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UNIVERSITY OF TECHNOLOGY

Definition of performance measurements

- A case study of a small high technology
company that is a part of a listed Group

Master of Science Thesis

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Preface

This master thesis has been conducted during spring 2014 at a Swedish company. The thesis is a part of the final examination at the master degree program Supply Chain Management at Chalmers University of Technology, Gothenburg, Sweden. The project has been interesting and provided us with a lot of valuable experiences for future work.

First of all, we would like to thank our supervisor, the CEO at Leptha, that has given us the opportunity to conduct the thesis at the company and for all support he has given us during the process. We will also thank the two controllers at the company with the fictive name Gamma and to the controller at the mother company, for all help and support during the thesis work.

We will also like to thank our supervisor at Chalmers University of Technology, Anders Isaksson, who has provide us with a lot of guidance, input and support during the whole process. With his knowledge about the subject, he has given us a lot of valuable information that have supported the work and contributed with interesting and useful information to the thesis.

Lastly, we would like to express our gratefulness to all people that have been involved and helped us during our work with this report. We will thank all employees at the Leptha for the warm and supporting attitude towards this project.

Gothenburg, June 2014

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Abstract

Markets are constantly changing, technologies evolves and innovations are introduced. For companies to be able to follow the changes in the market, good management is required to control the company towards right direction. There are several models and techniques for companies to use for guidance towards the company vision. One of them is the Balance Scorecard, which combines performance measurements that aim to examine how the company performs in different areas. The performance measurements give an overview about how the company is performing and it is proven to be a useful tool in order to guide the managers in decision making. By calculating performance measurements the company managers are able to take decisions based on real numbers.

This thesis has been conducted at a Swedish company that in this report has the fictive name Leptha. It is a company developing and manufacturing high technological products. The company was until 2013 a privately owned company but was then acquired by the company Beta that is a part of the Alpha Group. In connection with the acquisition, the company has changed from a small company to become a part of a listed Group. The integration required totally new procedures for financial reporting and there was a need to establish and define performance measurements for Leptha. The purpose with this thesis is to define performance measurements relevant to use for Leptha and companies within the same industry. Furthermore, how the performance measurements are extracted and reported in order to support business decisions will be described. Also a recommendation is given about how a successful implementation is conducted. In order to reach this purpose, four research questions were proposed.

- 1) What performance measurements are appropriate to use for a small production company that is a part of a listed Group?
- 2) Where can the data needed for enabling calculation of the performance measurement, be found and what formulas and templates are appropriate to use in order to calculate the performance measurements?
- 3) When and in what way is the performance measurements reported?
- 4) How can performance measurements be implemented in a successful way?

In order to answer the research questions, discussions have been held with key employees at Leptha, Gamma and Alpha. To be able to support this information a theoretical framework has been conducted. The result of the thesis is that 42 performance measurement has been presented and defined together with information about how the data will be extracted and reported. It has also been a discussion about what the company shall consider when implementing the measurements within the company.

Key words: Performance measurement, Management controlling, Balanced Scorecard, Reporting and Implementation.

Declaration of abbreviations and concepts

BI = Business Intelligence

BRIC = Brazil, Russia, India and China

BRM = Business Review Meeting

BSC = Balanced Scorecard

CEO = Chief Executive Officer

EBIT = Earnings before Interest and Taxes

EPS = Earnings per share

ERP = Enterprise Resource Planning

HR = Human Resources

KPI = Key Performance Indicators

KRI = Key Result Indicators

MTTR = Mean Time to Repair

OPEX = Operation Expenses

PI = Performance Indicators

R&D = Research & Development

RI = Result Indicators

ROCE = Return of Capital Employed

WIP = Work In Progress

Performance measurement: Throughout the thesis, the term performance measurement refers to an indicator used by management to measure, report, and improve performance. These are classed as either a key result indicator, a performance indicator, or a key performance indicator.

Table of content

Preface.....	I
Abstract	II
Declaration of abbreviations and concepts.....	III
1. Introduction	1
1.1 Theoretical background.....	1
1.2 Case study.....	2
1.2.1 Company organization and management	3
1.2.2 ERP systems	4
1.3 Problem Discussion	4
1.4 Purpose	5
1.5 Research questions	5
1.6 Thesis structure.....	7
2. Method	8
2.1 Literature review	8
2.1 Research strategy.....	9
2.2 Research design.....	9
2.2.1 Case study research	9
2.2.2. Action research.....	10
2.3 Research Process	11
2.4 Reliability and Validity	12
3. Theoretical framework	14
3.1 Management Controlling.....	14
3.2 The Balance scorecard.....	15
3.3 Performance measurement	16
3.3.1 Key performance indicators	17
3.3.2 Key result indicators.....	18
3.3.3 Performance indicators.....	18
3.3.4 Result indicators	18
3.4 Reporting.....	18
3.4.1 Enterprise Resource Planning & Business Intelligence.....	19
3.4.2 Big data.....	20
3.5 Implementation.....	20
3.5.1 How to develop a Balance scorecard.....	23
3.5.2 Successful implementation of a Balance scorecard.....	23

3.5.3 Implementation of Performance measurements	24
4. Result.....	26
4.1 Market	26
4.2 Production	29
4.3 Research and development.....	34
4.4 Service & Support	37
4.5 Finance	39
4.6 Human resources	46
5. Discussion	51
5.1 Performance measurements & management controlling.....	51
5.2 Extracting and reporting data	52
5.3 Implementation.....	54
5.3.1 Project and performance measurements implementation	54
5.3.2 Implementation of a Balance scorecard.....	57
6. Conclusion and Recommendations	59
6.1 Contributions and future research	61
7. References	62

List of Figures

Figure 1. Group organization	2
Figure 2. Leptha's organization.....	4
Figure 3. Thesis Structure	7
Figure 4. Changes in publications of the key words during the years.....	8
Figure 5. Time table of the research process.....	12
Figure 6. The Balanced Scorecard	15
Figure 7. Four types of performance measurements. Parmenter (2010).....	17
Figure 8. The Balanced Scorecard six perspectives	60

List of Tables

Table 1. Summary of market measurements	29
Table 2. Template of delivery on time	30
Table 3. Summary of performance measurement for the production	34
Table 4. Template of Major milestone precision	36
Table 5. Template of Release precision.	36
Table 6. Summary of performance measurements used in R&D.....	37
Table 7. Summary of performance measurements for Service & Support.	39
Table 8. Summary of performance measurement for the Finance	46
Table 9. Age interval.....	48
Table 10. Skill matrix.....	49
Table 11. Summary of performance measurement for Human Resources.....	50

1. Introduction

In this chapter the thesis background is presented. First, a theoretical background about the topic is introduced. Followed by a case company description and the thesis problem formulation. Finally, the structure of the report is presented.

1.1 Theoretical background

The primary task for companies today is to develop, manufacture and sell their products and services to customers in selected markets (Samuelsson, 2004). However, the markets are increasingly changing since the technology is constantly evolving and new innovations are introduced on the market. This result in that companies are required to constantly work to meet these new technologies by developing new tools and strategies to understand this new business world (Dumitrescu & Fuciu, 2009). For companies to be able to succeed in the changing market, good management is required that can control the company towards the right direction (Vuko & Ojvan, 2013). According to Samuelsson (2004) the aim of management control is to steer the business towards the company vision and the defined goals. To achieve the goals there are various control concepts for different targets for example, financial management, operations management and corporate governance. Financial management is required to achieve the strategic objectives in terms of vision, mission and strategies (Dumitrescu & Fuciu, 2009).

According to Vuko & Ojvan (2013) financial management is about planning, implementing, monitoring, evaluating and controlling the business activities toward the common goals. How companies work with financial management is individual and are partly based on the company's own tradition and leadership. It is also influenced of conditions of other companies and the communities in which it operates (Samuelsson, 2004). Financial management is based on three different control models; a formal control system, an operational control-and reward system, and a less formalized control system. How the work is conducted between the three control systems varies between companies and between different periods and epochs within the same company. It is according to Samuelsson (2004) important that companies are constantly observant about when the different control systems should be used and also that companies should find a good balance between the various systems.

In order to succeed with company management, there are various models and techniques that companies can use. Over the years, several models have been developed. One common model is the Balance scorecard (BSC), presented by Kaplan and Norton in an article from 1992 in Harvard business review. The article addresses the importance of measuring the right things in order to make the right decision "What you measure is what you get" (Kaplan & Norton 1992). The amount of information is usually not the problem, it is to get the accurate information that can support the decision making that is important. They also address that in order to manage the company in right direction a balanced management is needed, meaning that more than the financial perspective has to be considered. This have become even more important in the last years when the competition has raised due to the globalization.

The BSC is a tool for the top management and the owners to get fast information about the company to enable good decision making (Dumitrescu & Fuciu, 2009). The model consists of

four perspectives: financial, customer, internal processes and learning & growth (Amaratunga, Baldry & Sarshar, 2001; Kaplan & Norton, 1992). It is important that companies work with all four perspectives since it gives a higher reliability of how the company performs, than companies that only focusing on some parts (Daly, 1996). Another reason for using all four perspectives is to help managers to avoid improvement of one part, with expense of another (Mendoza & Zrihen, 2001). Every perspective consists of different performance measurements (Amaratunga, Baldry & Sarshar, 2001) that are used to give indications about how the company performs today and how it will perform in the future (Grönlund, Tagesson & Öhman, 2010). It gives the management both operational and financial information in a relatively easy way (Mendoza & Zrihen, 2001). Furthermore, the performance measurements are used as guidelines when comparing the company with its competitors, to illustrate the company development and work as an alarm. Since the measurements indicate the relative economic situation they can also be used when comparing different sized companies (Grönlund, Tagesson & Öhman, 2010).

To get an overall view of the company it is useful to use performance measurements that describe different parts of the organization (Amaratunga, Baldry & Sarshar, 2001). The financial measurements give a detailed view about the company assets and liabilities and are proven to be useful tools in order to describe the economic situation and guide the managers in decision making (Grönlund, Tagesson & Öhman, 2010). Furthermore, what performance measurements that a company use depends on what areas they consider important and where they want to perform better. By analysing performance measurements frequently the managers of the company are able to act in a suitable way due to the economic situation (Amaratunga et al. 2001; Dumitrescu & Fuciu, 2009). Depending on in what industry the company acts in, the performance measurements will differ and the key figures will be individual for each businesses depending on what the company choose to include in their calculations (Grönlund, Tagesson & Öhman, 2010).

1.2 Case study

In this thesis Leptha, is the case company for the study. The company was originally a privately owned company but was acquired 2013 by Beta, that is part of the Alfa group. A short description of the companies are given below.

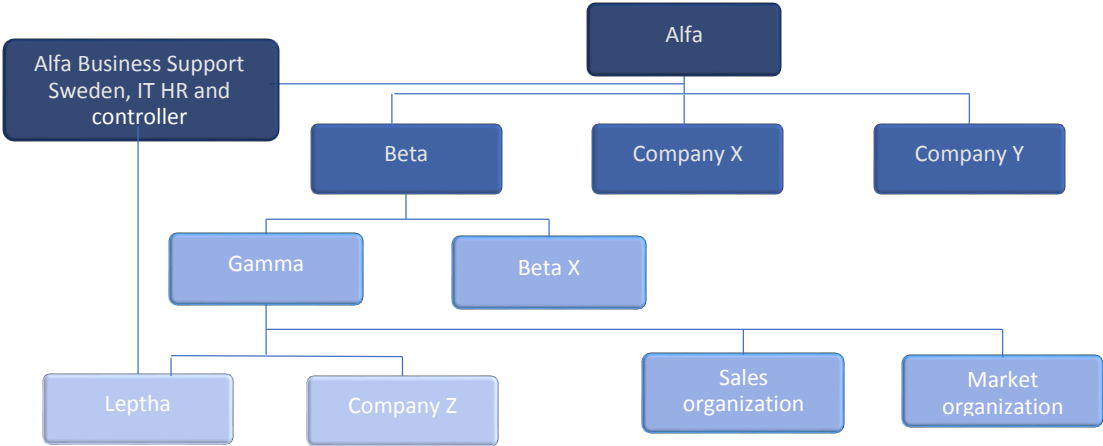


Figure 1. Group organization

Alfa is a global, technology company that has about 14 000 employees in 40 countries. The turnover 2013 was close to 2.4 billion EUR and the shares are listed on the stock market. The company has a wide array of products that are mainly used in development and protection of infrastructure. The company vision describes how the company wants to play a leading role by solving environmental challenges that the world is facing (Company webpage, 2014). The strategic targets are divided into financial and operational, the main financial strategy is to have Earnings Per Share (EPS) growth of at least 15 percent per year with restrictions with, solvency ratio of at least 25 percent, positive cash flow over a cycle, ROCE > 15 percent and Net Dept./EBITDA < 3.5. The main operational strategic target is to be number one or two in the industry, this is then divided into long-term cost leadership, being the innovator, industry's best management and speed management. During the years Alfa has made several acquisitions of companies acting in the same industry. In 2005 the acquisition of the company Beta was done.

Beta is a global company with approximately 3800 employees in 33 countries. It is a leading developer, manufacturer and distributor of advanced technology products. During the years Beta has done several acquisitions, one of most recent is the acquisition of Leptha in 2013 that is now part of the division Gamma.

Leptha is a company developing and manufacturing high technology products. The company has 18 employees and the head office is in Sweden. The company business is characterized by very technical advanced high price low volume products and they are offering three different products. The years 2009 to 2011 the company revenue was about 25 MSEK, but the last two years the company has grown dramatically.

1.2.1 Company organization and management

The organization at Leptha can be viewed in Figure 2 below, with the CEO on the top with six managers that are responsible for the different departments, marketing, R&D, software, purchasing & logistics, production and support & demonstration projects. This six managers together with the CEO is members of Leptha's steering group which has a meeting once a week. At these meetings a review is given for each department and decisions are taken on how to continue the work for the next coming week. The decisions are jointly taken with the CEO's opinion as the last say. The managers are responsible for the employee at their departments, however the departments do not have an own budget and when decisions are to be made these are taken within the steering group. The culture at the company is open with the aim to listen to every employee's opinions. To keep the culture open, a summary of the steering meetings are sent to all employees in purpose to get all employees know what is happening within the company.

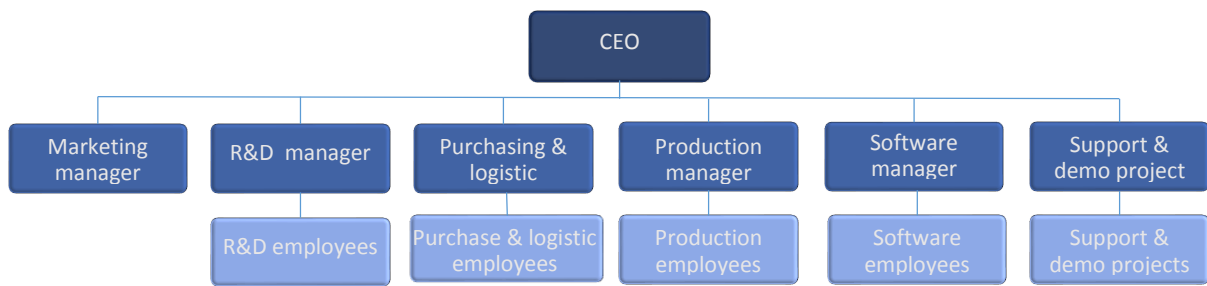


Figure 2. Leptha’s organization

Outside the organization of Leptha there is a sale department which is responsible for all sales at Gamma, see Figure 1 above. The sales personnel are responsible for selling Leptha’s products and they are in direct contact with the CEO at Leptha regularly. Moreover, the marketing department is also placed separate from Leptha, see Figure 1 above, however there is a marketing manager at Leptha that has responsible for minor marketing projects. Decisions about fairs and larger marketing decisions are taken within this separated department. Furthermore, the departments of IT, HR and the controller responsibility are placed at Alfa level.

Leptha is, as mention earlier, a subsidiary to Beta and a part of the Gamma division, see Figure 1 above. Six times a year the CEO at Leptha has a Business Review Meeting (BRM) together with the CEO and the controller at Gamma. The BRM aims to review how Leptha has performed in previous period and to take decision about how the work is to proceed. Majority of the decisions are taken at this level of the organization. Each month a financial review is given to the CEO and the controller at Gamma. This reporting is done through the ERP system.

1.2.2 ERP systems

In the current situation Leptha is using two different ERP systems, Monitor and VISMA. Monitor provides an overall solution for companies, however Leptha is only using the inventory and production modules. Monitor was implemented during the autumn 2013. The other system Visma, is an economical business system for small to medium sized companies. It consist of different modules and Leptha is using the two modules, Visma SPCS and Visma Time. Visma SPCS is the module where the company register all their financial actions and Visma Time is a module used to register the working time by the employees.

1.3 Problem Discussion

In connection with an acquisitions, problems often occurs. Usually there are small or medium sized companies that are acquired by larger companies. Large companies have well established procedure and strategies for how the work will be performed. However, small companies do not have the same requirements for especially the financial part and are therefore often lacking procedures that are needed after the acquisition.

Before the acquisition, Leptha was a small and privately owned company and therefore there were lower requirements for business management and there were no need for reporting

performance measurements. Due to this, the company has not been working with reporting performance measurements before the acquisition. The problem that the company is facing is that they do not have any procedures for reporting figures of performance measurements. In order to solve this problem the company need to know exactly what type of measurements to measure, define all measurements and also to develop methods on how to report the measurements. Another problem is to know what data sources to use, how to extract the data and how to process the data. The company has a newly implemented ERP system for the production and because of that there are limitations about how much data that is available and can be used when calculating the performance measurements. Furthermore, the ERP system for the production is not connected to the existing financial reporting system. This results in that different methods for extracting data is needed and that the data is manually combined in order to calculate the performance measurements.

Another problem that often occurs when changing management structures within companies is the implementation of the system. A lot of companies usually put a lot of effort and resources on developing new processes, however, they often fail with the implementation. If the implementation fails, the new process will not generate the expected benefits to the company and the resources could therefore have been utilized in a better way. It is therefore important to ensure that the implementation will succeed.

1.4 Purpose

The purpose with this thesis is to define performance measurements relevant to use for Leptha and companies within the same industry. Furthermore, how the performance measurements are extracted and reported in order to support business decisions will be described. Also a recommendation is given about how a successful implementation is conducted.

1.5 Research questions

In order to fulfill the purpose, the problem is divided into four research questions that are separated but dependent on each other. This means that the questions need to be solved in a specific order, starting with the first question and then followed by the others.

RQ1) What performance measurements are appropriate to use for a small production company that is a part of a listed Group?

RQ2) Where can the data needed for enabling calculation of the performance measurement, be found and what formulas and templates are appropriate to use in order to calculate the performance measurements?

RQ3) When and in what way is the performance measurements reported?

RQ4) How can performance measurements be implemented in a successful way?

The first research question aims to identify what performance measurements that are relevant to use for a small production company that is part of a listed Group. It is a rather common problem to identify relevant performance measurements for smaller companies that have been acquired. The problems occur because smaller companies have lower requirements on accounting than listed companies and have no obligation to display any key figures. In an acquisition the parent company require performance measurements in order to identify in what direction the business is moving. It is relevant to know the business situation in an early stage since then appropriate decisions can be taken to manage the company towards the right direction.

The second research question aims to examine where the data needed for calculations of the performance measurements can be found. Furthermore, the question also aims to identify what formulas and templates that are appropriate to use in order to calculate the performance measurements. It is essential to use accurate data in order to make correct calculations. If incorrect data, formulas or templates are used the calculations can be misleading and the company can make decisions based on inaccurate results.

The third research question aims to examine when and in what way the performance measurements will be reported. It is essential to report the data when needed in order to make accurate decisions in a certain situation.

The fourth research questions aims to analyze how performance measurement can be successfully implemented in companies. The implementation phase is important to include since it will have an impact on the final result.

1.6 Thesis structure

The report is divided into the sections that are illustrated in Figure 3 below. The introduction presents the background, problem discussion, the purpose and the research questions. This is followed by the method, theoretical framework and the result of the study. Based on the theoretical framework and the result, a discussion is conducted and final recommendation are presented.



Figure 3. Thesis Structure

2. Method

In the following section the method used in order to fulfill the purpose and answer the research questions is presented. The section begins with a literature review followed by what research strategy that have been used. Thereafter the research deign, addressing case study research and action research, is presented followed by the research process. The section ends with a chapter discussing validity and reliability.

2.1 Literature review

The topic of the report has been discussed in various articles and books of several authors. When searching for different keywords connected to the topic several matches were found. Using the search word Balance scorecard in Google scholar there were 52 900 hits, with no limitation on publishing date. With the limitation on publications during 2014 there were 1560 hits. Searching at Chalmers library and the data base Business source premier there were 50 hits when using the search word Balance scorecard between 1996 and 2013. The second keyword Performance measurement is giving 3 880 000 hits when searching in Google scholar with no limitation on publishing date and when searching with the limitation published during 2014 there were 63 500 hits. Using Chalmers library and the data base Business source premier there were 16 008 hits on Performance measurement between 1941 and 2013. Searching with the word implementation of Balance scorecard at Google scholar gave 57 200 hits with no limitation on publishing date and with the limitation publications during 2014 there were 1840 hits. At Chalmers library and the data base Business source premier seven hits were given for the same search word between 1998 and 2012. Using Google scholar when searching for Financial management 2 890 000 hits were given with no limitation on publication date and with the limitation on publications during 2014, 105 000 hits were given. Searching in the data base Business source premier for with the same word 45 205 between 1980 and 2014 hits were given. When searching for the keywords lot of data was found, which indicates that a lot of research have been done about the subject before. The staple diagrams in Figure 4 below illustrates how the amount of the publications of the keywords have change during the years.

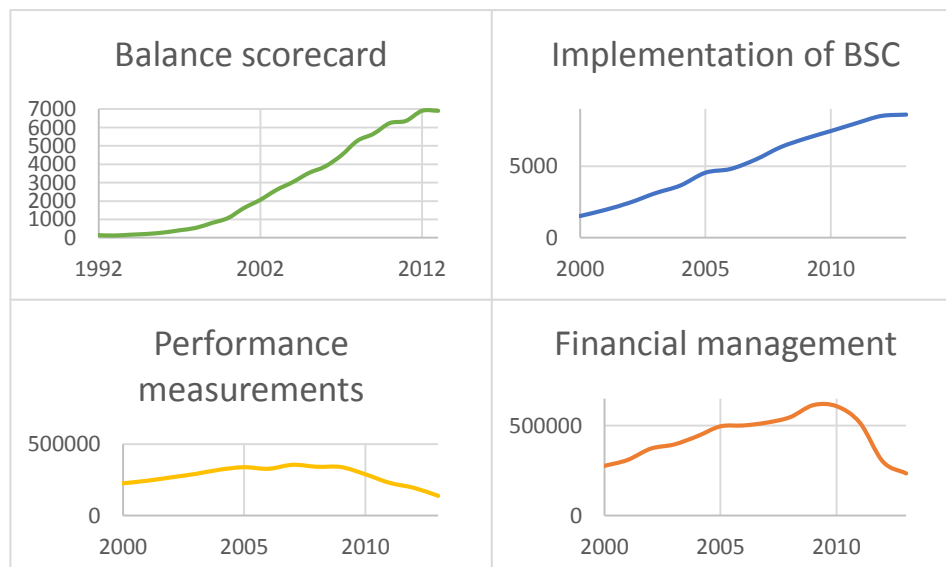


Figure 4. Changes in publications of the key words during the years

2.1 Research strategy

The research strategy can be divided into qualitative and quantitative methods. According to Bell and Bryman (2003) the division is a useful way of classifying different methods that are used in business research. Furthermore, it is also helpful for a range of issues concerned with the practice of business research.

The characteristics for a quantitative research method is that the data is collected from various survey units and are then converted into numbers and based on these, statistical analysis are then performed. The qualitative research method is based on the researchers interpretation and understanding about the situation. The information is more profound giving a deeper understanding and is more describing. This data is collected from the inside by the researcher that is acting as a participant or an actor. The strength of the qualitative research method is that it gives a picture about the overall situation. This overall picture allows a greater understanding. (Holme & Solvang, 1993)

However, it has been some criticisms toward the qualitative research method saying that it is too subjective. This means that the study relies too much on the researcher's interviews that can have been impacted on relationship with the investigated. Another criticism is that the findings are almost impossible to generalize due to the small amount of cases studied. Difficulties of replication is another critic, but this depends on the unstructured design of that there are hardly any standard procedures to follow. (Bell & Bryman, 2003)

To fulfil the purpose of the study a qualitative research method has been used. This method has been used, in order to define the relevant performance measurements a deeper knowledge about the company was required. This information has been collected through meetings with key employees at Leptha, Gamma and Alfa, where also the definitions of the performance measurements have been discussed. To minimize the risk of influences by the relationships there have been discussions with different persons within the Group. The qualitative method is also suitable for the study since it gives an overall picture of the company situation. A quantitative research method provide overall information with low level of details, which would not have given any substance to this study and therefore is not used.

2.2 Research design

In the following section the research design used for this study is presented. The design used is a combination of a case study research and an action research.

2.2.1 Case study research

The basic case study involves an intensive and detailed analysis of a single case, which for this thesis is a case study of the company Leptha. This design has shown to be suitable for business and management research and has led to some of the best-known studies (Bryman & Bell, 2003). Case studies are well-used in policy-making processes and are usually a part of political science analysis and have been used on a great variety of decisions. Schattschneider, Herrin and others have applied the case study in the 1930's and it has later been used by Raymond Bauer and his coworkers (Lowi, 2011). According to Yin (2003) the case study research can be used in many different situations and contributes to knowledge about individuals, groups and

organizations. It has also shown to be a useful tool in economics, where a structure of an industry or the economy of a certain region is investigated. The case study arise from the needs and desires to understand complex social phenomena. It allows researchers to retain the holistic and meaningful characteristics of a real life event for example organizational and managerial processes. The questions how and why are likely to favor the use of a case study. The case study research is a research strategy that comprises an all-encompassing method, covering logic of design, data collection and specific approached to analyze the data.

According to Bryman & Bell (2003) the case study design often favor the qualitative methods, especially unstructured interviews or participant observation since those are seen as particularly helpful in the generation of a detailed, intensive examination of a case. This align with the choice of the research method for this thesis. A case study can be about single location, a single organization, a person or a single event and are usually conducted at a workplace or at an organization. Since the case is the object of interest and aims to provide an in-depth clarification, the researcher is usually a part of the organization for months up to some years. In order to conduct this report the writers have been a part of Leptha for five months.

For this thesis a single case study has been used to address the research questions. According to Yin (2003) there are different kinds of single case studies that are appropriate in different situations. The critical case study is used to test a well-formulated theory, the extreme or unique case study is useful when every case is unique and shall be documented. The representative or typical case study is suitable when the object is to capture circumstances or condition in a normal day situation for example a company project. The revelatory case is used when researchers makes observations of a specific situation. The fourth addressed case study is the longitudinal case study which means that the same case is studied two or more times. For this thesis a representative or typical case study has been used.

2.2.2. Action research

According to Sagor (1993) an action research is conducted of people that want to improve their own situation and investigate if work can be done in a better way. Furthermore, the action research is about taking actions based on systematically collected data. The purpose of an action research is to learn through actions that leads to professional or personal development (Koshy, 2005). In this master thesis the action research has been conducted mostly at the company Leptha but also at Gamma. The managers at Gamma want to get a better understanding about how Leptha performs in different areas within the company. Due to that, relevant performance measurements have been define.

According to Koshy (2005) the action research is a five step process including problem formulation, data collection, data analysis, reporting of results and action planning. Since the main purpose of making an action research is to improve professional practice the process is not completed until actions have been taken. However, actions are not always easy to take but there are strategies that can be used in order to implement the change. One strategy is to present the collected data and the final results. Another strategy is to establish a pilot program and competing pilot programs that will trigger each other. The appropriate actions at Leptha have been to first present the study, how the study has been performed and what results that have been generated. The designed templates have been given to the person responsible to conduct

the performance measurement calculations at the different departments. Furthermore, information is given about what the useful information can be found and what formulas to use when calculating the performance measurements. For this to be a successful implementation further work is needed by the company. It is essential to describe the importance of the study in order to keep the employees continue with this work even after the researchers have left the company (Kotter, 1996).

2.3 Research Process

In order to get knowledge about the company, internal secondary data including information about Leptha, Beta, Gamma and Alfa have been collected through studies of the companies' webpages, annual reports and company presentations. Secondary data is data that has been collected and compiled with another purpose than for the actual study (Carlsson, Christensen, Engdahl & Haglund, 2001). To get knowledge about management controlling, BSC and performance measurements a pre-study was conducted on the topics. Furthermore, a study about the company Leptha was conducted in order to get an understanding about the problem the managers wanted the researchers to solve. By combining the theoretical knowledge and the company's current problem situation the purpose of the thesis was developed followed by formulations of the four research questions.

In order to answer the first research question, a literature study has been conducted combined with discussions with key employees at Leptha, Gamma and Alfa. The external secondary data that has been used, was collected from books, webpages and scientific articles. The data has been studied in order to obtain information about: how companies are managed, models that are used for company management, what performance measurements that are suitable to use and how a management tool is implemented in an organization. A relevant model to use in this study is the BSC that was introduced by the professors Robert S. Kaplan and David P Norton 1992. The model is suitable for this study since it is based on performance measurements that will support the managers' decision making. This model is also well-used by companies within the same industry, which motivates why this model has been used in this study. During the discussions with key employees primary data was collected. Primary data is data that has been collected directly from first-hand experience and has been collected by the reportwriters in order to support the actual study (Carlsson et al., 2001 ; Businessdictionary, 2014). In order to define the performance measurements that are relevant for Leptha and companies in the same industry, primary data has been collected through several meetings with the CEO at Leptha and with the controllers at Gamma. The meetings have been designed as deeper qualitative discussions about what performance measurements that Leptha wants to measure and also what measurements that Gamma consider important for Leptha to measure. The contact with the CEO has been mostly through weekly meetings and also through email. The contact with Gamma was initiated with a meeting in Switzerland and continued with telephone meetings, emails and a meeting at Leptha's office in Sweden. Furthermore, information to define the performance measurements has also been given by the controller at Alfa by telephone meetings, emails and a personal meeting at Leptha's office.

In order to answer research question number two, discussions were held with key employees and studies were performed at Leptha, also a theoretical study was conducted. The discussions and the studies at the company aimed to get knowledge about the ERP systems that the company has, in order to identify how to extract the data required for calculations of the performance measurements. Furthermore, an identification was made about what measurements that directly can be calculated in the systems. To find suitable formulas and templates a theoretical study was performed in combination with discussions with key employees. To design useful templates input was given from employees at Gamma.

Research question number three has been answered by discussions with the CEO at Leptha to establish a reporting procedure of the performance measurements within Leptha and to Gamma. During the meetings the CEO has informed when the performance measurements need to be reported. Thereafter an estimation has been made about when the different performance measurements are appropriate to be reported.

To answer research question number four a theoretical study has been performed in order to give a recommendation to Lephta about how they shall conduct the implementation in a successful way. Kotter’s eight steps to a successful implementation, together with other authors supporting this way of implementation, have been used. Furthermore, implementation about performance measurements and BSC has also been studied.

In the Figure 5 below the time distribution of the working process is presented.

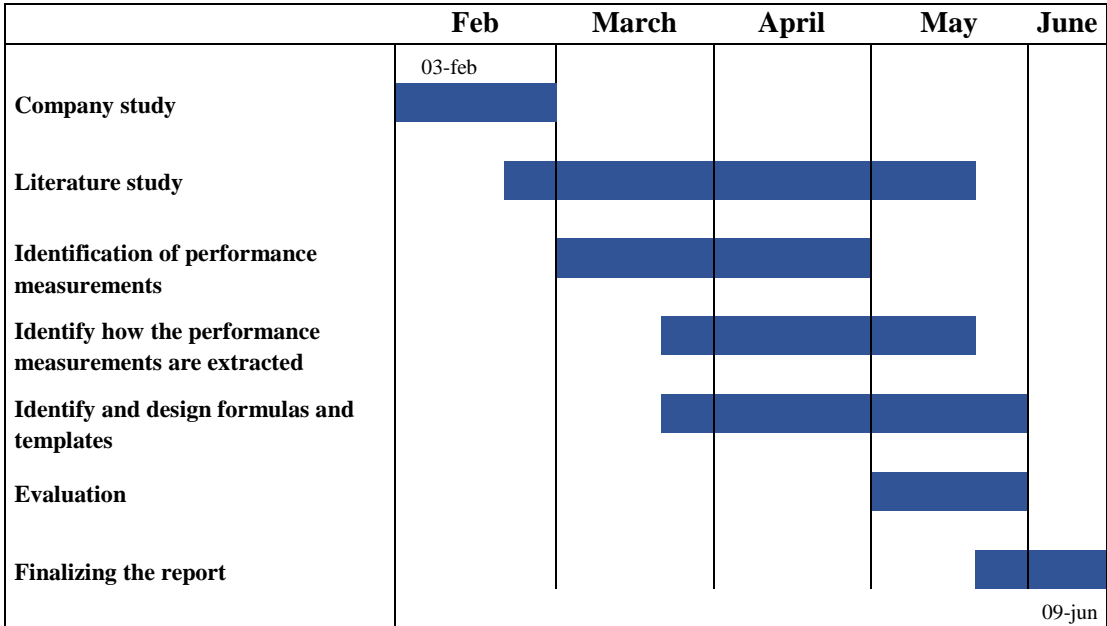


Figure 5. Time table of the research process

2.4 Reliability and Validity

When writing reports it is important to evaluate the research by discussing the two perspective validity and reliability. These perspectives are important to observe to enable that the report becomes believable and also to achieve high quality of the report. Validity is, according to

Bryman & Bell (2011) defined as the integrity of the conclusions that is generated by the research. To guarantee a high validity of the study there has been a triangulation between theoretical information, meetings with relevant persons and own reflections. The most critical risk of this report, based on validity, was to get right definitions of the performance measurements. To ensure to get right definitions and to minimize the risk of getting stuck in only one perspective there have been discussions with the CEO at Leptha, the controllers at Gamma and the controller at Alfa. These definitions have then been compared with theory and own reflections to ensure that the definitions are correct. For this report the external validity or generalizability can be considered a bit low, since it is a single case study and how it can be representative in order to yield findings that can be applied more generally to other cases can be questioned. However, it is important to remember that a case study research does not always aim to find typical cases that can be used to represent a certain class of objects (Bryman & Bell, 2003). Furthermore, a case study should also be generalizable to a theoretical propositions and not to populations and universes, which answers the questioning about the generalization of the case study (Yin, 2003). Furthermore, the defined performance measurements and how they can be implemented in a successful way can partly be used by companies within the same industry.

The second perspective, reliability is according to Bryman and Bell (2011) defined as if the result of the report is repeatable or not. Since there have not been any questionnaires or interviews during the work, the risk for reliability is inadequate low. When defining the performance measurements, these have been discussed with the CEO at Leptha and controllers at Gamma and Alfa. The information during the meetings has been discussed with all parties which results in that the CEO at Leptha knows what have been discussed with the controllers at Gamma and Alfa and conversely. This has resulted in that the repeatable is minimized.

3. Theoretical framework

The theoretical framework covers theory about management controlling, balanced scorecard, performance measurement, reporting and implementation.

3.1 Management Controlling

The concept of controlling has several different meanings, but according to Samuelsson (2004) controlling is different types of actions to achieve specific goals for a business. Controlling is therefore information that after some processing turns into other information to enable an easier way for companies to control the business in right direction (Samuelsson, 2004; Vuko & Ojvan, 2013). This information can according to Samuelsson (2004) provide information both internally and externally. The information covers both plans for future activities and outcome values of activities performed in the past.

Financial control is a part of the managing controlling and guides the company to steer towards their financial goals (Vuko & Ojvan, 2013). The traditional approach of financial management is to only concentrate on the financial measurements. However, this has changed and today the financial control has a further task by keeping track of things happening around the company and not just the financial part (Samuelsson, 2004). The company task is to control, develop and produce products or services in selected markets. Leaders' tasks are to ensure that these objectives are met in the most efficient possible manner. To ensure its effectiveness, there are three different control systems that companies can use: a formal control systems, an operational control system and reward system and finally a less formalized control system.

The formal control system is based on the business concept. It establish and sets up strategies and plans at different levels within the company. This control system can be divided in three different categories, the strategic issues, the one-year control and the operative control. The strategic issues describes a company in a holistic perspective and focus on the business concept and what type of strategies the company are using. The one-year concept describes what to do and how to do it, on a yearly basis and the operative control define what to sell and produce within a few days. The operational control system and reward system is based on how the company will be organized and what type of structure the company should use. It also include allocation of decision rights and ways to coordinate activities. The reward system includes designing of carrier paths for the employees to get a feeling of development but also financial benefits in form of pay raises and commission. The less formalized control system is established to provide organizations with right employees. It is important that companies have employees with right competences and education to cope with the work requirements. Furthermore, companies should also implement a business culture among the employees to guide them in different situation. (Samuelsson, 2004)

The control systems are dependent on each other, especially the formal control system and the operational control system, since there are fluctuations within both the internal and the external environments (Samuelsson, 2004). The external fluctuations require organizations to change and the controlling system has to guide the changes. The control systems need to be combined in order to enable the company to easily get an overview of the entire company and to be able

to make good performance. Company success is highly dependent on the performance, which is a result of how well the company has followed its strategies (Sharma, 2012). However, the company needs to understand what actions makes them successful or not, in order to constantly improve. This is achieved by controlling both the financial and other perspectives of the business. One tool to use in order to succeed with the controlling of the company is to use the BSC (Dumitrescu & Fuciu, 2009; Sharma, 2012).

3.2 The Balance scorecard

The BSC is today one of the most common frameworks for performance measurements (Chytasa, Glykasb & Valiris, 2011). It was developed to transform the originally financial measurement system to a more balanced approach where performance measurements also were representing other perspectives of the company. The scorecard is a set of measurements that provide the top management team a fast and comprehensive overview of the company (Kaplan & Norton, 1996). This model offers managers a tool to convert the company's vision, business concept and strategy into an overall set of measurements (Dumitrescu & Fuciu, 2009; Kaplan & Norton, 1996).

The BSC converts a company's vision and strategies into objectives and targets distributed across four perspectives (Kaplan & Norton, 1996). These perspectives are, the financial perspective, the customer perspective, the internal processes perspective and the learning and growth perspective (Kaplan & Norton, 1996; Dumitrescu & Fuciu, 2009; Sharma, 2012). The financial perspective gives information about how the company should succeed financially and how they will appear to the shareholders (Kaplan & Norton, 1996; Sharma, 2012). The customer perspective gives information on how the company should appear to the customers in order to achieve the vision. The third perspective gives information about what business processes the company should focus on in order to satisfy customers and shareholders. In the fourth perspective data supporting learning and growth are collected to give the company information about how they should improve in a sustainable way to reach the company vision. The relation between the company vision, strategy and the four perspectives is shown in Figure 6 below.

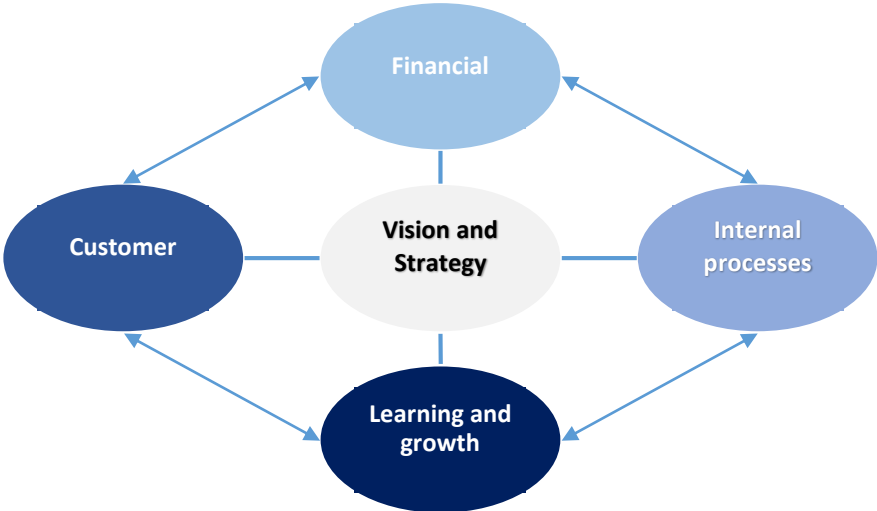


Figure 6. The Balanced Scorecard

Amaratunga, Baldry & Sarshar (2001) and Kaplan & Norton (1992) claim that by combining the four perspectives, the BSC helps managers to understand interrelations between the different perspectives. This can then support them to transcend traditional notions about functional barriers and lead to improved decision making and problem solving. Within the four perspectives the company formulates both nonfinancial measurements and traditional financial measurements to give the managers a more balanced view of the company performance (Kaplan & Norton, 1992; Sharma, 2012). According to Kaplan & Norton (1992) 15 to 20 performance measurements divided between the four perspectives are recommended.

3.3 Performance measurement

A performance measurement is a set of data that is processed to provide information about how the company performs and what targets the company should strive for. The performance measurements are used to compare a company's development between different time periods and it is used both internally to make decisions but also for stakeholders to get information about the company. To ensure whether these achievements are satisfactory, the companies must evaluate their performance. However, it is difficult to evaluate the performance if there is nothing to compare with and therefore the performance measurements are a suitable tool for companies to use. (Neely, 1999; Samuelsson, 2004)

It is important to remember that performance measurements can have both good and bad impacts on the company. Measurements that have positive effect on the company's short and long-term development can provide powerful and important results, while measurements with lower efficacy may give a misleading picture of how the company is performing and can thus lead to wrongly made decisions (Samuelsson, 2004). A performance measurement should only be used when it is relevant for the company. It should also be easy to compare the measurements between different time periods and companies within the same industry (ibid). Between different industries the performance measurements usually have differences, therefore it is important to compare the measurements within the same industry (Aktieskolan, 2009).

Companies in modern society is often innovative and what companies want to measure and display changes frequently over time and it is therefore important that companies are constantly working to renew but also develop new indicators (Samuelsson, 2004). According to Neely (1999), companies interest for performance measurements have raised during the last years. One reason can be the changing nature of work, where it has been a movement from high labor intensive production towards more mechanical production. Another reason is the increased competition that is a result of the globalization. Furthermore, other factors can be the specific improvement initiatives such as totally quality management and lean production. The power of information technology has probably also had an impact since it has made the capture and analysis easier as well as it has given the opportunity to review data and make subsequent actions.

The performance measurements are essential for effective and efficient management of an organizations (Pun & White, 2005; Waggoner, Neely & Kennerley, 1999). What a company choose to measure will reflect its corporate culture, strategy formulation and deployment. The

measurements an organization employs is both qualitative, for example financial measurements and employee turnover, and quantitative for example quality and customer satisfaction. The growing interest for performance measurements have led to an extension to the non-cost performance. The function of a measurement should be a method of generating information that will be useful in a wide range of problems and situations. (Pun & White, 2005)

The performance measurements are important, however the traditional financial measurements such as solidity, liquidity and profit have been criticized to encourage short-termism, lack of strategic focus and that it often fails to provide data on quality, flexibility and responsiveness. It has also encourage managers to minimize the variance from standards rather than seek continuous improvement, fail to provide information about how competitors are performing and what customers wants and has instead encourage local optimization (Parmenter, 2010). Furthermore, another criticism is that the measurements are historical focused, providing information about what occurred in the last week or month. Managers want to have measurements that give indications about future occurrences (Neely, 1999). This is why the company should have a mix of measurements and use a BSC to steer the company in the right direction taking different perspectives into account.

According to Parmenter (2010) there are four kinds of performance measurements. Key Performance Indicators (KPIs) that describe what to do in order to increase the performance, Key Result Indicators (KRIs) that describe how the company has performed in a certain perspective. The third category is Performance Indicators (PIs) that indicate what to do. The last category is Result Indicators (RIs) that provide information about what has been done. In order to decide about how many measurements a company should have, a useful guideline is the 10/80/10 rule. Indicating that 10 KRIs, 80 RIs and PIs and 10 KPIs are appropriate. How the four different categories of measurements are connected is shown in Figure 7 below. Parmenter (2010) also discuss that the company should have a governance report consisting of ten measurements providing high-level KRIs that are reported to the board. Furthermore, the company should have a BSC consisting of about 20 measurements with a mix of KPIs, RIs and PIs.

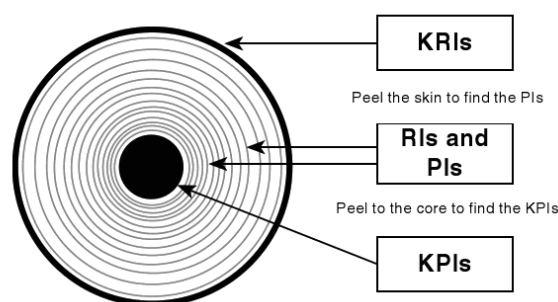


Figure 7. Four types of performance measurements. Parmenter (2010)

3.3.1 Key performance indicators

The KPIs are measurements that focus on the most critical aspects for the organizational performance in the current situation and in the future. They cover a shorter period of time and

are reviewed on a daily or weekly basis. Parmenter (2010) has defined seven characteristics of the KPIs: they are nonfinancial measurements, they are acted on by the CEO and senior management team, they are measured frequently, they indicate what actions that is required by employees, they encourage appropriate actions and they tie responsibility down to team level.

3.3.2 Key result indicators

The KRIs measure one or a few of the key outcomes from the company's activities. This category of measurements include customer satisfaction, employee satisfaction, net profit before tax, profitability of customers and return on capital employed. They are useful for managers since they give clear information about what direction the company is heading. However, they do not give the information about what actions to take in order to change something. The KRIs usually cover a long period of time and are reviewed monthly and quarterly. (Parmenter, 2010)

3.3.3 Performance indicators

The PIs are important measurements for the company, however they are not keys to the business. They are nonfinancial measurements and complement the KPIs. In the BSC they are shown together with the KPIs for each organization, division, department and team. Furthermore, the measurements in this category aims to help the team to align themselves with the organization's strategy. Examples of PIs are: late delivery to key customers, customer complaints from key customers and sales calls organized for the next week. (Parmenter, 2010)

3.3.4 Result indicators

The RIs summarize all activity at the company and include all the financial performance measurements. To understand what to increase or decrease the result of the activity has to be analyzed. Examples of RI are: net profit on key product lines and sales made yesterday. (Parmenter, 2010)

3.4 Reporting

The reason for reporting is to convey information that is useful for those who have an active interest in the company concerned, mainly the stakeholders (Letza & Zairi, 1994). According to Busco, Frigo, Riccaboni & Quattrone (2013) the aim of the information to the stakeholders is to give a deeper understanding of how the company performs. In order to make right decisions it is essential that the stakeholders understand how the company creates and sustains value over time since they can exert a great deal how the company is managed (Letza & Zairi, 1994). According to Stebbens & Bray (2013) the scope of corporate reporting should be extended in order to better support investors' own valuations of performance prospects and business value. Furthermore, to also enable investors to make judgment about the senility of their valuation to key risks and opportunities. By providing more information within the corporate report, including different perspectives of the business, managers are able to take decisions that have a broader perspective. The demand for corporate reporting has grown as the stakeholders want to have a greater understanding about the company they are engaged in. The importance of stakeholders engagement in the corporate reporting has increased since it has enabled the corporation to question and challenge parts of the business that before was taken for granted.

The demand for greater transparency has in parallel contributed to internal reflection of strategic drivers. (Busco et al., 2013)

When creating a corporate report it is essential to focus on the end user in order to provide appropriate information needed to take right decisions and actions. The end user for a corporate report is usually the stakeholders and the information in the report need to communicate information to at least four groups, the equity group, the loan creditor group, the employee group and the business contract group. Furthermore, information that preferably should be included in the report is competitiveness, efficiency, productivity, capital investment, R&D, innovation, quality achievements, and effectiveness. This information should be brought to attention for various stakeholders not only internal. For a report to be useful it is essential that it is relevant, complete, reliable, understandable, objective, comparable and timely. Moreover, in order to protect the organization for making irrational and damaging decisions it is recommended to have end-user participation. (Letza & Zairi, 1994)

According to Letza & Zairi (1994) it is, as stated before, important that the information is reported timely. Paramenter (2010) also states that due to what the performance measurements inform they will be reported to the management team in a timely fashion. Some measurements shall be reported daily or weekly others monthly, quarterly or yearly. By reporting daily or weekly information about the key performance areas in the month-end becomes less important. The management team will then know intuitively how the results will be in the end of the month. How the reporting is done within the organization differs between companies. However, in order to make the reporting understandable and easy to overview, a visualization by compiling data in to graphs with the top five measurements is suggested by Paramenter (2010). Reporting should not only be done to managers, it is important that the information is shared between all stakeholders, however in the exception of certain confidential data.

3.4.1 Enterprise Resource Planning & Business Intelligence

Integrated ERP applications have brought a new way of delivering information over the past few years (Bindu-Tripuramallu, Chou & Chou, 2005). The main objective of utilizing an ERP system is to merge data from different sources in the company in order to provide information to the different stakeholders. Nowadays the importance of distributing data across the company boundaries has increased. The ERP system is designed to record business transactions data, reconcile data, make changes to existing data and run predefined business reports. However, it is not a system for data analysis and decision support processes and therefore Business Intelligence (BI) tools have been introduced (Bindu-Tripuramallu, Chou & Chou, 2005). The aim with a BI systems is that it can pull data from the ERP system and then perform different analysis and deliver superior reporting which can help employees to make accurate and timely decisions. By using existing data from the ERP system the BI tools are capable of analyzing short- and long-term scenarios. By integrating a BI system and an ERP system will usually add value to the company in form of providing analyses about information on best and worst case scenarios in various situations (Bindu-Tripuramallu, Chou & Chou, 2005; Koronio & Yeoh, 2010). It also optimizes the ERP investment since it contributes to improve competitive advantages. The better and quicker decisions that can be made is a result of a visual interface

that makes easier and faster access to frequently updated information for the managers. (Bindu-Tripuramallu, Chou & Chou, 2005)

3.4.2 Big data

The importance of digital data has increased during the years. The large amount of available data has result in that managers get information about different perspectives of their business, which improve their decisions. The main purpose with big data is to collect intelligence from data and translate the information into business advantages. Big data is said to be a management revolution, however as every major change in a business, the challenge of becoming a big data-enabled organization requires both hand-on and hands-off-leadership. The main differences from normal analytics is the volume, velocity and variety. The amount of data that can be handled in one data set has raised during the years. The speed of data creation is even more important than the volume and has enabled companies to receive real-time information which has made it possible for them to be more agile than their competitors. The third difference is the variety, which means that the data has different sources for example messages from social media and readings from sensors. The earlier used analytics brought rigorous techniques to decision making, however big data is at once easier and more powerful. (Brynjolfsson & McAfee, 2012)

By using big data, managers are able to make decisions based on evidences and information and not on institution. According to Brynjolfsson & McAfee (2012) people within businesses today rely too much on intuition than on real data. Decisions made on institution are often a result of when data is limited, expensive or not available in digital form. There are several challenges when using big data, managers have to embrace evidence-based decision making and companies need to hire scientists that can interpret and find patterns in the data in order to provide useful information to support the decision making.

In order to get the full benefits of the big data, companies have to overcome management challenges. First of all it is not the amount of data that will affect the success it is about the leadership. The success will depend on if the leader set clear goals, ask the right questions and define how success looks like. The second challenge is to get talent labor, people that are able to handle the huge amount of data and are able to cross the gap between correlation and cause. Decision making will be affected since an effective organization puts information and decision rights at the same place. However, when using big data the information is created and then transferred. This requires cross-functional cooperation where people that have understood the problem are brought together with right data and people that know problem solving techniques. Furthermore, the company culture has to change, by analyze the data they have instead of making decisions based on intuition. (Brynjolfsson & McAfee, 2012)

3.5 Implementation

In this section important steps towards a successful implementation are presented. Furthermore, successful implementation of performance measurements and BSC will be described.

To make a successful implementation of a project there are different steps that need to be accomplished in a certain order. Several authors have analyzed, discussed and recommend which steps that are essential to accomplish a successful implementation. Kotter (1996) addresses eight steps towards a successful implementation in his book “*Leading change*”. In this section these eight steps will be supported by other authors recommending similar steps

1. Establishing a Sense of Urgency

This is the initial step in the process of implementation and according to Kotter (1996), establishing of a sense of urgency is important in order to gain cooperation. If the urgency is low it is difficult to create a group with enough credibility and power to convince and guide key individuals to communicate and create a changing vision. Good leadership associated with bold and risky actions is essential when establish a sense of urgency.

2. Creating the Guiding Coalition

Kotter (1996) claims that to accomplish a major change within an organization a powerful force is required to sustain the process. Therefore it is important to create a guiding coalition composed with right level of trust and shared objectives. There are four characteristics of an effective guiding coalition. The first one is position power, addressing the question if enough key players are committed. The second one is expertise, questioning if there are various point of views in order to make intelligent decisions. The third one is creditability, addressing if the group has enough people with good reputation in the organization. The last one is leadership, questioning if there are enough leaders included in the group to drive the changing process. According to Sobek (2011) and Umble, Haft & Umble (2003) a successful implementation needs strong leadership, commitment and top management participation. Sobek (2011) also claims that the leadership behavior will have an impact. The leader should support and structure the team to create a good teamwork. Moreover, Umble, Haft & Umble (2003) states that an executive management planning committee that champions the project is essential to succeed the change.

3. Developing a Vision and Strategy

Kotter (1996) states that in order to make people strive towards the change a vision referring as a picture about the future is important. There are three important purposes with a vision for change. The first is to clarify the general direction for change. Second, it motivates the people within the organization to take actions in the right direction. The third purpose is to coordinate different people’s actions in a fast and efficient way. According to Umble, Haft & Umble (2003) and Beckhard & Pritchard (1992) the organization should create a vision for the project but also define goals, expectations and deliverables. Furthermore, Sobek (2011) states that leadership has an important role when creating a clear vision to guide the change.

4. Communicating the Change Vision

According to Kotter (1996) the real power of a vision is unleashed when involved persons within an organization or activity have a common understanding of its goals and direction. However, to gain understanding and commitment to a new direction by the employees is never easy and especially not in a large organization. According to Sobek (2011) communication

between the involved persons making the change and people or departments affected by the change is essential for a successful implementation. Moreover, due to that the change can be difficult and disruptive it is important to prepare the employees and make them understand and accept the reasons for implementing the change. Furthermore, it is also important that they understand how they will benefit from the change.

5. Empowering Employees for Broad-Based Action

Kotter (1996) states that empower employees is essential since an environmental change requires an organizational change. In order to make internal transformation people have to assist and hence empowerment is needed. The purpose of empower people is to make them take actions. Empowerment can be done by communicate a sensible vision to the employees, make structures compatible with the vision, providing training needed, align information and personnel systems to the vision and confront supervisor who undercut needed changes. Sobek (2011) emphasize that having widespread involvement with a frontline of employees engaged in all stages creates ownership and a sense of making difference. The author also states that empowering employees is important since they are in the best position to understand problems and to generate improvements. In order to empower people, training might be necessary, which can be accomplished through internal or external training programs. The training can be formed by allowing employees lead the necessary changes for improvement or by using external help. According to Umble, Haft & Umble (2003) training is probably the most recognize critical success factor for an implementation since the employees need to have knowledge to solve problems and an understanding about the new task they are to perform.

6. Generating Short-Term Wins

To make changes take time and hence short-term wins are important to make the employees to continue the changing work. To create immediate wins also counteract resistance. Usually the short-term wins need to be communicated by the leader and should not be waited to appear by themselves (Kotter, 1996). According to Beckhard & Pritchard (1992) the success of any fundamental change is affected by the establishment of consistency between the stated priorities, goals and the reward system that defines what is valued in an organization. Accomplishments that should be rewarded are actions that are contributing to that the change is heading in the right direction.

7. Consolidating Gains and Producing More Change

To celebrate the short-term wins should not be perceived as the changing process is completed, contrary the wins should be used in order to make the next step in the overall vision (Kotter, 1996). To encourage an achievement of a certain goal should be rewarded, however the rewarding should serve as an inspiration to further work in order to accomplish a successful change (Beckhard & Pritchard, 1992).

8. Anchoring New Approaches in the Culture

The final step is to incorporate the change in the organizational culture and make it become an accepted norm. To succeed with this, patience and power are required to change the organizational culture to fit the realized vision (Kotter, 1996). According to Sobek (2011)

changing the underlying organizational culture is a major challenge and an inhibitor to a successful implementation and its sustainment. An implementation may trigger profound changes in the corporate culture and if the people within the organization are not properly prepared, resistant, denial and chaos will be predictable consequences. However, if suitable management techniques are used the organization should be prepared (Umble, Haft & Umble, 2003).

3.5.1 How to develop a Balance scorecard

To enable companies to develop a BSC in a good way there are four foundation stones that the company shall use. These stones are described below and are: plan, measure, communicate and action.

Plan: The planning step is when the business and company plans becomes an economic plan with a budget. However, a problem with the budgeting is that it is usually based on the last year's performance digits. Due to that the planning should instead be based on the company goals, strategies and performance measurements. The key measurements should illustrate the things that the company will prioritize. (Petri & Olve 2014)

Measure: In order to measure and analyze, relevant data needs to be collected. This can be accomplished in different ways depending on what resources the company has. Since most companies have ERP systems they can be used for extracting data. However, some data can not be extracted directly from the ERP system and therefore manual work is needed. Collecting relevant data can be accomplished in three different ways: use performance measurements that already exists in other reports, use digital data from the ERP systems that needs some manual work and use manual data that is not present in any digital form. (Petri & Olve 2014)

Communicate: To communicate the result is important, however usually more time is allocated to conduct the report than communicate it to the persons it affects (Kotter, 1996). A reasons can be that some information about the performance measurements is missing and the calculations have not been completed. Furthermore, the manager's self-interest to the BSC might not be that positive, and the financial measurements gets more focus. Sometimes the managers do not recognize that employees have interest in the results. Effective communication can be accomplished by workplace meetings. (Petri & Olve 2014)

Action: The main purpose of using a BSC with different performance measurement is to provide the managers relevant data to support the decision making (Kaplan & Norton, 1996). The performance measurements indicate if the company works in line with its strategies. If there are differences between the performance measurements and the strategies it indicates that the organization does not work as the strategy aimed to or that the strategy did not give the planned output. If so, managers and employees need to decide about actions to take in order to change this. If the employees do not know the priority rules of the actions they will probably not make decisions that is in line with the strategies. (Petri & Olve 2014)

3.5.2 Successful implementation of a Balance scorecard

Nine step to implement a BSC in an effective and efficient way according to Jääskeläinen & Sillanpää (2012), Dumitrescu & Fuciu (2009) and the Balance scorecard Institute (2014) is presented below.

- 1) The first step is to create an assessment about the challenges and values of the company's vision and mission. It also includes a managing plan for the challenging process to enable a smooth implementation.
- 2) The second step will include development of the company strategy in order to focus on the customer needs and the company's value intention. The strategy includes strategic perspective, strategic themes and strategic result.
- 3) The third perspective divides the strategy into different objectives for different parts of the company. The objectives are divided in a strategically theme level, categorized by strategic perspective and categorized in strategically maps and then later merged together to deliver one set of strategic objectives to the entire company.
- 4) The fourth perspective takes the enterprise-wide strategy objectives and formalize them in an overall company strategy map. This map visualize how the company create value for its stakeholders.
- 5) The fifth perspective includes the development of performance measurements in each of the strategic objectives. This perspective also include identifying of expected targets within the different strategic objectives and also a baseline is developed and benchmarking of different companies is done.
- 6) Perspective number six includes a development initiative for supporting the strategic objectives. For a successful implementation it is important to ensure the development of responsibility from all departments across the organization. This step is therefore also including to apportion responsibility to the appropriate people within the company.
- 7) Perspective number seven is the first step in the actual implementation phase and aims to apply the correct software in order to facilitate that the employees can get the right information at the right time to make the calculations. When implementing the BSC it is preferable to make it with as high automation as possible since it adds structure and helps the employee to better decision making through quick access to actual data.
- 8) The eight perspective includes that the company takes the BSC from a business perspective and narrow it down to the various business units. This means that the BSC for the overall company is translated into the different departments and then even down to individual scorecards for the employees. This is necessary since it contribute to an understanding about what each employee need to accomplish in order to reach the company vision.
- 9) The nine perspective is an evaluating process. During this evaluation the company has to consider whether its strategies to achieve the vision are fulfilling their purpose in a desirable way. Furthermore, the company has to consider if they uses the right methods and is measuring the right performance measurements.

3.5.3 Implementation of Performance measurements

To introduce performance measurements in a company is a process of three steps, first define the measurements, then implement the measurements and finally to use the measurements (Chytasa, Glykasb, & Valiris, 2011). If the company fails with any of the steps in the process,

they will not receive the desired result. The implementation is often the phase where businesses often fails since employees consider the changing work completed before the implementation phase is finalized. The implementation of the performance measurements within the company is a critical phase and has several challenges (Jääskeläinen & Sillanpää, 2012). The most common challenge in an implementation is the employees lack of understanding for the aim of the measurements and therefore not the usefulness of them (Kasurinen, 2002; Jääskeläinen & Sillanpää, 2012). Due to that, they often ignore or resist working with them because they do not find them relevant. They are instead concentrating on their ordinary work task. Another challenge is that there are often too many responsible persons for the project, which results in non-responsible where no one takes responsibility for the project (Jääskeläinen & Sillanpää, 2012). If no one takes responsibility for the project there will not be a successful implementation.

To succeed with an implementation of performance measurements there are according to Kasurinen (2002) two different aspects to consider, the organizational implementation and the technical implementation. The organizational implementation refers to inform the employees about the changes and also to convince them that it is essential to use the measurements. It is also important to educate the employees to use the measurements and to obtain commitment among the personal (Jääskeläinen & Sillanpää, 2012). To succeed with the technical implementation of the performance measurements it is essential that the content of the measurements is sufficient and the creating of an appropriate ERP system is adequate. To succeed in the technical part it is also important that the design of the system is user-friendly for the employees (Kasurinen 2002).

4. Result

In this chapter the result of the thesis is presented and analyzed. In total 42 performance measurements are defined and deeper information about why they are relevant to measured is described. Moreover, information about how the data is extracted from the ERP systems is described together with the created templates and formulas used for the calculations. The measurements have been divided into the categories: market, production, research & development, quality, finance and human resources. A summarize of all performance measurement within the category is shown at the end of each section.

4. 1 Market

In this section performance measurements connected to the market will be presented, including: market share, sales leads, sales forecast orders in hand, demonstration projects and success rate of demonstration projects. In the formulas the time period used is one month unless anything else is stated.

Market share

Definition: The market share describes the percentage of the market that the company has compared to competitors.

The aim of measuring the market share is to obtain information about how the company performs compared to other companies within the same market. This makes it to an external performance measurement. The information that the measurement provide indicates to the company if they are increasing or decreasing at the market. Today the market share is calculated higher up in the organization by the separated marketing organization in the Alfa Group. The formula for calculating the market share is presented below.

Formula:

$$\text{Market share [\%]} = \frac{\text{Total sales by the company}}{\text{Total sales on the market}} \cdot 100$$

Sales leads

Definition: The sales leads are all potential sales for the company.

The aim of conducting the sales leads document is to create knowledge about all potential sales that are on the market for this industry. Today the information to conduct the sales leads document is collected through examine the market for possible sales. The information is collected by the CEO and the marketing department. After the collection the data is structured in an excel document. However, to make this process more efficient in the future the Leptha will use an ERP tool, which is today used within the Alfa Group. In this program salesmen in the Group are listing all sales on the market. The CEO and the manager at the marketing

department at Leptha can then use this information in order to conduct the sales leads every second month. This information is reported to Gamma during all BRM.

Sales forecast

Definition: The sales forecast describes the business projects where the company hope to win the quotation. It is therefore projects that have a high possibility to result in sales.

The aim of conducting the sales forecast is to give Leptha an overview of when possible sales can occur and the possible income that they can generate. By adding the expected sales prices, there will be an indication on how far the company has come in order to reach the expected budget target. The projects are in sales forecast until a contract is signed and are then moved into orders in hand. For each project, information are collected about the customer, the product and how far the procurement has come. This information are then used in order to rank the projects from low to high, which indicates how possible it is that the project will turn into an order in hand.

Today, the sales forecast is produced by analyzing the sales leads and based on that they decide which sales projects that are most possible to occur and are then included in the sales forecast. The sales forecast is made in an excel document where the information is structured. In the future an ERP tool will most probably be used to conduct the sales forecast and it will then turn into a production plan given by the sales department within the Alfa Group. The sales forecast is today conducted monthly with a 12 month foresight and is reported during all BRM.

Orders in hand

Definition: The orders in hand describe the amount of sales where contracts are signed and a purchase order is registered in the ERP production system. This measurement is divided in four categories: currently, quarterly, total and overdue.

The aim of compiling the orders in hand for Leptha is to give information about what orders they have and how large part of the budget they have reached. Current orders in hand describe the amount of orders that the company has at the moment. The quarterly orders in hand describe what orders the company has during a quarter. The total orders in hand describe all orders that the company has during a year and the overdue orders in hand describe all orders that has past the planned delivery date. Today the orders in hand are documented and calculated in an excel document using information collected from the sales department. The orders in hand document is conducted by the CEO monthly and is reported during all BRM.

Demonstration projects

Definition: The total amount of demonstration projects that the company does in order to demonstrate the systems for the customer.

The aim with demonstration projects is to sell systems and the target is to sell at least one system per demonstration. Today the company is making demonstrations for customers interested in buying systems. Some demonstrations are paid and others are unpaid. The company is aware of how many demonstration they are making every year. However, to increase the control of the amount and to get a separation between paid and unpaid demonstrations, an excel document is provided to Leptha. Responsible for documenting and calculating the amount of demonstrations quarterly and yearly is the marketing department and it will be reported at the BRM. The formula for calculating the demonstration projects is presented below.

Formula:

$$\text{Demonstrations} = \text{Paid demonstrations} + \text{Unpaid demonstrations}$$

Success rate of demonstration projects

Definition: The success rate of demonstration projects describes the amount of demonstration projects that have result in sales.

The aim of measuring the success rate of the demonstration projects is to get knowledge about if the demonstration projects are profitable. This is interesting to know since the cost for inventory and high risks are connected to the demonstrations. This measurement will be divided into two categories, paid demonstration projects and unpaid demonstration projects. Leptha is today aware of the total demonstrations that they are conducting. However, the success rate of the paid and unpaid demonstrations are not calculated. The information needed in order to perform the calculations is given by an excel document where the marketing department will document each demonstration project. This information will be documented regularly and the success rate for each product and region will be calculated quarterly and yearly and will then be reported at BRMs. The formulas for calculating the success rate of paid and unpaid demonstrations are presented below.

Formula I:

$$\text{Successrate of paid demonstrations [\%]} = \frac{\text{Sold systems from paid demonstrations}}{\text{Total demonstrations}} \cdot 100$$

Formula II:

$$\begin{aligned} \text{Successrate of unpaid demonstrations [\%]} \\ = \frac{\text{Sold systems from unpaid demonstrations}}{\text{Total demonstrations}} \cdot 100 \end{aligned}$$

Summary of performance measurement for the market

<i>Performance Measurement</i>	<i>Definition</i>	<i>Reporting</i>	<i>Data Source</i>
Market share	Percentage of the market that the company has.	-	-
Sales leads	All potential sales for the company.	All BRM	Excel template
Sales forecast	Describes all business projects where the company hope to win the quotation.	All BRM	Excel template
Orders in hand	Number of contracted sales.	All BRM	Excel template
Demonstration projects	Number of demonstration projects that the company does in order to show the systems for customers.	Once a year at a BRM	Excel template
Success rate of demonstration projects	Demonstration projects that have resulted in sales.	Once a year at a BRM	Excel template

Table 1. Summary of market measurements

4.2 Production

In this section performance measurements connected to production are presented, including: delivery on time, inventory lead time, inventory value, days in inventory, inventory in relation to reserved material, obsolete inventory, production cost, supplier reliability and quality of suppliers. In the formulas the time period used is one month unless anything else is stated.

Delivery on time

Definition: Delivery on time describes how close to the planned delivery date the actual delivery was made. Delivery on time is both taking early and late deliveries into account.

The aim of measuring delivery on time is to get knowledge about how exactly the deliveries are made. A high figure for this measurement might indicate that the occupancy in the manufacturing is too high or that components from subcontractors are delayed. Furthermore, the root cause for a late delivery has to be taken into account, sometimes it might be the customer that wants a later delivery and therefore some adjustments might be essential in the calculation.

Today the company is documenting when their deliveries of the final product are made. However, they do not analyze if this is agreeable with the goal they have in delivery precision. In order to know how close to planned delivery date the delivery was made, a table is used where the production department document all deliveries regularly. A color code is used in order to determine in which category the delivery belongs to. A green delivery indicates less than seven days late. The yellow category indicates that the delivery is done between seven and 29 days late. The orange category indicates that the delivery was made between 30 to 59 days late. The red category indicates that a delivery was made 60 days late or more than 60 days late. The reporting is made yearly during a BRM. The delivery time is presented in Table 5 below.

Delivery on time									
Customer	Product	Planned delivery date	Actual delivery date	Differentiation	>7 days	≤7 days	≤30 days	≤60 days	Reason for late delivery
X	A								
Y	B								
Z	C								
Total									

Table 2. Template of delivery on time

Inventory lead time

Definition: The inventory lead time describes how long time it takes for a company to produce a system or key modules.

The aim of calculating the inventory lead time is get an understanding about how long time it takes to produce a system or the key modules. This information is relevant when making inventory and sales planning. The lead time will be divided into three categories; if subunits are in inventory, if subunits are not in inventory but all components to manufacture the system or key modules are in inventory and if neither subunits nor components are in inventory. In the first case, a calculation is made for the throughput time for a system and key modules when subunits are available in inventory. In the second case, a calculation is made for the throughput time for a system and key modules when components are in inventory. In the last case, a calculation is made for the throughput time for a system and key modules, when there are no components in inventory. Today the lead time calculations are not completed since data is missing. However, some data is provided in Monitor. The production department is responsible for calculating the lead time yearly or when new products or sub-units are introduced. The reporting is made yearly during a BRM.

Formula:

$$\text{Total time} = \text{Assembling time} + \text{Time to receive material} + \text{Testing time}$$

Inventory value

Definition: Inventory value is the total value of all components and products that are in inventory and Work In Progress (WIP).

The aim of measuring the inventory value is to get an overview about the amount of tied up capital the company has in inventory compared to the total assets. The inventory value include all booked value of products and components in inventory. This measurement is calculated by Leptha today and the data is provided in Monitor. Moreover the inventory value can be directly calculated in Monitor. The finance department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formula used for calculating in presented below.

Formula:

$$\text{Inventory value} = \text{Components and products in inventory} + \text{WIP}$$

Days In Inventory

Definition: The Days In Inventory (DII) describes how long time products and components are in inventory.

The aim of measuring this performance measurement is to get an indication about how fast a company converts their inventory into sales. If the turnaround on sales is slow this might be an indication that there are internally or externally problems that need to be solved. Today DII is not calculated by Leptha. However, the data needed for the calculation is provided by Monitor and Visma SPCS. This measurement is calculated yearly by the finance department and is reported once a year at a BRM. The formula for calculating this measurement is presented below.

Formula:

$$\text{Days in inventory} = \frac{\text{Avg Inventory value}}{\text{Cost goods sold}} \cdot 365$$

Inventory in relation to production plan

Definition: The inventory in relation to the production plan describes the amount of inventory that is covered by the production plan.

The aim of measuring inventory in relation to the production plan is to indicate if the amount of inventory is sufficient to cover the customers demand. If the demand for the components is higher than the inventory it will in some cases result in delays of finalizing the customer products. If the inventory is higher than the demand it will most probably indicate that too much capital is tied up in inventory. Leptha does not calculate this performance measurement today. However, the information needed for making the calculations is provided in Monitor. The responsible department for calculating the inventory in relation to the production plan is the production department. This measurement will be calculated and reported at all BRM. The formula used for calculating this measurement is shown below

Formula:

$$\text{Inventory in relation to production plan} = \text{Inventory} - \text{Production plan}$$

Obsolete inventory

Definition: Obsolete inventory are products or components in inventory that have been replaced and have not been used in the production for a certain time.

The aim of measuring obsolete inventory is to know how much components and products that are in inventory that has no value for the production. However, the obsolete inventory can be sold but for a lower price or used as spare parts for old systems. Reasons for high level of obsolete inventory can be a result of, low demand, introduction of new techniques or the phasing out process for a product or component was not made in an optimal way. Today the company has obsolete inventory, however they do not know how big part of the total inventory that the obsolete inventory is. This measurement is not able to calculate today since the obsolete inventory is not register in Monitor due to the newly made implementation. However, this is a relevant measurement for Leptha and they will start calculate this when data is available. The formula used for calculating this performance measurement is presented below.

Formula:

$$\text{Obsolete inventory in relation to inventory} = \frac{\text{Obsolete inventory}}{\text{Total inventory}} \cdot 100$$

Production cost per system

Definition: The production cost per system describes the total cost for producing a system, including material and man-hours costs. Components within a product that are bought internally within the Group are excluded.

The aim of measuring the production cost is to know how much a system actually cost to manufacture and if the cost has been reduced during the years. The total cost will include all costs connected to production of a system such as material costs, man-hour cost and costs for testing. This performance measurement is important to measure since it enables the company to set appropriate prices on the systems. Moreover, it is interesting to compare the production cost between the products in order to investigate if one product is more man-hour intensive and if this, due to similarities with other products, can be reduced.

The production cost for the systems are estimated by Leptha, however the process of calculating the actual production cost for each system and key modules has just begun since the recent implementation of Monitor. The system include prices for each component and also the amount of man-hours used in the production. The production department is responsible for the calculation. The measurement is reported yearly to the management team at Gamma. The formula used for calculating the production cost is presented below.

Formula:

$$\text{Production cost} = \text{Material cost} + \text{Man hour cost} + \text{Testing cost}$$

Supplier Reliability

Definition: The supplier reliability describes how well the supplier delivers on time.

The aim of measuring supplier reliability is to find out how good the suppliers are in delivering on time. This measurement gives an indication on, if the suppliers usually deliver their products on time or not and also how many weeks it differ. This is important to measure since the company is highly dependent on sourcing components and it can therefore be an indicator if a supplier needs to be replaced due to poor delivery performance.

Today the supplier reliability is not calculated by Leptha but it is an important measurement to begin calculating since the sales volumes are increasing and the company wants to reduce their lead time to customer. In order to meet the customer requirements the company need to have reliable suppliers. The information about planed delivery date and actual delivery date is available in Monitor and is based on registration of the receiving goods. Responsible for making the calculations monthly is the production department. The reporting will be done internally within Leptha and to the suppliers an evaluative report will be given yearly. The formula used for calculation can be viewed below.

Formula:

$$\text{Supplier reliability [\%]} = \frac{\text{Deliveries on time}}{\text{Total deliveries}} \cdot 100$$

Quality of suppliers

Definition: The quality of suppliers describe the quality of the delivered components from the suppliers.

The aim of measuring the quality of the suppliers is to give information to the company on how good the quality of the components from the supplier are. The quality is defined as how many products that the company can use without any defects or errors. This performance measurement will indicate if the products from the supplier are good enough or if the company should change supplier.

The quality of suppliers is a measurement that Leptha is not able to calculate today since data is missing. However, it is possible to calculate this measurement in Monitor if a new module is bought and implemented. This measurement is important to start to measure since the sales volumes increases and the company wants to reduce the lead time to the customers, which is affected if components delivered are defect. Furthermore, the components are expensive and extra components cannot be held in inventory in case of breakages. The responsible department for this measurement will be the production. The formula for calculating this measurement can be viewed below.

Formula:

$$\text{Quality of suppliers [\%]} = \frac{\text{Defective components delivered}}{\text{Total delivered components}} \cdot 100$$

Summary of performance measurement for production

Performance measurement	Definition	Reporting	Data source
Delivery on time	How close to the planned delivery date the actual delivery was made.	Once a year at a BRM	Monitor
Inventory lead time	How long time it takes to produce a system or key modules.	Once a year at a BRM	Monitor
Inventory value	The total value of all inventory that the company has.	Monthly	Monitor
Inventory in relation to production plan	The amount of inventory that is covered by the production plan.	All BRM	Monitor
Inventory in relation to revenue	The inventory value compared to the total revenue of the company.	Once a year at a BRM	Monitor & Visma SPCS
Obsolete inventory	Products or components in inventory that have been replaced and have not been used in the production for a certain time	-	No information
Production cost per system	The total cost for producing a system	Yearly to Gamma	Monitor
Supplier reliability	How well the supplier delivers on time	-	Monitor
Quality of suppliers	The quality of the delivered components from the supplier.	-	No information

Table 3. Summary of performance measurement for the production

4.3 Research and development

In this section performance measurements connected to research and development are presented, including: development cost, development cost in relation to revenue, major milestone precision and release precision. In the formulas the time period used is one month unless anything else is stated.

Development cost

Definition: The development cost is divided between two categories: cost for innovations & improvements and life cycle cost. Included in development cost is all costs connected to the two categories.

Innovation costs are all costs that are connected to developing a new hardware or software. Improvements costs are all costs that are connected to improving existing hardware or software. The life cycle costs are all costs connected to correcting development errors. The aim of measuring the development cost is to get knowledge about the amount of monetary and human resources that the company allocates to research and development. By dividing the development cost into two categories an overall picture is presented to the company on how the developments costs are divided. If there is a high percentage on correcting development errors, it will indicate that the company need to make improvements in this area in order to lower the total costs.

The overall development cost is calculated by Leptha today, however they do not divide them into the two categories. The information needed to calculate the development cost for the

different categories is provided in Visma. The material cost is provided in Visma SPCS and the man-hour cost is provided in Visma Time. The finance department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formulas used for calculation is presented below.

Formula I:

$$\textit{Development cost for innovation \& improvement} = \textit{Material cost} + \textit{Man hour cost}$$

Formula II:

$$\textit{Life cycle cost} = \textit{Material cost} + \textit{Man hour cost}$$

Development cost in relation to revenue

Definition: The development cost is divided between two categories: cost for innovations & improvements and life cycle cost. These costs are then taken into relation with the total revenue. Included in the development cost are all costs connected to the two categories.

The aim of calculating the development cost in relation to revenue is to indicate how large part of the total revenue that the company has invest in research and development. This measurement is not calculated today by Leptha but the data needed is provided in Visma. The material cost and the total revenue is provided in Visma SPCS and the man-hour cost is provided by Visma Time. The calculations will be performed by the financial department and the result is reported yearly to Gamma. The formula for calculating this measurement is presented below.

Formula I:

$$\begin{aligned} \textit{Development cost for innovation \& improvement in relation to revenue} [\%] \\ = \frac{\textit{Development cost for innovation \& improvement}}{\textit{Total revenue}} \cdot 100 \end{aligned}$$

Formula II:

$$\textit{Life cycle cost in realtion to revenue} [\%] = \frac{\textit{Life cycle cost}}{\textit{Total revenue}} \cdot 100$$

Major milestone precision

Definition: The major milestone precision describes how precisely the company reaches the defined milestones per project, measured in weeks.

The aim of measuring the milestone precision is to get information on how well the company follow the project plan when projects are performed. A project that do not reaches its major milestones is likely to be delayed and also to exceed the project budget. By measuring the major milestones precision, the company can during a project allocate more resources if needed and take correction actions. The major milestone precision is not calculated for the projects today by Leptha. However, this is important to measure in order to evaluate the projects. An excel

document is provided to Leptha where they can fill in the needed information in order to get a knowledge about the milestone precision. The measurement will be calculated by the R&D department for each finalized project and will only be reported internally within Leptha. A summary of the template used for the milestone calculation can be viewed in Table 4 below.

Major milestone precision			
Project	Planned start	Actual start	Difference
A	2014-01-30	2014-01-30	0
B	2014-01-30	2014-02-14	15

Table 4. Template of Major milestone precision

Release precision

Definition: The release precision describes how close to the planned release date the actual release was made. Release precision is both taking early and late releases into account.

The release precision is calculated for both releases of new products and when a new edition is released. The aim of measuring release precision is to control how exactly the releases are made. This measurement gives an indication if the projects are released on time or if the planned project time is exceed. This is important to measure since exceeding the time will impact the costs of the project and it will also impact costs connected to the release, for example marketing cost. Furthermore, if the release of a product is late the time to market increase and there is a risk for loss of sales and a reduced market share.

Today the releases are documented by Leptha, but there are no follow up in order to identify if the releases were made when planned. An excel document is provided to the company where they document necessary information needed to evaluate the precision. The measurement will be calculated by the R&D department for each finalized project. A summary of the template used for the release precision can be viewed in Table 5 below.

Release precision				
Project	Planned release	Actual release	Differentiation	Reason for late release
Project A	2014-01-30	2014-01-30	0	
	2014-01-30	2014-02-14	15	

Table 5. Template of Release precision.

Summary of performance measurement for R&D

Performance measurement	Definition	Reporting	Data source
Development cost	All costs connected to the development department. These costs are divided between innovations & improvements and life cycle development.	Monthly	Visma Time & Visma SPCS
Development cost in relation to revenue	The development costs described above in relation to the total revenues.	Yearly	Visma Time & Visma SPCS
Major milestone precision	How precisely the company reaches the defined milestones per project	-	Excel template
Release precision	How close to the planed release date the actual release was made.	-	Excel template

Table 6. Summary of performance measurements used in R&D

4.4 Quality

In this section performance measurements connected to the quality of the systems are presented, including: down time at customer, mean time to repair, service cost and warranty. In the formulas the time period used is one month unless anything else is stated.

Down time at customer

Definition: The down time at customer defines as the time when the system is unusable by the customer because of system failures.

The aim with this measurement is to control how much down time the system has at the customer. A low down time result in higher customer satisfaction since the down time result in high costs for the customer. By controlling the down time, the company becomes aware of quality problem with the systems which require modifications of the product. The down time at customer is a figure that Leptha is aware of, however they do not calculate it. An excel document is provided to the company where they can document necessary information that is needed in order to calculate this measurement. Responsible for the calculation is the service & support department. The reporting is made internally within Leptha monthly and to Gamma at all BRM. The formula used for calculation is presented below.

Formula:

$$Downtime\ at\ customer = \frac{\sum\ Repair\ ending\ day - Breakdown\ day}{Total\ time\ at\ customer}$$

Meantime to Repair

Definition: The Mean Time to Repair (MTTR) is the average time it takes for the company to repair a system for its customer.

The aim of this measurement is to get an understanding about how long time a reparation of a system takes. The meantime to repair is the total time it takes for the company to repair a system, from the starting day of the reparation until the reparation is finished. The time it takes to repair a system is not calculated at Leptha today. The data needed is provided in Visma Time and a excel document is provided to the company where they can document more exact information about the repairs. The calculation will be made by the service & support department monthly with a sliding yearly average and is reported to Gamma at all BRM. The formula for calculating the MTTR is presented below.

Formula:

$$MTTR = \frac{\Sigma \text{Repair ending day} - \text{Repair starting day}}{\text{Total breakdowns}}$$

Service cost

Definition: The service cost is divided into two categories: cost for service related to maintenance agreement and cost of normal service and support. Included in the service cost are all costs connected to the two categories.

The aim of measuring the service cost is to give an indication to the company how much it costs to support the systems. Based on this the company can set appropriate prices on the maintenance agreements and the hour cost for normal service and support. The service cost indicates how good the quality of the systems and their components are. To have a high rate of service and support can impact the customer satisfaction, since they are not able to use the system if something is broken. The service costs are divided into software support and hardware support. The software cost is divided into LSS, OS and Leica software and the hardware is divided between the different products.

The service costs are today calculated by Leptha and it includes all material cost and man-hour cost that are connected with the service. The material cost is provided in Visma SPCS and the man-hour cost is provided in Visma Time. The data is combined into an excel document where the calculation is made. Calculation of the measurements are done monthly by the service & support department and are then reported internally within Leptha. The measurements are reported to Gamma at all BRM. The formulas for calculating the service costs are presented below.

Formula I:

$$\text{Service cost related to maintenance agreement} = \text{Material cost} + \text{Man hour cost}$$

Formula II:

$$\text{Service cost related to normal service and support} = \text{Material cost} + \text{Man hour cost}$$

Warranty cost

Definition: The warranty cost is the cost that occurs during the first year when the warranty time applies.

The aim of measuring the warranty cost is to indicate to the company how high the costs are for supporting the systems during the first year. This measurement is especially important to measure since the costs during this time is not paid by the customer. Furthermore, it also indicates how good the quality of the systems are. The warranty costs is today estimated by Leptha by considering the approximately material cost and man-hour cost occurred for service of systems during the year of warranty. However, the warranty cost is important to measure in exact figures since it indicated the quality of the recently delivered products. The material cost is provided in Visma SPCS and the man-hour costs is provided in Visma Time. The Service & Support department is responsible for the calculation and the measurement is reported to Gamma once a year at a BRM. The formula used for calculation is presented below.

Formula:

$$\text{Warranty cost} = \text{Material cost} + \text{Material cost}$$

Summary of performance measurement for the quality

Performance measurement	Definition	Reporting	Data source
Downtime at customer	The time when the system is unusable by the customer because of system failures.	All BRM	Excel template
Meantime To Repair	The average time it takes for the company to repair a system for its customer.	All BRM	Visma Time
Service cost	All costs connected to the two different categories: maintenance agreement and cost to normal service and support.	All BRM	Visma Time & Visma SPCS
Warranty cost	The cost that occurs during the first year when the warranty time applies.	Once a Year at a BRM	Visma Time & Visma SPCS

Table 7. Summary of performance measurements for the quality.

4.5 Finance

In this section performance measurements connected to finance are presented, including accounts receivable in relation to revenue, account receivable not covered by security, day sales outstanding, EBIT in relation to revenue, gross profit 1, gross profit 2, operating cash flow, operating expenses, profit, return of capital employed and revenue. In the formulas the time period used is one month unless anything else is stated.

Account receivable in relation to revenue

Definition: The Account receivable is the amount of money that is invoiced but not paid by the customers. This measurement is calculated for a certain period with the total revenue as a moving average over three month.

The aim of measuring the account receivable is to give an indication about how much of the total revenue that is invoiced but not yet paid. This is important to measure since it is essential for the company to have liquidity but also that every sale is a high risk due to the high value products. The account receivable is calculated for not overdue receivables and overdue receivables. The overdue receivable is divided into different intervals: overdue by 7, 30, 90, 180 and more than 180 days. Leptha is today measuring the account receivable, however the account receivable in relation to revenue is not calculated. The data needed for the calculations is provided in Visma SPCS. The data is then combined in an excel document where the calculation is performed. The finance department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formula for calculating this measurement is presented below.

Formula:

$$\text{Account receivable in relation to revenue [\%]} = \frac{\text{Account receivable}}{\text{Total revenue}} \cdot 100$$

Account receivable not covered by security

Definition: The account receivable not covered by security describes the invoiced amount that have not been covered by a money security by for example a bank.

The aim of measuring this is to give an indication on how large part of the total sales that is not covered by security. The optimal case is to have all account receivable covered by security since that will minimize the risk for down payment. To secure the account receivable would be especially beneficial for Leptha since they trade with high value products and every sale is a risk. Leptha is not calculating this measurement today. However, the data needed for the calculation is provided in Visma SPCS, this information is then combined in a excel document in order to make the calculations. The finance department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formula for the calculations is presented below.

Formula:

$$\text{Account receivable not covered by security [\%]} = \frac{\text{Account receivable not covered by security}}{\text{Total Account receivable}} \cdot 100$$

Day Sales Outstanding

Definition: The Day Sales Outstanding (DSO) describes the average number of days it takes for the company to collect the revenue from 3rd part customer. The DSO is calculated for a decided period.

The aim of measuring DSO is to give the company information about how good they are at collecting money from their customers. A low number indicates that the company receive the money fast, this is advantageous since they can put the money into use again. A high number indicates that it take longer time to collect the money, which is not beneficial for the company. The DSO is not measured by Leptha today but it is interesting to know since there are high expenses connected to the products. The data needed for the calculations is provided in Visma SPCS, this information is then combined in a excel document in order to make the calculations. The finance department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formula for calculating the DSO is presented below.

Formula:

$$DSO = \frac{\text{Account recivable}}{\text{Total credit sales}} * \text{number of days}$$

Earnings Before Interest and Taxes in relation to revenue

Definition: The Earnings Before Interest and Taxes (EBIT) in relation to revenue describes how large profit, excluding interest and income tax expenses, that the company has made compared with the revenue. This is calculated for 3rd part sales.

The aim with this measurement is to give an indication on, how good the profit actually is. This is one of the most important measurement for the Group since Alfas vision is to have an EBIT in relation to the revenues at 25% in 2015. The EBIT in relation to revenue is not calculated by Leptha today, however this is a measurement that is used by Gamma and due to that it becomes essential to measure even for Leptha. However, since Leptha in the future will almost only sell their products to the sales department within the Group the EBIT for 3rd part sales will almost be zero. Due to that this measurement will be calculated for the whole Gamma. The formula used for calculation is presented below.

Formula:

$$EBIT \text{ in relation to revenue } [\%] = \frac{EBIT}{\text{Totla revenue}} \cdot 100$$

Gross Profit I in relation to total sales

Definition: Gross profit I is the profit after deducting of the total costs of sales to 3rd part customer.

The aim with this measurement is to compare the current state of the company with the past performance. The Gross profit I describe the profit of the sales by just comparing the total sales and total cost of sales. This measurement is measured as a percentage of the revenues to enable comparing the profit with the revenues. The Gross profit I is not calculated today by Leptha, however this is a measurement used by Gamma and due to that it becomes essential to measure even for Leptha. However, since Leptha in the future will almost only sell their products to the sell department within the Group the Gross Profit I will almost be zero. Due to that this measurement will be calculated for the whole Gamma. The formula used for calculating is presented below.

Formula:

$$\text{Gross profit I in relation to total sales [\%]} = \frac{\text{Total sales} - \text{Total cost of sales}}{\text{Total sales}} \cdot 100$$

Gross Profit II in relation to total sales

Definition: Gross profit II is Gross profit I after deducting of variance- and other costs of sales. Total sales includes sales to 3rd part customer and intercompany sales.

The aim with this measurement is the same as Gross profit I, to compare the current state of the company with the past performance. Gross profit II differ from Gross profit I by also including the variance costs and other costs of sales. The Gross Profit II is not calculated today by Leptha, however this measurement is used by Gamma and due to that it becomes essential to calculate even for Leptha. The data needed for the calculation is provided in Visma SPCS and an excel document will be used for the calculations. The finance department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formula used for calculating is presented below.

Formula:

$$\begin{aligned} \text{Gross profit II in relation to total sales[\%]} \\ = \frac{\text{Gross profit I} - \text{Variance cost} - \text{Other cost of sales}}{\text{Total sales}} \cdot 100 \end{aligned}$$

Operating Expenses in relation to total sales

Definition: The Operation Expenses (OPEX) describes the expenditure that a company has in order to perform its normal business operations.

The aim of measuring OPEX is to give the company an indication about how much expenses that are generated when performing the normal operations, in order for them to know if they shall lower the expenses. Manager’s responsibility is to decide how much they can reduce the expenses without affecting the company’s ability to compete with competitors on the market. Leptha is not calculating OPEX today but the data needed for the calculation is provided in Visma SPCS and is exported to an excel document where the calculation is made. The finance

department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formula for calculating OPEX in relation to sales can be viewed below.

Formula:

$$OPEX \text{ in relation to total sales} = \frac{EBIT - \text{Gross profit II}}{\text{Total sales}}$$

Profit

Definition: The profit describes how profitable the company is.

The aim with this measurement is to give an indication if the company is profitable or not. This is measured to get an idea how well the company performs. Today the profit is calculated by Leptha and the data needed is provided in Visma SPCS. The finance department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formula used for calculation can be viewed below.

Formula:

$$\text{Net Profit} = EBIT - \text{financial costs} - \text{taxes}$$

Return Of Capital Employed

Definition: The Return Of Capital Employed (ROCE) describes a company's profitability and efficiency of the capital employed. Capital employed is the total assets minus the current liabilities.

The aim of measuring the ROCE is to get an understanding about how profitable and efficient the company is with its capital employed. A high number indicates a more efficient use and it should be higher than the company's capital costs. The ROCE is a useful measurement when comparing profitability across companies and especially for companies in capital-intensive sectors. ROCE is also interesting to compare over time since generally investors tend to favor companies with a stable and increasing ROCE. Today the ROCE is not calculated Leptha but it is a well-used measurement within the Alfa Group, why this becomes important to measure for Leptha as well. The data needed is provided in Visma SPCS, this information is then combined in a excel document in order to make the calculations. The finance department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formula for calculating the ROCE is presented below.

Formula:

$$ROCE[\%] = \frac{EBIT}{\text{Capital Employed}} * 100$$

Revenue I

Definition: Revenue I describes the revenue when divided into hardware, software and maintenance. The revenue includes only sales to 3rd part customer, no internal sales are included.

The aim with this measurement is to control how much of the company revenue that comes from sales of products, sales of software and the proportion of revenue generated by sales of maintenance. This measurements will also be divided into internal and external revenue. Furthermore, the Revenue I is measured for target setting and is dictated from higher up in the organization. This will be measured to ensure the distribution of income from the three different parts and also to give an indication if any of the parts is growing or decreasing.

The Revenue I is not calculated by Leptha today but the information will be provided in Visma SPCS. The data needed for the calculations are exported to an excel document where the calculations are made. The finance department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formulas used for the calculations can be viewed below.

Formula I:

$$\text{Hardware revenue [\%]} = \frac{\text{Revenue generated by hardware sales}}{\text{Total revenue}} \cdot 100$$

Formula II:

$$\text{Software revenue [\%]} = \frac{\text{Revenue generated by software sales}}{\text{Total revenue}} \cdot 100$$

Formula III:

$$\text{Maintenance revenue [\%]} = \frac{\text{Revenue generated by maintenance}}{\text{Total revenue}} \cdot 100$$

Revenue II

Definition: Revenue II describes the revenue when divided into revenues from matured and merging countries. The revenue includes only sales to 3rd part customer, no internal sales are included.

The aim of dividing the revenues into matured and merging countries is to give the company an indication about how much of the sales that are made in the different parts and what part that is growing most. Countries included in the category merging countries are the BRIC countries and in the mature category are all other companies included. This separation is made by the Alfa Group. Furthermore, the Revenue II is measured for target settings and it is dictated higher up in the organization.

The Revenue II is not calculated by Leptha today, but the information will be provided in Visma SPCS. The data needed for the calculation is exported to an excel document where the calculations are made. The finance department is responsible for making the calculations

monthly and the reporting is done through the ERP system to Gamma. The formulas used for calculations are presented below.

Formula I:

$$\begin{aligned} & \text{Revenue in matured countries [\%]} \\ & = \frac{\text{Revenue generated by sales in matured countries}}{\text{Total revenue}} \cdot 100 \end{aligned}$$

Formula II:

$$\begin{aligned} & \text{Revenue in developing countries [\%]} \\ & = \frac{\text{Revenue generated by sales in merging countries}}{\text{Total reveue}} \cdot 100 \end{aligned}$$

Total revenue

Definition: The total revenue is the total of all products and services the company has sold within a period.

The aim of this measurement relates to the revenue for sold products and services performed by the company’s normal business. Deducting are made for discounts, value-added-tax and other taxes connected to the total revenue. The total revenue is measured by Leptha today and the information is provided in Visma SPCS. The finance department is responsible for making the calculations monthly and the reporting is done through the ERP system to Gamma. The formula used for the calculation can be viewed below.

Formula:

$$\text{Total revenue} = \text{Income from sales of products and services}$$

Summary of performance measurement for Finance

Performance measurement	Definition	Reporting	Data source
Account Receivable in relation to revenue	The amount of money that is invoiced but not paid by the customer.	Monthly	Visma SPCS
Account Receivable not covered by security	The invoiced amount that have not been covered by a money security.	Monthly	Visma SPCS
Day Sales Outstanding	The average number of days it takes for a company to collect the revenue from 3 rd part customer.	Monthly	Visma SPCS
EBIT in relation to revenue	How large profit, excluding interest and income tax expenses, that the company has made.	Monthly	Visma SPCS
Gross Profit 1 in relation to total sales	The profit after deducting of the total costs of sales to 3 rd part.	Monthly	Visma SPCS

Gross Profit 2 in relation to total sales	The Gross profit I after deducting of variance- and other costs of sales.	Monthly	Visma SPCS
Operating Expenses in relation to total sales	The expenditure that a company has in order to perform its normal business operations.	Monthly	Visma SPCS
Profit	How profitable the company is.	Monthly	Visma SPCS
Return Of Capital Employed	Describes a company's profitability and efficiency of the capital employed.	Monthly	Visma SPCS
Revenue 1	The revenue is divided into three different groups; hardware, software and maintenance.	Monthly	Visma SPCS
Revenue 2	The revenue is divided into revenues from matured and merging countries.	Monthly	Visma SPCS
Total Revenue	The total of all products and services the company has sold within a period.	Monthly	Visma SPCS

Table 8. Summary of performance measurement for the Finance

4.6 Human resources

In this section performance measurements connected to human resources are presented, including: absent days, appraisals, average age, gender balance, labor turnover, skill matrix and training hours completed.

Absent days

Definition: The measurement absent days describes the amount of days that an employee is not working, excluding vacation days.

The aim of measuring the absent days is to indicate how much the employees are working. A high number of absent days can be a result of that the company is not taking care of their employee properly and actions have to be taken in order to change this.

The absent days for each employee is today documented in Visma Time by Leptha. In order to calculate a percentage of absent days an excel document is provided to the company. The Human Resource (HR) department is responsible for making the calculation monthly and the reporting is done yearly to Gamma at a BRM. The formula used for calculation is presented below.

Formula:

$$Absent\ days\ [\%] = \frac{Total\ absent\ days}{Total\ working\ days} \cdot 100$$

Appraisals

Definition: The appraisals describe how many of the employees that have had a performance review during the year.

The CEO or another business manager shall yearly have individual interviews with the employees to set up personal goal, evaluate the working situation and suggest future improvements. The amount of appraisals is measured to get an understanding about if the employee is satisfied with the work and if he or she will improve at any level within the company. Furthermore, the aim is also to collect ideas from the employee about company improvements. The CEO at Leptha try to have appraisals with the employees once a year. However, in order to calculate this measurement, an excel document is provided to Leptha. The HR department is responsible for making the calculation monthly and the reporting is done yearly to Gamma at a BRM. The formula used for calculation is presented below.

Formula:

$$\text{Appraisals}[\%] = \frac{\text{Number of appraisals}}{\text{Employees}} * 100$$

Age of employees

Definition: The age of employees describes the average age of employees and are further divided into year intervals.

The aim of measuring the average age is to give information to the company how the distribution of age is between the employees. To make this measurement more detailed the employees are also divided between the intervals: 20-30, 30-40, 40-50, 50-60 and older than 60 years. For a good working condition the distribution between ages shall be balanced. The average age of the employees is today estimated by Leptha. In order to make a more exact calculation an excel document is provided to Leptha where the data of the average age will be calculated. The HR department is responsible for making the calculation yearly and the reporting is done to Gamma at a BRM. The formula for calculation of the average age is presented below together with Table 9 that is a summary of the template used for the age interval.

Formula:

$$\text{Average age} = \frac{\text{Total age}}{\text{Employees}}$$

Division of age of employees					
Employee	20-30	30-40	40-50	50-60	<60
Employee A	1				
Employee B			1		
Employee C			1		
Total	1		2		

Table 9. Age interval

Gender balance

Definition: The gender balance describes the allocation of male and female that are working at the company.

The aim of measuring the gender balance is to indicate how the balance is between the genders within the company. The gender balance is today estimated by Leptha. In order to make a more exact calculation an excel document is provided to the company where the data about the gender balance will be calculated. The HR department is responsible for making the calculation yearly and the reporting is done yearly to Gamma at a BRM. The formulas used for calculating the measurements are given below.

Formula I:

$$Female [\%] = \frac{Female\ employees}{Total\ employees} \cdot 100$$

Formula II:

$$Male [\%] = \frac{Male\ employees}{Total\ employees} \cdot 100$$

Labor turnover

Definition: The employee turnover describes the number of employees that have been replaced in a certain time period.

The labor turnover is measured in order to indicate how long time the employees tend to stay at the company. High turnover might be harmful for the company since they might lose skilled personal.

Today the labor turnover is not calculated by Leptha. However, the company is aware of the amount of personal that have left the company during the years. The information needed for the calculation is partly provided in Visma Time. In order to make more exact calculations an excel document is provided to the company where the data about the labor turnover will be calculated. The HR department is responsible for making the calculations yearly and the reporting is done yearly to Gamma at a BRM. The formula used for the calculation is presented below.

Formula:

$$\text{Labour turnover} = \frac{\text{Employees that have left the company during the year}}{(\text{Employees in the beginning of the year} + \text{Employees in the end of the year}) / 2}$$

Skill matrix

Definition: The skill matrix is a matrix with information about the employee’s qualifications and competences.

The aim of this measurement is to get an overview what competences that the employees at the company have. This information indicates if a competence restructuring is needed within the organization. Leptha does not have any skill matrix today, however this is important to have when evaluating the company skill levels. An excel document is provided to the company where the HR department will regularly document information needed in order to evaluate the skill levels. The reporting of the skill levels is done yearly to Gamma at a BRM. A summary of the template used for Skill matrix can be viewed in Table 10 below.

Skill Matrix				
Employee	Education	Skills within different departments	Computer skills	Language skills
Employee A				
Employee B				

Table 10. Skill matrix

Training hours completed

Definition: The training hours completed describes how many training hours that have been invested in the company’s employees.

The aim with the measurement is to control if the company invest enough training for the employees or if they need to invest more. The amount of training hours completed by the employees is not calculated by Leptha today. An excel document is provided to the company, where the HR department can fill in training hours performed by the employees during the year and also make calculations of average training hours performed. The measurement is calculated and reported yearly to Gamma at a BRM. The formula for calculating this measurement is presented below.

Formula:

$$\text{Training hour completed} = \frac{\text{Total training hours}}{\text{Total employees}}$$

Summary of performance measurement for Human Resources

Performance measurement	Definition	Reporting	Data source
Absent days	The amount of days that an employee is not working, excluding vacation days.	Once a year at a BRM	Visma Time
Appraisals	Percentage of employees that have had a performance review during the year.	Once a year at a BRM	Excel template
Age of employees	The average age of employees at the company.	Once a year at a BRM	Visma Time
Gender balance	The allocation of male and female that are working at the company.	Once a year at a BRM	Visma Time
Labor turnover	The number of employees that have been replaced in a certain time period.	Once a year at a BRM	Excel template
Skill matrix	A matrix with information about the employees' qualifications and competences.	Once a year at a BRM	Excel template

Table 11. Summary of performance measurement for Human Resources

5. Discussion

This chapter will discuss the four research questions that are presented in section 1.5. The Performance measurements & management controlling will discuss the first research question, the section including extracting and reporting data will discuss research question two and three and the implementation section will discuss research question 4.

5.1 Performance measurements & management controlling

To manage a company in the direction as desired it is important that the company has a clear vision and also strategies to reach the vision. Today there are many companies that make decisions based on instinctive feelings and not on real data in form of collected data or calculated numbers. To make decisions that feels right at the moment is risky and decisions made should instead be based on correct data and numbers that have been collected from different perspectives of the company. In order to use performance measurements as decision material it is important that right values are measured and right data is used. Since Alfa is a listed Group there is a high pressure from the shareholders to exhibit good results in order to keep them continue to invest in the company, why the importance of making right decisions is essential. Making right decisions require accurate data and therefore it becomes important for Leptha and other subsidiaries to measure how they perform. The final result for Alfa depends on how every subsidiary performs. Furthermore, to enable right decision making an overall view with a concentrated content is essential for the managers. Therefore, performance measurements have to be represented from different perspectives of a business and align with the company vision. The measurements that are defined for Leptha provide information about six perspectives of the company. If only some perspectives are focused on the decisions that are taken will result in unbalanced management controlling.

What performance measurements that are measured within organizations differs due to the different visions. The performance measurements defined for Leptha is based on Alfa's vision and it permeates the entire Group. Since the performance measurements are defined based on Alfa's vision this can be seen as a top-down approach, which means that the measurements have not emerged from Leptha's own vision. This is not unusual for companies acquired, however this can cause some problems. Managers and employees might have a low knowledge about the aim of the measurements and what they will result in, therefore the incentives for calculating the measurements are low. Furthermore, the employees might not understand the importance of the measurements since the decisions are taken higher up in the organization which can affect the calculations and the reporting.

What performance measurements that are used in an organization also depend on what kind of company it is. For a producing company, measurements connected to production is more important and for a company selling services, measurements connected to HR are more important. Leptha can be considered as a production company with a focus on R&D, therefore measurements connected to these two categories are important. However, for companies focusing major on R&D the HR measurements are also important since the company is highly dependent on its employees' competences. However, these measurements are not always

considered by the managers to be very important. It is not unusual that some performance measurements are considered as more important by the management team and are more focused on than others. To separate the more important measurements are not negative, since they can then represent the company's KPIs. Important to acknowledge is though that the measurements separated as KPIs can be categorized as KPIs meaning that they should be indicators to make the company to perform better. Moreover, financial measurements are usually the measurements that gets most attention from the management team. However, it is important to remember that the non-financial measurements in somehow affect the financial measurements, hence they become important as well. The reason for Alfa to have a high focus on profit and revenue might be because of pressure from the shareholders, which is then reflected to the other companies in the Group. Other performance measurements that do not get so much attention by the managers are environmental measurements. As the society becomes more aware of the environment more pressure is places on the companies, hence it has become important for the companies to perform their activities more environmental friendly. In order to account the environmental footprint for the stakeholder the company should define and calculate performance measurements within this area.

As discussed above, the performance measurements defined for Leptha have not emerged from Leptha's own vision and due to that they are kind of detached and are not connected to any steering model. By not having the performance measurements connected to any steering model makes it difficult for the managers and employees to understand the aim of the measurements and how they will affect the company. By using for example the steering model BSC the performance measurements will be connected to different perspectives and to the company vision. The BSC aims to help the company manage the business in a balanced way towards the vision. However, for Leptha to develop a BSC can be complicated since they then will have to take the performance measurements and fit them into the BSC four perspectives, which is the opposite way of the normal development when the performance measurements emerge from the vision. However, this can be solved by developing a BSC with six perspectives, instead of Kaplan & Norton (1996) four perspectives, representing the categories that the performance measurements are now divided in. By using a six perspective BSC a clear overview of the company is given, since it includes all parts of the company. The company is already divided into the six departments today and it would not be suitable to change it into four. Furthermore, the six perspectives are all included in Kaplan & Norton (1996) four perspectives model.

5.2 Extracting and reporting data

The reporting is an important part when introducing performance measurements within a company. Without a good reporting the calculated measurements will not be presented in a good way and that will affect the expected result. Depending on what ERP systems that are used by the company, it will affect how they can export the data from the systems. Leptha has, as already mentioned, two different systems and they need to make the reporting as efficient as possible with the resources they have. As mentioned earlier, the company is working with the ERP system Monitor for the inventory and production, with Visma SPCS for their financial reporting and with Visma Time for the time-reporting. All information related to inventory and

production will therefore be extracted from Monitor, all financial information will be extracted from Visma SPCS and all information about the work tasks and the working hours performed by the employees is extracted from Visma Time. To obtain information not included in the production or financial and time system, manual work is required, where data is registered in different templates. Data from Visma and Monitor is extracted into excel documents and calculated according to the formulas and templates shown above in section 4.1.

If companies use one common system they would reduce human errors and also reduce manual work required to compile the data from the various systems. It would also help to better analytical ability since all data is collected in the same place. When companies use one ERP system or connected systems it is also possible to start using Business Intelligence (BI). As mentioned earlier in the report, BI combines the data from the systems and companies are then able to make analytical analyses both for long and short term decisions. However, it is not possible to combine the two systems used at Leptha today and to change to another system would require a lot of resources both financially and working hours of the employees. As the company is relatively small there are not a large problem in the current situation with two different systems. It is easy to extract the data from the different systems and export it into an excel document and most of the measurements do not need major manual work. The company will however avoid producing measurements that require large amount of manual work as the costs to develop performance measurements can not be higher than the benefit obtained by producing them. By using a comprehensive system, it is easier to get an overall picture of how the business preforms and it is easier to obtain data. It also reduces the risk of human errors associated with manual tasks.

Another important aspect is when a company is a part of a large Group which consists of several different companies. The companies are all different parts of the Group and should therefore work towards the same goal and everyone needs to report to the same company in the end. Since Alfa is a large Group, much data is transferred between companies and requires that there are systems that can simplify this process. With a large amount of data that companies get, managers can easily control how the business preforms and hence make quick and more accurate decisions. The amount of data that can be handled by the companies have increased during the years and has been enabled with new technologies. The purpose with a large number of data is that companies are able to collect a lot of information and use it as an advantage for decision making. It is therefore possible to get a lot of information about how the company performs and what to do in different situations. However, companies are not able to handle too much information and it is important that companies sort what information that is essential for the business and not work with too much data that they are not capable to handle. Too much information can result in that the company may not obtain the information that is important for their particular business and it could therefore create difficulties for decision making. To prevent these difficulties the companies have to focus on their vision and strategies for selecting the data needed to reach their goals. Leptha is in the current state not involved in the overriding system and they have their two separate systems that they use. This means that the information from other companies within the Group do not affect Leptha.

As mentioned earlier in the report, it is important that the information provided by the performance measurements are reported to the receiver on time. Leptha reports most of the measurements in connection with the BRM and it is important that the company has completed the measurements on time as there are requirements to report these measurement from higher levels within the organization. By reporting their numbers on time the company can at an early stage identify changes in business activities. This means that the company quickly can reduce the cause of negative changes. It also provides larger probability that the company makes right decisions in situations.

In addition to the external reporting, the internal reporting within the company is equally important as the external. Some measurements will only be reported internally since this information is not that important higher up in the organization, while it is of great importance internal to get information in order to achieve other goals. By reporting the results to the employees, they get a better understanding on how the company is performing and what is needed to improve. Leptha has in the current situation an open culture within the whole company and provide a lot of information to their employees. Since the company is small it is easy to reach out to the employees and also to have regular meetings to report the results. When reporting, it is important that the results are shown clearly to the employees. If the results are not shown in a clear way, there is a risk of misunderstanding among the employees, which can affect the quality of decisions.

5.3 Implementation

In this part of the discussion, implementation of a project is presented followed by how an implementation of Balance scorecard is done.

5.3.1 Project and performance measurements implementation

For a project that results in a major change in an organization the implementation of the project is essential in order to succeed. If the implementation is conducted properly the change will become a part of the organization. If the opposite occurs and the implementation fails it can have major impact on the company in terms of for example costs. In order to conduct a successful implementation there are several tasks that need to be accomplished during the process. Despite that every implementation of a project is unique and that the surroundings will impact the changing process, some similarities have been identified. As a result of that the implementation has major impact on the business and its organization, several authors have addressed this topic and pointed out some specific steps to go through in order to conduct a successful implementation. Some authors give more specific and detailed information about how companies should implement new things while other authors address more general steps to conduct. When studying various theories and methods that present exact steps to conduct a successful implementation, the implementation team have to be a bit careful to directly apply this within an organization. The current situation at the company has to be studied as well as the impact of the surroundings and how they can affect the implementation. The theories and methods provided from research are useful, however to fit a company's current situation they might need some adjustments.

In section 3 above implementation strategies were presented, taking ideas from Kotter (1996), Sobek (2011), Umble, Haft & Umble (2003) and Beckhard & Pritchard (1992). They claim that an organization has to accomplish several steps in order to succeed with an implementation. The first step is to establish a sense of urgency that aims to initiate the implementation. If employees feel that a change is needed and understand how they will benefit from it, the change will be easier to conduct. It is not unusual that people that do not see any need for a change will refuse to work with it and therefore be a barrier for the changing process. However, those people can be convinced when they really understand the change and when make personal benefits. When implementing performance measurements in an organization that have not been used before, obstacles might arise. Ignorance and resistance of employees towards the measurements are results of a feeling of perceived irrelevance. This is often a result of lack of understanding about the objectives and the receiving benefits. For Leptha to succeed with their implementation of the performance measurements it is important that the employees are prepared that the calculating and the reporting of the performance measurements will impact their work. They have to understand why they should do this and also what they individually and as a team will benefit from it.

To create a feeling of urgency, understanding and commitment an implementation team with support from top management is essential. This team aims to guide the employees through the change and therefore good leadership is important. The team should include skilled personal but also represent different departments at the company. By including people from different areas in the company, different perspectives is taken into consideration which will make the implementation at the different departments smoother. To only include employees from one or few departments will make the other employees as bystanders and they might occur as barriers. To have the top management involved and committed to the change is essential in order to succeed. If managers do not understand the purpose of the change or does not want to be involved, the implementation will most likely fail. It will be difficult for the implementation team to change the organization if they do not have the commitment from the top managers. The managers should not only be a part of initiating the change, they should be a part of the whole transformation and therefore close communication is essential.

The performance measurements presented earlier in the report have been defined together with the CEO at Leptha and he is committed and understand the change that is needed. He also understands the importance of calculating the measurements and how they will impact the organization higher in the Group, which will contribute to a smoother implementation. However, some problems can arise, which are connected to that the managers at the different departments does not understand the importance of the measurements since they have not been a part of the development. If so they might have a negative impact on the employees at the different departments. However, the commitment might not be a large problem since the organization is flat and there are few employees.

Developing a vision and strategy should be done by the guiding team and the manager in order to guide the employees towards the common company goals. However, the employees will only strive towards the right direction if they understand the vision, why the communication of the vision has to be clear and understandable. The communication of the vision is then essential,

since by having a good vision about the implementation that only the implementing team and the manager understand will not help the organization in the changing process. It is essential that everyone in the organization has a common understanding about what direction to head for and what milestones to achieve during the way. If the communication is not done in an appropriate way, the company will end up with a fragmented organization striving towards goals they think are the right ones and the corporation towards the common vision will be problematic. When communicating the vision the employees should also feel as a part of the change and that the guiding team is there to support them, not to do all the needed work. Good leadership and behavior of the leaders and managers are therefore important. The vision can also help to coordinate different peoples' actions and merge them in order to be a part of the change. At a large organization a lot of people will be involved in the change and the vision will therefore help the whole organization to strive towards the common goal. To coordinate people in a smaller organization is easier, however if the climate at the company are not open, barrier can be faced. The organization at Leptha is both small and the culture open and therefore there would not be any major coordination problems during the implementation.

Having a guiding team and top management commitment do not mean that everything shall be accomplished by these people. For a change to emerge empowerment is essential. No change will come unless people feel a part of the project. The empowerment gives the employees a feeling of making a difference and gives them permission to act towards the goal. By empowering the employees they will be involved in the project which will result in better performance. Furthermore, when an employee has responsibility over a certain area the incentives for making a better result increase. In order to make the calculations of the performance measurements to work in an optimal way at Leptha, the amount of responsible employees shall be limited. The reason for this is that if there are too many involved in the same task no one will feel responsible, which can result in that the measurements are not calculated and reported.

Before empowerment is given, some kind of training might be necessary. If an employee does not feel comfortable in a certain situation due to lack of knowledge, performance or result will not be as planned. If right training is given to the employees there are higher possibilities that the expected result will be reached. Training is probably the most recognize critical success factor for an implementation since the employees need to have knowledge to solve problems and an understanding about how the new task will be performed. If no training is provided and if the managers assume that the employees will know what to do, the expected outcome might not be as desired. If the employees do not have any guidelines or expectations about how the task will be performed, the work will most probably be solved individually, which might not align with the expected result. In order to make right calculations, training must be provided for employees that do not have the knowledge about calculation of performance measurements. At Leptha empowerment shall be given to the employees to document data, extract data and perform some of the calculations. To give them responsibility for making this work, they will feel as a part of the new change. Since most of the employees at Leptha do not have an economical background a suitable introduction is important where the new task is presented.

When implementing the performance measurements in the organization a technical part has to be taken into consideration. In order to ease the implementation and the future work it is important that the content of the measurement system is sufficient and that it is user-friendly for all employees. To ease the work further, standardize instructions and templates can be given to the employees. By having standardized templates and a clear instruction the calculations will be performed in the same way every time regardless of who is doing them. Furthermore, standardization also facilitates continuous improvements.

Since an implementation can be a major project and proceed over a long time, short term wins on the way are important in order to encourage further work. To connect milestones with wins it encourages the employees to continue on with the change. With no wins on the way the trail can feel long and the final goal unattainable. To have some kind of reward when right goals have been achieved supports the employees to continue the work. However, only actions toward the goals shall be rewarded and the wins and rewards should not be inhibitory to the continuing work. The achievement should rather be an encouragement to continue with the changing process.

How successful an implementation will be is affected by how well the change is incorporated in the organization. The change has to be a part of the company and the new way of how things are done, it has to become a norm in the company. If the change is not becoming a part of the company it is not unusual that the employees deny the change and resume the old way of working. If so, all effort for making the change successful will be in vain. To make the change as a part of the organization all the earlier discussed steps are essential, the importance of having all employees committed to the change will be the most critical part and also the most challenging. In order to succeed with the implementation of the performance measurements at Leptha, the work needs to continue even after the first reporting. Moreover, if the tasks are performed less often it is not unusual that the employees forget how to perform the tasks and therefore ignore them. If the performance measurements are calculated in different time periods this might not be a problem since the work will continue on naturally. In the start-up phase the employees shall perform the calculations and frequently report them internally in order to learn and also to get routine to produce the measurements in a smooth manner. In this phase correction of errors can be done.

5.3.2 Implementation of a Balance scorecard

To develop a BSC contains several steps that have to be considered. The foundation of the BSC is the vision and it has to be defined in an understandable way in order to make the implementation as smooth as possible. If the vision is not well defined and understandable it will not guide the company as it should. In order to make the next step, developing the strategies successfully, the first step has to be accomplished in an excellent way. Useful strategies can not be developed without a clear vision. The following step is to break down the strategies into different objectives for different parts of the company. This is important since the goal then becomes more graspable for the employees and they feel more as a part of the project. When having individual goals for each department the goals become more personal and increase the incentives for achieving good results that is in line with the common objectives.

Step number four is to create a visualization of the strategy map that will help the stakeholders to easier understand the vision and the strategies. Visualization is a useful tool when creating a good overview of situations. When developing the performance measurements that is the fifth step, it is important to develop the measurements based on the vision, if not, the measurements will not consist of useful information for decision support. They also have to be understandable in order to increase the incentives for employees to perform the calculations. When developing performance measurements it is also useful to benchmark. However, even if there are similarities between companies, it is important to consider the own company situation in order to develop suitable performance measurements. In order to implement a BSC it is important that the employees feel responsibility for the change. To create responsibility the employees should feel as a parts of the process, otherwise the employees will feel as bystanders.

By using a user-friendly software the usage of the BSC becomes easier, which lowers the barrier for denial of use because of complicated task. The software tools also helps to minimize the manual work as well as providing new effective ways of working with the BSC. However, introducing new software will require training and support for the employees. Creating the BSC involves a lot of work and time and therefore the process has to be evaluated. If no evaluation is made about the vision the strategies and the performance measurements the company will not know if they are heading in the right direction.

6. Conclusion and Recommendations

To manage a company towards its vision, information from all part of the business is essential. The information aiming to support decisions has to be summarized in an adequate way and contain useful data from different perspectives of the business. This is especially important for larger organizations and groups where decisions taken in the mother company depends on what information that has been reported from the subsidiaries. In order to give the managers at the mother company a clear overview about how the company performs different performance measurements can be reported. Recommended is to use performance measurements that represent different perspectives of the business that are in line with the company vision. In order to know if the measurements represents all perspectives of the business a division can be made. For Leptha, six perspectives including different measurements is recommended.

All the defined performance measurements in the result section are relevant to measure for Leptha. However, more focus can be placed on some in the beginning and then be followed by the other ones. In market, sales leads, sales forecast and orders in hand are the most important. In production the measurements focusing on the own performance should be considered first followed by the ones measuring the suppliers performance. In the R&D category the development cost in relation to revenue is recommended to be measured initially. Furthermore, the release precision is also recommended to be measured initially since it has a major impact on other business activities. All measurements in the quality category are recommended to be measured since they are all focusing on how the company is perceived by their customers. In the finance category all measurements are recommended to be measured. For the HR category the absent days should be measured since it has an impact on company costs and projects. Furthermore, the labor turnover is recommended to be measured since losing employees can contribute to a major competence loss for the company. The company is recommended to develop performance measurements connected to sustainability as higher pressure is put on companies in terms of environmental sustainability. These measurements aim to indicate to the company how large their environmental footprint is and based on this, the company can determine suitable action to be taken. To make the business operations more environmental friendly can contribute to cost reductions and increase interest for investments by stockholders. Furthermore, to easier manage the company, Leptha is recommended to develop a BSC with six perspectives (see figure 8 below) representing the different departments within the company and covering essential parts. Since the definition of the performance measurements have been a top-down approach it is important that the company feel own responsibility, which can be facilitated by a BSC as well.

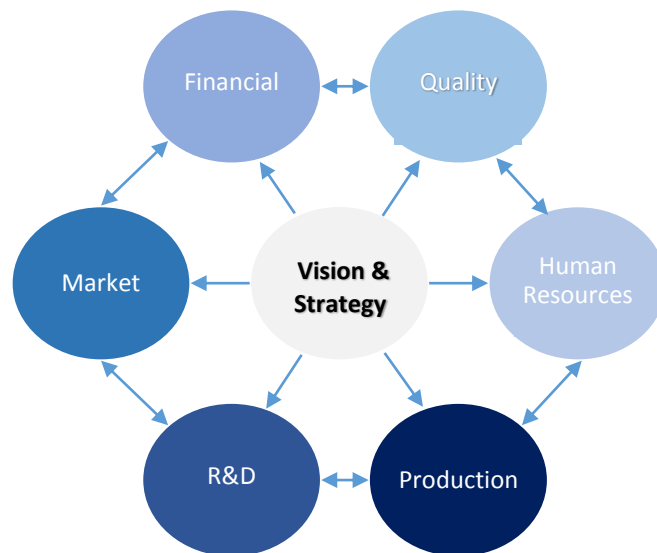


Figure 8. The Balanced Scorecard six perspectives

The majority of the data needed for the calculations of the performance measurements are provided in the ERP systems that the company uses. Since the company has two different systems that are not connected to each other, some manual work will be required to conduct the performance measurements. To make manual calculations are not any problem today since there are quite low quantity of data. However, the most optimal for the company in the long run is to exclusively use a comprehensive system that includes all business units within the company. Furthermore, the ERP systems used at Leptha is not the same as the other companies in the Group which also impact how the reporting is made. It is recommended for Leptha to use the same system as the other companies within the Alfa Group in order to reduce the manual work and enable easier sharing of data between the different companies. The templates and formulas that are appropriate to use when calculating the measurements are shown in the result section above.

In what time period that the measurements shall be reported is described in the result section above. For each measurement there will be an explanation about when and how the measurements will be reported. The reporting time differs between the measurements and depends on when they need to be reported further up in the organization. Some measurements can be reported directly while some measurements need some manual work before they are reported. The recommendation for Leptha is to start working with the recommended reporting intervals that is stated in the result section above and after a while evaluate if the intervals are appropriate or if they need to be changed. How Leptha shall report the measurements are usually at BRM but some are also reported direct by the ERP system.

To succeed with an implementation several steps have to be performed. If some steps are excluded in the implementation the change will probably not reach the expectations. Leptha is recommended to follow the eight steps when implementing the performance measurements. To begin with some performance measurements and then follow with the others are also

recommended since then the first ones are aiming to be short term wins. Furthermore, they are also recommended to follow the presented steps for conducting an implementation of a BSC. The company shall also consider if they want to implement the BSC at the same time as the performance measurements. The company is recommended to do the implementations at the same time since the company is already in a changing process and the subjects are connected.

6.1 Contributions and future research

A lot of research have been done earlier on this topic. However, this report can be seen as a contributor to theory since it addresses specific performance measurements for a small technology company just acquired and now included in a large Group. Moreover, the recommendation to develop a BSC with six perspectives based on different areas in a company, can contribute to that companies compile their performance measurements in a BSC. Furthermore, the implementation has been discussed based on what different authors advocates and recommends and then used in the perspective of implementing performance measurements and a BSC. The choice of method for this thesis, a case study combined with an action research are both widely used methodologies. However, the generalization of a case study has been questioned. With this study this can in somehow be contradicted since this study can be used for other companies facing similar problems. It is not unusual that companies recently acquired need some kind of performance reporting.

Since this study has aimed to define performance measurements and identify where data needed for calculations can be found, the implementation of the performance measurements at Leptha has not been focused on in this study. Therefore an interesting subject that is proposed as future research topic is to investigate how the implementation of the performance measurements have been done and if it has been successful. Another proposal is to investigate if the company is using the six perspective BSC as a steering model and if it has been successful.

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