of agreement may enhance the possibility that the idented strategy result in a realised (Boyer and McDermott (1999).

Skinner (1969) argued that it is a missing link between MS and corporate strategy. The findings point out that this link between MS and corporate strategy is still missing. In addition, since the case company struggled with integrating lean into MS it may indicate that there is two links that are missing. The link between MS and lean, and the link between MS and corporate strategy. A gap between MS and corporate strategy according to Skinner (1969) may influence a company's performance of the production system negative.

Based on the findings in this study the analytical framework can be further developed. The part of the analytical framework regarding MS content, the lean operations strategy-matrix, can be extended. Since the lean literature lack information of each strategic decision area, some decision areas were excluded. The grey decision areas in Figure 20 are those that need to be further focused on. The decision area 'Measurement and reward system' was included in this research, but the lean theory was too weak explaining how a company should work aligned with lean in this aspect and therefore also marked grey. Further, from this thesis it has been found that the strategic decision area 'capacity' should include the lean points 8 and 13, which were added into the changes of analytical framework in Figure 20.

Further, the analysis on the MS process regarding the Bicheno (2004) 'Three ways of implementing lean' was easy to use to judge how lean is formulated and implemented. However, the three ways of implementing lean were too general. To be able making a better judgement on which way a company is implementing lean it would be better if this model is further developed and explained in more detail for example including check-list for each implementation way.

It can also be concluded that the first three steps at Kotter´s 'eight-step transformation plan' were evident by the case company. However, since the company was in the beginning of the implementation it is therefore hard to draw the conclusions if Kotter´s model fit the whole implementation process. The findings regarding MS process shows also that the strategy formation is made by the operating managerial level and thereafter pushed towards the top managers. The analytical framework concerning MS process did not entail any model that

described this phenomenon. However, concrete suggestions of changes cannot be made on the analytical framework regarding MS process. It is therefore interesting to see if the lean integration into MS in other companies is also formulated by operating level.

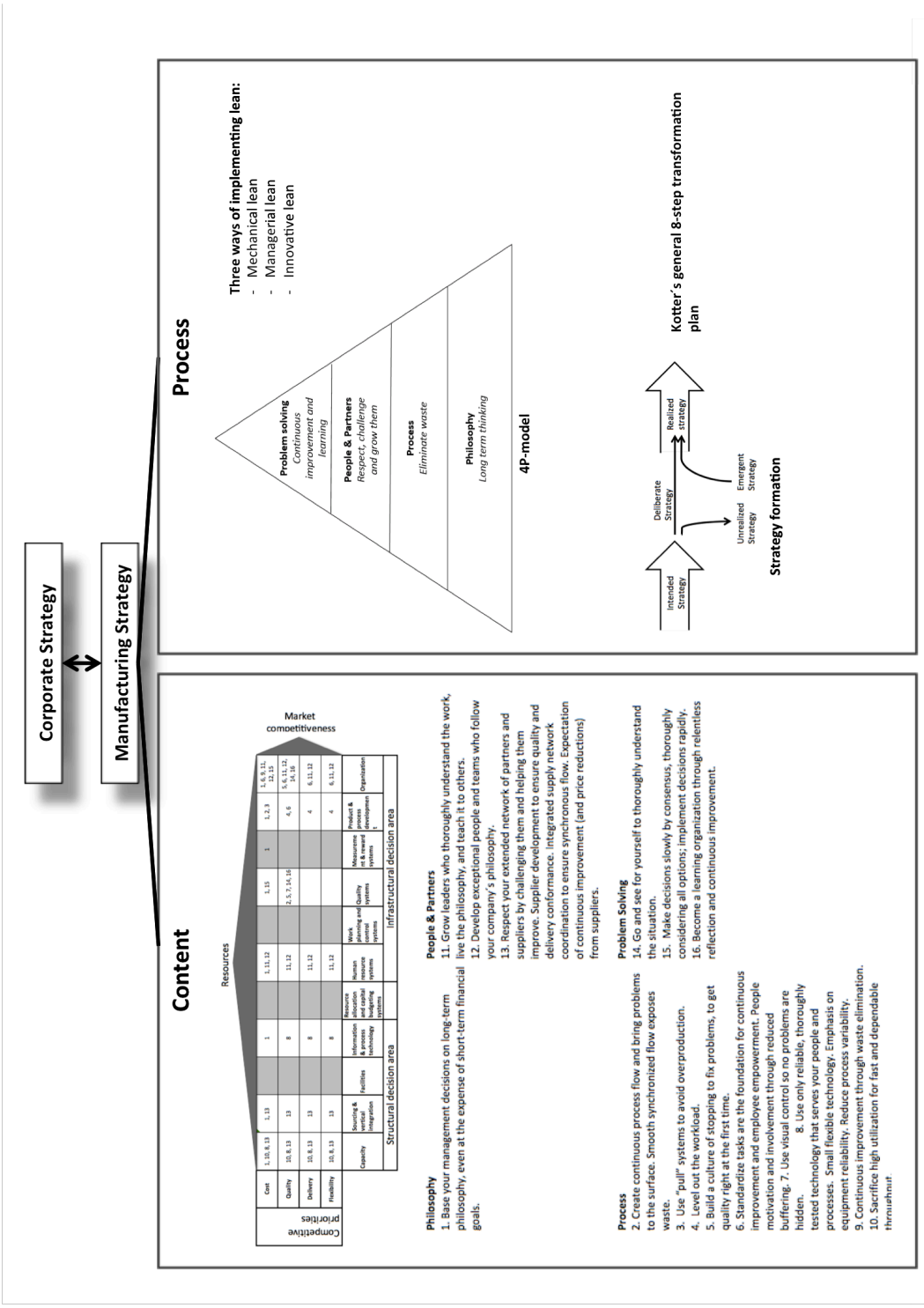

Figure 20. Changes based on findings on the analytical framework.

Future research

The new analytical framework constructed after the findings in this thesis in Figure 20 above, emphasise areas that future research should focus on. First, it should develop the strategic decision areas, marked grey, that are lacking lean points in the part of MS content. Future research should also investigate which managerial level is formulating and implementing MS.

Further, from this thesis has it been found that the case company is in an early phase of the lean implementation and not aligned with many of the lean points in the analytical framework. The findings by an investigation how a company that is in a late lean implementation phase and is aligned with the lean points will help the research to have a better fit between theory and the real world situation for practitioners.

The research has been delimited to only look on one company in the automotive industry. If the same research would be done in another context, which means in another industry, company size and managers the result will probably be different. Thus, it would be interesting to investigate the level of strategic consensus regarding lean integration into MS in other contexts. In addition, since the study was delimited into a time frame that did not enable to investigate how successful lean integration into MS look like, future research should therefore investigate this issue, to help practitioners towards an easier lean implementation.

7 Reference list

Acur, N., Gertsen, F., Sun, H., & Frick, J. (2003). The formalisation of manufacturing strategy and its influence on the relationship between competitive objectives, improvement goals, and action plans. *International Journal of Operations & Production Management , 23* (10), 1114-1141.

Andersson, R., Eriksson, H., & Torstensson, H. (2006). Similarities and differences between TQM, six sigma and lean. *The TQM Magazine , 18* (3), 282-296.

Barnes, D. (2002). The complexities of the manufacturing strategy formation process in practice. *International Journal of Operations & Production Management , 22* (10), 1090-1111.

Bell, J. (2000). *Introduktion till forskningsmetodiken* (3 ed.). Lund: Studentlitteratur. Sverige

Bentley, W., & Davis, P. (2009). *Lean Six Sigma secret for the CIO.* Boca Raton: CRC press.

Bergman, B., & Klefsjö, B. (2010). *Quality from Customer Needs to Customer Satisfaction* (3 ed.). Lund: Studentlitteratur.

Bhamu, J., & Sanhwan, K. (2014). Lean manufacturing: literature review and research issues. *International Journal of Operations & Production Management , 34* (7), 876-940.

Bicheno, J. (2004). *The lean Toolbox: towards fast, flexible flow.* (3th edition). Buckingham PISCIE Books.

Bourne, M., Gregory, M., & Mills, J. (2002). *Strategy and Perfomance: Creating a winning formula.* New York: Cambridge University Press.

Boyer, K., & McDermott, C. (1999). Strategic consensus in operations strategy. *Journal of Operations Management , 17* (3), 289-305.

Bryman, A., & Bell, E. (2011). *Business Research Methods* (3 ed.). New York. Oxford Univeristy Press.

Dubois, A., & Gadde, L.-E. (2002). Systematic combining: an abductive approach to case research. *Journal of Business Research , 55* (7), 553-560.

Fane, G., Vaghefi, M., Deusen, C., & Woods, L. (2003). Competitive advantage the Toyota way. *Business Strategy review , 14* (4), 51-60.

Ferdows, K., & De Meyer, A. (1990). Lasting improvements in manufacturing perfomance: in search of a new theory. *Journal of Operations Management , 9* (2), 168-184.

Floyd, S., & Wooldridge, B. (1992). Managing strategic consensus: the foundation of effective implementation. *Academy of Management Executive , 6* (4), 27-39.

Forza, C. (2006). Work organization in lean production and traditional plants: What are the differences. *International Journal of Operations & Production Management , 16* (2), 42-62.

Hall, J. (2006). Environmental supply chain innvation. In J. Sarkis, *Greening the supply chain* (S. 233-249). London: Springer.

Halldórsson, Á., & Aastrup, J. (2003). Quality criteria for qualitative inquiries in logistics. *European Journal of Operational Research , 144* (2), 321-332.

Hayes, R., Pisano, G., Upton, D., & Wheelwright, S. (2005). *Operations, strategy, and technology. Pursuing the competitive edge.* Hobuken John Wiley & Sons.

Hines, P., Holweg, M., & Rich, N. (2004). Learning to evolve: A review of contemporary lean thinking. *International Journal of Operations & Production Management , 24* (10), 994-1011.

Kellermanns, F., Walter, J., Lechner, C., & Floyd, S. (2005). The lack of consensus about strategic consensus: Advancing Theory and Research. *Journal of Management , 31* (5), 719-737.

Kotter, J. (1996). *Leading Change. Chapter 1: "Transforming organizations: Why firms fail.".* Harvard Business School Press.

Kotter, J. (1995). Leading change: why transformation efforts fail. *Harvard Business School Press* , 59-67.

Liker, J. (2004). *The Toyota way: 14 Management principles from the world´s greatest manufacturer.* New York: McGraw-Hill.

Liker, J. (2009). *The Toyota way: vägen till världsklass.* Malmö: Liber.

Liker, J., & Convis, G. (2012). *The Toyota way to lean leadership: achieving and sustaining excellence through leadership development.* New York: McGraw-Hill.

Mann, D. (2009). The missing link: Lean leadership. *Frontiers of Helth services Management , 26* (1), 15.26.

Martin, K., & Osterling, M. (2007). *The Kaizen event planner: Achieving rapid improvement in office, service and technical environment.* New York: Productivity Press.

Martínez Sánchez, A., & Pérez Pérez, M. (2001). Lean indicators and manufacturing strategies. *Internation Journal of Operations & Production Management , 21* (11), 1433-1451.

Marucheck, A., Pannesi, R., & Andersson, C. (1990). An exploratory study of the manufacturing strategy process in practice. *Journal of operations management , 9* (1), 101-123.

Maskell, B., & Kennedy, F. (2007). Why do we need lean accounting and how does it work? *Journal of Corporate Accounting & Finance , 18* (3), 59-73.

Miltenburg, J. (2005). *Manufacturing strategy: How to formulate and implement a winning plan.* New York: Productivity Press.

Mintzberg, H. (1978). Patterns in strategy formation. *Management Science , 24* (9), 934-948.

Mintzberg, H., Ahlstrand, B., & Lampel, J. (2005). *Strategy safari: A guided tour through the wilds of strategic management.* New York: Free press.

Noble, C. (1999). The eclectic roots of strategy implementation research. *Journal of Business research , 45* (2), 119-134.

Pettersen, J. (2009). Defining lean production: some conceptual and practical issues. *The TQM Journal , 21* (2), 127-142.

Rapert, M., Velliquette, A., & Garetsson, J. (2002). The strategic implementation process Evoking strategic consensus through communication. *Jorunal of Business Research* , 301-310.

Robson, C. (2011). *Real world research: a research for users of social research methods in applied settings.* Chichester, 3: Wiley.

Shah, R., & Ward, P. (2007). Defining and developing measures of lean production. *Journal of operations management , 25* (4), 785-805.

Skinner, C. (1969). Manufacturing: missing link in corporate strategy. *Harper & Row* , 55-57.

Slack, N., & Lewis, M. (2011). *Operations strategy.* Harlow: Financial Times Prentice Hall.

Slack, N., Johnston, R., & Chambers, S. (2007). *Operations management.* Harlow: FT Prentice Hall.

Strannegård, L., & Styhre, A. (2013). *Management: an advanced introduction.* Lund: Studentlitteratur.

Swink, M., & Way, M. (1995). Manufacturing strategy: proposition, current research, renewed directions. *International Journal of Operations & Production Management , 9* (4), 1-19.

Williamson, K. (2002). *Research methods for students, academics and professionals.* Wagga Wagga: Centre for Information Studies.

Womack, J., Jones, D., & Roos, D. (2007). *The machine that changed the world.* New York: Free press.

Woodside, A. (2010). *Case study research: theory, methods, practice.* 1: Emerald Group.

Yin, R. (2003). *Case study research: design and methods.* Thousands Oaks, Calif, 3: Sage Publications.

Appendix 1: Interview questions

Question about…

…the interviewee:

- What is your responsibility within KAG?
- How long do you work for KAG?

...lean definition and goals:

- How do you define lean?
- What is needed for KAG to become lean?
- Why does KAG want to implement lean?
- What do KAG want to achieve with lean?
- What should be in the KAG´s lean vision?
- What do you know about the long-term lean goals for KAG?

...general operations strategy:

- Do you have a documented operations strategy?
- What does the performance objective **quality** mean?
- What does the performance objective **cost** mean?
- What does the performance objective **flexibility** mean?
- What does the performance objective **delivery** mean?

Example how questions were asked for the matrix below:
Is *quality* more important than *cost*?
Answer alternative: No=0, Equal=1, Yes=2

	Quality	Cost	Flexibility	Delivery	Sum
Quality					
Cost					
Flexibility					
Delivery					

…capacity:

- How is KAG´s ability to change the capacity level regarding:
- Amount of products?
- Type of products?
- Change of delivery date?

…vertical integration:

- Which lean methods do KAG use together with suppliers regarding improvement of value stream and products?
- Which part of the value chain is KAG responsible for?

...information and process technology:

- What criteria have KAG when investing in new technologies?

...human resource systems:

- Which lean training and tools or other possibilities support employees within KAG to develop themselves?
- What possibilities do employees have within KAG to develop themselves?

…quality systems:

- What is a typical way of solving problems at KAG?

...measurement and reward:

- How do the reward system work at KAG?

... products and processes development system:

- What is KAGs view on product standardisation?
- What is KAGs view on standardised processes?

...organisation:

- If you want to improve something how do you proceed?
- How do KAG work with improvements?

…lean *implementation:*

- How do you describe lean implementation at your company?
- How far is KAG in the lean journey?

Just started 1 2 3 4 5 6 7 Finished

- Which year do you think that you have finished with the lean implementation?
- What strategic initiatives have you done the last year to integrate lean in the company?
- What strategic initiatives do you plan to do the next coming time to integrate lean in the company?
- What is KAGs Vision?

Appendix 2: Prioritization of performance objectives

	TM Purchasing	TM Operations	TM HR	TM PPQ
Quality	5	5	2	5
Cost	5	2	3	3
Flexibility	0	0	2	0
Delivery	2	5	5	4

	GM China	GM Czech Republic	GM Mexico	GM Germany
Quality	5	6	5	6
Cost	2	0	3	4
Flexibility	0	2	0	2
Delivery	5	4	3	0

	OM China	OM Czech Republic		
Quality	3	5		
Cost	3	5		
Flexibility	2	0		
Delivery	4	2		

	LM China	LM Czech Republic	LM Mexico	LM Germany	Global LM
Quality	3	6	4	5	5
Cost	0	4	0	3	3
Flexibility	3	1	2	0	0
Delivery	6	1	6	4	4

The table below presents the average for each managerial level in each competitive priority.

	Top Management	Middle Management	Operating Management
Cost	3,3	2,4	2,5
Quality	4,3	5,4	4,3
Delivery	4,0	3,2	3,8
Flexibility	0,5	0,8	1,3

Appendix 3: Five implementation steps