
Traditional Management Accounting in Process-oriented Manufacturing: Frictions In a World of Bearings

- A case study of SKF

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Abstract

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Background and problem: In recent years many firms are adopting new process-oriented systems and concepts to become more competitive. The emergence of these concepts, such as lean production, has put the traditional Management Accounting System (MAS) in a challenging situation where it is argued to give birth to potential conflicts and harm the application of new operational concepts. Decades of criticism have led to the development and discussion of lean accounting and control, suggesting a more appropriate use of MAS. Research reveals, however, that traditional MAS remain popular in practice. Although the general critique towards traditional MAS is overwhelming, our literature review displays very few articles describing the concrete implications, such as how and where in the organization they appear. As a result of this we will attempt to contribute to existing research by investigate where conflicts appear, how they are handled, and if different design and use of the MAS at different hierarchic levels may help to manage these potential problems.

Aim of study: The purpose of this thesis is to increase the understanding of potential conflicts between the use of traditional management accounting and a process-orientation. The second purpose is to initiate a discussion on how the organizational dimension can contribute to this subject.

Methodology: We have chosen to conduct a qualitative case study in order to answer questions such as “why” and “how”. The data was collected through semi-structured interviews, and the theoretical framework is built on well-established theories connected to our research question. Six interviews and two observations were performed at different hierarchical levels at the case company.

Analysis and Conclusion: The design of the harmful MAS was in broad terms concurring to theory. Although, direct conflicts were, to a great extent, prevented through the use of lean controls and other control instruments. Moreover, we discovered that the organizational design and different use of MAS at different levels could further help to prevent direct conflicts. In addition, this case study resulted in three interesting findings: (1) traditional MAS with a coercive approach to control served to ‘individualize’ accountability, (2) the process-orientation was, in direct contrast to lean literature, ensured by centralization of decision-making, and (3) communication was important to balance between the two perspectives of accountability and process-orientation.

Keywords: Management Accounting, Management Control, Traditional, Lean Production, Lean Manufacturing, Process-orientation, MAS, MCS, VMAS, HMAS

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1. Introduction

In this chapter we will give an introduction of our chosen research subject by first examining the background and then engaging in a problem discussion. This will lead us to the key question, purpose and delimitations of this thesis.

1.1 Background

In recent years companies have experienced a variety of rapid changes in an increasingly competitive context. Many firms are adopting new innovative production systems and concepts, to increase productivity, lower costs and improve the quality of their products. Such initiatives imply a change in companies' organizational design (Burns & Vaivio, 2001).

The fact that companies strive for operational excellence has made "Lean-a-like" concepts immensely popular, and is why *Just-in-time (JIT)*, *Total Quality Management (TQM)*, *Six Sigma*, *Kan-Ban* and *Total Preventative Maintenance (TPM)* are today widespread and recognized as elements of lean production (Fullerton et al. 2013). In the late 1990s a survey revealed that 90 percent of corporate executives ranked lean production as 'somewhat critical' or 'critical' to becoming a high-performing manufacturer (Jusko, 1999) and more recently a survey showed that more than 50 percent of American manufacturers had implemented some level of lean production (Maskell & Kennedy, 2007).

The term 'Lean production', first coined 1988 by IMVP¹ researcher John Krafcik, became known to the public through the publication of "The machine that changed the world" by Womack and Jones (1991). The concept, with roots in the Toyota Production System (TPS), evolved from Taiichi Ohno's experiment and initiatives over three decades at Toyota Motor Company (Shah & Ward, 2007). Lean production, described by Mouritsen and Hansen (2006, p. 267) as "best-practice operations management", emphasizes the creation of a continuous one-piece flow through the value stream by the establishment of a process-oriented organization with a solid customer focus. This implies a change from a traditional mass-producing company organized in a vertical setting to organize around identified value streams and letting the customer be the one that triggers production. Lean production seeks to identify value-adding activities and eliminate waste, based on customer perceived value (Womack & Jones 1996). Hodge et al. (2011) observe that the objective of lean production is to create the most value for the customer while consuming the least amount of resources to design, build and sustain the product.

The emergence of "lean-a-like" concepts has resulted in a business environment with a wide variety of organizational structures and processes with more focus on the lateral dimension of the company's value chain. Prompted by this, the use and design of traditional management accounting systems have ended up in a challenging situation, where their very existence is questioned by some.

¹ International Motor Vehicle Program,
<http://www.imvpnet.org>

1.2 Problem discussion

For decades there has been a discussion about the inappropriateness of traditional Management Accounting Systems (MAS) in a process oriented organization (Kaplan, 1983; Åhlström & Karlsson, 1996). Several studies, with support of contingency-based research, have argued that lean production necessitates change in accounting practices, control and measurement systems (Fullerton & McWatters, 2002; Maskell & Baggaley, 2004; Kennedy & Widener, 2008). The fact that Lean production is a complex managerial concept, which spans the entire company, from product development to strategies (Womack & Jones, 1991), increases the pressure for change. Some even say that traditional management accounting is experiencing a prolonged crisis because it has lagged behind these new managerial concepts (Bromwich & Bhimani, 1994).

The traditional MAS, initially designed to support traditional mass-production, has a hierarchical relation to target setting, motivation, incentives and rewards (Mouritsen & Hansen, 2006), focused on functional departments (Kennedy & Widener, 2008). Lean production, on the other hand, focuses on achieving a continuous “one-piece” flow throughout the value stream, pulled by the customer with minimum waste (Kennedy & Brewer, 2005). As an example of the differences, companies seeking effective low-cost manufacturing, with the support of traditional management accounting, will focus on maximizing capacity utilization. This could, in direct conflict with lean production, lead to the creation of lean-defined wastes, such as overproduction and excess inventory (Maskell & Kennedy, 2007).

An incompatible traditional management accounting system has been claimed to be one of the barriers for a successful lean implementation and a recipe for failure by several authors (Åhlström & Karlsson, 1996; Maskell & Kennedy, 2007; Li et al., 2012). According to Maskell and Kennedy (2007) this is explained by the use of wrong measurements and the use of standard costing or other fully absorbed costing methods. They argue that this leads to erroneous decisions, information which is hard to interpret, and complex and time-consuming reporting. They also claim that traditional MAS leads to myopic behavior focused on cost and stock prices instead of what creates value for the customer.

The discussion has also been taken so far that some argue that there is no or little room for traditional MAS in lean operational management (Bromwich & Bhimani, 1994). Mouritsen and Hansen (2006) summarize the criticisms of traditional cost accounting, as it demands efficiency improvements without any guidance on how this will be achieved:

“The critique of accounting is monumental and fundamental: accounting misrepresents and distorts; it creates carrots and sticks but no specific indication of how things can be improved; and it develops bureaucracy” - Mouritsen and Hansen (2006, p. 271)

Although the general critique is overwhelming, our literature review displays very few articles describing the concrete implications of traditional MAS in a process-oriented organization. However, Maskell and Kennedy (2007) attempt to concretize the critique by describing hypothetical examples, why we will use

their article as a framework. Nevertheless they provide no guidance on where potential conflicts are likely to appear in the organization.

Decades of criticism of traditional MAS in lean environments have led to the development and discussion of lean accounting and lean control (Lind, 2001; Fullerton & McWatters, 2002; Maskell & Baggaley, 2004; Maskell & Kennedy, 2007). A more recent case study conducted by Kennedy and Widener (2008) resulted in a framework, based on prior literature, suggesting appropriate use of MAS in a lean environment. The authors distinguish between lean accounting and control by arguing that lean accounting aims to reduce the steps in the transaction process, eliminate standard cost in favor of actual cost, and cease the cost allocation. Lean control, on the other hand should re-focus the performance measurement system and emphasize social and behavioral controls (Kennedy & Widener, 2008).

With the contribution of lean accounting research at hand, evidence from earlier research and surveys suggests that traditional management accounting remains popular in practice (Drury et al., 1993; Ezzamel et al., 1995; Burns & Yazdifar, 2001; CIMA Survey, 2009).

As a summary, research reveals that there is a potential problem implementing a horizontal perspective without changing the MAS. Both qualitative and quantitative studies show that organizations indeed change their MAS when implementing lean, but also present evidence that traditional MAS is still present. However, a literature review displays fewer articles discussing the concrete implications of maintaining a traditional MAS in a process-oriented organization. Moreover, previous research has mainly focused on the design and use of MAS and has not studied if conflicts appear at different levels in the organization. Nevertheless we can see indications that this could be a relevant factor as the MAS take different forms at different hierarchal levels (Kennedy & Widener, 2008), and different levels have different responsibilities (Eriksson & Zetterquist et al., 2006).

As a result of this we will attempt to contribute to existing research by investigate where conflicts appear, how they are handled, and if different design and use of the MAS at different hierarchic levels may help to manage these potential problems.

The background and problem discussion of our study have led us to a number of questions, narrowed down to the following key question:

1.3 Key Question

- How do organizations handle potential conflicts between the traditional MAS and their process-orientation?

1.4 Purpose

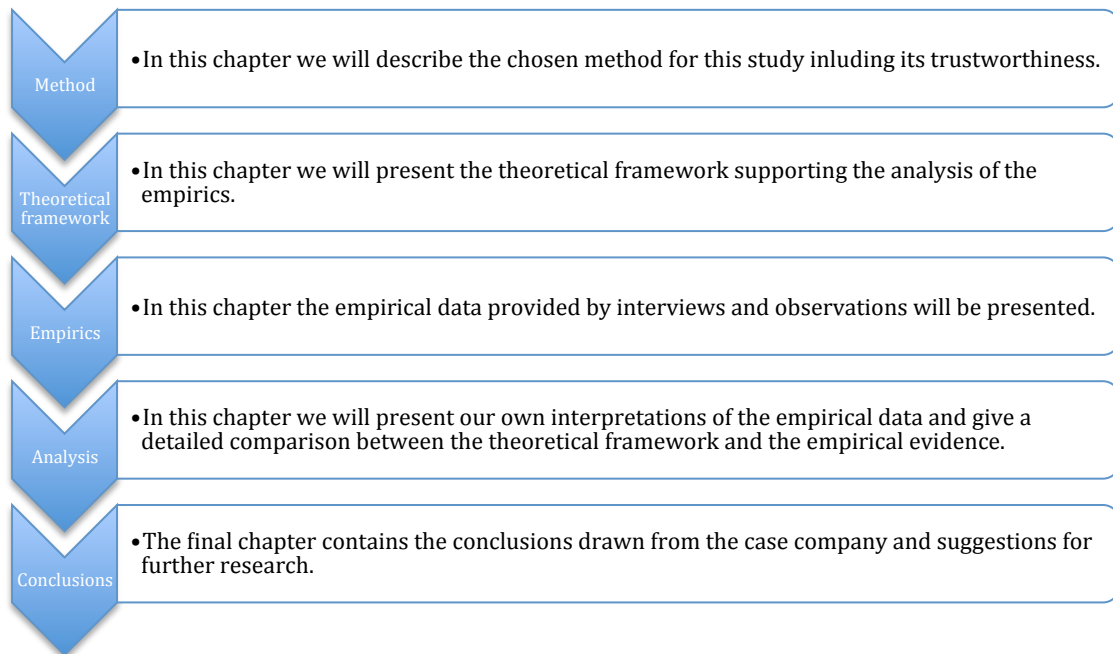
Through a qualitative case study, this thesis aims to increase the understanding of potential conflicts between the use of traditional MAS and a process-orientation. The second purpose is to initiate a discussion on how the organizational dimension can contribute to this subject.

1.5 Delimitations

This thesis is limited to one case examining how they handle potential conflicts between a traditional MAS and a process-orientation. We will not analyze in depth the extent to which the case company applies lean production, accounting or control. Another delimitation is that the majority of the respondents were Business Controllers.

1.6 Disposition

The continued structure of this thesis is divided into five chapters as shown below.



2. Method

In this chapter, different research methods will be discussed followed by an argumentation for our selected method. We begin with the research approach and how information was gathered, ending with method for analysis and trustworthiness of this thesis.

2.1 Research approach

Within business research methods there is often a distinction between a quantitative and a qualitative approach (Blumberg et al., 2011). Quantitative research is often used on measurable problems, and qualitative on more complex and in depth problems (Bryman & Bell, 2005). Berg (2009 p.2) describes the advantages of a qualitative approach as "... the fruitfulness and often the greater depth of understanding we can derive from qualitative procedures". Given the purpose and problem formulation of this thesis, we believe that a qualitative method is the most suitable for our study. As the purpose is to extend knowledge on how traditional management accounting can be in conflict with a process-orientation, a deeper understanding and closer connection to the object is needed.

An important part of the researcher's work, and also a central problem, is to relate theory to practice. When writing a scientific report, the authors can have either a theoretical or an empirical approach, or a combination of the two (Patel & Davidson, 2003). This thesis has both a theoretical and an empirical approach. Our research began with a review of existing theory to act as a base for our empirical study. The theoretical framework was later supplemented to better explain our empirical findings.

2.2 Case study

Backman (1998) explains that a case study is useful when the object is a complex organization or situation and the focus of the research is to understand and explain. The objective is to obtain multiple perspectives of a single organization by extracting information from company brochures, annual reports along with direct observations and interviews (Blumberg et al., 2011). In other word, the objective of a case study is to obtain a holistic approach.

A case study gives us the opportunity to understand management control in practice (Scapens, 1990), and implies working closely to the object at hand (Ejvegård, 1996). In our study, the focus is to describe and analyze how potential conflicts between traditional management accounting and a process-orientation appear, and how it is perceived at different levels. In order to be able to observe real feelings and opinions from the interviewees, we believe that it is important to focus on one organization with a holistic view. With this knowledge we have chosen to take the approach of a case study in this thesis.

According to Ejvegård (1996), a descriptive approach involves describing how something is done and/or to explain how something is. Explanatory research goes further, and theory is created to answer "why" and "how" questions (Blumberg et al., 2011). In our case study we have chosen a descriptive approach in order to describe potential conflicts. Furthermore, a part of the thesis has a

more explanatory approach where the aim is to explain why things are perceived as being in conflict with each other and how they are handled.

2.3 Source of information

Sources of information are often divided in primary and secondary data. Primary data is information collected by the researcher himself, through, for example, interviews or surveys. The advantage of primary data is that the material is customized to the research question and that the researcher has greater control of the material. The disadvantage is that it can be costly, and that the researcher is dependent on the respondents and their will to participate (Ghauri & Grønhaug, 2005).

Secondary data is information from earlier research. The advantage of using secondary data is that it is timesaving and often of high quality. The disadvantage is that the risk of misinterpretation increases with the distance from the primary source (Bryman & Bell, 2005).

As we are elaborating on a specific and complex situation we chose primary data to act as a base for our empirics. The information was collected primarily through semi-structured interviews and observations at our chosen case company, which we will explain more carefully below. Secondary data used in this thesis consists of annual reports and internal documents such as financial reports and monthly employee magazine.

2.3.1 Selection of company and respondents

In the process of selecting an appropriate organization to act as a foundation for our case study, we evaluated a number of organizations as potential case objects. In order for a company to be suitable for this thesis, some degree of lean production or process-orientation needed to be established. We also believed that studying a large global manufacturing company with production plants in Sweden would give us the necessary width, depth and complexity for our empirics.

SKF proved to be a suitable case study because they met all the requirements and were willing to devote the time necessary for conducting the interviews. A case company description will follow in chapter 4.1.

2.3.1.1 Choice of respondents

Since neither of the authors had studied or worked at the case company, an early interview was carried out to get to know the company and its organization. This was important to establish a basic understanding of the company and identify appropriate respondents in the organization. This was accomplished by interviewing Henrik Fällman at Group Finance, who gave us the necessary information about the organization and later helped us to plan and contact future interview objects.

Since problems and conflicts between the MAS and the process-orientation are expected to appear differently at different levels of the organization, it was important to conduct interviews at several levels. We decided to interview Business Controllers because of three reasons: (1) Controllers are expected to be those who are most familiar with the case company's MAS, (2) Controllers should be aware of where conflicts occur, and (3) Controllers are present at all

hierarchical levels. Together with Henrik, we chose to study the Renewable Energy (Renewable) business unit within the Strategic Industries (SI) business area since Renewable has production plants in the Gothenburg area. This allowed us to fulfill the aim of this study by studying business area level down to shop floor and thus capture the organizational dimension.

2.3.1.2 The following people were interviewed

- Henrik Fällman – Former Business Unit Controller at Railway, SI
Currently within a SAP-project at SKF Group
- Karin Carstens – Former Business Controller at Service line, RSS
Currently within a SAP-project at SKF Group
- Magnus Frändegård – Business Area Controller at SI
- Pär Ihsckrog – Business Unit Controller at Renewable BU
- Jakob Andersson – Factory Controller at the D-Factory,
Renewable BU, SI
- Johan Wiksfors – Production Area Manager at the D-Factory

An organizational chart and description will follow in chapter 4.

In addition to the interviews conducted, two observations were performed at the D-factory to examine the production system and SKF's lean concept 'Business Excellence'.

2.3.1.3 Execution of interviews

As described by Blumberg (2011), structured interviews are useful if the goal of the study is to describe or explain, but they do not allow us to explore a topic, as the questions and answer possibilities for the respondents are predefined by the researcher. As we did not know beforehand how and where conflicts would appear, because our problem exists within human perception, a more unstructured interview technique was suitable. This was done using a semi-structured interview technique. We used an interview guide to ensure that the same issues were addressed in every interview in order to increase the comparability, but many of the questions were open-ended in order to give the respondents the possibility to turn the interview in different directions and to come up with new sub-topics. Follow-up and probing questions were used to let the respondents elaborate on particularly interesting issues. Each interview lasted around two hours.

The immense amount of information coming from the semi-structured interviews was recorded in order to focus on the conversation and relevant follow-up questions. After each interview a discussion and an accurate transcript followed to ensure that the questions from the interview guide were answered.

2.3.2 Theoretical framework/ Data collection

Our theoretical framework consists of a mixture of articles from academic journals, books, earlier studies and other relevant writings within the area. The data was obtained from several different databases such as Web of Knowledge, Business Source Premier and Scopus. Frequent key words were "Management control", "Management Accounting", "Lean", "World Class Manufacturing", "Lean Manufacturing", "MA", "MCS", "MAS", "Lean Accounting", "Lean Control" and combinations of those.

2.4 Method of analysis/ Data analysis

There are a whole set of rules on how to process, analyze and interpret information coming from a quantitative study. In a qualitative study, however, this can be very confusing but yet very creative (Troost, 2007). Some argue that the analysis should be done in conjunction with interviews and sometimes during the actual interview (Kvale, 1996). Others argue, on the other hand, that analysis should not be done until all data is collected and interviews completed. In this thesis we have conducted some analysis in conjunction with interviews in order to ensure that relevant analysis ideas have been noted. However, the majority of the analysis has been conducted after the last interview as recommended by Troost (2007).

When processing the immense amount of information coming from the interviews, we have chosen a simplified version of “data reduction” as described by Ryen (2004). The method involves creating categories based on the topics discussed during the interviews. The raw data is then distributed across those categories. This was accomplished by first breaking down the raw data into smaller units consisting of statements and reasoning, then distributing these statements and reasonings to relevant categories. The analysis was then performed.

2.5 Trustworthiness

Positivists often question the trustworthiness of qualitative research, possibly because their concepts of validity and reliability cannot be used in an appropriate way (Shenton, 2004). However, several writers have tried to customize these concepts to better fit with qualitative research. In this thesis we have used Shentons (2004) article as a base in order to describe how we have tried to enhance the trustworthiness of this study.

2.5.1 Creditability (internal validity)

By interviewing several people at multiple levels, who all were well acquainted with the MAS, we got different opinions that together helped us to develop a more trustworthy view of the company. The rationale behind using multiple sources of evidence is that you develop converging lines of inquiry, and can apply a process of triangulation (Blumberg, 2011). We also examined previous findings to assess the congruence with earlier studies of the same case company. In addition, we believe that the early interview increased the creditability (Shenton, 2004), as we got familiar and built trust with the case company prior to the data collection.

2.5.2 Transferability (generalizability)

Generalizability is difficult to achieve from a single case study. We have tried to give an illustrative view of the surroundings from where we draw our conclusions. Furthermore, it is up to the reader to determine whether if the contextual situation is applicable to their situation and thus the ability to transfer our findings.

2.5.3 Dependability (reliability)

To ensure that answers from the respondents were correct and trustworthy, we sent out the subjects beforehand to help the respondents to prepare. As there is a

risk that respondents prepare answers to sensitive questions, we only sent out topics and not specific questions. Similar questions were asked in each interview and interpretations were made in parallel. Moreover, a tape recorder was used to ensure that no material was lost which also gave us the opportunity to listen to the interviews multiple times, although we are aware that it may have affected the responses given by the interview objects. The respondents were also given the opportunity to review and approve the empirical chapter in retrospect. As for enabling future research to repeat the work we have tried to describe the report in detail.

2.5.4 Confirmability (objectivity)

Throughout this process we have tried to be as objective as possible. Our aim was that the findings would be a result of the experiences and ideas of the respondents, though it is difficult to ensure that our characteristics and preferences have not influenced our work. In order to enhance the objectivity we allowed the interview guide to be highly influenced by the theoretical framework and previous similar studies. In addition, the interview guide was tested on fellow students to ensure the interpretations of the questions. We also believe that triangulation and transparent description of the data analysis process has improved the objectivity of this study.

2.6 Critique

The chosen research method used in this thesis is limited to two observations and six interviews with the majority being Controllers at the case company. This can affect the outcome of this study, since Controllers may be argued as biased respondents. Interviewing additional managers would have been able to offset this potential distortion but was, however, not an available option.

3. Theoretical framework

The third chapter will present the theoretical framework that serves as a foundation of this thesis. We will begin by describing our chosen definition of 'Management Accounting System' and how communication and usage matters. We will then, after having described the concept of lean production, explain the typical shortcomings of traditional management accounting in a lean environment. The chapter ends with a summary of previous studies of lean accounting and control, and the explanation of the organizational dimension.

3.1 Management accounting and control systems

There are a many different definitions of management accounting and management control systems in the literature, and these are sometimes used interchangeably (Chenhall, 2003). Literature within management control reveals that management accounting and control systems include all the devices that organizations use for controlling managers and employees (Merchant & Van der Stede, 2007; Ferreira & Otley, 2009). Malmi and Brown (2008, p. 290) define it as:

“Those systems, rules, practices, values and other activities management put in place in order to direct employee behavior”

An important part of these systems is the management accounting system (MAS), which allocates accountabilities and responsibilities and provides organizations with information (Kastberg & Siverbo, 2013). The MAS function is to support employees and managers in accomplishing the goals and objectives of the organization (Fischer, 1995). In line with Malmi and Brown (2008) we view the MAS as a package of different systems. Since one of the aims of this study is to initiate a discussion about the organizational dimension, we want to highlight that the organizational design is a part of the MAS.

In this thesis we will distinguish between vertical and horizontal use of the MAS. Our definition of vertical MAS is that it is designed to allocate responsibilities (Kastberg & Siverbo, 2013) and ensure that resources are obtained and used effectively and efficiently (Anthony, 1965). This is often accomplished through dividing a company or process in different units as profit or cost centers in order to achieve better accountability and control (Merchant & van Der Stede, 2007). Our definition of horizontal MAS is that it exists to coordinate, support decisions and control behavior in processes (Kastberg & Siverbo, 2013) in order to maximize the outcome of a process as a whole.

Throughout this thesis, in line with Kastberg and Siverbo (2013), we will label those parts of the MAS intended for vertical use VMAS, and those parts intended for horizontal use HMAS.

3.2 The communication and use of the MAS

After examining a MAS and its technical components, it is hard to say how it is perceived and thus the meaning of it. It is the nature of the communication processes surrounding a control system, not its technical properties, which determine how it is perceived (Simons, 1995). How the information is used or monitored distinguishes whether it is a control mechanism or a measurement to

provide information for decision-making (Malmi & Brown, 2008). This is supported by Horngren (2004) who states that the objectives of management accounting is to support decision-making, while the objectives of management control is to motivate employees to achieve the organization's goals and find indicators linked to those.

The MAS has a wide range of objectives and functions. Studies have highlighted more uses of MAS than the traditional functions of decision-making and control (Zimmerman, 2001; Mellemvik et al, 1988). Within the lean management literature the importance of a coordinative use of MAS is underscored and emphasis is placed on how systems, like kanbans, can help processes run smoothly (Grabau, 2009; Liker, 2009).

3.2.1 Coercive and enabling controls

Depending on the flexibility managers feel about performance indicators they may either enable them to better manage their work or have a more coercive impression of a control system (Adler & Borys, 1996; Ahrens & Chapman, 2004). In line with our statement above, it is not only the design but also the implementation of the control system that distinguishes whether it is enabling or coercive (Adler & Borys, 1996).

Coercive formalization specifies organizational rules with the aim of producing a foolproof system (Jordan & Messner, 2012). Such coercive systems are of more traditional cybernetic design in order to control and address the focus on preplanned objectives and standards (Anthony, 1965). This kind of control is closely attached to our definition of VMAS.

Enabling formalization, in contrast, designs organizational rules to empower employees in a way that the work process does not have to be foolproof, and enables employees to deal with contingencies (Jordan & Messner, 2012). Organizations attempt to design and operate formal systems in order to support the actual users (Ahrens & Chapman, 2004). This is somewhat relatively more important to our definition of HMAS.

3.3 Traditional management accounting and control

As a consequence of the industrial revolution, economies of scale through large capital investments became prevalent. In order to ensure maximum efficiency in those investments, owners implemented systems to measure the efficiency by which labor and material were converted to finished products. The early management accounting measures focused on cost per product and employee to gain information and to act as an incentive to achieve productivity goals. Measures were often focused on segments providing information for benchmarks and evaluating managers (Johnson & Kaplan, 1987).

In order to create comparability with lean control and accounting, as will be described later in this chapter, we use the same framework as Kennedy and Widener (2008). The framework, emerging from studies conducted by Ouchi (1979) and Snell (1992), builds on the control typologies, bureaucratic controls ('Output' and 'behavioral') and 'social mechanisms'.

Output control is a form of bureaucratic control, where managers set targets for employees to pursue (Snell, 1992). In the traditional setting (VMAS) output

control is dominated by financial performance measures based on standards (Kaplan, 1983). The measurements focus on individual objects, such as departments or employees, in order to allocate responsibilities and accountability (Kastberg & Siverbo, 2013). Performance is traditionally evaluated by means of variance analysis based on budgets or other preplanned objectives. In a manufacturing environment, operational effectiveness measures rely heavily on efficiency measures such as utilization of resources (Anthony, 1965, Chenhall, 1998b). Incentive systems linked to these performance measures have traditionally rewarded individual performance (Sandberg, 1982).

The second form of bureaucratic control is behavioral control. In a traditional manner, this system regulates the actions subordinates perform on the job. As described by Snell (1992, p. 294) "(...) behavioral control is initiated top-down in the form of articulated operating procedures". This involves, to a great extent, personal surveillance.

A more informal alternative to bureaucratic control is the use of social mechanisms. In the traditional MAS this kind of control is very limited and almost absent, since it relies to a great extent on a bureaucratic form of control. Not until recently has social control become a part of the MAS (Ouchi, 1975). Case studies (Kennedy & Widener, 2008; Lind, 2001) reveal that the empowerment of employees in a traditional manufacturing environment is restricted to managers and supervisors in a top-down setting.

Table 1: Summary of control mechanisms in traditional MAS

| Output control | Behavioral | Social |
|--------------------------------|-------------------------------|------------------------|
| Financial performance measures | Standard operating procedures | Absent |
| Variance analysis | Personal surveillance | Empowerment restricted |
| Accountability | | |
| Preplanned objectives | | |

3.4 Lean production

Lean production is, as stated earlier, currently used by many companies around the world and is considered crucial to being a competitive producer with regard to quality, cost, flexibility and customer response time. Lean production is a complex managerial concept, which spans the entire company, from product development to strategies (Womack & Jones, 1991). The five key guiding principles described in lean literature (Womack & Jones, 2003; Kennedy & Brewer, 2006) are:

1. Define Value and identify the value streams
2. Eliminate waste
3. Make value stream flow
4. Pull instead of push
5. Continuous improvements

Lean production emphasizes on identifying value-added activities and eliminating waste. When defining value it is important to clarify who is doing the defining and what they value. In lean production, value is based on and defined by the end-use customer and not by the company itself (Kennedy & Brewer, 2006). From a lean perspective all business processes, whether value-adding or

not, contain waste. Reducing waste means that the same customer value can be delivered at a lower cost (Grasso, 2005). According to Ohno (1988) and Womack (1996), there are seven types of waste:

1. Over-production – The worst form of waste is when producing more than is needed by the customer or the next process.
2. Waiting – Due to delays in an upstream process.
3. Transport – All kinds of transportation or movement of material and work in progress. Time on transport should be minimized.
4. Extra processing – Due to defects, overproduction or excess inventory.
5. Inventory – Having more than is needed to satisfy the value stream flow.
6. Motion – Unnecessary movements of employees and machines due to inefficient layout, defects, reprocessing etc.
7. Defects.

Implementing lean implies an organizational change with a focus on lateral flows between workstations. The traditional company organized in a vertical setting is replaced by a process-oriented organization. This means reorganizing the company into value streams based on the identified value-added activities for a particular product/service (Womack & Jones, 1991). The idea is to abandon traditional batch-and-queue production that leads to inventory build up, unsatisfactory order-to-delivery cycle times, excessive rework and waste (Kennedy & Brewer, 2006) and instead making the value stream flow. An essential part of this is the just-in-time delivery of materials and finished goods. This means that each process should receive the right part, the right amount at exactly the right time in order to achieve a continuous “one-piece” flow in the value stream, thus making good quality of parts and products a prerequisite (Shingo, 1981).

The concept necessitate a change from traditional mass production where material is pushed through the production triggered by a master schedule, to a pull system where customer orders trigger production. This means, unlike traditional mass production that nothing will be produced without a customer order and ultimately a shift from “make-to-stock” to “make-to-order” (Åhlström & Karlsson, 1996).

Lean production emphasizes continuous improvements since its philosophy is that there is no perfect end-state with zero waste. This means constantly seeking new and more productive ways of performing activities in search for perfection (Grasso, 2005).

Implementing lean has a substantial impact on the organizational design. Responsibilities and decision-making are decentralized to multifunctional teams organized in a cell-based part of the value stream. This is an important part of the continuous improvements principle since it is no longer solely up to management-level employees to generate new ideas for improvements. In lean production, frontline workers are viewed as intellectual assets capable of improving the flow of value to customers (Kennedy & Brewer, 2005).

3.5 Traditional management accounting in a lean environment

The appropriate design and use of MAS is highly dependent upon the environment in which it operates (Kaplan, 1983; Johnson & Kaplan, 1987; Fisher,

1992; Chenhall, 2003; Abdel-Maksoud et al., 2005). Studies have discussed the inappropriate use of VMAS in lean environments for decades, and pointed out the root cause to be that it is designed to support traditional mass production (Kaplan, 1983; Åhlström & Karlsson, 1996; Kennedy & Brewer, 2006; Maskell & Kennedy, 2007; Fullerton & Wempe, 2008).

In order to concretize the inappropriateness of traditional management accounting, Maskell and Kennedy (2007) describe typical shortcomings in their opinion. These are summarized below and will also be used in the analysis.

3.5.1 Wrong measurements

Measurements in traditional MAS are often in direct conflict with the lean philosophy since overhead absorption, labor efficiency and other utilization measures encourage employees to build inventory. Overproduction and excess inventory are, as described before, considered waste in lean production and should therefore be avoided. The underlying assumption that supports this kind of measure is that profits are maximized through maximized utilization of resources, an assumption not agreed upon in lean production (Maskell & Kennedy, 2007).

3.5.2 Wrong costs

Traditional costing methods such as standard or activity based are used for several reasons in companies. This includes decisions support, valuation, pricing and performance measures. These methods focus on carefully calculated costs for individual products. However, the lean production enterprise is more concerned about the costs of the value streams as a whole (Maskell & Kennedy, 2007). Standards also become outdated relatively fast in lean production with continuous improvements, and has a built-in inefficiency since it include defects, setup time and other types of waste defined in lean production (Dhavale, 1996).

3.5.3 Decision-making

According to Maskell and Kennedy (2007), lean enterprises that solely use standard costing or other fully absorbed product costing methods as a basis for decisions will act in a dangerous way. The underlying assumptions, as described above, are incorrect in a lean environment and will lead to poor decisions. Maskell and Kennedy (2007) elaborate on this by showing a couple of examples. One of them is excess capacity since traditional measures provide incentives to avoid excess capacity and run machines at the cost of increased inventory. Furthermore, they conclude that excess capacity is always a result of lean implementation since waste is eliminated and capacity released, meaning that traditional measures will, in some cases, send the message of a lower utilization of resources followed a lean implementation. Another underlying assumption highly questioned by lean production is the use of labor time and machine hours as primarily drivers for cost and overhead allocation. Lean production determines the cost of products by looking at the rate of flow through the value stream and the volume pulled by the customer (Maskell & Kennedy, 2007).

3.5.4 Information and complexity

Information coming from traditional MAS is argued to be time-consuming and complex (Maskell & Kennedy, 2007). Traditional MAS have a tradition of producing financial reports understandable for very few employees in the

organization. Maskell and Kennedy (2007) argue that it is not due to ignorant employees, but because of the degree of complexity related to these reports. In a lean environment, where decision-making is decentralized, the understandability of the reporting must be enhanced and preferably come in plain English (Maskell & Kennedy, 2007).

3.5.5 Customer focus

The starting point of a successful lean implementation is the understanding and focus on customer value. Traditional VMAS, however, is argued to focus myopically on cost, stock prices and earnings of the company (Maskell & Kennedy, 2007). Even though this is very important, the focus for a lean enterprise must be on how to create more value for the customer, since the idea is that this will in turn create even greater value for the shareholders (Maskell & Kennedy, 2007).

3.6 Lean control

As a consequence of the previous chapter, concerns are raised about the need for “new” management accounting and control, and a lot of research has been conducted in the subject. If substantial changes take place in the manufacturing processes, the management accounting system must also change if it is to provide relevant information for managerial decisions and control (Foster & Horngren, 1988; Kaplan, 1986; Nanni et al., 1992).

As a platform we will use Kennedy and Wideners (2008) article that summarizes earlier research about management accounting and control in a lean environment, with the same framework described earlier. As lean controls are supporting a process-orientation, such as a lean concept, we label these control mechanisms as HMAS.

Table 2: Summary of control mechanisms in Lean production

| Output control | Behavioral | Social |
|---|--|---|
| Non-financial performance measures Frequently communicated | Standard operating procedures Codifying best practice | Empowerment Peer pressure Visualization Training Incentives |

3.6.1 Output control

Companies that implement a lean concept have greater use of non-financial measures (Ittner & Larcker 1995), and rely less on efficiency-based measures as described earlier in this chapter (Abernethy & Lillis, 1995). Companies practicing lean manufacturing tend to measure and communicate information more frequently than in a traditional setting (Lind, 2001; Lucket & Eggleton, 1992). Fullerton and McWatters (2002) found that firms need a decision-making system that incorporates bottom-up measures, and frequent reports of quality results. Financial measures, argued to be complicated and non-supportive of the operational process, should primarily be used in higher levels in the organization (Maskell & Baggaley, 2003).

3.6.2 Behavioral control

Adler (1993) explains, through his empirical research, that standardized work captures learning by codifying best practice and then encourages workers to

constantly improve on this best practice. Rondeau et al. (2000) found a direct relation between a lean manufacturing initiative and standard operating procedures. Worth noticing is that standardization itself does not result in continuous improvements: it has to be supported with empowerment for workers to do so (Adler, 1993).

3.6.3 Social control

Kennedy and Widener (2008) show in their study that informal social control has a key role in a lean environment through the use of employee empowerment, peer pressure, visualization and training.

Firms empower employees by providing them with information that enables them to participate in decision-making that affects organizational outcomes (Bowen and Lawler, 1992; Lawler et al., 2001). Ittner and Larcker (1995, p. 6) suggest that “the primary role of MAS in TQM environments is providing empowered workers with information for problem solving and continuous improvement activities”.

Using a multi-case study methodology, Ezzamel and Willmott (1998) conclude that there is a significant increase in peer pressure to motivate performance after introducing TQM. In practice this is accomplished by linking performance measures and rewards to work-team performance (Ezzamel & Willmott, 1998).

With a more informal control system and a higher reliance on frontline workers to generate new ideas for improvement, a new way of distribution of information is required. Several studies conclude that visual control systems, such as visual boards, have an important facilitating role for providing necessary and understandable information (McGovern & Andrews, 1998; Zayko et al., 1998).

Training is particularly important in companies practicing new manufacturing technologies since these technologies require broader, more complete, and more advanced skills (Dean & Snell, 1991). As a result, employees in operations receive more training if their facility practices advanced manufacturing techniques (Snell & Dean, 1992).

The importance of linking incentives to the new organizational focus has been highlighted by several authors (Snell & Dean, 1992; Fullerton & MacWatters, 2002). This is accomplished, as mentioned earlier, by team-based rewards linked to quality and customer satisfaction, instead of motivating individual performance in a more traditional manner. However, there is no evidence of such changes taking place in practice (Kennedy & Widener, 2008).

3.7 The organizational dimension

Earlier empirical case studies have showed that the design and use of the MAS varies at different organizational levels within a company (Kennedy & Widener, 2008). We will, because of that, describe the basic theory of why and how companies organize in certain ways. Following this presentation we will discuss the determinants of what influences employees attention.

3.7.1 Why Bureaucracy?

Bureaucracy is undoubtedly the most common form of organization and is usually described based on Max Weber's view. According to Weber (1947), bureaucracy aims to be technically superior to other forms of organization by

being precise, predictable, continuous and conflict free (Eriksson-Zetterquist et al., 2006).

In a bureaucracy, managers have the right to decide over their subordinates according to a set of pre-defined rules. Bureaucrats (employees) are organized in a hierarchy with multiple levels of managers and subordinates who are expected to perform certain level-specific tasks and follow certain rules. The clear rules enable bureaucracies to become impersonal administrative arrangements. As bureaucrats are limited to the tasks they have been assigned, their work becomes standardized, predictable and effective (Brunsson, 2002; Weber, 1947). A key component is that the bureaucrat is professionalized, i.e., has a specific area of competence and responsibility (Eriksson-Zetterquist et al., 2006). This creates a clear distribution of work assignments and authority between different hierarchical levels of the bureaucracy, in order to facilitate overall coordination at higher levels and focused specialization at lower levels.

3.7.2 Structuring of attention

The purpose of structuring an organization is divided between two principle reasons, (1) to facilitate workflows and (2) to focus attention. The former relates to the physical flow of materials and information, the latter to where employees focus their time and energy (Simons, 2000). According to Simons, the three primary levers that enable the structuring of attention are: (1) The design of work units, (2) Span of control and (3) Span of accountability.

The basic design choices regarding work units available to managers concerns whether to organize around similar work processes or specific markets. The first are more commonly known as functions and the second as division or business unit. Companies organize by functions to benefit from specialization and economies of scale in especially production and R&D. Organizing around products, customers or market geography aims at achieving product specialization, specialized expertise and knowledge about customers and the understanding and responsiveness to local preferences. Even though the two types of work unit designs are used interchangeably in an organization, management face important trade-offs between specialization and market responsiveness (Simons, 2000).

When examining the organizational chart for a particular company, the solid lines showing reporting relationships will determine the span of control for a certain manager. Span of control describes the resources directly under a manager's control (Simons, 2000). Together with span of accountability, which describes the range of performance measures used to evaluate a manager's achievements, we will know who is accountable to whom and what they are accountable for (Simons, 2000).

The three mechanisms described above will be essential when structuring an employee's span of attention, i.e. what an individual will attempt to gather information on and influence (Simons, 2000). Span of attention can either be narrow or broad, and thus determine whether a plant manager is having any interest in the business outside the factory walls.

Lean production stresses the importance of customer focus. Chenhall (2008) in his review essay, among others, argues that horizontal organizations (HO),

rather than traditional vertical organizations, are more suitable. In addition, companies organized around functions with a limited span of attention, are exposed to the risk of sub-optimization, meaning, for example, that a single unit prioritizes its financial outcome in front of communication and cooperation with other units within the process or company (Simons, 2000).

3.7.3. Individualizing accountability

The concept of accountability, attributable to the emergence of role specialization, implies an evaluation of tasks and duties in terms of accounting information. The attention around meeting specific standards is, however, argued to neglect the considerations of consequences attached to specific duties.

In a seminal article, Roberts (1991, p. 355) shows concern about hierarchical accountability to create “a sense of the self as essentially solitary and singular, nervously preoccupied with how one is seen”. Roberts maintains that hierarchical accountability serves to ‘individualize’.

Roberts argues that accounting information, typically the central tool for accountability, acts as a mirror through which producers and their activity are made visible, judged and compared. In Roberts’ own words:

“Its apparent objectivity, and the positive and negative sanctions that surround its use make it the image of events that counts”. – Roberts (1991, p. 363)

Roberts refers to Foucault (1979), who talks about disciplinary effects, and elaborates upon exclusion. He claims that those who witness an exclusion of an individual is given an example of what might happen to them. It traces out a possible future and thereby reinforces the weight of the standards by which they are judged. Roberts argues that the fear of exclusion leads to a sort of self-absorption where the individual’s own survival depends upon meeting the set out standards. However, Roberts argues that self-absorption is not only related to defensive behavior but also the enhancement of self, meaning the positive possibilities such as the immediate gratification of praise and future career opportunities.

Comparing the ideas on individualizing accountability to Adler and Borys (1996) description of coercive control reveals similarities. Whether a control mechanism is defined as coercive or enabling lies within the use and perception of an employee, while individualizing accountability is explained by the reaction of individuals. However, these concepts are different from each other, it is nevertheless apparent that the coercive approach to control and individualizing accountability can be connected in a process. This is most likely as Adler and Borys (1996) maintain that an individual’s perception of a control mechanism as coercive could result in defensive behavior due to reporting obligations. In that sense would individualized accountability be an expected result of coercive controlling, why, conversely, an enabling approach to control may have the ability to diminish that risk.

3.8 Summary

As a summary, the MAS is important for purposes such as allocating responsibilities and supporting processes. The perception of the MAS depends

on how an organization chooses to communicate and use it. Theory implies that traditional MAS is dangerous and can lead to erroneous decisions in a process-orientation. As an answer to the critique, earlier research has found that there is a higher reliance on social control when implementing “lean-a-like” concepts. The objective of the system should be to support the process by providing employees with relevant information in an enabling and understandable format, implying a greater use of one-dimensional non-financial measures. Despite what theory implies, traditional management accounting practices which are stated to be in conflict with lean, are still widely used. Moreover, we have introduced the organizational dimension by describing basic bureaucratic theory and how attention is structured within organizations.

4. Empirics

In this chapter we will present our empirical findings obtained in our interviews and observations. Initially we will introduce the case company, followed by a description of their lean concept and MAS design. The remaining sections will present the experiences from different hierarchical levels. Definitions and acronyms will be explained continuously in this chapter. In addition, an overall list can be found in the appendix.

4.1 SKF

4.1.1 Company description

SKF is a leading global technology provider established in 1907 with a turnover of SEK 64 575 million and has over 46,000 employees (SKF, 2012). SKF offers competitive products divided across five technology platforms: bearings and units, seals, mechatronics, services and lubrication systems (SKF, 2012). SKF's mission is to deliver industry-leading, high value products, services and knowledge-engineered solutions through sustainable earnings growth with values including empowerment and teamwork (SKF, 2012).

The business of SKF has historically been producing and selling commodities, but is transforming towards value-based engineering and bundling of products and services (Henrik Fällman, 2013-03-21).

4.1.2 Organization

The business of SKF is divided into three roughly equal-sized business areas (BA's) with respect to different markets, two supporting the Industrial Market ('Regional Sales and Service' and 'Strategic Industries') and one supporting the automotive market.

The first BA of Industrial Markets, 'Strategic industries' (SI), consists of seven business units (BU's) that provide a full range of products solutions and services to both original equipment manufacturers (OEM's) and end-use customers. The business units are: Aerospace, Renewable energy, Traditional energy, Industrial drives, Precisions, Railway and Off-highway and Lubrication. Each business unit has full responsibility for sales, business development, manufacturing and engineering (SKF, 2012).

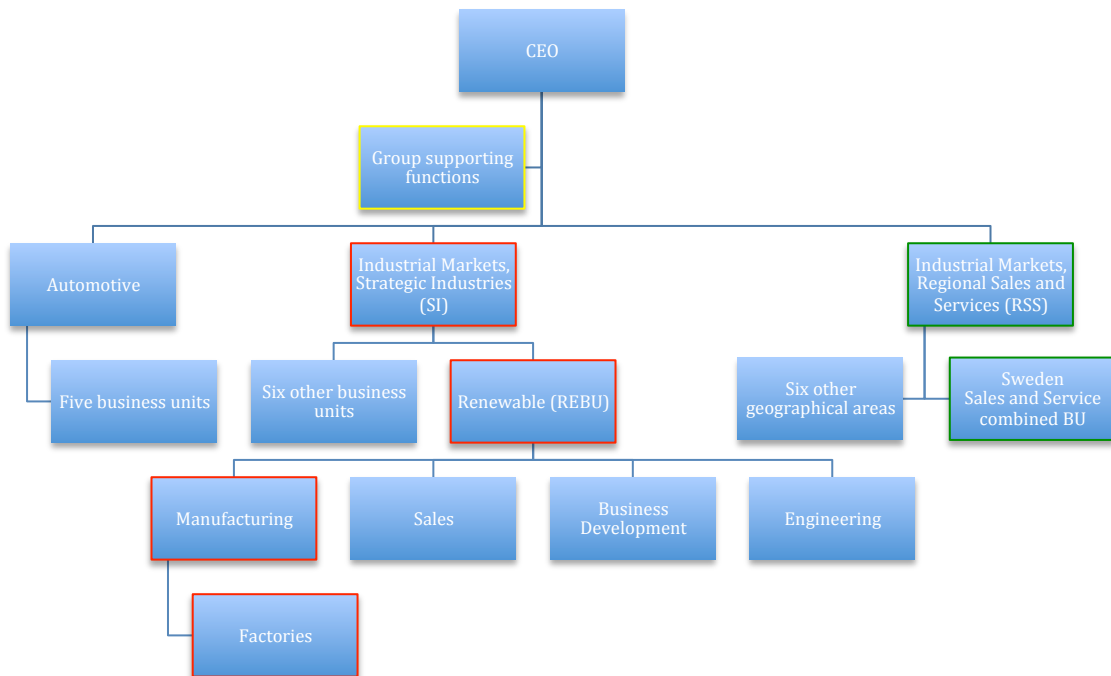
The second BA of Industrial Markets, 'Regional Sales and Services' (RSS) is responsible for managing and working with SKF's industrial distributors and serve the industrial after-market. The BA is divided into seven geographic areas serving both OEM and end use customers within a wide range of industries not covered by SI. The business units of RSS have, similarly to SI, their own engineering and business development but very limited manufacturing (SKF, 2012).

The Automotive BA of SKF consists of five business units supporting their customers in bringing innovative and sustainable solutions to the global vehicle markets. The Automotive BA develops and produces a variety of bearings, seals and services (SKF, 2012).

SKF's production is divided between all BU's in respect of product lines, meaning that a business unit serving the Renewable Energy market will produce spherical

rolling bearing (SRB) since most of their sales volume is SRB's. However, to achieve economies of scale that BU will produce all dimensions of that product line and thus serve every other BU within SKF that demands SRB's. Consequently, a 1:1 flow between manufacturing and sales within one BU is rather unusual, implying a great deal of internal cross selling (Henrik Fällman, 2013-03-21).

Figure 1: The Organizational map of SKF.



Source: Developed by the authors in accordance to interviews

Our empirical evidence was gathered mainly from the Renewable Energy BU (REBU) within the Strategic Industries BA (highlighted in red). In addition one interview was performed at a BU within the Regional Sales and Services BA (highlighted in green) and one at Group supporting functions (highlighted in yellow).

In the following sections, we will first present the case company's lean concept 'Business Excellence' and secondly explain and summarize management accounting and control at SKF. Thenceforth, the experiences from different hierarchical levels will be presented.

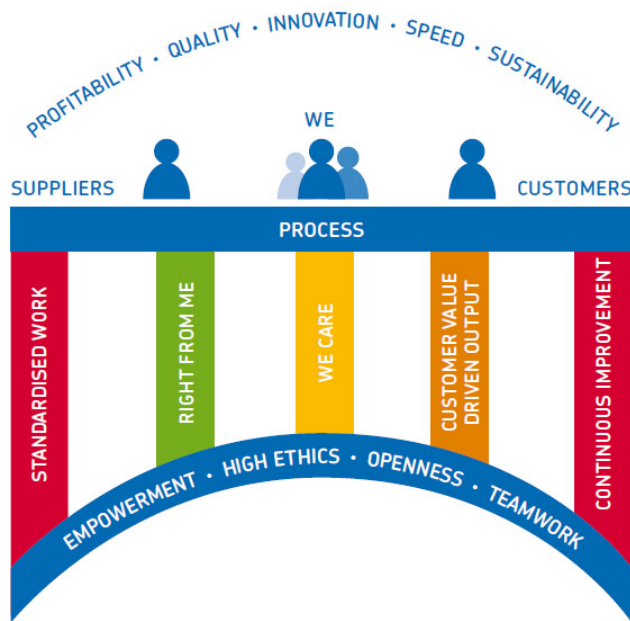
4.1.2 SKF's Lean concept 'Business Excellence'

In the middle of the 1980s, SKF decided to abandon their traditional batch-and-queue manufacturing in favor of product line manufacturing. Earlier a batch of products went through a specific process and then, when the batch was finished, another process continued the process of a product. The new concept is called the "channel concept", where a whole product line is included in the manufacturing process. It is organized as a pull system, meaning that each subsequent step in the production concept process pulls the products worked in the previous machine to it (SKF Staff Magazine, 2013).

The next step was Manufacturing Excellence, which was established in mid 2000. This concept incorporated increased empowerment by employees and greater responsibility in the manufacturing process. When Business Excellence was established in 2010, the thought was to include other functions such as administration. Today it includes manufacturing, transactions, technology and product development (SKF Staff Magazine, 2013).

Business Excellence is about bringing value to customers in the most effective and efficient way and at the same time enabling SKF to reduce costs by eliminating waste (SKF 2012, s. 32). The concept is built upon three equally strong areas, namely Culture, Six Sigma and Quality. Each of these areas has its own special qualities and strengths and a Business Excellence-triangle, as can be found in the appendix, is used to demonstrate how they relate and interact with each other. The culture of SKF is presented through a Business Excellence Bridge, as demonstrated below, containing fundamental elements such as drivers, values and principles for guidance along the value chain. The culture describes how things should be done in order to become more effective and more efficient.

Figure 2: The Business Excellence bridge.



Source: SKF Annual report 2012

Six Sigma is a set of tools and methods to improve processes and quality. In a traditional form, Six Sigma is run in the form of projects to make sure variations are reduced. Reduced variation in turn improves quality and new successful outcomes of Six Sigma projects are therefore incorporated into the quality system. Lean Six Sigma is used to optimize and streamline SKF's processes.

SKF applies Lean production in accordance with our theoretical framework. However, their business environment, with the production of commodities, prevents them from solely producing to customer orders. As rapid deliveries and consequently stock availability are key success factors in this industry, the majority of the production is done according to stock-level targets.

4.1.3 Management accounting and control in SKF

Concepts regarding the management accounting and control are set centrally by Group Finance or BA-management, and are stringently used throughout the organization. Below we describe the most central concepts and KPI's, based on descriptions given by the respondents, to facilitate the continued reading.

4.1.3.1 Full cost concept and standard costing

SKF applies a full cost concept, where all costs are distributed down to value-stream-level within factories. Costs are allocated based on number of employees, net sales/production volume and capital employed within a specific value stream.

Standards are calculated for each product every year in accordance to the business plan, implying that a planned efficiency improvement in the business plan is reflected in the standard costs for next year. Costs are distributed and calculated for each product based on the expected cycle time in the bottleneck of the value stream. When all standards are calculated, a performance standard (PS) is established by using the lowest calculated standard cost for a particular product. This is due to the fact that a particular product is produced at multiple locations. The PS is, however, not subject to change every year.

4.1.3.2 Profit centers and transfer prices

In addition to the full cost concept, SKF has structured all their operational units to be profit centers supported by a comprehensive transfer pricing system. Transfer prices at SKF are of great concern due to the fact that a vast part of the transactions are internal. Top management determines prices and profits are split 50/50 between production and sales units. The prices are fixed and adjusted every second year, though 'specific business agreements' can be made between sales and production. The profit-sharing principle is that the selling party (typically a production unit) does not receive its profit until the sales department has sold the product to an external part.

4.1.3.3 Total value added

The most central concept at SKF is the Total Value Added (TVA) measure. It is deeply integrated in all the operational units and variable compensation is often connected to it. Simplified, the TVA concept provides a business operating margin decreased by the cost of capital employed. The TVA concept is thus inspired by the Economic Value-Added model (EVA).

“The TVA is deeply rooted and includes everything, for better or worse. It is harder to affect but is closely connected to the economic value of the company”. – Karin, RSS Controller

According to SKF, the measure promotes greater operating profit, capital efficiency and profitable growth, and correlates well with share price over a long period of time (SKF, 2012).

4.1.3.4 Budget and Business plan

The annual business plan is of great importance for SKF and is considered a 'holy commitment'. The development process is iterative and starts during autumn, to be completed in December when the business plan is communicated throughout

the company. In practice the process starts bottom-up and ends top-down, and is tightly monitored during the year.

Measures such as TVA, cost level and sales price level (SPL), as defined below, are all incorporated in the business plan, which makes it both complex and time consuming to establish. The business plan is usually reported monthly, covering almost everything, customized to the specific unit.

4.1.3.5 Balanced scorecard

SKF implemented a long time ago a balanced scorecard with the conventional perspectives: customer, process, employees and shareholder. The function of the scorecard is mostly communicative, rather than performance measuring. Strategic initiatives from management are broken down throughout the organization to be customized for every operational unit in order to link operational activities to strategic agendas.

4.1.3.6 Key Performance Indicators

Relevant indicators depend on whether the operational unit is a plant or a sales company. Common measures are defined below, and are also found in the appendix.

- The cost level measure compares the actual cost to SKF's performance standard (PS).
- Efficiency shows how much of the production-channels' opening hours are used directly to manufacture products.
- Productivity is calculated by comparing man-hours to net output.
- Sales price level (SPL) is the external price compared to PS.
- Internal price level (IPL) is the internal price compared to PS.
- Product line profitability (PLP) analysis is performed to evaluate the profitability for an entire product line. This analysis looks beyond the organizational design and internal price structure. The analysis is also a helpful tool to, for example, identify a factory's major internal customer.
- Cost variability determines how well variable costs correlate with volume.

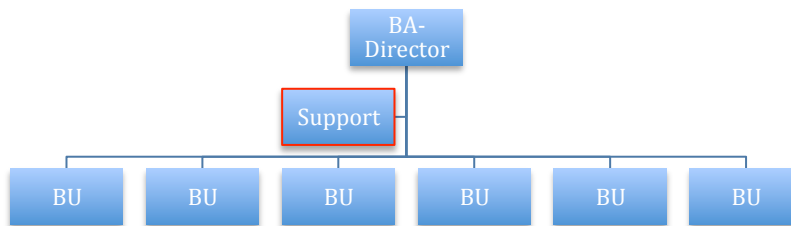
At manufacturing, the two most important KPI's are cost level and TVA. Other frequently used KPI's are: Operating margin, Total IPL / SPL, value added cost level, productivity, efficiency and shipments. For sales companies, SG&A is compared to different measures, most frequently SG&A/Net sales. The sales prices level (SPL) is also a central KPI.

For the remaining part of this chapter, experiences from different hierarchical levels will be presented. Starting at business area level and then climbing down the hierarchical ladder.

4.2 Business Area – Strategic Industries

4.2.1 Description

Figure 3: The organizational map of the Strategic Industries business area.



Source: Developed by the authors in accordance to interviews

The Strategic Industries business area (SI) consists of a director, support staff and six business units. The previous name of SI was the Industrial Division with manufacturing and sales organized separately. Two years ago, a major reorganization was carried out to bring both manufacturing and sales into one business unit with the idea of organizing product-to-end-customer under the same roof. Magnus Frändegård, BA controller of SI, describes the purpose of the reorganization:

“This reorganization was made in order to get better prioritization of factory resources and processes towards customers.” – Magnus, BA Controller

The organizational design, and the choice of full cost method, is established because SKF wishes to measure how every unit is contributing to the aggregated result. The thought is to give managers responsibility of the profit, making the business plan a ‘holy commitment’. Magnus believes that being a profit center is more motivating than just concentrating on costs. In practice, however, the use of profit centers implies a lot of focus towards transfer prices.

“It is a lot of focus and frictions when it comes to transfer prices, and that is not where we want our time spent” – Magnus, BA Controller

Opinions about the transfer pricing system will be shown to be a recurring theme of other respondents.

4.2.2 Management accounting and control

As a BA-controller, focus is on evaluating the different BU’s and the operational units within them. This is accomplished through standardized reporting procedures, where financial statements and KPI’s are monthly evaluated based on deviations. Although the report is standardized and used by every unit within SKF, the financial statement and KPI’s are customized to better fit the reporting unit. Important KPI’s for manufacturing are, according to Magnus; cost level, deliveries, business operating income and TVA, while a sales unit’s report emphasizes measures such as SPL and SG&A in relation to sales. Controlling at BA-level relies to a large extent on financial information. When overviewing the financial reports, the BA-controllers focus on the big picture, providing a more holistic view. This implies that they do not focus on details as long as the aggregated numbers are in accordance to the plan. However, Magnus describes that his job is not limited to the financial reports. When overviewing a process

there are a lot of decisions concerning many different BU's, meaning that a more holistic view is needed to make a decision on such an issue. Moreover, Magnus is involved in investment decisions, process improvements and the development of transfer prices and standard costs.

4.2.3 Managing the lateral dimension

Magnus expressed that there is a risk that BU's within the organization optimize their own business rather than SKF as a whole due to limited controlling in this matter:

“It is difficult to find an instrument where you are rewarded for optimizing SKF as a whole. The sales units have great contact with customers and factories where they ensure that products are delivered on time for example. So it is rather communication and not control instruments that support this.” – Magnus, BA Controller

As a lot of transactions are across BU's, this implicates that there is no cybernetic MAS controlling the process in such situations, and that SKF relies on communication to optimize the process.

Magnus clarifies that because of the transfer-pricing model, there are different price levels on different markets, and therefore some customers are more profitable than others. Magnus describes a theoretical situation where a factory has full workload, having to prioritize between two customer orders.

“Then the factory will, in order to optimize their result, choose the most profitable customer order, which is possibly not the most important customer to SKF” – Magnus, BA Controller

According to Magnus, SKF attempts to handle these situations through escalation and better communication, why Magnus underscores the advantages of organizing around BU's.

“If we look at the D-factory, they earn more by selling to other BU's than their own. There is almost a risk of sub-optimization in the opposite direction, but in those situations we have the BU-director as a guarantor that the business as a whole will be optimized” – Magnus, BA Controller

In Magnus opinion sales units are quick to escalate issues where they are given lower priority when transactions are between BU's as well, this time escalated and overviewed at a BA-level.

Magnus also describes a prior situation where sales units could choose to buy from different factories with different Internal price levels, optimizing their own business but not SKF as a whole.

“These situations are eliminated through better system support, and we monitor situations like that very tightly. There are always creative sales units, so of course there is a risk of situations like this” - Magnus, BA Controller

Magnus explains that the reorganization was partially done to avoid these kinds of sub-optimizations, by letting one director manage both manufacturing and sales as in the case of business units.

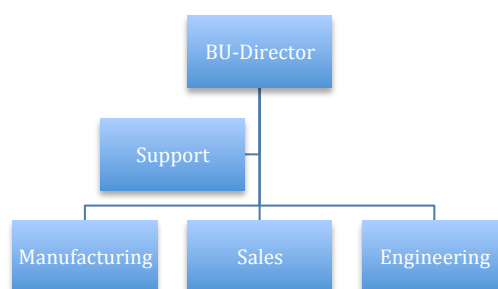
“(…) Earlier there was a big tension between manufacturing and sales, causing prioritization problems.” – Magnus, BA Controller

Nowadays, Magnus clarifies that these tensions are supposed to be handled by a BU-director, overseeing the whole process. Although, Magnus explains that he considers it to be easier for BU's that have a more 1:1-flow between manufacturing and sales. If the Renewable business unit would have such a flow, the BU-director would be ensuring that there are no sub-optimizations, looking at the whole picture.

4.3 Business Unit - Renewable

4.3.1 Description

Figure 4: The Organizational map of Renewable business unit.



Source: Developed by the authors in accordance to interviews

The Renewable Business unit (REBU) consists of a director, three operational legs and support staff. REBU is responsible for both OEM and after-market customers within the 8 countries that they are present. The Regional Sales and Service division handles customers outside those 8 countries. REBU manufactures about 80 % of its customer's products and purchase the rest from other factories. Only about 30 % of the produced products within REBU are sold to REBU customers, the vast majority are sold internally to other BU's. Pär Ihrskog, BU Controller of REBU, explains why:

“A lot of what we manufacture, especially within SRB, are bread and butter products and are used in a variety of industries” – Pär, BU Controller

Figure 5: Manufacturing and sales in terms of volume at REBU.



Source: Developed by the authors in accordance to interviews

4.3.2 Management accounting and control

As a BU-controller, the attention is primarily on evaluating the manufacturing and sales units within the BU. The concentration is mainly on measures that deviate from the business plan. Those measures are broken down, using a gap

analysis, to understand the deviations. Pär explains that BU-controllers have a higher level of detail compared to the BA-level. Apart from the financial reports, Pär describes that a lot of his time is consumed by non-financial reporting, including strategy, production and sales volume, and market issues related to customers and competitors.

Generally the TVA-measure is described as the most central KPI for SKF. However, during an economic set back, such as the one experienced by SKF today, attention for BU-controllers is focused around costs since the TVA incorporates too much.

“If you want to be clear in you communication, TVA is not a great measure just because there are so many things you cannot effect” – Pär, BU Controller

Because of that a lot of control effort is put on communicating cost-related metrics, such as cost variability, to become more flexible in handling sudden volume losses.

4.3.3 Managing the lateral dimension

As SKF is organized with different profit centers, Pär tells us that the risk of sub-optimization is always present.

“It is a continuous struggle, it is not easy. I think I encounter those quite frequently, sub optimizations” – Pär, BU Controller

Pär, on BU-level, therefore has to consider the fact that units within the value stream are concerned with optimizing their own unit. In accordance to Magnus, Pär point out that the transfer price system can give birth to potential problems. Every sales unit has a preferred factory, though the system has historically enabled them to buy from other factories.

“A sales unit in the US can, for example, have a preferred factory in the US. This sales unit can theoretically buy from a factory in Gothenburg because the transfer price is cheaper there. This would imply that the shipping costs would be much higher, and the profit of the sales unit is purely internal when in fact it is a loss for SKF as a whole” - Pär, BU Controller

Nowadays Pär explains that this is strictly monitored and that the system now prevents such behavior. Another historical problem related to transfer prices is what is known within SKF as the “grey market”, made possible because OEM prices are much lower than after-market prices.

“Historically there have been some examples when an OEM sales unit sells to an after-market customer in OEM prices.” – Pär, BU Controller

Pär explains that this is not an actual problem today because customers are codified and there are more control systems to prevent this from happening. As transfer prices are internal transactions, Pär points out that focus should be on customers instead of internal negotiations.

“We should not focus to much on transfer prices, it is what it is, the left and right pocket of SKF. On the other hand, it creates the TVA and affects our compensation so it is difficult to neglect it totally. Earlier

we had a system that made it possible to negotiate prices, and as it affects the bottom line and in the end your bonus, a lot of time was spent on this. Sometimes it would be more advantageous to negotiate transfer prices with a factory than actually concentrating on external customers” - Pär, BU Controller

As the transfer prices now are fixed, Pär concludes that this conflict does not exist anymore, though ‘specific business agreements’ are made from time to time. Moreover, he believes that one of the advantages of having business units is the fact that they have a better overview. When issues arise, or when decisions about investments have to be made, Pär stresses the benefit from organizing around business units.

“Instead of letting factories and other profit center decide by themselves, strategic matters are discussed and executed on a higher level where we have a holistic view” – Pär, BU Controller

This indicates that strategic issues are, in accordance to Magnus, escalated to a higher hierarchical level. However, Pär explains that there is a theoretical problem that other BU’s would interfere and have specific interests in the factory owned by REBU.

“If another BU wants our factory to expand or increase a product line, it is our BU that has to make the investment. Consequently, we want it to have great result impact, as we are responsible for it. On the other hand, there are plenty of us wearing the ‘SKF-hat’ in moments like that. As long as the investment or change of profit capability is incorporated in the business plan there should not be a problem as we are measured against deviations” – Pär, BU Controller

This suggests that culture and the possibility of integrating changes in the business plan are important to achieve process-optimization. In addition, Pär highlights that SKF’s Steering committees and Reference teams help to coordinate and support trans-boundary decisions.

Pär explains that SKF is a complex and very global company, and that factories often do not know who sells or buys their products.

“The PLP-analysis, where you follow a product line, gives us the possibility to enhance the contact between a factory and their sales units” - Pär, BU Controller

As the reorganization was carried out quite recently Pär maintains that this contact still can be improved. Furthermore, he described the problem that sales units are too optimistic in their forecasts causing risk for over-production.

“As the factories bear the cost of capital of stocks and over production, sales units stand no risk in anticipating a too high demand. It is easy to buy using someone else’s credit card. However, we have had great progress in these matters and becoming more process-oriented and finding smarter concepts and processes, having better planning and controlling systems” - Pär, BU Controller

As incorrect forecasts can be very costly, Pär adds that decision regarding the official three-month forecast is centralized to group-level.

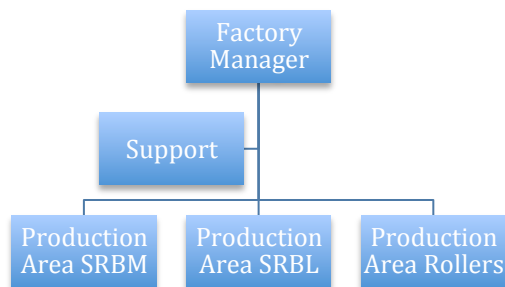
4.4 Manufacturing - D-factory at Renewable BU

4.4.1 Description

The D-factory of BU Renewable Energy, hereafter called 'the plant', is located in Gothenburg and produces spherical roller bearings (SRB). The plant is one of two Swedish factories within the Renewable energy BU. The D-factory produces medium sized bearings while its sister plant produces large. The products are, as stated earlier, used and sold within every BA of SKF.

The plant employs around 700 people and is organized in three different production areas (PA's), 'Medium', 'Large' and 'Rollers'. Medium and Large produces the SRB's while Rollers produces the key component rollers. The plant manager, together with the management team and supporting functions, manage the factory. Within every PA there are 3-4 bearing 'channels' (production streams). These are divided depending on the size and products manufactured so that they together cover the entire range of products.

Figure 6: The Organizational map of D-factory



Source: Developed by the authors in accordance to interviews

The manufacturing units produce volumes based on forecasts made from the sales units and themselves. The specific volume is later decided at group-level as the official three-month forecast. The factories produce to the central warehouse in Gothenburg, where they bear the cost of capital of the stocks. When a sales unit orders products they are delivered to a regional distribution center and by that no longer in the plant's balance sheet.

4.4.2 Management accounting and control

Jakob Andersson, Business Controller at the D-factory, believes that SKF measure both frequently and in detail.

“Generally, I believe that we measure everything and anything, many times over. We often do it at the lowest level. We put a lot of effort to keep track of details.” – Jakob, Factory Controller

The monthly financial statement, however, is described as “the holy cow”, something that the controllers experience is quick and painless due to high level of automation and standardization.

As a plant controller, Jakob focuses on deviations from the business plan to understand and explain changes. Sometimes deviations derive from changes a factory cannot effect (e.g. currency effects), why Jakob explains that it is important to find measures that a channel can affect, for example the cost of scrap, loss and rework. Even though a lot of effort is used to measure details, the

lowest level of detail is the channel. Jakob describes that measuring on machinery level is unnecessary since they have identified that there is only one bottleneck within a channel stream. Because of that, they never measure between the lathe, grinding and assembly, but focuses on the flow as whole.

The TVA measure is present in the plant like everywhere else within SKF group. However, Jakob considers it not to be used to any great extent. He does not know why this is the case, but he has some theories:

“My theory is that TVA for our factory is relatively good. I claim and say that our factory is a cash cow for SKF and SKF uses our factory to be a cash cow. So we want to pump out as much money as possible from our factory to do other things. (...) The TVA measure is too good for achieving controlling purposes, and that’s why its not used. People would believe that we earn lots of money and be satisfied in a crisis like this.” - Jakob, Factory Controller

Johan Wiksfors, Production Area Manager, believes that focus has to be on leading indicators that support the production. He claims that the TVA measure is an important KPI. However, he describes the TVA measure to be a highly lagging KPI that is difficult to affect.

“Solely using the TVA-measure does not tell you much. In order to have good management accounting you have to find KPI’s that are leading, which helps us to get us there. We have more and more leading indicators which is good.” – Johan, Production Area Manager

The scorecard, used for evaluation and guidance, at PA and channel level is mainly focused around non-financial KPI’s, such as number of completed order lines, broken promises, availability failures, setup time, productivity, number of completed individual training plans and scrap, loss and rework. Important financials are net output and value added cost level. As the financial report is comprehensive and lagging, the communication to shop floor workers is focused around relevant measures.

“If I would go out and talk about TVA or inward deliveries per month, it would not work. Talking about the amount of produced order lines becomes much more relevant. Depending on whom you talk to, various KPI’s take different forms, but aim at the same thing. For example, broken promises at PA level while completed order lines at the channel.” – Johan, Production Area Manager

During the observation of the channel concept on the production floor, we saw that information was communicated more frequent using visual boards adjacent to the production cells. Focus was primarily on the non-financial information coming from the scorecard. The visualization became more apparent when entering the so-called ‘Business Excellence room’, where daily morning meetings are held. These meetings, devoted to elaborate on continuous improvements in the production process, were to a great extent supported by boards mapping: current issues and possible solutions/new standards, setup time, down time, broken promises, availability failures, completed order lines and work in progress. Shop floor employees were very much empowered in the process of

improving the production system by the support of non-financial executional cost drivers instead of pure financial information.

4.4.2 Managing the lateral dimension

Jakob believes that the way the plant is organized with different profit centers and detailed monitoring may come at a price.

“Our approach to controlling, and our organizational separation, gives us a great risk that we optimize individual units and focuses on them. The entire organization is based on that we have an eye on the details all the way down. So we are exposed to the risk of sub-optimization.” - Jakob, Factory Controller

When the question about the risk of creating unnecessary stock was raised Jakob was quick to add that overproduction is a sin at SKF. He explains that overproduction is prevented through obvious stock goals, and that if those goals are reached they shut down the channel.

As of today, during an economic setback, almost no power is delegated, meaning that the plant management deals with almost all decisions and prioritization because of saving obligations. According to Jakob, the risk of sub-optimization becomes more apparent in a more normal situation with high demand. In such times, the three PA's are more disconnected to each other and rather compete with each other.

“When looking at the staffing within all the PA's, I (as channel or PA manager) may realize that we have too many in my area and maybe under staffed in another channel. However, no one will admit this. The same thing occurs when ensuring that all machines on the site look good. We have no incentives to look beyond our channel or PA which is why we are comfortable with optimizing the channel or PA I am responsible for. Then we know that things are going well for us and no one will yell at us.” - Jakob, Factory Controller

Jakob explains that this is a problem, and that they are trying to manage this issue by creating a group feeling where employees can see the big picture. However, Jakob describes that when sub-optimization is obvious they will handle it through centralization of decision-making rather than shared visions.

Johan agrees upon this issue, meaning that every channel has somewhat too much been “a company within the company”. He implies that there are some policies that are not supposed to discourage this but actually do it. Johan is referring to skills and performance bonuses. The bonus is linked to the performance of your channel, as is an employee's skills development, implying that working at another channel could, in some cases, impair your bonus and the progress of the skills development. But seen from a PA perspective, the flexibility would gain the whole PA and thus SKF. Johan has, however, not noticed any harmful behavior.

“Due to tight control of resources, I am not experiencing any risk that one channel could perform better at the expense of others.” – Johan, Production Area Manager

As common goals of the PA are included in the individual performance evaluation, it is supposed to encourage employees to assist other channels.

“When setting individual performance goals, some are common objectives for the whole PA, like productivity and value added cost level. We do this to encourage personnel lending between channels so that if all the units perform well in terms of productivity, it will benefit each and every one of us.” – Johan, Production Area Manager

The fact that there are union and safety regulations regarding working at different channels also undermines the possibility to move personnel.

When observing KPI's for the plant, an interesting observation was that some productivity measures could be enhanced if the channels chose to produce larger batches, and thus the risk of building inventory. This is, however, prevented through obvious stock goals, cost of capital employed and profit-sharing principles. Moreover, it is explained that it is the supply chain department that chooses what to produce, and in what order.

4.5 Regional Sales and Service

4.5.1 Description

The regional sales and service department is divided into after-market and OEM customers, and a service line. Within RSS all of the products are purchased from either a regional distribution center or directly from a factory. Factories never sell straight to a customer; this relation is owned by the sales department.

The service line within RSS Sweden, which we will focus on in this thesis, is an exception in the way that they control the whole process, end-to-end. This means that consultants and the sales department are organized in a combined operational unit unlike other BU's within the SKF Group, where production and sales are organized as separate units within the BU's.

4.5.2 Management control and accounting

Karin Carstens, Business controller at RSS Sweden, explains that the controller function concentrates on monitoring performance in relation to the annual business plan. Karin describes that she communicated the results monthly, trying to explain important deviations in words in order to support managers at the operational level.

The most important KPI's are SPL, cost level and SG&A related to sales. At the combined unit, an important KPI was the occupancy rate (chargeable hours/total hours) of service consultants. In interest of communicating understandable information, Karin expressed that presenting the causes of the results and action plans were important ingredients.

4.5.3 Managing the lateral dimension

Karin described that within the traditional sales department she did not experience any conflicts, “you concentrate on optimizing your own unit”. She believed that potential leveling in order to achieve process-optimization is more likely to appear higher up in the organization where they have a more holistic view, from production to customer.

Karin explains that they perceived the integrated service line as positive, avoiding the conflicts between different units and now overseeing the service line as a whole.

“We got the feeling of an end-to-end process, controlling the whole business instead of a small part of it.” – Karin, RSS Controller

As production and sales usually are separated at SKF, this was something they had to fight for, keeping the service line as a combined unit. Although they were able to keep the service line, Karin explains that they chose to divide sales and service in terms of accountability, meaning that they measured both sub-units and the BU as a whole. Karin explains that this was done in order to help and support managers by providing them with relevant information in the monthly financial report. Although the intentions were good, the separation implied a risk of sub-optimization, focusing too much on the sub-units and not the business as whole.

“As we measured both we were afraid of sub-optimizing our resources. Should consultants be used in a project in one unit or attend a strategic important meeting in another? A unit manager will always choose chargeable project hours before strategic meetings. It takes a manager with a trans-boundary view to oversee this situation.” - Karin, RSS Controller

In order to get unit managers to value sales meetings, Karin explains that they had to regulate this kind of activity, calling it ‘sales support’ and excluding it from the original occupancy rate and having transfer prices between the sub-units. However, when sales support became chargeable internally, employees that enjoyed sales meetings prioritized those ahead of chargeable external hours. This behavior called for another instrument to prevent excess use of consultants at sales meetings.

“In the end we want to maximize our external chargeable time so we had to introduce a clearance system for sales support. A sales manager had to clear that support was needed” - Karin, RSS Controller

This means that after implementing the transfer prices to facilitate sales support, an additional tool had to be introduced to make the system more foolproof by centralizing decision-making.

5. Analysis

In this chapter we will present our own interpretations of the empirical data and give a detailed comparison between our theoretical framework and the empirical evidence. First we will relate the MAS and lean controls of SKF with theory, second we will describe the organizational dimension, and third we will discuss the experienced conflicts.

5.1 Traditional MAS, lean control and earlier critique

In this section we will present a short description of the traditional MAS practiced by SKF along with their lean controls, related to theory. After having laid the ground we will describe the associated critique towards traditional MAS linked to our empirical findings.

5.1.1 SKF and traditional MAS (VMAS)

Snell (1992) described output controls as goals that management set for employees to pursue, which in a traditional setting is dominated by financial performance measures based on standards (Kaplan, 1983). In the case of SKF, annual business plans are used to direct employee's attention, and performance is evaluated by means of deviation analysis from the business plan. SKF has a complex management accounting system that allocates accountability down to individual objects, such as departments and sub-units within those. In comparison to earlier studies, highlighted in the theoretical framework of this thesis, its apparent that SKF's MAS is to a great extent designed in accordance to the traditional MAS and our definition of VMAS (Kastberg & Siverbo, 2013; Anthony, 1965)

5.1.2 SKF and lean control practices (HMAS)

Apart from the traditional MAS, SKF has implemented a lean production concept and supportive lean controls linked to that. The lean concept is mostly visible at the production level, and functions in its surrounding. As argued by Maskell and Baggaley (2003), financial measures were not used at the shop floor level where controlling exclusively relied on non-financial performance measures for output control. Through the daily morning meetings, information was communicated frequently (Lind, 2001, Lucket & Eggleton, 1992), using visual boards (McGovern & Andrews, 1998; Zayko et al., 1998) and employees were constantly encouraged to identify waste and improve the standard operating procedures (Adler, 1993; Rondeau et al., 2000). Although performance measures and rewards were linked to work-team performance in accordance to Ezzamel and Willmott (1998), peer pressure was not obvious. The lean control practices identified at SKF are to a large extent consistent with Kennedy and Wideners (2008) framework, with non-financial output control, standard operating procedures for behavioral control and a high reliance on social mechanisms, such as empowerment, visualization and incentives.

5.1.3 Critique towards traditional MAS

Earlier in this thesis we highlighted some direct critique towards traditional MAS in a lean environment. We will below try do explain why, or why not, SKF experienced any problems in these matters.

5.1.3.1 Wrong measurements

The first critique was the use of wrong measurements, which lead to overproduction and thus the creation of unnecessary stock. In the case of SKF they did not use utilization measures in the manner described by Maskell and Kennedy (2007). The creation of unnecessary stock was moreover prevented through obvious stock goals. When stock goals are fulfilled, they shut down production in order to avoid the creation of stocks. These stock goals could be interpreted as customer orders, which in turn can be taken as a pull system rather than a push system (Womack & Jones, 2003; Åhlström & Karlsson, 1996). Furthermore the prevention of unnecessary stocks is assisted by the cost of capital employed and the profit-sharing principle, as the factory bear the cost of capital until the sale is made and profits shared. SKF did not experience that their measures provided a risk of creating unnecessary stock, and after conducting our interviews we felt that overproduction it tightly controlled and not a problem in that manner.

5.1.3.2 Wrong costs

Another critique was the use of wrong costs, concentrating on product costs and standards, argued not to be useful in a lean environment (Maskell & Kennedy, 2007). SKF uses standard costs, meaning that costs are allocated down to each product based on forecasts, not too far from the prior explanation. However, SKF also measures the channels (i.e. value streams), recommended by theory. The fact that SKF practices both implies that they can benefit from value stream costing, and still use the information from product costing for other reasons. In that way there is no conflict in this subject, although the use of those two different measurement systems is time consuming.

When using standard costs Dhavale (1997) argues that it incorporates waste and therefore becomes outdated and does not focus on continuous improvements. In our case company standards are established from the annual business plan where continuous improvements are incorporated. Although, we understand that these standards could get outdated during the year. Apart from this it was obvious that SKF, through daily meetings, continuously tried to improve the process and eliminate waste at production level.

5.1.3.3 Decision-making

According to Maskell and Kennedy (2007), traditional MAS can lead to erroneous decisions when it comes to excess capacity and overhead allocations. In accordance to Maskell and Kennedy, SKF applies a full cost concept where overhead costs are distributed on every value stream based on number of employees, net sales and capital employed. This implies that a higher capacity usage results in a lower cost per manufactured product and is thus signaling to avoid excess capacity. This is, however, prevented through a number of other metrics and accounting principles, as described above, to minimize stock keeping and the avoidance of overproduction. Although SKF recently has experienced times of low demand and excess capacity, the respondents evidently indicate that Maskell and Kennedy's (2007) critique to be prevented.

5.1.3.4 Information and complexity

Information coming from traditional MAS is argued to be complex, time consuming, and understandable only for a few people. The arithmetic reports give no practical guidance for employees (Maskell & Kennedy, 2007). SKF uses very complex reports that are, although standardized, time consuming to establish. At production level complexity is reduced and simple one-dimensional information is communicated frequently. Directly above, information is more complex and contains a lot of measurements and evaluation is concentrated on deviations. As SKF measures everything down to details the accounting information can be divided into its components. In that way controllers have the possibility to derive where changes come from and communicate clear objectives. However, how SKF calculates certain KPI's makes the measures difficult to understand, but as we almost exclusively interviewed business controllers we can assume that they are biased in the question if information was complex and hard to interpret. Nevertheless, some respondents expressed that SKF possibly measures too much, and that controlling details can be harmful apart from very time consuming. As a result SKF is now examining the possibility of downsizing the controller function and reduce the level of detail.

5.1.3.5 Customer focus

The critique against focusing too much on costs and stock prices instead of customer value is ambivalent in our case company. SKF is currently undergoing a transformation from being a traditional commodity good producer to focus on value-based engineering, meaning that customer value is the starting point when developing and pricing new products and solutions for its customers. Even though SKF is becoming more customer-centric, the majority of its business is still producing and selling commodities with a cost focus.

As described earlier the TVA-measure is of great importance when it comes to tracking performance at SKF. The concept is closely attached to the financial performance of SKF and correlates well with its share price over time. In that sense customer value is subordinate to financial and stock price performance.

On the other hand, customer centric KPI's are incorporated through the balanced scorecard and the use of HMAS at production level, where measures such as broken promises, availability failures and customer complaints are taken seriously. This reduces the risk of myopic behavior argued to be associated with VMAS (Maskell & Kennedy, 2007).

5.1.3.6 Summary

As a summary we conclude that most of the design of the harmful MAS, described by Maskell and Kennedy (2007), was found at our case company. However, the direct negative aspects suggested by theory were in most cases prevented through the use of lean controls and other control instruments. Although the direct conflicts were prevented, information was, in accordance to Maskell and Kennedy (2007), very time consuming and complex above shop floor level.

5.2 Organizational dimension

As we discovered that the organizational dimension supported the process-orientation and the prevention of conflicts we will below describe our findings.

First we will elaborate on the organizational design and second on the different use of MAS.

5.2.1 Organizational design

As described in the empirical chapter, SKF has recently abandoned their functionally divided organization in favor of its present customer and process-oriented organization at BU-level. This means that business units today are designed to include the whole process, from manufacturing to sales, to support a particular customer segment. This was done, according to the respondents, to bring manufacturing and sales closer and increase the customer focus.

The new organization has, in accordance to Simons (2000), structured the attention for BU-directors to facilitate a process and customer focus due to a wide span of control and accountability, i.e., control of a whole process and held accountable for profits. The faith in the new organization among the respondents is high, and is believed to diminish the risk of sub-optimization since attention is structured to maximize the outcome of the process as a whole. As the organizational design is a part of the control package (Malmi & Brown, 2008) and that SKF's new organization exists to coordinate, support decisions and control behavior in processes, we label it as HMAS (Kastberg and Siverbo, 2013).

The benefit of the new organization, as expressed by the respondents, is the possibility to escalate important matters to managers having a holistic view, overseeing the total impact of a certain strategic decision. This entails that BA and BU-directors are viewed as guarantors for the maximization of processes and avoidance of sub-optimizations.

5.2.2 Different design and use of MAS at different levels

Something that moreover prevented direct conflicts between the VMAS and the process-orientation was that the MAS were used differently at different hierarchal levels.

At production level the concentration was on leading, non-financial measures that supports decisions. VMAS was still present but was not used as a control instrument for shop floor workers. Information at the floor was communicated frequently, focusing on enabling measures, using visual boards as described in 5.1.2. The primary role of the MAS was, in accordance to Ittner and Larcker (1995), to provide empowered workers with information for problem solving and continuous improvement activities.

At the factory management level, directly connected to production, the focus was mostly on deviations from the business plan and understanding why those deviations appeared. After understanding a deviation, focus could be addressed towards areas that were modifiable. The financial reports, as part of the factory's VMAS, was in that sense used in an enabling way, helping the manufacturing to improve.

At the BU and BA level focus was mainly addressed towards financial and strategic measures, in line with Maskell and Baggaley (2003). The same financial reporting labeled as VMAS at the factory level could be interpreted as HMAS at higher levels, as it supports decisions for a whole business process. Information was used for issues such as moving a channel to another country, or analyzing if

a product line is profitable. Apart from using information for strategic matters, BU and BA-controllers also overviewed the income statement and balance sheet, breaking down measures to understand changes. Information was although mostly used for coordinating manufacturing and sales by reporting volumes, preparing forecasts and the development of fair transfer prices. A lot of non-financial reporting including customer and competitor related issues was also performed at these levels. In that sense the primary role of the MAS was to coordinate, support decisions to maximize the outcome of processes, in accordance to the objective of HMAS (Kastberg & Siverbo, 2013).

By using the MAS differently our case company could allow lower levels, close to manufacturing, to concentrate on their specialization (Brunsson, 2002). Units at a higher level, on the other hand, focused on financial and strategic issues, having a more holistic approach. This is connected to the classic bureaucratic theory (Weber, 1947), where the bureaucracy divides duties and concentrate focus. The fact that most of the sub-optimization issues were handled at a higher level, where they have a more holistic view, could be a deliberate choice, letting lower levels concentrate on enhancing the production.

5.3 Experienced conflicts

The empirical chapter revealed that SKF has experienced a couple of conflicts/sub-optimizations as summarized in the table below. We will in this section provide a discussion in order to get a deeper understanding of how conflicts were handled and why they occurred.

Table 3: Described conflicts at different hierarchical levels.

| BA & BU | Factory level | RSS |
|--|-----------------------------------|------------------|
| Internal negotiations Grey market Preferred factory Optimistic forecasts Prioritizations of orders | Moving employees between channels | Measure sections |

5.3.1 Managing conflicts

At both BA and BU level our respondents described prior situations where manufacturing and sales units could spend a lot of time negotiating prices internally. Another previous problem was the 'grey market', the possibility that sales units could sell to after-market customers in OEM prices in order to be more profitable as a unit. Similar to the grey market problematic there were situations where sales units could purchase products from other factories than their preferred one. The way SKF avoided these three problems was through enhancing the system, making it more 'foolproof'.

As sales units did not bear the cost associated to stock keeping there was a risk that they presented too optimistic market forecast. Even if SKF has tight control of overproduction there is still the cost of excess raw material and labor. Such excess material and labor is in direct conflict with lean, as the basic thought is that production is drawn from customer orders (Åhlström & Karlsson, 1996). Moreover, factories could theoretically optimize their own unit by prioritizing orders with high IPL. These two problems were handled through escalation of issues to higher hierarchal levels.

At factory level each channel is measured and evaluated by it self, and therefore a risk of sub-optimizing existed. As skills and performance bonuses were linked to an employee's channel, working in another channel was undesirable. This was partly handled through incorporating common objectives in the individual performance goals and, if sub-optimizations were obvious, through escalation.

The combined unit controlled a whole value stream, but measurements were still made at sub-unit level. This implied that focus was shifted from "the whole picture" to "my section", as for example assisting another section on a sales meeting was harmful to your KPI. The situation was first handled by making the measurement system more 'foolproof', and secondly by incorporating a clearance system governed by managers with a more holistic view (centralization).

5.3.2 Understanding conflicts

Although the new organizational design, labeled as HMAS, is believed to diminish the risk of sub-optimizations, the majority of the transactions are still performed crosswise between BU's and operational units to achieve economies of scale. This means that SKF's processes, to a great extent, takes place beyond a BU-director's holistic view, implying that the process-orientation in fact is limited to processes taking place within a single BU.

Even though SKF has a process-oriented organization at BU-level their operational units, within the BU's, are functionally organized. Managers for operational units have, in other words, a narrow span of control since they only control a small part of the process, e.g. sales unit or factory (Simons, 2000). The operational units are structured as TVA-centers, held accountable for profits and evaluated based on variances to pre-planned objectives in accordance with our definition of VMAS (Kastberg & Siverbo, 2013; Anthony, 1965; Merchant & van Der Stede, 2007). This implies that the span of accountability is extensive since managers are held accountable for the complete income statement as well as the balance sheet (Simons, 2000). The wide span of accountability has in accordance to Simons (2000) resulted in a wide span of attention, meaning for example that a plant manager will, besides costs, direct a part of his attention at revenues.

The respondents' description of the pre-planned objectives to be "a holy commitment" indicated the perception of low flexibility concerning the performance measures. In that sense the TVA-concept can be determined as a highly coercive approach to control due to its cybernetic design and low flexibility (Jordan & Messner, 2012).

The wide span of accountability in combination with the coercive approach to control has evidently, in the case of SKF, resulted in attention towards non-value-added activity, described as sub-optimizations. The hierarchical accountability design enhanced by the perception of control mechanisms as coercive has, in accordance to Roberts (1991) and Adler and Borys (1996), resulted in defensive behavior best described by the ideas of 'individualized accountability'. As managers fear disciplinary actions they may become self-absorbed, implying that reaching specific performance standards will be done while neglecting the consideration of consequences (Roberts, 1991). As coercive controlling lacks flexibility towards reaching specific standards, the risk of self-absorption becomes more evident. In the case of SKF, the risk of individualizing

accountability is also increased by the fact that bonuses are connected to the TVA-concept, meaning that self-absorption may be a result of what Roberts (1991) calls 'the enhancement of self'. The sub-optimal behaviors such as prioritization of orders, internal price negotiations, grey market, optimistic forecasts, and preferred factory could all be derived from the individualizing form of accountability due to the wide span of accountability and coercive approach to control. In order to clarify this we will elaborate upon the sub-optimal behavior 'prioritization of orders'. Consider a plant manager held accountable and rewarded for profits. This manager has a limited span of control but is held accountable for both costs and revenues. This implies that the attention is not solely structured towards producing as cheap and effective as possible, the manager will also pay attention to revenues coming from the sales unit. In times when the plant manager is having difficulties reaching pre-planned objectives and the flexibility around these are perceived as low, the manager might fear disciplinary actions. In this case the manager might shift his focus towards revenues to increase the profits. As the manager has the opportunity to influence what orders to produce he will prioritize those with highest IPL while neglecting the consequences. This is made possible due to the distant control from superiors, as the accounting information is the mirror through which work is made visible.

Moreover it is interesting to elaborate on the discrepancies between intended and actual control effect. Even though measurements have supportive intentions managers can perceive those measures as goals, and in that way have a more coercive control effect (Adler & Borys, 1996; Ahrens & Chapman, 2004). As we discovered at the service line within RSS the intention of measuring sub-units separately was "to help and support managers" in an enabling way, it anyhow got a direct control effect. This could be interpreted as if the consultants within the service line perceived the control as coercive (Adler & Borys, 1996; Ahrens & Chapman, 2004), due to the frequent monitoring (Malmi & Brown, 2008; Jordan & Messner, 2012). As the measurements are perceived as coercive, employees may get self-absorbed, which can explain why consultants did not risk their own KPI by participating in strategic sales meetings (Roberts, 1991). Another example of individualizing accountability was experienced at the 'production channel' level. As with above described conflicts, the underlying cause was the use of VMAS where 'channels' within the factory were clearly separated in terms of accountability. Although interesting, this sub-optimal behavior cannot be categorized as a classic conflict between VMAS and process, since each channel belonged to different processes. However, as each channel would benefit from personnel lending, the limited collaboration was sub-optimal.

5.3.3 The implications of escalation

Apart from enhancing the ERP-system to avoid sub-optimal behavior it has become evident that SKF to a great extent relies on escalation of issues in order to ensure process-optimization. From a process-oriented perspective escalation is positive as the issues are raised to a hierarchal level where managers have a holistic view. However, the fact that SKF uses centralization as a mean to ensure process-orientation is eye-catching as it is completely in contrast to what lean literature suggests. In a lean environment empowerment and decentralization are underscored (Bowen and Lawler, 1992; Lawler et al., 2001; Kennedy &

Brewer, 2005; Kennedy & Widener, 2008), which is why it is interesting that our case company relies on centralization of decisions in order to achieve process-optimization.

Although the centralization of decisions is favorable from a process perspective in this case, it nevertheless undermines the accountability of profit centers because of the limited right to make decisions and thus affect the outcome. The case company's process of dealing with this issue is through communication and the incorporation of changes in business plan. By alleviating the accounting information and including communication this may possibly diminish the risk of individualized accountability as managers are aware of the fact that they cannot entirely effect their results and that some decisions are taken above their head. In other words, this means that the distant control is reduced and accounting information is no longer solely the mirror through which activities are made visible, judged and compared (Roberts, 1991).

As a summary, SKF has, on the one hand, TVA-centers with an individual performance perspective of operational units. On the other hand, above the individual perspective, SKF relies on centralized decision-making to ensure the process-optimization perspective. In order to balance between these two perspectives, continuous communication plays an important role.

6. Conclusion

The final chapter of this thesis contains the conclusion drawn from the case company and some suggestions for further research

In our thesis, Business Controllers at different hierarchal levels have been interviewed with the aim to increase the understanding about potential conflicts between traditional MAS and process-orientation, and to initiate a discussion on how the organizational dimension can contribute to this subject.

Prior literature points out that traditional MAS is not supporting the process-orientation, argued to be time-consuming, complex and using measures that are harmful (Maskell & Kennedy, 2007). We discovered that most of the design of the MAS, and the fact that it was complex and time-consuming, was concurring to the critique. However, the direct negative aspects suggested by theory were prevented through the use of lean controls and other control instruments such as obvious stock goals and cost of capital employed. Some utilization measures, criticized to be harmful, were not used as described by Maskell and Kennedy (2007). Moreover the potential conflicts between VMAS and the process-orientation were prevented through what we call an organizational dimension. Firstly, our case company was organized in business units with a holistic view, structuring attention to a whole process (Simons, 2000). Secondly, our case company used the MAS differently at different levels, letting higher hierarchal levels have a coordinative and supportive role, and lower levels to concentrate on functional duties (Eriksson-Zetterquist et al., 2006).

Nevertheless we discovered some conflicts deriving from the use of profit centers (VMAS), which structured attention on both costs and revenues (Simons, 2000). This resulted in some harmful behaviors such as internal negotiations and misusing the system to purchase cheaper products from non-strategic factories. This was explained by the creation of 'individualized' accountability due to a coercive approach to control (Roberts, 1991; Adler & Borys, 1996). An interesting finding was that the intended use of some accounting information was supportive but was perceived as coercive, due to frequent monitoring (Adler & Borys, 1996; Ahrens & Chapman, 2004), and by so creating individualized accountability. In order to prevent conflicts and achieve process-optimization our case company, in direct conflict to lean literature, relied on escalating issues to hierarchal levels with a holistic view. The negative aspect of centralizing decision-making, in terms of undermining the accountability, was balanced through continuous communication and the incorporation of changes in the business plan. As a result the risk of 'individualized' accountability could possibly have been reduced due to the alleviation of accounting information as the only image of individual performance (Roberts, 1991).

This thesis contributes to this field of knowledge by providing empirical evidence about where conflicts between traditional MAS and process-orientation can appear and how they can be handled. Even though our findings are trustworthy for our case company, it is difficult to generalize from a single case study. These findings are rather providing guidelines for future researchers and explicitly opening up for a discussion about the organizational dimension.

Further research

In the process of writing this thesis, several interesting areas of further research were discovered. This thesis is based on a single case study of a Swedish bearing manufacture with the majority of the respondents being Controllers. It would be interesting to compare the case of SKF with other organizations, and in such case interviewing management position employees. As the second aim of this thesis was to initiate a discussion on how the organizational dimension could contribute to this area of research we would like to encourage future authors to continue researching this area.

During this thesis we mentioned that SKF applies a 'full cost concept'. Although we did not examine this on a deeper level, we experienced a reasonably gap between intended and actual outcome of the cost allocation system. Therefore, we would also encourage further research to study this on a deeper level by perhaps including an institutional perspective.

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Karin Carstens, Business Controller at RSS Sweden
Interview at SKF HQ, 2013-03-26

Jakob Andersson, Business Controller at the D-factory (REBU),
Interview at SKF HQ, 2013-04-09

Johan Wiksfors, PA-Manager at the D-factory (REBU)
Interview at D-factory Medium Bearings, 2013-04-15

Per Ihrskog, Business Controller at Renewable BU
Interview at SKF HQ, 2013-04-15

Magnus Frändegård, Business Area Controller at Strategic Industries BA
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Appendix I – Definitions and acronyms

The following appendix provides a short list of definitions and acronyms prevalent in the empirical chapter.

SI – Strategic Industries

BA – Business Area

BU – Business Unit

REBU – Renewable Business Unit

RSS – Regional Sales and Service

PA – Production Area

SPL – Sales price level

TVA – Total Value Added

EVA – Economic Value Added

IPL – Internal price level

PS – Performance standard (Best of standards)

PLP – Product line profitability

SG&A – Selling, general & administration expenses

KPI – Key performance indicators

COGS – Cost of goods sold

SOP – Standard operating procedure

BE – Business Excellence

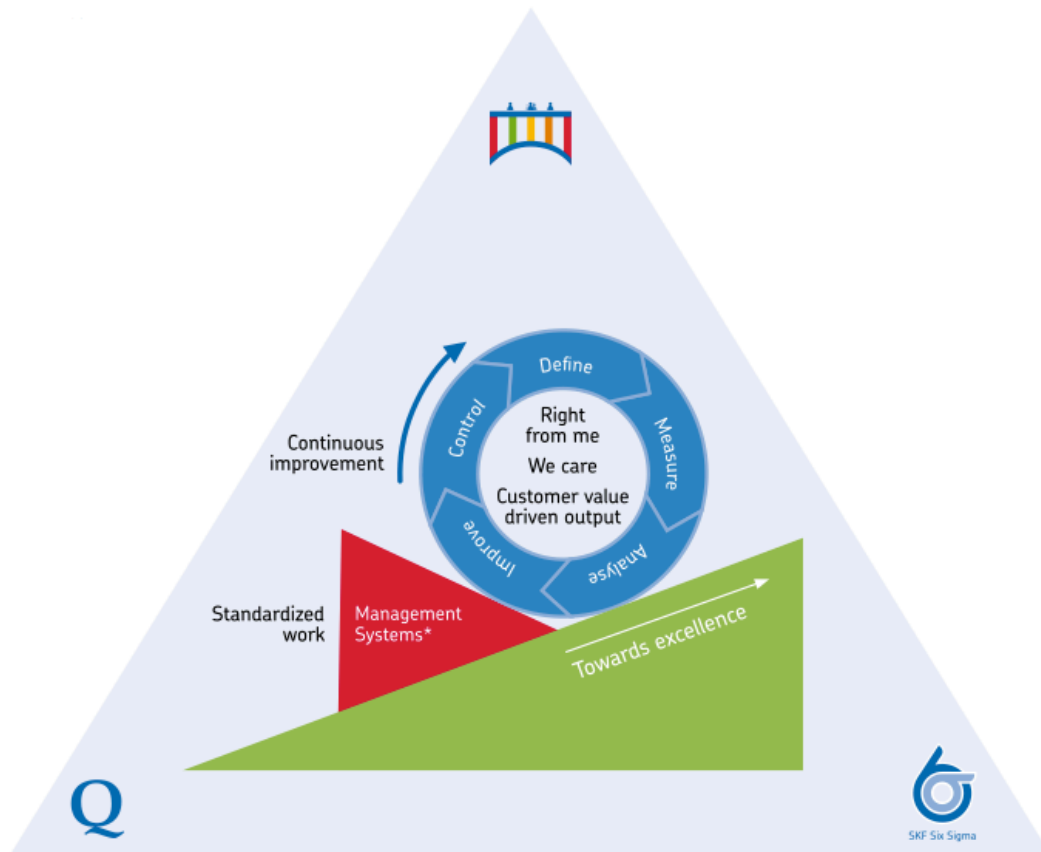
ME – Manufacturing Excellence

OEM – Original equipment manufacturer

SRB – Spherical rolling bearings

Appendix II - The Business Excellence Triangle

The following appendix provides an illustrative triangle showing how culture, Six Sigma and quality relate and interact to each other at the case company.



**Including Quality Management System and Environmental, Health & Safety System*

Source: SKF Annual report 2012

Appendix III - Interview guide

This appendix provides an overview of the topics covered during the interviews. As probing and follow-up questions were used frequently each interview lasted around two hours.

Background

- Briefly describe your background.
- Could you describe the organization you work within?
- What are your duties and responsibilities?

MAS

- What management control practices are used within your unit?
- Describe the instruments the parent unit uses to evaluate and control your unit.
What do you experience as the most important?
How do you perceive the complexity of the MAS?
- How do your unit control and evaluate subordinated units/employees?
What do you focus on? Important measures?
How is this communicated?

Controlling the lateral dimension

- How do you perceive the cooperation between units within the process?
- How do you ensure the maximization of processes?
What control instruments support this?
- How do you perceive the risk of sub-optimization?
Do you have any experiences in these matters? (Give example)
How was it handled?
How do you prevent future sub-optimal behavior?