UNIVERSITY OF GOTHENBURG
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SUSTAINABLE INTELLIGENCE

- A managerial approach to support sustainability through business intelligence

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ABSTRACT

Problem background: Despite a growing demand of transparency companies are struggling with moving the focus from financial to sustainable performance. To be successful in the long run organizations need to fulfill the sustainability of economic, ecologic and social dimensions all together. Countless existing corporate managers lack vital skills and tools to manage sustainability issues. Further, literature regarding the conjunction between sustainability and business intelligence is negligible. Therefore it is important to shed light on factors that can assist organizations combine sustainability and business intelligence.

Purpose: The main purpose of this study is to explore what managerial actions are necessary for the implementation of sustainability, in terms of the triple bottom-line, through business intelligence. Furthermore, previous research of implementation success factors is advanced in an attempt to contribute with managerial business practices for sustainability.

Overall research question: What is necessary, from a managerial perspective, for an organization to implement sustainability, in the context of the triple bottom line, through business intelligence?

Delimitations: In this thesis we emphasis with the managerial perspective since we lack technological skills needed to understand the business intelligence systems.

Methodology: The methodology used in this thesis is in line with a qualitative research method and an abductive approach. Henceforth, we have accomplished a case study on Schenker AB. The empirical findings derive from five interviews at Schenker AB and, in addition, one interview with an expert in the area of business intelligence, at Advectas AB.

Results and Conclusions: Sustainability is an important subject and much effort is focused on advancing sustainability practice. Moreover, managers and employees are striving for sustainability, and is thereby a great prerequisite for the implementation of sustainability through business intelligence. The communication and collaboration between business units is found vital for implementation success. This must include education and training in both sustainability and business intelligence. Further, finding a correlation between profitability and sustainability is a challenge, but in mastering the challenge the probability of top management commitment to sustainability through business intelligence will increase. Management control has to be based on one unison system, where information is displayed similarly to all users. In addition, the implementation process should be handled stepwise in order to move the entire organization in the same direction.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

The introduction will present the background of the thesis, which is the cause for problem discussion and purpose of this thesis. Moreover, the research questions and delimitations are set, and the chapter ends with the thesis structure.

1.1 BACKGROUND

Sustainability is a complex expression, which is interpreted in different ways. The expression is also utilized differently amongst corporations depending on strategies and goals. Over the last decade the concepts of sustainability have been among the most declared subjects globally (Dyllick & Hockerts, 2002; Glavic & Lukman, 2007; Petrini & Pozzebon, 2009). Accordingly, organizations are obliged to satisfy the present needs without compromising future needs. In today's globalized society, where social and economic inequalities are aggregating, and thereto environmental destruction, the significance of sustainability increases (Raynard & Forstarter, 2002).

Elkington (1997) describes sustainability through three integrated dimensions: economic, ecologic and social, also named the triple bottom-line. The economic dimension can be described as a company that constantly provides enough cash flow in order to guarantee the return demanded of the shareholders. Further the ecologic sustainability is characterized as using resources effectively and use less than what nature naturally can reproduce. Finally, when a company supplies their staff with enough information and resources and at the same time contributes to social profits, such as infrastructure and cultural engagement, social sustainability is accomplished (Dyllick & Hockerts, 2002; Elkington, 1997). These dimensions combined can help a company to achieve the strategies and goals in a sustainable manner.

A more sustainable-oriented approach has become an advantage on the global market due to the increasing pressure from various stakeholders (Miles & Covin, 2000). This pressure is explained by the growing demand of corporate transparency, such as corporate social responsibility statements and sustainability reports, forcing managers to not only consider increased sales, profits and decreased costs (Kolk, 2008; Zadek, 1999). Additionally, making allowances for sustainable development of the business itself and the surrounding context is crucial for success. Hence, numerous global companies have tried to incorporate sustainability into their business practices (Fiksel, 2006).

Regardless of the outburst of sustainable awareness, most enterprises have kept the sustainable ambitions apart from business strategy and performance valuation. Both business strategy and performance valuation tend to focus solely on economic indicators (Elkington 1997; Petrini & Pozzebon, 2009).

The history of decision support system originates from 1960's, once researchers began studying the use of technological tools in decision-making (Raymond, 1966; Ferguson & Jones, 1969). It was initially used as to collect data rather than utilize it for better decision-making (Bonczek, Holsapple & Whinston, 2014). Information system development has made it possible to automatize data collection, analyze gathered data and, thereby, gain competitive advantages (Johnston & Vital, 1988).

Technological advances have enabled intelligence to be more enclosing which has amplified the amount of data and the flow of information to be controlled (Gantz & Reinsel, 2011). Furthermore, the advances have contributed to a new complexity of business. In order to cope with the increasing data and the rapidly changing business environment many corporations have integrated different information technology systems into their daily business. Business intelligence has evolved during

the last decades and has become the main system for analyzing the collected data in those corporations (Gartner Research 2009).

According to Jourdan et al. (2008 pp. 121), Business intelligence could be defined as:

> "BI is "both a process and a product". The process is composed of methods that organizations use to develop useful information, or intelligence, that can help organizations survive and thrive in the global economy. The product is information that will allow organizations to predict the behavior of their "competitors, suppliers, customers, technologies, acquisitions, markets, products and services, and the general business environment" with a degree of certainty."

In other words, analyze the complex business environment with the objective to make better decisions. Research has confirmed that data driven decision-making is beneficial and companies utilizing business intelligence are performing superior than their competitors (Brynjolfsson, Hitt & Kim, 2011).

1.2 PROBLEM DISCUSSION

Despite a growing demand of transparency companies are struggling with moving the focus from financial to sustainable performance. A single-minded concentration on economic sustainability can only lead to short-term success, which is a problem in myopic companies (Dyllick & Hockerts, 2002; Merchant & Van der Stede, 2012). To be successful in the long run organizations need to fulfill the sustainability of economic, ecologic and social dimensions all together (Dyllick & Hockerts, 2002; Bansal, 2002). In consistence with the opinions of several CEOs regarding future development of sustainability, a necessary shift from shareholder value maximization to an understanding of how the corporation provide value for all existing and potential stakeholders is required (Lacy, Haines & Hayward, 2012). Hence, companies will have to detach from the economic perspective and further consider diverse effects on society and environment. According to Lacy, Haines & Hayward (2012), Hans Vestberg, CEO of LM Ericsson discourses the problem as:

> "We believe that it is not only a companies economic performance that determines its success, but rather successfully combining economic performance with active management of how the business impacts on social and environmental factors"

The knowledge regarding sustainability is absent in many corporations, which makes the process for sustainable development harder (Lacy, Cooper, Hayward & Neuberger, 2010). Education towards understanding the principles of sustainability is crucial for a successful sustainability business practice. Countless existing corporate managers lack vital skills and tools to manage sustainability issues (Lacy, Cooper, Hayward & Neuberger, 2010). Business intelligence might be an efficient tool to educate and manage sustainability practice.

The necessity for measuring and communicating the contribution of sustainability is an important step towards capturing the essential value of sustainability. Therefore it is interesting to investigate if the myopic behavior can be prevented with the support of "sustainable business intelligence". A challenge lies in including sustainability into the long-term goals and strategies (Lacy, Haines & Hayward, 2012; Yeoh & Koronios, 2010).

There is a substantial amount of literature about gathering and storing data and information concerning sustainable business, but less about how to implement and practice the data in business intelligence systems (Davenport & Harris, 2007; Farley, 1998). Consequently, literature regarding

the conjunction between sustainability and business intelligence is negligible (Petrini & Pozzebon, 2009). Therefore it is important to shed light on factors that can assist organizations combine sustainability and business intelligence. Furthermore, the rapid development of new technologies motivates research of business intelligence and sustainability to be repeated.

1.3 RESEARCH QUESTION

The problem discussion above leads to the following research question:

- *What is necessary, from a managerial perspective, for an organization to implement sustainability, in the context of the triple bottom line, through business intelligence?*

To support the overall research question, the following question will be answered:

- *Is business intelligence a tool for sustainability, and are there any benefits of combining the two?*

1.4 PURPOSE OF THE STUDY

Today's business climate is constantly changing and the need for timely and authentic business information is essential for organizations to succeed. However, little research has been conducted to discover how business information, in the context of business intelligence, can contribute to incorporate sustainability into business practice. The main purpose of this study is to explore what managerial actions are necessary for the implementation of sustainability, in terms of the triple bottom-line, through business intelligence. Furthermore, previous research of implementation success factors is advanced in an attempt to contribute with managerial business practices for sustainability.

1.5 DELIMITATIONS

Business Intelligence can be divided into two separate perspectives: managerial and technical. The managerial approach focuses on the methodology of working with information, communication and knowledge sharing. The technical approach focuses on the technological tools that support the process used to collect data and then integrate and analyze data. In this thesis we emphasis with the managerial perspective since we lack technological skills needed to understand the business intelligence systems. Due to this, the technical approach is not a part of the theoretical framework in this thesis.

Considering our aim of finding necessary factors for implementing sustainability into the core business intelligence system in a specific organization and limited time space, we only have the possibility to study one company.

Values contributed by implementing sustainability through business intelligence system are an important aspect in the investment process. Since measuring sustainability, per se, is difficult, calculating the value added is even harder. Therefore we have excluded this aspect from our thesis, but we are aware of its significance.

The triple bottom-line will not be divided into the three pillars in each individual chapter, as this thesis general conception is that triple bottom-line is perceived as "sustainability". To discourse each pillar individually would be too extensive.

We lack the knowledge of which systems are used to gather and analyze information concerning each pillar of the triple bottom-line. Consequently, this thesis will not include technical system solutions for sustainability implementation. It will not contain specific system appellations, but use business intelligence as an umbrella term for all of its components.

To further delimit the scope of the study, a deliberate choice was made to exclude to what extent the business intelligence system supports sustainability strategies and goals. We are aware that an inclusion would have enriched the arguments for business intelligence as a tool for sustainability.
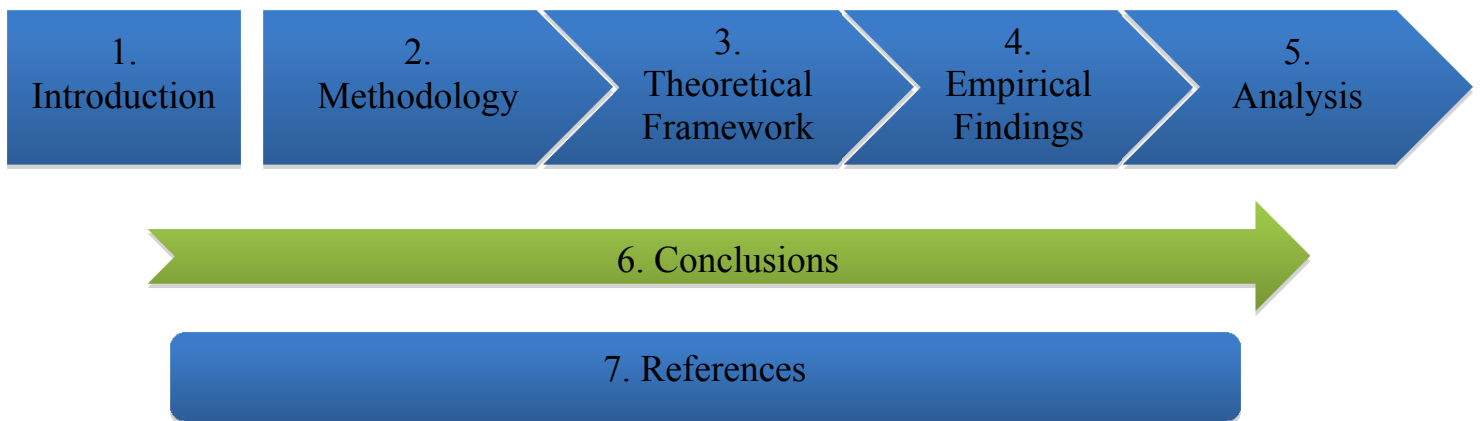
1.6 THESIS STRUCTURE

FIGURE 1-1. Thesis structure, own construction

2 METHODOLOGY

This chapter will describe the methodology applied to conduct the study. Firstly, the research approach and design is explained, and our justification for chosen methods. Secondly, data gathering techniques are presented and motivated. Thirdly, selection of case organization and respondents are displayed, and thereto the process of data treatment. Lastly, the credibility of this thesis is discussed in the context of validity and reliability.

2.1 RESEARCH APPROACH

The study is grounded on a descriptive view, which can be referred to research areas where there exists certain amount of knowledge since the investigation will describe an already studied area (Patel & Davidsson, 1994). The described area of research may consist of former or current patterns. While conducting a descriptive study, the researchers limit the extent of researched aspects. The result should be specified and thorough, and may contain descriptions of each aspect as well as relations between several aspects. A single research method is often used when considering descriptive studies (Patel & Davidsson, 1994).

This thesis conducts descriptive research to explore, explain and provide additional information about the studied object. We realize the lack of research on integrating sustainability through business intelligence and therefore we are trying to describe new patterns by filling in missing parts and expand the understanding within the area.

2.2 RESEARCH DESIGN

The following sections help the reader to evaluate the plausibility and generalization of the interpretations, made by the authors, of the upcoming result. These sections should describe central approaches used and how they will affect the result (Patel & Davidsson, 1994).

> "A research design is a logical plan for getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some set of conclusions (answers) about these questions. Between "here" and "there" may be found a number of major steps, including the collection and analysis of relevant data."
> (Yin, 2007)

2.2.1 CASE STUDY

A case study is a survey performed on a smaller finite group. Case studies are perceived from a holistic perspective and try to cover as much information as possible. They are satisfactory when the objective is to examine processes and changes (Patel & Davidsson, 1994).

Since our goal with the thesis is to capture an organizations ability to implement sustainability through business intelligence, the choice was made to conduct a case study. By interviewing several representatives, we can apprehend a holistic perspective of our research questions (Yin, 2007). A case study could also provide specific links and circumstances without creating general assumptions for other businesses.

2.2.2 ACADEMIC APPROACH

The material for theories is data and information about the studied reality, also called empirics. A problem emerges when researchers are about to relate theory to reality. The problem can be handled in three different ways: deductive, inductive and abductive. The deductive approach is defined as drawing conclusions assisted by general principles and existing theories about separate cases (Patel & Davidsson, 1994). This approach is inadequate in the way of making statements instead of explaining patterns and relationships. This might lead to meaningless conclusions and no further contribution to future research (Alvesson & Sköldberg, 2009).

In contrary, the inductive method is described by Patel and Davidsson (1994) as following the path of discovery, which means that the researcher can investigate the research object without having firmly established former theories. On the basis of the collected information and empirics the researcher can instead formulate a theory. The disadvantage with this method is the unawareness of the range of the theory because it is based on empiric material typical for a unique situation.

Abduction is an alternative to the mentioned methods above. Alvesson & Sköldberg (2009), explains that it is difficult to force all research into inductive or deductive methods. Hence, they describe abduction as a hybrid of deduction and induction. A single case is labeled from general patterns, which, if they were true, can justify the case. Furthermore, new observations should support the interpretation. An advantage with abduction, compared to induction and deduction, is that it includes understanding by concentrating on underlying patterns.

In our research we are trying to find solutions and understandings in the way of integrating sustainability into business intelligence. To be able to comprehend the descriptive orientation in this thesis it is crucial to combine empirical facts, in the shape of interviews, with previous theory in the literature. In contrast to deductive and inductive methods, which appear more one-sided and unrealistic, abduction is preferred in case studies (Alvesson & Sköldberg, 2009). To avoid an overly narrow research methodology, using abductive method is motivated.

2.2.3   RESEARCH METHOD
There exist two main types of research methods: qualitative and quantitative. The two methods are different in many aspects, for example the qualitative method is defined by the researchers' interpretations of the information. The quantitative method is applied when the researcher tries to organize, describe, process and analyze data (Patel & Davidsson, 1994). According to Patel & Davidsson (1994), the qualitative method is favored when there is a need for a deeper understanding of the subject. The ambition is to understand and analyze the completeness of an object. When the problem is to interpret and understand the respondents' experiences and find underlying patterns the qualitative approach is favored. It is also preferred when examining text material, for example when analyzing the result of interviews. It is also useful when processing books and articles. However, to process and analyze text material and interviews is very time-consuming which reduces the sample in this thesis.

Whereas the quantitative method requires measuring, rather than describing, a range of opinions, behaviors, appearances and technicalities it would not provide enough in depth information to support our research. To be able to understand the studied phenomenon it is fundamental to investigate the process where sustainability efforts are conducted and the employees' versions of the process and the business environment. Consequently, to fulfill the purpose of the study the qualitative method is applicable.

2.3   DATA GATHERING
For the purpose of capturing a managerial view on how to implement sustainability in to business intelligence system, it is appropriate to conduct interviews. The interviews were performed on different organizational units to seize multiple thoughts and opinions to answer the research questions. In addition an interview was conducted with an expert in the area of business intelligence. To be able to support the empirical findings a literature review has been executed.

2.3.1   PRIMARY DATA
Data that are collected for a specific research, using appropriate methods for an exclusive problem, is called primary data (Hox & Boeije, 2005). It is advantageous to collect primary data as the research design and data collection strategy can be structured to fit the research question, which will

make a valuable contribution to resolve the problem. However, collecting primary data is time-consuming.

2.3.1.1 *INTERVIEWS*

An interview can be described as an interaction between two individuals with different and unequal characters (Lantz, 1993). The interaction is based on voluntariness and the communication between the interviewer and the respondent is the object for analysis.

The questions asked in the interview can be conducted in numerous ways depending on the grade of structure. According to Lantz (1993), there are four varieties of interviews: open, addressed open, semi-structured and structured. An open interview consists of wide questions and contributes with diverse definitions of a studied phenomenon. On the contrary an interview can be structured and the considered questions are constructed in advance in order to obtain information about a defined phenomenon. Within the range of these extremities one can find open addressed and semi-structured interview.

An open addressed interview was accomplished in the outset of the study with an expert in the field of study whereas our knowledge was modest and the research is sparse. Starting the interview with a general query resulted in that the respondent focused, with the guidance of the interviewer, on the noteworthy topics (Lantz, 1993), and contributed valuable information for upcoming interviews. Accordingly, the remaining interviews became semi-structured since we had a deeper understanding to ask more relevant and specific questions. The semi-structured interview is based on predetermined questions and attendant questions and provides a combination between open and structured answers. The respondent reflects on the subject of interest (Lantz, 1993). Semi-structured interviews were used to control the outcome but simultaneously being flexible to perceive the respondents point of view. By doing this, data that relates to the topic of our thesis will be gathered.

2.3.2 SECONDARY DATA

Secondary data are data originally collected for a different purpose and reused for another research question (Hox & Boeije, 2005). These types of data are easy accessible, but could originally have been collected for a different purpose than the purpose of the actual research. Henceforth, complications can arise when trying to apply the gathered data to empirical findings.

Secondary data in this thesis consist of literature, articles and sources collected from the Internet. The purpose of the assembled data is to provide a theoretical framework and to create a foundation for better understanding of the researched area to be able to answer the profound research question.

During the process of gathering information several keywords has been used, such as "sustainability", "triple bottom-line", "business intelligence", "sustainability and business intelligence", "critical success factors for business intelligence", "sustainability and competitiveness", "management control", "structured data", "unstructured data" and "Big Data".

2.3.3 SELECTION OF CASE ORGANIZATION

Schenker AB has a strong connection to sustainability since it operates in a business setting where the environmental and social impact is substantial. Therefore it is vital to pursue an active business practice to achieve sustainability and thereto make sustainable decisions. The company is also a frequent user of business intelligence systems as an important part in the flow of information and decision-making, which makes it a suitable interview object. Additionally, the corporation has a connection with our university, University of Gothenburg: school of business, economics and law. This created a possibility to cooperate with proper interviewees to attain a valid outcome.

The same opportunity was given with the Volvo group. Nevertheless, Volvo group was considered cumbersome and the probability of capturing the range of sustainability proliferation within the organization was not the same. It was more suitable to investigate a minor company in order to acquire a holistic interpretation of the case organization and yield a greater validity. The choice of a minor company was also made due to the limited amount of time.

2.3.4 SELECTION OF INTERVIEWEES

To get a thorough understanding and acquire a complete picture of the studied object there is a need for accurate selection of interviewees (Holme & Solvang, 1997). The authors describe two aspects of importance when selecting respondents. Firstly, a wide range of respondents with disparate background is needed to apprehend a universal picture of the research object. Secondly, it is important that the respondents have a profound knowledge in the actual subject. It was chosen to conduct interviews with personnel on managerial levels, since we apply a managerial approach to business intelligence.

To obtain an apprehension of business intelligence we considered an interview with Thomas Svahn as essential. Thomas has developed business intelligence from a managerial approach since 2005. We believed that he would bring relevant information about how to conduct the future interviews at Schenker AB and contribute to a profounder knowledge of business intelligence.

We also had the opportunity to perform interviews at Schenker AB. In order to recognize how several subdivisions and functions understand sustainability and affect sustainability, we sought to conduct the interviews across functions at the corporation. The aspired effect is to create a better picture of how an organization, generally, can implement sustainability through business intelligence. On the other hand, if we singularly select one subdivision or function, the result of the case study could be one-sided and the level of diffusion could be disturbed. A case study within one function is superior when the focus is on profoundly discovering how that function is practicing sustainability.

The first target was to complete an interview with a managerial function since they outline goals, strategies and management control, and have influence in almost every decision made. Sustainability practice should be considered from managerial functions and through an interview we are able to investigate the focus on sustainability efforts.

Continuously, an interview with an auditor/accountant was considered as an advantage. Since auditors often interact with top-managers, they are a potential part of implementing sustainable strategies in the organization. The auditors' main target is financial matters as a supporter of sustainability. Thus, they have great knowledge about the enterprise and are efficient in compiling information to make better decisions.

Further, a person from the information technology function would be favorable as respondent, as he/she works closely with business intelligence and understands its functions and advantages. Additionally, they have an ability to modify the system according to the needs and demands in order to achieve sustainability. The information technology function has a crucial role to support sustainability proliferation through business intelligence and make the information and the system comprehensible and applicable in the organization. The interview will also contribute to our understanding of business intelligence systems.

Finally, an interview with an environmental manager should contribute to our research. The interview would give an insight in Schenker ABs' sustainability efforts and supply with reflections about implementing sustainability through business intelligence.

TABLE 2-1. Selection of Interviewees, own construction

Name	Title	Role	Corporation	Type of interview
Thomas Svahn	Chief Operating Officer	Business Intelligence expertise	Advectas AB	Adressed-open
Maria Magnusson	Manager for IT Development	Technological approach to Business Intelligence.	Schenker AB	Semi-structured
Anders Bükk	Chief Accountant	Office view of sustainability	Schenker AB	Semi-structured
Mikael Witthoff	Internal Auditor	Operational view of sustainability and Business Intelligence	Schenker Åkeri AB	Semi-structured
Inger Uhrdin	Head of Strategic Projects & Business Intelligence	Managerial approach to Business Intelligence	Schenker AB	Semi-structured
Monica Holm	Environmental coordinator	Corporate sustainability expertise	Schenker AB	Semi-structured

2.4 DATA TREATMENT

The primary and secondary data has been treated with respect to the interview respondents and cautiously evaluated to increase the credibility of the thesis. The secondary sources were critically reviewed and we prioritized gathering material from acknowledged journals.

A choice was made to tape all interviews because of the advantage of data treatment afterwards (Lantz, 1993). The downside with taping interview could result in respondent reticence and the process of analyzing the recordings is time-consuming. Since all respondents agreed to be taped, our opinion is that the interview material was not negatively affected. To attain as much information as possible, one person handled the interviews whilst the other person registered important reflections and conclusions.

Patel and Davidsson (1994), states that continuously analyzing collected material during the qualitative research is beneficial. This could lead to ideas of how to proceed and new angles of the problem could enrich the study. According to Patel & Davidsson (1994), it is helpful to initiate a session of analysis whilst the impressions of the interview are still fresh. That is why we immediately after the interviews briefly discussed and analyzed the results. When all the interviews were completed we transcribed the recordings in order to analyze them in full. Since our knowledge of the purpose of the interviews is wholesome, we were able to comprehend all necessary data from the interviews. As the purpose of the interview was not to capture the behavior of the respondents, we considered taping and noting as sufficient (Lantz, 1993).

During the analysis we listed keywords to each chapter in the thesis and constructed a summary of every interview. In the process of analysis, data that did not fulfill the purpose of the study was deleted. Afterwards, we compared the results to discover patterns and advance knowledge.
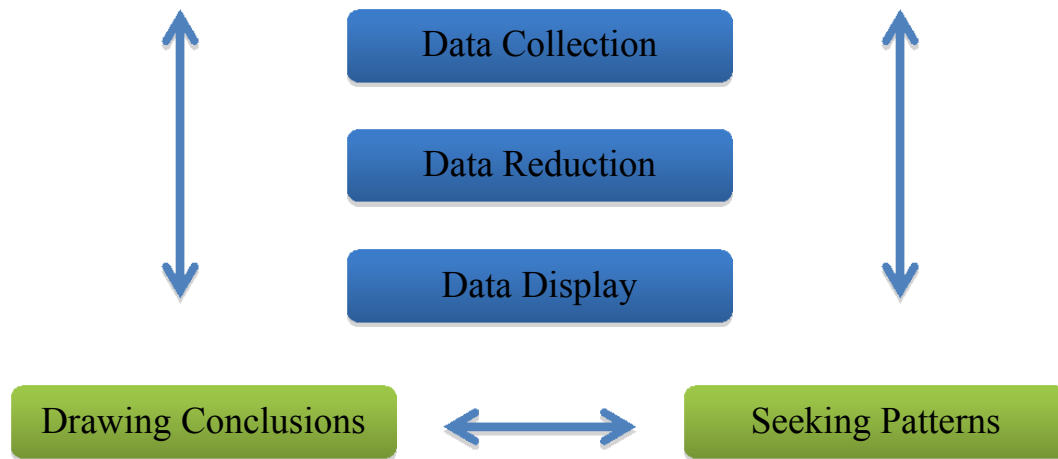
FIGURE 2-1. Data treatment, Modified after Lantz (1993)

2.5 CREDIBILITY

The intention of this thesis is to be objective, but simultaneously report the experienced picture of the studied objects. In a qualitative research, two components are exercised to measure the success of objectivity: validity and reliability (Kirk & Miller, 1986). Reliability and validity are not symmetrical. Reliability can be attained without validity, however, perfect validity would generate perfect reliability (Kirk & Miller, 1986). Thus, valid measures are always reliable, but reliable measures are not always valid.

2.5.1 VALIDITY

Validity is about the conformation between what is purposed to be investigated and what is actually investigated (Patel & Davidsson, 1994). Subsequently, it is about finding an instrument to measure the studied object and validate the instruments purpose for which it is being used, that is, measure what is to be measured.

Interviews covering general and specific questions were conducted in this thesis to obtain validity. As mentioned above, all interviews were taped to make it possible to analyze the empirics in its completeness. As a result, a comprehensive picture can be constructed and no realities of importance will be excluded. The interviews were thereto conducted with personnel from different business units within Schenker AB to reduce subjectivity, which broadened the empirical material and enhanced the validity. Moreover, the empirical results were sent to all interviewees before deadline to ensure that no misunderstandings had occurred.

To attain as high validity as possible, theories concerning interview methodology were used in planning the interviews and the appurtenant questions. A seminary regarding interviews was as well attended.

2.5.2 RELIABILITY

Reliability is concerning to what extent the utilized instrument can resist unexpected proceedings, in other words, to what degree the study is repeatable (Bryman & Bell, 2011).

The idea of taping the interviews is likewise a part of increasing the reliability, for it gives the possibility to repeat the recordings as many times as required in order to ensure that everything is correctly apprehended. An important aspect in interviews, to increase the reliability, is that the interviewer acts in such a way that the respondents understand what is expected of them (Patel & Davidsson, 1994). The semi-structured interviews allowed the respondents to reflect freely about the questions and the interviewers did not interrupt the respondents, but rather encouraged to further

thoughts. Accordingly, the reliability was improved due to honest and prudent answers. An example of an interview guide is enclosed in APPENDIX I so that related and further studies can be made.

During the interviews proposals of new conceivable interviewees were obtained, which was simplifying the respondent search process greatly. A selection of individuals within Schenker AB was advised for interview, and therefore it is important to reflect on the probability of biased respondents who perhaps would give a satisfactory perspective of the company. Interviewing respondents from different business areas was a deliberate choice to reduce a biased result and acquire comprehensiveness. Thereto, the interview questions varied depending on interviewee, since the different managers have dissimilar knowledge about sustainability and business intelligence.

However, our selection of interviewees is not blanket, and due to the restricted time schedule the impending conclusions might not join in if we had had other respondents (Holme & Solvang, 1997).

3 THEORETICAL FRAMEWORK

The theoretical framework will include theories about critical succes factors for implementation of business intelligence, and sustainability in terms of the triple bottom-line. The chapter succeeds with previous research in the area of combining sustainability and business intelligence, and thereto sustainability management and competitiveness.

3.1 SUSTAINABILITY

Currently, markets change rapidly and the strategies of the corporations are more challenging than it used to be (Wagner, 2004). Due to the increased amount of information, new measures for analyzing the constantly changing business climate are necessary. These measures should also concern sustainability efforts and relate them to corporate strategies (Bose, 2004). In this manner sustainability gets measured, but perhaps partially reflected in the economic transactions. It means that they are controlled in specific systems that are unrelated to the economic success of the organization. Consequently, the focus on sustainability measures is not similar to the economic performance measures (Bose, 2004).

Researchers have developed business cases suggesting that an economic approach can be integrated with social and environmental issues in a way that does not interfere with the firms' practice of maximizing shareholders value (León-Soriano, Jesús Muñoz-Torres & Chalmeta-Rosalen, 2010). Furthermore, by adopting this in a way that do not interfere with shareholder strategies, the corporation can make the sustainability strategies acceptable for all shareholders and therefore compensate the stakeholders (Bieker et al., 2001)

The benefits of sustainability within the corporation are numerous. From a strategic perspective, sustainability exertion could increase shareholder value simultaneously as meeting accountabilities to other stakeholders (Husted & de Jesús Salazar, 2006). Financial measures are not sufficient and there is a need for new measures. These new measures should capture the impact of sustainability, because what the corporation measure is the focused area and also the managed area. Consequently management should not singularly measure financial results (Husted & de Jesús Salazar, 2006).

In an article by Lacy, Haines & Hayward (2012), of 766 interviewed CEOs, conclusions considering sustainability was made including a clear perception that the CEOs considered sustainability crucial for future business success and competitive advantage. Due to the increased sustainability issues, consumers addresses more attention to the subject, thus, it is important to satisfy new sustainability demands. They also stated that attention to the sustainability issues will increase in the following five to ten years and that the consumers are the most important stakeholder in order to drive the sustainability management. Further there is a need for implementing sustainability into the core business practice. The authors claims that implementation across functions is the biggest hurdle in incorporating sustainability practice within the organization.

Another essential aspect to consider is the personnel. In order to implement sustainability the organizations need to educate and develop future managers. Today's managers are not prepared with enough tools and skills (Lacy, Haines & Hayward, 2012)

3.1.1 TRIPLE BOTTOM-LINE

Corporate sustainability can be achieved when the requests of corporations' direct and indirect stakeholders, such as employees, shareholders, clients and government, are fulfilled without compromising for the requests of possible future stakeholders (Global Reporting Initiative, 2013). To accomplish this, corporations have to maintain and increase their long-term economic, social and ecologic investments (Dyllick & Hockerts 2002). The definition of sustainability can be divided

into three key elements: Economic-, social- and ecologic sustainability (Elkington, 1997; Hubbard, 2009; Brown, Dillard & Marshall, 2006; Global Reporting Initiative, 2013).

According to Dyllick & Hockerts (2002); Hubbard (2009), social sustainability refers to human capital, such as skills, motivation, and loyalty of the employees. The corporation has to supply their staff with information and resources for being able to work according to the organizations strategies and goals. Additionally, social profits, for example good education systems, cultural engagement and infrastructure, are important to achieve social sustainability. Accordingly the mission is to strive for stakeholders' comprehension of the organizations purpose and motive.

Further, the economic sustainability means that the organization constantly generates enough cash flow in order to guarantee the return demanded of the shareholders (Dyllick & Hockerts 2002; Hubbard, 2009; Global Reporting Initiative, 2013). Lastly, ecologic sustainability is reached when corporations use their resources effectively and uses less than what nature naturally can reproduce, alternatively finding sustainable substitutes (Dyllick & Hockerts 2002; Hubbard, 2009; Global Reporting Initiative, 2013).

3.2 BUSINESS INTELLIGENCE

The term "Business Intelligence" has been viciously explicated by previous researchers and there are numerous definitions of this wide expression. Lawton (2006), describes business intelligence as a tool for "letting companies gather, store, access, and analyze huge amounts of data so that they can make better decisions regarding customers, suppliers, employees, logistics, and infrastructure". Shariat & Hightower (2007), are explaining the term, on the basis of a Gartner group's definition, as "a set of business information processes for collecting and analyzing enterprise (business) information, the technology used in these processes, and the information (knowledge) obtained from these processes. BI is frequently referred to as an umbrella term that brings together almost all of the data disciplines of an organization".

| Data | Informatio n | Knowledge | Correct Decisions |

Structured and unstructured data in the organizations different systems…

transformed and developed to usefull information for analysis…

that forms ground for future decisions…

that moves the company in a favorable direction.
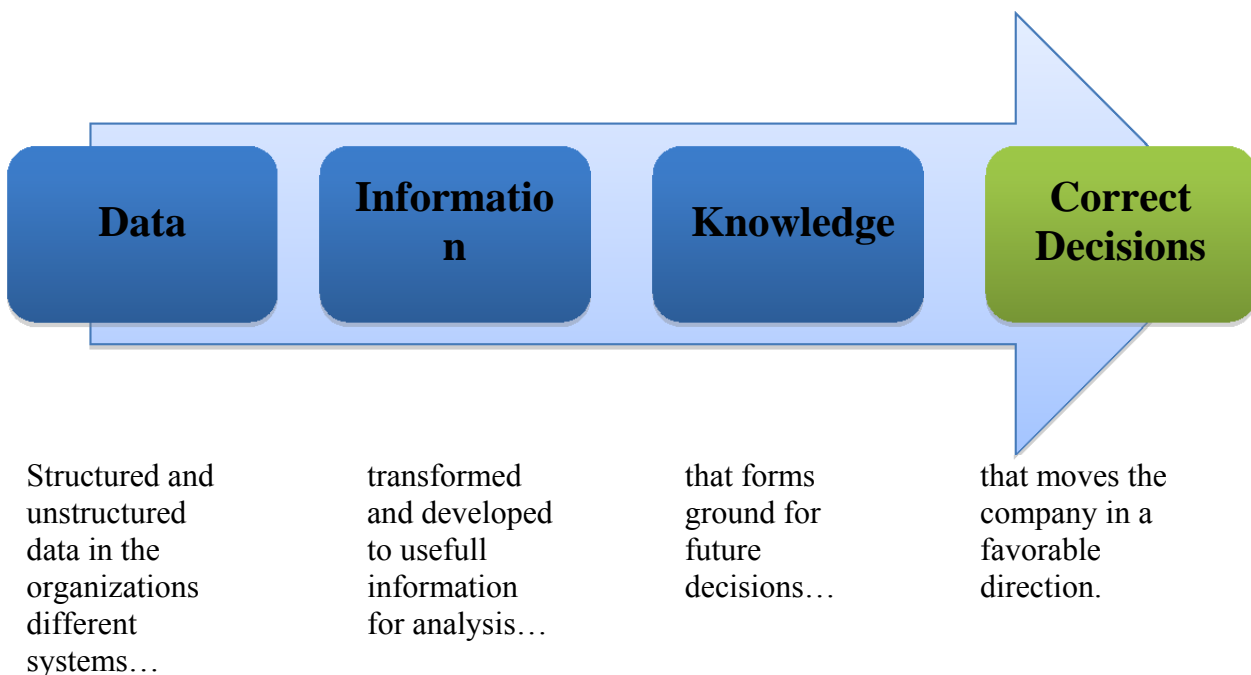
FIGURE 3-1. Business Intelligence. (Thomas Svahn 2014)

Business Intelligence can be handled from two separate perspectives: managerial and technical (Olszak & Ziemba, 2012). The managerial approach focuses on the methodology of working with information, communication and knowledge sharing. The technical approach focuses on the technological tools that support the process used to collect data and then integrate and analyze data. This study has a managerial approach and therefore strives to apprehend the purpose of business intelligence as useful managerial intelligence to make better decisions (Lönnqvist & Pirttimäki, 2006). From a managerial perspective, business intelligence is seen as a timely, qualitative and easy instrument for understanding business information, and should provide knowledge of the capabilities of the firm and competitive advantages (Negash, 2004; Ranjan, 2009).

3.2.1 BENEFITS WITH BUSINESS INTELLIGENCE

Information is a highly valued resource within a company, and having the ability to collect and analyze information to make better decisions through business intelligence can lead to business success (Shollo & Kautz, 2010; Ranjan, 2009).

Business intelligence is becoming a necessity in many corporations, and to achieve a successful adoption to a new system it is vital to identify and comprehend the benefits provided (Moss & Atre, 2003; Petrini & Pozzebon, 2009; Williams & Williams, 2007).

Ranjan (2009); Moss & Atre (2003); Davenport (2006), defines clear benefits with business intelligence, for example:

- Finding profitable customers and understanding their actions to predict future behavior thereto minimize customer dissatisfaction and increase recurrence.

- Increase revenues through faster identification of new markets, opportunities and customers.

- Increase profit through better targeted promotions, identification of poorly performing products and internal inefficiencies.

- Increase reputation through better and faster stakeholder and shareholder communication and service

- Predict competitor behavior to be advantageous on the market.

A well investigated and legitimated investment or project could, against all odds, go wrong and entail losses. With the support of business intelligence an organization would be able to understand the outcome and transmit knowledge to benefit in future decision processes (Borking et al., 2011). To understand and make use of these benefits will help organizations with the implementation of a new system and enforce the sustainability intentions within the corporations.

3.2.2 CRITICAL SUCCESS FACTORS

In order to find the essence of implementing sustainability through business intelligence it is important to study what makes an implementation successful in an organization. This study applies equivalent grounds for implementing sustainability in business intelligence as for implementing business intelligence in an organization. A literature review shows that there are many attempts to define critical success factors for different industries. It is difficult to frame general success factors pertinent in all industries, nonetheless, Rockart (1979) made a worthy definition when explaining areas where particular attention should be drawn to in business to become fruitful. The author outlines critical success factors, as "the limited number of areas in which, if they are satisfactory, will ensure successful competitive performance for the organization".

3.2.3   CRITICAL SUCCESS FACTORS FOR BUSINESS INTELLIGENCE

A business intelligence implementation can be viewed as an ongoing process, an organic cycle where questions are of iterative nature, and will be successful if business users are regularly modifying and optimizing the system (Olszak & Ziemba, 2007). The implementation is a sophisticated commission requiring resources and technology that satisfy the specific business case (Moss & Atre, 2003). Furthermore, to preserve organizational commitment to the new system, or decision base; as for example sustainability, a substantiated business case must be established (Yeoh & Koronios, 2010). With the continuous change of today's business environment it is becoming essential to have a flexible system that monitor the business status and forecasts strategic movements in relation to the objectives of the corporation (Ranjan, 2008).

From a managerial perspective there are a number of elements discussed in the literature originating from the prerequisites mention above. Zutshi & Sohal (2004) proclaims that top management commitment is vital for implementation realization. Several researchers support the importance of top management obligation – Chandrashekar, Dougless and Avery, (1999); Yeoh & Koronios, (2010); Knights & McCabe, (1996); Poon & Wagner, (2001); Daily & Huang, (2001); Hawking & Sellitto, (2010); Borking et al, (2011). The authors describe aspects of positive impact that the company can have on the implementation of a new system, or decision base; in this study sustainability. Briefly those aspects are:

- Generate motivation and provide guidance to all employees

- Designating a champion/leader/manager for supervising the implementation and the progress of the declared objectives.

- Helping the concerned parties in the implementation to assess realistic and achievable objectives

- Assigning time for learning, training, communication and motivation during the implementation

- Providing sufficient resources in right time for all implementation stages.

The following sections will further present those elements.

3.2.3.1   CHAMPIONSHIP

Championship means having executive and operational sponsors that are acquainted with the system and have the understanding to manage the implementation (Poon & Wagner, 2001). A champion should have an overall knowledge of the implementation process, including communication, managing and information technology skills, acknowledgement from the top management and be able to handle a range of responsibilities (Zutshi & Sohal, 2004). Besides, the champion should have knowledge of the organizations operations to make decisions regarding the implementation, and the authority required. Champions are expected to be closely tied to the process so that they can assist on organizational level, but as well on separate project levels.

Chenoweth, Corral & Demirkan (2006); Howell & Higgins (1990), labels the importance of a supportive leader for implementation success. If users are restrictive and uncooperative, additional training and motivation is needed to change their attitudes. In the opposite situation, when management is unsupportive and the users are supportive, Chenoweth, Corral & Demirkan (2006) found that there still is a chance for implementation success if users are determined that the implementation will bring value and manage to convince the management.

There has been research suggesting that championship, in the context of a champion, is not compulsory for implementation success (Wixom & Watson, 2001). The authors found that the implementation of data warehousing required a broader engagement because of the magnitude of the process, thus one champion is insufficient to handle all the support needed. Furthermore, they enlighten, on similar grounds, the improbability of bottom-up support and influence for acceptance of the system, and the significance of taking into consideration that diverse implementations requires differing amount of resources and commitment.

3.2.3.2 COMMUNICATION AND CULTURE

In every organization some sort of culture is prominent and the flexibility and willingness to change differs between organizations and individuals (Alvesson & Svenningsson, 2008; Merchant & Van der Stede, 2012). The ability to involve the whole corporation in the introduction of the new system can lead to better communication and acceptance of the system (Russo & Fouts, 1997; Zutshi & Sohal, 2004; Alvesson & Svenningsson, 2008). According to Nohria & Beer (2000), communication should be conducted from top management, but concurrently engage bottom-up communication.

Culture change takes time but it is an important stage in the implementation (Yeo, 2002; Zutshi & Sohal, 2004). Poon & Wagner (2001); Yeo (2002), states that the corporate culture change can be a failure case when there is reluctance and incomprehension to the new system. In addition Alvesson & Svenningsson (2008); ascertained, through a case study at a global high-tech company, that if managers lack motivation, interest and legitimate knowledge in the change process, personnel would not be able to understand the purpose of the change. Consequently, the change process will have negligible effect and rather cause misunderstandings, frustration and resistance (Kotter, 1995; Simons, 2013). To avoid these outcomes, the organization needs to communicate a mutual view of the implementation process, but also the intended strategies and goals (Alvesson & Svenningsson, 2008).

Communication is a profound necessity in the introduction of a new system or decision base (Cline, 2000). It is crucial to provide information to internal and external stakeholders, to create a forum for discussion, and spread the awareness and knowledge about the system implementation throughout the company to avoid as much resistance as possible (Gilbert & Cordey-Hayes, 1996; Wixom & Watson, 2001; Zutshi & Sohal, 2004). This will have beneficial consequences on the entire process and on the future efforts with the system (Yeoh & Koronios, 2010; Chandrashekar, Dougless & Avery, 1999).

To evade implementation failure, cultural clashes, resistance and antagonism a main issue is to educate all concerned members in the system and the expected benefits with it (Knights and McCabe, 1996; Poon and Wagner, 2001; Yeoh & Koronios, 2010; Merchant & Van der Stede, 2012). Education is essential for understanding the strategies and goals, in the perspective of knowing why we are doing something, of the company. The lack of education is often a primary reason to adoption failure within corporations (Lacy, Haines & Hayward, 2012). Once again the degree of participation in the developing process and the implementation is a vital factor, which can be managed through learning and training (Soo Wee & Quazi, 2005; Yeoh & Koronios, 2010; Heller, 1998; Daily & Huang, 2001; Alvesson & Svenningsson, 2008). Education can provide the personnel with valuable information concerning what actions or results are expected and how to fulfil the task in the best possible way. Training and learning could also motivate personnel to perform better, as they understand the purpose of the task (Merchant & Van der Stede, 2012). Creating an understanding for the business and its impact on the sustainability factors, an implementation will most likely be successful (Sun, Kee Hui, Tam, & Frick, 2000).

An iterative system adoption process is favourable, which means implementing in several manageable steps (Borking et al, 2011; Yeoh & Koronios, 2010; Simons, 2013). An organization has to address attention to what is important and manageable at the moment, since the opportunities are endless but resources are restricted (Simons, 2013). Implementing the entire system in one step can create frustration among users for the reason that the workload could become too heavy and the understanding for the system deficient. Moreover, Nohria & Beer (2000) adds the fact that a company must combine system implementation with corporate culture and make the process flexible to allow for spontaneity.

3.2.3.3 RESOURCES

The resource disposal, such as people, technological, and financial, is important. An abundance of financial resources can provide both people and technological resources (Poon & Wagner, 2001). People could be understood as knowledge, motivation and quantity, whilst technological could be expressed as advanced information technology systems and amount of understandable data. Financial resources are commonly explicated as money. Though, having sufficient resources is not adequate, the resources must be delivered timely and allocated correctly for implementation success (Yeo, 2002; Nah & Delgado, 2006; Wixom & Watson, 2001; Moss & Atre, 2003).

3.2.3.4 LINK TO BUSINESS OBJECTIVE

There should be a clear link between the system and the business objective; the system should provide benefits not achievable in other ways (Yeoh & Koronios, 2010). Moreover, to convince users of the benefits and the advantages with the system, or decision base, a clear vision and a well-established business case is needed. These fundamental features help the organization to link the system to business objectives and generate a greater commitment to the implementation and the understanding of forthcoming procedures (Poon & Wagner, 2001; Yeo, 2002; Ranjan, 2008).

According to Yeoh & Koronios (2010); Davenport & Harris (2007), an implementation should be business driven with support from information technology staff and experts within the technical areas. Their research found that business-related problems often were directed to information technology department despite the concrete business-relation. Several researchers stress the significance of the managerial/business approach to system implementation to achieve a system that will be integrated with corporate strategies and goals (Yeoh & Koronios, 2010; Poon & Wagner, 2001; Yeo, 2002; Mukherjee & D'Souza, 2003; Moss & Atre, 2003).

3.2.4 STRUCTURED AND UNSTRUCTURED DATA

In the literature there are two dimensions of data: the source of data and the type of data. The sources of data can be divided into internally integrated and externally integrated (Negash, 2004; Blumberg & Atre 2003; Baars & Kemper 2008). The first is gathered inside the corporation and the second includes information about the external environment of the company. The two types of data are called structured and unstructured data (Negash, 2004; Blumberg & Atre 2003).

Structured data is recognized when it exist in in a record or a file and can be analyzed with computing equipment (Baars & Kemper, 2008; Lim et al 2012). The data that is being used in business intelligence systems are often internally gathered and consists of structured data (Lönnqvist & Pirttimäki, 2006; Lim et al, 2012; Blumberg & Atre, 2003). It is accumulated transactions data that already been made within the corporation (Yermish et al. 2010). As a result the reports are based on what the company has been done in the past or what they are currently practicing (Minelli, Chambers & Dhiraj, 2013; Shim et al. 2002). However, since the strategic information often lies outside corporations' boundaries, collection and consideration of solitary structured data is not enough (Negash 2004; Baars & Kemper 2008).

Therefore there is a need for collection of a second form of data, called unstructured data. It may consist of multimedia-, internet-, mobile- and text-based data that the corporation is not in control of (Minelli, Chambers and Dhiraj, 2013; Lim et al, 2012; Shollo & Kautz 2010). Through this type of data managers can base their decisions on strategic information that tells them something about the surrounding business environment that they do not control (Negash. 2004). The potential of business intelligence systems has therefore increased. Accordingly the decision can incorporate strategies on future matters (Minelli, Chambers & Dhiraj, 2013). According to Blumberg & Atre (2003); Negash (2004), it is essential to combine structured and unstructured data to deliver accurate information to the users due to the fact that these are equally important for crafting decisions. A future challenge lies in analyzing and structuring unstructured data, which are time-consuming, difficult and demands skillful analysts as well as advanced information technology systems (Harbison & Ryan, 2009).

3.2.5 BIG DATA

The trend of global corporations have formed the present and the past business intelligence research progress. International travelling, faster Internet connection, global production networks and the ability of outsourcing have created possibilities for large information technology improvement (Friedman, 2005). This development has led to highly detailed and contextualized information that is, if analyzed, valuable for organization decision-making (Chen et al. 2012). Moreover, the developed information technology systems have contributed to the possibility of capturing the growing information stream and facilitate data analyzing, which helps the organizations perform better decisions (Chen et al. 2012). Today, as we gather substantially much more web-based, mobile and sensor-generated data, companies can support their business decisions based on more detailed, contextualized and relevant information (The economist 2010a; The economist 2010b).

Recently, organizations have become more interested in the advantages of Big Data (Office of Science and Technology policy, 2012). Big Data can be considered as a huge amount of unstructured data that has the need for real-time analysis (Chen, Mao & Liu, 2014). Big Data can have three characteristics: velocity, variety and volume (Laney, 2001; McAfee & Brynjolfsson, 2012). Velocity refers to the timeliness of Big Data, data collection and the analyze process, which must be rapid and appropriate. Variety is described as different types of data that includes semi structured and unstructured data, for example: multimedia-, internet-, mobile- and text based data but also include structured data. Lastly, volume labels the increased information that can be derived from transactions with the support of developed information collecting systems (Laney, 2001; McAfee & Brynjolfsson, 2012).

Further, analysis of Big Data contributes to opportunities for noticing and comprehends new values. According to McAfee & Brynjolfsson (2012), Big Data enables companies to "decide on the basis of evidence rather than intuition". It also brings challenges, such as how to organize and manage these large amounts of data and information flow. The exponential increase of data volume will create huge possibilities for Big Data analysis and yield better business-decisions (Chen, Mao & Liu, 2014).

Over the last decades there has been a lot of research concerning structured data (Agrawal, Bernstein, Bertino, Davidson, Dayal, Franklin, et al 2011). Nowadays management relies on structured data that can be used in business intelligence systems (Minelli, Chambers & Dhiraj, 2013; Chaudhuri, Dayal & Narasayya, 2011). In order to capture the valuable information in the unstructured data, the usage of Big Data analysis is crucial. If Big Data is utilized efficiently and with quality, it will lead to an increase of knowledge within organizations, productivity and competitiveness (Manyika, McKinsey Global Institute, Chui, Brown, Bughin, Dobbs, Roxburgh & Byers, 2011).

3.3 BUSINESS INTELLIGENCE AND SUSTAINABILITY

3.3.1 BUSINESS INTELLIGENCE AS A TOOL FOR SUSTAINABILITY

Petrini & Pozzebon (2009) explains that a complete integration of business intelligence in corporate management systems is not common in organizations today, consequently, sustainability assimilation in business intelligence is rare. The authors confirm that sustainability has acquired greater attention in corporate management, but the absence of more refined informational support is a problem that has to be considered in the future. Moreover, their research indicates that business intelligence systems could be an adequate instrument for sustainability communication and proliferation. Melville (2010) describes the usage of an information system as a way of "enabling new practices and processes in support of belief formation, action formation, and outcome assessment". The author reflects on the benefits with information systems and the systems capabilities of making a valuable contribution to integrating sustainability in corporate management and business practices. When linking sustainability, stakeholder and shareholder value complications can emerge since there still is a lack of sustainability initiatives in many corporations due to poor understanding of sustainability benefits and competitiveness (Schaltegger & Synnestvedt, 2002). Sustainability investment priorities are deliberated as a critical factor for management to consider remaining a competitive corporation, and there are several ways to integrate sustainability matters into the existing system (Henri & Journeault, 2010). For example, integration could befall by developing sustainability performance indicators and to continuously practice them in decision situations, external communication and internal motivation. Additionally, linking business objectives to sustainability and including sustainability expenses in the budget etcetera.

The incorporation of sustainability into business practice is still an issue for companies (Figge et al., 2002). Corporations lack the knowledge to properly measure the benefits and drawbacks with sustainability (Briassoulis, 2001). They do not address the issues in a systematic way and lack tools to support sustainability in the operative business practice (Briassoulis, 2001).

3.3.2 SUSTAINABILITY MANAGEMENT AND COMPETITIVENESS

The awareness of sustainability commitment is increasing among organizations and society at large (Christmann, 2000; Schaltegger & Synnestvedt, 2002; Wagner, 2005). From a management control perspective, Simons (2013) describes four different variables of business strategy, named four levers of control. Firstly, the "beliefs systems" is outlined as communicating core values and mission. Secondly the "boundary systems" is described as specifying and enforcing limitations. Thirdly, the "diagnostic control systems" is intended to construct, monitor and support targets. Fourthly, the "interactive control systems" is characterized by promoting communication, learning and exploration. Subsequently, these four levers of control could be used when implementing a new business strategy, for example sustainability. Moreover, Merchant & Van der Stede (2012), labels two different competitive strategies; low-cost or differentiation. The low-cost strategy implies that corporations are trying to reduce costs, create economies of scale through vast volumes and standardization. A differentiation strategy involves refinement of the products or services to be perceived as unique.

However, from a daily business perspective there is an issue in combining sustainability and profit and to remain competitive (Schaltegger & Synnestvedt, 2002). Researchers argue that sustainability investments should be considered as typical business issues and the focus should not lie on whether sustainability investments are profitable or not, the question is in which particular situations it pays to be sustainable (Reinhardt, 1998).

The main objective with sustainability is to contribute to the wider societal well (Matten & Moon, 2008). When organizations base decisions on sustainability they should consider three aspects: environmental integrity, social equity and economic sustainability (Bansal 2005). Further Kuosmanen & Kuosmanen (2009), states, with the support of investment calculation of sustainability value, that sustainability is a key to success in both private and public corporations. Additionally, Kiewiet & Vos (2007) clarifies that sustainability both reduces business risk and increases market opportunities, but is also an overall responsibility for corporations. In contrast, Barnett (2007) aligns that researchers are still struggling to find the relationship between investment in sustainability initiatives and the return, in economic measures, of that investment.

According to Werbach (2009), corporations tend to disconnect sustainability from economic measures. Consequently, the organization manages sustainability matters away from their core business. However, studies that have described the correlation between economic performance and corporate sustainability have shown that some market leaders have been successful in incorporating these two in their objectives and strategies (Werbach, 2009). By relating sustainability with the objectives and strategies, corporations can gain competitive advantages (Crittenden et al. 2011; Grecu & Nate 2014). Further, Crittenden et al. (2011) claims that a corporation needs to inform all stakeholders about the advantages of sustainability, and thereby create motives to purchase the corporations sustainability developed products or services. Thus competitive advantages could be accomplished.

Grecu & Nate (2014) adds the following advantages of sustainability practices.

- Cost saving due to cleaner production methods and innovations

- Lower health and safety costs

- Lower labour costs and innovative solutions due to good working conditions contributes to motivation and less disputes and unsatisfactory.

- Improve company reputation.

- Market advantage, it may contribute to better relationships with customers and adds something special to the selling product.

- Ethical investors. It may advance the relationships with new investors.

4 EMPIRICAL FINDINGS

This chapter will present the empirical findings during the interviews. The chapter setup will be based on the theoretical framework and will treat the respondents' thoughts about sustainability implementation through business intelligence.

4.1 SUSTAINABILITY

The interviews were conducted with personnel from different positions within Schenker AB and an external expert in business intelligence, and the comprehension of sustainability varied. One respondent described that his sustainability collaboration with the University of Gothenburg enhanced his understanding of the subject through this interaction. A few interviewees ascertained that a solid societal change is critical for advanced sustainability efforts. This should involve laws and regulations promoting sustainability development. In addition, the consumer behavior must change to demand sustainability in order to force the companies to concentrate on all three pillars of the triple bottom-line equally. Thomas Svahn would recognize the stakeholders, such as government, investors, customers and consumers, as the most important enforcer of sustainability. If stakeholders change their behavior and demands, corporations have to adapt to the changes to survive.

4.1.1 TRIPLE BOTTOM-LINE

Anders Bükk and Maria Magnusson describe ecological sustainability as the corporate impact on environment in the form of pollution and environmental destruction. Moreover, Anders Bükk consider sustainability as,

> "Sustainability refers to creating profit without affecting the environment negatively"

Monica Holm further adds the socio-ethic perspective, and explains that a sound economic growth is as well important to reach sustainability and the three pillars of the triple bottom-line. Thomas Svahn, who collaborates with the University of Gothenburg, gave a broad explanation. He is thanking the network with the school for his understanding of sustainability and defines sustainability in alignment with the triple bottom-line. Likewise, a complete triple bottom-line definition was given by Mikael Witthoff, who further drilled down in the three perspectives of the triple bottom-line with operational examples. Inger Uhrdin underlined the definition of sustainability as accomplishing the objectives with long-term focus and transparency. Further she explains that ensuring long-term profitability whilst creating social benefits and attractive working conditions is a success factor for corporate sustainability.

4.2 SUSTAINABLE BUSINESS INTELLIGENCE

Schenker AB has a well-established business intelligence system with numerous users. According to Maria Magnusson, this is one reason for the decent understanding of the system among the personnel. The system is a part of the decision-making process and supports with corporate performance improvements. The system assists in displaying economic indicators, communication with customers and suppliers, and to compare former performances in order to make better decisions. A current project is regarding salesmanagement, whose objective is to chart possible and profitable customers and understand their purchasing behavior.

Schenker AB business intelligence system derives from its haulage company, where a first system was constructed. The current CEO of Schenker AB realized the need for business intelligence progress and engaged a business intelligence manager to push the development forward. Through this employment, Schenker AB has been able to create a speaking partner from the business side to the system administrators.

Some respondents believed that business intelligence could be a valuable instrument in the implementation of sustainability. Several aspects are to be considered since business intelligence covers a wide field of application and has an extensive range of potential users. To drain all benefits of the system to achieve sustainability, information has to be analyzed and interpreted in relevant performance measurements. Some respondents stressed the significance of knowing what to be measured and how to measure, further, sustainability is difficult to measure and a challenge for future decision-making.

4.2.1 CRITICAL SUCCESS FACTORS FOR SUSTAINABLE BUSINESS INTELLIGENCE

The following sections will describe certain managerial actions in the sustainability implementation process and their importance for a successful adoption.

4.2.1.1 CHAMPIONSHIP

There is a general agreement from all interviewees that top management is playing the major role in incorporating sustainability in a company. As stated firmly by Mikael Witthoff,

> "It is the CEO and top management, there is no one else. If they are not supportive, nothing will happen"

Inger Uhrdin states that the current CEO of Schenker AB is a frequent user of the business intelligence system and has been very supporting in the system development, and she highlights the importance of finding champions within the organization. Furthermore, there have been champions among the personnel, says Mikael Witthoff. He describes an education process with the intention of creating sustainability coaches at a number of business locations. All aspects of the triple bottom-line were included; the economic aspect in form of reduced fuel consumption because of eco-driving, the social aspect in form of better drive planning which reduces stress and tension, and the ecologic aspect in form of eco-driving which reduces emissions. The best performing location, he explains, had a champion who encouraged the sustainability practice and managed to educate and convince his colleagues to work for sustainability. That particular commitment turned out to be a success factor for the sustainability adoption. Nevertheless, it has been problematic to tackle the sustainability issues, because of its intangible characteristics.

Moreover, Mikael Witthoff mentions that champions within the area of business intelligence are important for overall understanding of the system to make correct decisions based on relevant information. He states that support from top management, such as resources, is vital for the champions' motivation and possibility to succeed with their task. Anders Bükk has a similar view on championship as Mikael Witthoff. He believes that top management, in their role as decision maker, has to fund the ideas of the champion and give authority to proliferate the findings throughout the enterprise. A further insight was given by Maria Magnusson and Monica Holm, who think that all personnel should have some sort of individual responsibility of integrating sustainability into business practice. Maria Magnusson considers that the creation of champions is reliant on the accessibility to the systems and the ability to influence the content.

4.2.1.2 COMMUNICATION AND CULTURE

In order to implement sustainability into business intelligence, communication is the foundation for success. Knowledge about the system and the sustainability efforts need to be proliferated across unit functions to involve the entire company in the implementation process. It is important to form a holistic view of the corporations' sustainability strategies and goals amongst the different business units, to avoid myopic self-interest and unawareness of the sustainability intentions. Maria Magnusson says,

> "This is a huge challenge for the company, especially since Schenker AB has a decentralized business structure"

Mikael Witthoff reflects on the decentralization and confirms that the knowledge diffusion of the business intelligence systems is good despite the decentralization, and acknowledges top management commitment as a big part of the success. Furthermore, Mikael Witthoff and Monica Holm describe how the communication between employees and managers is handled through different committees whose mission is to exchange information and experiences between units. A number of business units also have daily meetings to discuss short-term goals, but as well problems. Mikael Witthoff is though doubtful if daily monitoring is favorable, since short-term issues can be overanalyzed from managers and create unnecessary tension. Nonetheless, communication across functions is still a tricky field, he says, and shared problems could be solved much easier with improved internal and external communication.

Much of the internal communication from middle managers to top management is conducted by lobbying and creating interest for proposals, since middle managers often lack authority to pursue business intelligence system matters, says Maria Magnusson. In addition, she claims that the dialogue with top management, but also with customers, is essential to communicate the motives of having sustainability in business intelligence. Monica Holm is responsible for Schenker AB sustainability report, which she thinks is a helpful source for internal and external communication. The report contains, for example, sustainability strategies, goals, efforts and performance outcome. As an environmental coordinator, Monica Holm, wishes an even more proactive corporate approach to sustainability to continue develop within the area. She also believes that supplier communication is vital, since Schenker AB's suppliers are accountable for the major ecologic effect. Anders Bükk ponders about communication possibilities as well, and adds a separate perspective. He believes that top management communication is good, in the perspective of top-down sustainability communication. However, the bottom-up communication is not working equally well. Directives from head office in Germany are often communicated to be followed, ranging from environmental aspects to accounting matters. Several respondents consider bottom-up communication as a critical factor to identify the required features of the system and cancel unnecessary procedures in order to rationalize the current system and avoid duplicate of work.

One part of the communication and culture process involves learning and training. Maria Magnusson describes persons in charge of system processes and their close connection with system users as a possibility to educate users in sustainability in business intelligence. Referring to Mikael Witthoff, educating users and other personnel creates motivation to work for the sustainability objectives within business intelligence. He describes different educations within Schenker AB with the aim of enhance the awareness of sustainability, for example courses in eco-driving and health and safety. This is a key factor for a successful implementation of sustainability into business intelligence. Further, Monica Holm describes that Schenker AB provides interactive sustainability education, which often is on the agenda in customer meetings. According to Thomas Svahn, the first step is to educate the directorate and top managers in the advantages of sustainability through business intelligence. Afterwards, managers, on all levels of the organization, can utilize business intelligence systems for further sustainability learning and training among the personnel.

Moreover, both Thomas Svahn and Inger Uhrdin label the implementation pace as a critical factor for the probability of involving all personnel in the adoption without encountering resistance. Thomas Svahn observed that,

> "Implementing sustainability through business intelligence has to be handled stepwise, as sustainability often is unstructured data and is still immature in business intelligence systems"

This will avoid opposition and frustration amongst the users and other personnel, because of less amount of work and better working conditions. Along with this process, the personnel can mature in their sustainability practice.

Maria Magnusson explains the significance of working in the same direction and expresses a general willpower for sustainability within Schenker AB. According to Inger Uhrdin, business intelligence should communicate corporate vision and mission so that every user acquire similar picture of the company. Schenker AB has created a forum with representatives from each business unit, which provides an inclusive view of the entire corporation when developing the common business intelligence tool. Thereby savings could be made due to similar information and efficient decision-making. Moreover, Schenker AB has the intention of proliferate sustainability goals from top-management to the lowest levels in order to practice sustainability in every commitment. As a result of Schenker AB obvious effect on sustainability, it is a natural cultural manner to operate for sustainability, says Mikael Witthoff. Additionally, if the sustainability aspect of culture would be vague, the company would convey a message that will affect the corporate reputation negatively. Therefore it is vital to incorporate cumbersome subjects, such as sustainability, in business discussions, which he believes are taken seriously at Schenker AB.

4.2.1.3 RESOURCES
In spite of substantial communication capability, all respondents emphasized the importance of allocating sufficient resources where they are needed. Schenker AB operates in a highly competitive business, where the margins are tight and the latitude restricted. Therefore, the possibility to request for resources is limited. The majority of the interviewees agreed upon the fact that if sustainability contribution, in economic terms, is not measureable, resources will not be provided. Consequently, it might be a challenge to acquire resources to specific sustainability projects.

Inger Uhrdin emphases the significance of prioritizing the resource allocation since resources is scarce. Maria Magnusson explains that time and budget restrictions are a main cause to insufficient sustainability efforts through business intelligence. Due to the tight margins, Mikael Witthoff enlightens the organizations fondness of cost-efficient solutions. However, he explicates that plentiful resources has been provided for education of business intelligence at Schenker Åkeri AB, and this has led to greater understanding and usage of the systems. In conclusion he believes that the resource allocation is relatively sound, but he stresses the importance of management support of resources. Anders Bükk further considers technological support, in form of helpful systems, which measures correctly and reflects the results appropriately, as important for implementation success.

4.2.1.4 LINK TO BUSINESS OBJECTIVE
Schenker AB has incorporated sustainability in their goals and strategies, and there is a general perception that the company is striving for sustainability. Moreover, the general perception proceeds from an ecologic perspective. Monica Holm explains Schenker AB sustainability integration as thorough, as a consequence of an early engagement in sustainability work. Conversely, she states that it is easier to implement sustainability than it is to maintain and update the procedures.

Maria Magnusson believes that ecologic and social aspects are not integrated in business intelligence and daily business practice in the same way as economic aspects. To achieve this, top management must establish corporate sustainability goals and strategies, and diffuse these internally and externally. Further, she states that,

> "Sustainability efforts are depending on project type… our goal is to display sustainability impact in the projects, to apprehend our influence"

She further clarifies that projects with economic objectives obtain negligible sustainability attention. Therefore it is important to include sustainability in every business project. Recent years, Schenker AB has been addressing more focus on observing environmental impact. There has been a clear business approach from managers, says Maria Magnusson, and the dialogue has improved between information technology units and management. This is crucial to link sustainability to corporate strategies and goals through business intelligence. Furthermore, Mikael Witthoff considers that sustainability efforts leads to reduced costs, for example reduced fuel consumption and less injuries, and is a thankful subject to discuss with the directorate. Thus, sustainability will be easier to implement in business objectives as well as business intelligence.

However, if the primary objective is to generate profit, personnel will persuade profit maximization regardless of the other sustainability goals, says Thomas Svahn. He perceives that sustainability integration through business intelligence is scarce in many corporations, as profit goals are more strictly managed. Sustainability is often seen as a cost and resistance could easily emerge. Although, he exemplifies different liabilities, as sustainability objectives, in a public organization because of greater external pressure. Thereby it is easier to implement sustainability through business intelligence since sustainability is stronger integrated in the corporate strategies and goals.

Further, Inger Uhrdin accents the importance of the employees' capability to discover the benefits of the system in order to reach their goals and increase the attention to the system. Continuously, there is a need to give a complete representation of the company objectives and strategies, otherwise only certain parts get emphasized. Accordingly, by linking sustainability objectives to each individual project, the sustainability practice from all personnel can mature and the relation towards the overall objectives strengthens. The corporate values concerning sustainability are vital for its implementation. These are also success factors for implementing sustainability through business intelligence, she says.

Moreover, Anders Bükk positions short-term economic pressure as the highest interest, though it does not conflict with long-term sustainability objectives. In the long run, profit is achieved due to daily sustainability efforts. Monica Holm urges that long-term sustainability objectives are desirable to follow up, as short-term objectives often are insignificant and merely display parts of the reality.

4.2.2 STRUCTURED AND UNSTRUCTURED DATA
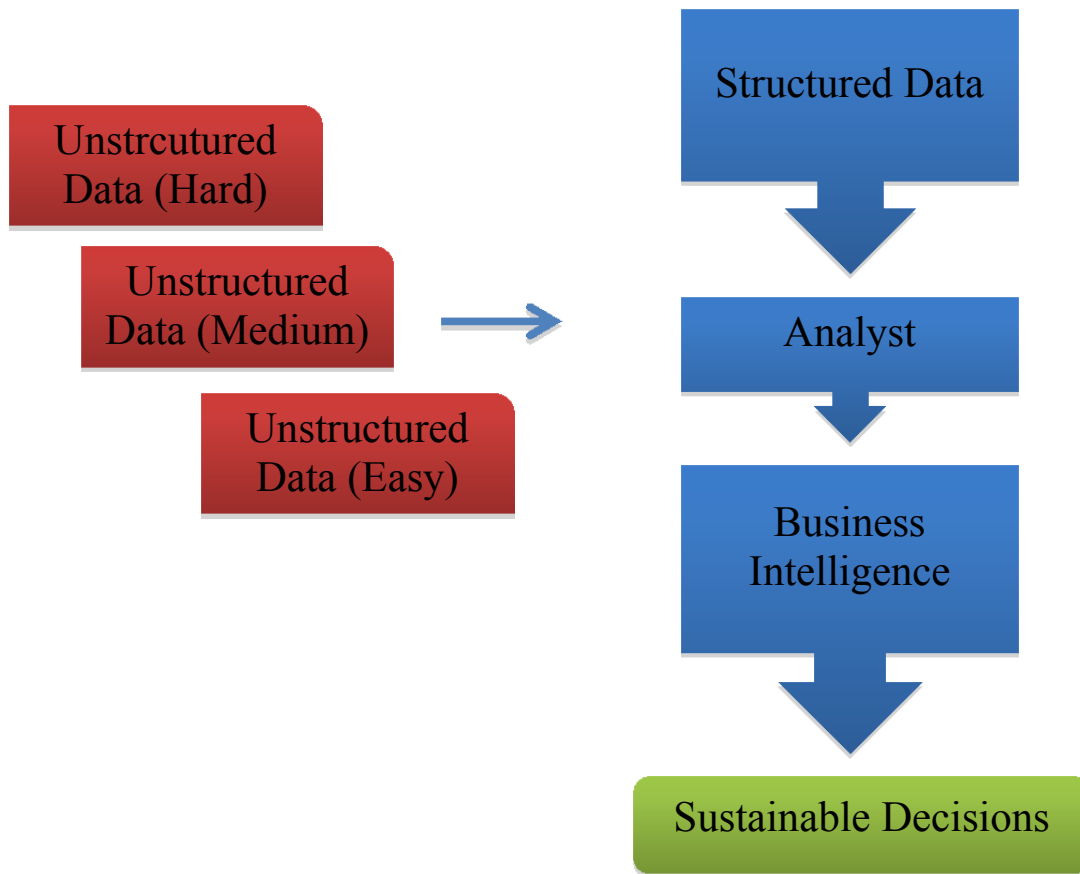
FIGURE 4-1. Structured and Unstructured data, own construction

All interviewees within Schenker AB pondered the organizations information technology infrastructure as prosperous and containing plenty of structured data from different sources that could be used internally. Inger Uhrdin states that this type of information contributes to optimize business processes within the corporation. This outcome of information is easily measured; for example, there are existing ways in order to measure pollution from haulage. However, the challenge is to achieve automatization of continuously updating key figures.

The interviewees at Schenker AB, states that unstructured data is scarce and not included in the information technology infrastructure equally as structured data. Further, Inger Uhrdin and Maria Magnusson reflect that unstructured data needs to be structured and analyzed in order to become applicable in business intelligence and utilized for advantageous decision-making.

Additionally, Thomas Svahn describes sustainability key figures as difficult to construct and measure, since the information primarily is gathered externally. When the corporation does not own the information gathered, assumptions and manual interpretations have to be made, therefore key figures may be biased. These types of efforts are difficult, expensive and time-consuming and, in addition, the management control could be based on inaccurate key figures, he says.

Solving this problem is crucial for implementing sustainability through business intelligence, according to Thomas Svahn, since sustainability principally consists of unstructured data. He states that sustainability experts within corporations lack knowledge concerning business intelligence.

Since the area still is immature, there is a need to handle the issue stepwise. Furthermore, he describes three levels of difficulty when collecting and analyzing unstructured data. The first level, named "easy" is information about the company as an employer and production processes and their sustainability impact, which could be gathered and analyzed automatically. Secondly, the "medium" level consists of sustainability information from suppliers and customers, and could partially be automatized. Lastly, the "hard" level is information based on estimations, as emission per employee and consumer behavior, and can only be handled manually. Efforts regarding the easily collected unstructured data need to be prioritized and measured equally as other economic key figures. Hence, sustainability key figures will have corresponding focus and measured automatically on a daily basis. Thomas Svahn considers this as the most essential part to implement sustainability through business intelligence.

4.2.3   BIG DATA

Several respondents agreed that the volume of information is large and is increasing. Thomas Svahn, who interacts with numerous companies working with Big Data, expressed its applicability when corporations analyze unstructured data and try to assimilate several different parameters, which can contribute to a deeper understanding of consumer behavior and demands through a variety of information sources. Thus, in predicting the future to be able to lead the development, the velocity aspect of Big Data could help organizations to gather data and utilize it in business intelligence systems, says Inger Uhrdin. Thereby, the organization could use the business intelligence system in combination with Big Data to enlighten the entire corporation where efforts are dynamic, and become advantageous against competitors. However, Schenker AB is not currently analyzing Big Data since the line of business do not require it.

4.3   BUSINESS INTELLIGENCE AND SUSTAINABILITY

The following sections will describe the empirics found on the subject of using business intelligence for sustainability, and further the respondents' thoughts around the competitive advantages of sustainability.

4.3.1   BUSINESS INTELLIGENCE AS A TOOL FOR SUSTAINABILITY

Sustainability is not yet completely incorporated through business intelligence, but the interest of integration has risen recent years, says Thomas Svahn. He argues that sustainability and business intelligence belong together. However, in practice the relationship is not equally clear and the majority of the respondents agreed that the foremost focus is still on economic monitoring. Maria Magnusson clarifies that the sustainability information must be handled better, since plentiful information is accessible, and thereby Schenker AB are able to improve the consolidation of information into business intelligence and connect the information to corporate strategies and goals. Mikael Witthoff confirms that there is a need for systems that can handle large haulage contractors. Currently it can be difficult to capture all necessary data, especially since other external systems prevent internal systems to collect preferred information.

The interview with Inger Uhrdin, though, resulted in a future-oriented perspective of sustainability and business intelligence, where she described the work of creating a user-friendly unison business intelligence system. She explicates that a well-established flexible system, with many users, would allow sustainability efforts to grow within the company and evolve into affecting corporate strategies and goals. Creating a unified system will fulfill social aspects when users feel involved in the system process and transparency emerges. Inger Uhrdin described that,

> "Currently, we are building an interactive system with the possibility of illustrating desired key figures and deciding mutual definitions… We construct a tool where all users can gather information from one solitary source, which is quality-assured"

The aim is to provide similar information to all users, says Inger Uhrdin. In this sense homogeneity is created within the organization. Operating the system thus becomes simple because of the ability to manage all levels of information consolidation within one solitary system. Moreover, the search for deviations, comprehend how it has affected the business area, and finding the core grounds is simplified. Together, these are prerequisites for a successful implementation of sustainability through business intelligence.

Nonetheless, it is crucial to understand the meaning of the key figures and realize their actual usefulness in business intelligence, says Mikael Witthoff. The process of decide what to measure is fairly easy, but decide how to measure and understand those measures is more problematic. Hence, people with accurate knowledge about the organization and the system should introduce a manageable amount of relevant and useful sustainability key figures in business intelligence. Consistent with Anders Bükk, the system must provide information about what is addressable and how to address it to create awareness and interest for sustainability matters. Monica Holm adds the importance of putting the sustainability objectives in relation to what is achieved, given the often relative character of sustainability goals. Additionally, Inger Uhrdin says, in the context of implementing sustainability through business intelligence,

> "Sustainability should be a focus area within business intelligence and broken down into comprehensible parts to establish interest for the subject".

Monica Holm, though, predicts a problem in incorporating sustainability through business intelligence because of the complexity of collecting sustainability data and thenceforth illustrating the data in a reasonable way. On the other hand, she mentions that different tools are used for emission reports, but those reports mainly processes the ecologic perspective.

4.3.2 SUSTAINABILITY MANAGEMENT AND COMPETITIVENESS

There seems to be a general compliance among the interviewees of linking sustainability and profit to achieve the desired sustainability results. Furthermore, all interviewees acknowledge the vast amount of information available, nonetheless, the major issue is distinguishing what to be measured and how to measure. Thomas Svahn explains that several enterprises are producing a sustainability report in addition to annual reports. Nevertheless, sustainability reports are not a management tool and therefore are strategies and goals not determined in accordance with those reports. A company regulates in accordance with corporate control systems, and those systems often lack sustainability concepts. He suggests forming conditions to operate with systematization aspects, for instance to embrace sustainability monitoring similarly as economic monitoring. Inger Uhrdin also proposes to undertake sustainability from a managerial approach. In so doing, companies can find appropriate metrics for sustainability and generate an enhanced internal and external comprehension for sustainability and become competitive through understanding and motivation. Thomas Svahn claims that evidence of prior successful and profitable sustainability integrations through business intelligence will help convince corporations to apply the concepts.

Mikael Witthoff comments that competitiveness can be achieved through sustainability and business intelligence. By analyzing the market and having an effective information consolidation process through business intelligence, competitiveness is reached when the company can take advantage of reduced costs via minor ecologic impact and superior social conditions.

Sustainability practice must be validated, as it is a fundamental qualification in business with large clients, says Inger Uhrdin. It is of outmost importance to link sustainability matters with profit, and there are great benefits in making better sustainability decisions. Business intelligence is the tool in the decision process to increase value-adding, through reduced time spent on collection and compilation of reports. As a result, a greater satisfaction is yielded internally and externally, which

is rewarding for all concerned parties. In accordance with Anders Bükk, an organization could be profitable and competitive in the long-term by investing in sustainability. He states that investments in social aspects, such as keeping personnel within Schenker AB, are beneficial because of reduced employee turnover, recruitment and education expenses. Furthermore, new business techniques are motivating companies to innovate ecologic solutions to become competitive and maintain economic sustainability.

Monica Holm explains that better planning and loading processes within Schenker AB could lead to greater profit and sustainability. Besides, Schenker AB would not give responsibility to someone else to change their procedures to reach sustainability. She further commented that,

> "If we succeed with sustainability efforts, we might gain business advantages. Nonetheless, sustainability should be pursued whether or not there is a business advantage in sustainability"

It is up to Schenker AB to prove that they are better than their competitors in the area of sustainability, and thereby become able to offer sustainable solutions, she says.

5 ANALYSIS

In the following chapter, the empirics found and the chosen theories will be compared. Further, patterns and correlations will be discovered between the two in order to draw conclusions.

5.1 SUSTAINABILITY

Sustainability is interpreted differently depending on position and business network. During the interviews we discovered that the understanding of sustainability ranged from a purely ecological view, to a broader understanding including the three perspectives of the triple bottom-line. We found that the business network, in which the respondents operate, influences the extent of their understanding of the triple bottom-line. Lacy, Haines & Hayward (2012), states that there is a need for education of managers in sustainability to equip future managers with proper tools and skills. Subsequently, it can be indicated that greater understanding of sustainability leads to grander efforts in the subject, and thereto we can see that, for example, a closer connection to an educational institution generates preconditions for the triple bottom-line.

Moreover, Thomas Svahn considered stakeholders, and especially consumers, as the most important actuator of sustainability and a crucial part in the implementation. This is a factor that has not been discussed as frequent of in the literature of business intelligence and sustainability. Thomas Svahn implies that the consumer behavior must change to demand sustainability from corporations (Lacy, Haines & Hayward, 2012). Thereby, sustainability driven companies will likely become more profitable since consumers will tend to demand their products or services.

5.1.1 TRIPLE BOTTOM-LINE

The respondents have noticed the three pillars of triple bottom-line with separate focus. Most attention is targeted against the ecological perspective and the general knowledge of business and environmental impact is greatest within this area. Although, it appears that the overall corporate sustainability focus is primarily on the economic aspect of the triple bottom-line (Husted & de Jesus's Salazar, 2006; Bose, 2004). Since the economic aspect is an obvious objective in most companies, the interviewees did not reflect about the aspect at first. Economic sustainability is receiving oblivious attention because of its natural business character.

The ecologic perspective, though, attained greatest focus as sustainability and ecology are often discussed simultaneously, and therefore it is the first association made when considering sustainability. Moreover, the ecology debate is more active than ever before and the interest for sustainability efforts is increasing (Lacy, Haines & Hayward, 2012). A third reason to the immediate connection between sustainability and ecology could be the ecology-affecting-business-environment in which Schenker AB operates.

It appears that the social perspective is well established at Schenker AB and social matters are handled continuously to achieve social benefits and to become an attractive employer, which is in line with Dyllick & Hockerts (2002). Even though, the social perspective is well developed, it is important to establish relevant key figures in business intelligence in order to support management control.

During the interviews it was noticed that closer connection with business operations seemed to enhance the comprehension of the tripe bottom-line. For example, on operative levels such as Schenker Åkeri AB, all three pillars are present on a daily basis, through accomplishing the economic objectives, reducing emissions and increase working conditions for the personnel. At Schenker AB, sustainability efforts appear more concrete on operational levels as a result of their tangible triple bottom-line impact.

In accordance with Dyllick & Hockerts (2002); Hubbard (2009); Global Reporting Initiative (2013), the respondents claim that Schenker AB should operate to achieve profitability without affecting the needs of future generations. Several respondents in line with Dyllick & Hockerts (2002); León-Soriano, Jesús Muñoz-Torres & Chalmeta-Rosalen (2010) have expressed the importance of long-term focus on sustainability since it is a relatively new area and cannot be conquered in the short run.

5.2 SUSTAINABLE BUSINESS INTELLIGENCE

Schenker AB applies business intelligence in their daily operations and the system can be used by numerous employees to make better decisions. Consistent with the two perspectives described by Olszak & Ziemba (2012), this thesis has a managerial approach and thereby we were able to comprehend the corporate intensions of sharing information and knowledge throughout the company by appointing a speaking partner from the business side to the information technology units. This appointment creates connections between managerial and technical units and incorporates additional business objectives in the system (Shariat & Hightower, 2007). Without a speaking partner, relationships between business units might be harder to find and the dialog could become occasional rather than frequent.

The organizations' managerial approach to business intelligence has been successful in implementing economic sustainability. Schenker AB utilizes benefits of the system, such as predicting customer behavior and customer communication, in alignment with Moss & Atre (2003). Compliant with Williams & Williams (2007); Moss & Atre (2003), Schenker AB has comprehended the benefits with business intelligence, but still lacks motivation and knowledge to a complete sustainability adoption in the system. Forthcoming sections will further analyze positive behaviors of Schenker AB, but also improvements to be made to apprehend a complete triple bottom-line adoption through business intelligence.

5.2.1 CRITICAL SUCCESS FACTORS FOR SUSTAINABLE BUSINESS INTELLIGENCE

Knights & McCabe (1996) and Poon & Wagner (2001) among others, states that top management commitment is of outmost importance in the implementation process, and during the interviews it was very clear that the respondents had the same opinion of implementing sustainability through business intelligence. All interviewees agreed that top management has to allow for corporate champions to support and push sustainability development into business intelligence, and assigning time for communication and motivation. Furthermore, top management has to provide sufficient resources and incorporate sustainability in strategies and goals for business intelligence (Yeoh & Koronios, 2010; Daily & Huang, 2001).

The following sections will analyze the empirics, with the support of the theoretical framework, found on championship, communication and culture, resources and link to business objective.

5.2.1.1 CHAMPIONSHIP

The history of Schenker AB business intelligence systems demonstrates that championship is crucial for implementation success. The current CEOs supportive attitude towards business intelligence led to a well-established system used by numerous employees. In consistence with Chenoweth, Corral & Demirkan (2006), all interviewees stated that a supportive leader with proper knowledge and authority would facilitate the implementation process. In accordance with Maria Magnusson and Zutshi & Sohal (2004), the champions should have accessibility to the systems and the authority to affect the content. Ander Bükk complements that the champion needs adequate resources in order to accomplish the objective.

The education process, which Mikael Witthoff described, is a good example of the importance of a champion for implementing and proliferating sustainability efforts within a company. Equivalent

champions for sustainability in business intelligence were not discovered during the interviews, although, a clear pattern is recognized, in line with Poon & Wagner (2001), between implementation success and champions. Firstly, the absence of sustainability champions within business intelligence could be explained by an overly extensive area to singularly handle, as Wixom & Watson (2001) correspondingly states with data warehousing. Secondly, either management or users could be restrictive and unsupportive to the sustainability initiatives in business intelligence, according to Chenoweth, Corral & Demirkan, (2006) and Howell & Higgins (1990), and therefore the champions do not acquire proper audience and influence. This could be solved through better communication and motivation according to Chenoweth, Corral & Demirkan (2006). Thirdly, more resources should perhaps be provided for sustainability efforts in business intelligence in order to enable the champion in completing the objective (Zutshi & Sohal, 2004).

5.2.1.2 COMMUNICATION AND CULTURE

In accordance with Maria Magnusson, an open communication culture is a key factor for implementing all three pillars of the triple bottom-line through business intelligence. This statement is verified by Cline (2000) and Gilbert & Cordey-Hayes (1996), which declare the importance of creating a communication-friendly business environment within the company. Through an open attitude towards discussion and reflection an enterprise could allow for ideas and viewpoints to proliferate throughout the entire organization. Subsequently, as described by Zutshi & Sohal (1997) and Merchant & Van der Stede (2012), most employees can participate in the implementation process, and thereby a greater acceptance and understanding for the sustainability integration through business intelligence can be acquired. Moreover, Schenker AB has the intention of diffusing all three perspectives of sustainability into every commitment, but the empirics show that the sustainability commitment is highly dependent of project type and decision-making division. It is important to communicate the importance of integrating ecologic and social aspects in every project and decision situation, even though the primary objective is economic. A clear pattern is discovered among several interviewees, who state that a holistic view on corporate strategies and goals concerning sustainability is a necessity for implementation success (Alvesson & Svenningsson, 2008). A unison business intelligence system would help the organization to manage projects and objectives with similar information, regardless of business level or location.

In the process of making all three pillars of the triple bottom-line equally incorporated and valued in decision-making, an organization could further invest in education concerning business intelligence and sustainability (Knights & McCabe, 1996; Yeoh & Koronios, 2010). Schenker AB holds an interactive education in the area of ecology, which is beneficial in the process of communicating sustainability with the aim of educating both stakeholders and personnel in the subject (Wixom & Watson, 2001). As mentioned above, the social related educations that Mikael Witthoff explains, is a further step towards creating sustainability awareness (Sun, Kee Hui, Tam & Frick, 2000). Learning and training is vital in the implementation process, in accordance with several respondents. This is also confirmed by Soo Wee & Quazi (2005), Daily & Huang (2001) and Merchant & Van der Stede (2012), which claim that learning and training would lead to improved comprehension of sustainability. Furthermore, Lacy, Haines & Hayward (2012) confirm that lack of education is often a primary reason to adoption failure.

In consistence with some respondents, in order to find relevant key figures for measuring economic, ecologic and social matters in business intelligence and solve common issues across business units, Schenker AB needs to handle all types of information and decision-making in one united system. For example, the committees, described by Mikael Witthoff and Monica Holm, are a useful source for communication and discussion. This can result in, in accordance with Alvesson & Svenningsson (2008), better personnel involvement and additional demands can be satisfied via increased

interaction across functions and corporate levels. Likewise, one united system would bring all users together and greater understanding of shared problems could be achieved.

During the interviews, we apprehended a pattern in the inertia of bottom-up communication, which can be explained by the thoughts of Wixom & Watson (2001) who states that an excessively big implementation process reduces the probability of bottom-up influence, and sustainability could be seen as such an implementation. Nohria & Beer (2000) consider flexibility and spontaneity in top-down management as a successful method of managing communication and corporate culture. As a result, communication possibilities would allow for bottom-up communication and thereby enable interaction between business and information technology personnel. We recognized Schenker AB as knowledge abundant, although there seems to be a lack of encouragement for collaboration between personnel within business intelligence and sustainability. However, Mikael Witthoff states that top and middle management engagement in the sustainability change process is active, which is, in line with Alvesson & Svenningsson (2008), a prerequisite for its implementation success. Further, we can perceive that business intelligence can be a tool for easier and more efficient communication between top management and lower divisions (Moss & Atre, 2003; Borking et al, 2011).

Both Thomas Svahn and Inger Uhrdin stressed that the pace of sustainability implementation through business intelligence has to be controlled stepwise. This correlates with Borking et al (2011) and Yeoh & Koronios (2010) who believe in more efficient adoption of sustainability in business intelligence due to better user comprehension of the implementation purpose and thereby increased motivation.

Finally, a subject that has not been discussed as frequently in the literature regarding business intelligence and sustainability is the prominence of previous successful implementations. Thomas Svahn and Anders Bükk state that this is a crucial factor in order to strive for sustainability through business intelligence systems. Consequently, role model companies are required to push the development within the area of combining sustainability and business intelligence.

5.2.1.3 RESOURCES
Previous research has found the importance of allocating enough resources to implementation processes regarding sustainability and business intelligence (Poon & Wagner, 2001). Further, the interviewees assent of the fact that abundant resources would aid the implementation process and future sustainability endeavors. Since Schenker AB operates in a highly competitive business market with tight margins, it could be problematic to acquire sufficient resources, especially as the contribution in sustainability obligations are troublesome to value in economic terms. In alignment with the opinion of several respondents, the company is facing a future challenge in allocating resources timely and correctly in order to accomplish the sustainability goals through business intelligence. This challenge is also mentioned as a success factor by Yeo (2002), Nah & Delgado (2006) and Moss & Atre (2003).

5.2.1.4 LINK TO BUSINESS OBJECTIVE
An interesting element was given in the interview with Monica Holm, who stated that Schenker AB made an early engagement in sustainability matters. This could be considered as advantageous in the implementation process of economic, ecologic and social aspects through business intelligence, since employees are well aware of Schenker AB sustainability practice. This element is also described by Poon & Wagner (2001) as a success factor. Monica Holm further explains that updating sustainability strategies would be beneficial in the aim of developing corporate sustainability practice. It may seem as a good idea, as it could lead to greater exertion in implementing the triple bottom-line through business intelligence.

Additionally, Inger Uhrdin states, in accordance with Ranjan (2008) and Yeo (2002), the significance of users understanding of the benefits and advantages with the system to link the system to business objectives. Thereby, greater commitment could be obtained to the implementation. To achieve this, as stated in the "communication and culture" chapter, top management must integrate sustainability goals and strategies with the overall objectives, and communicate them internally in the business intelligence system. This is also in line with the findings of Yeoh & Koronios (2010).

According to Maria Magnusson and Inger Uhrdin, the integration of business intelligence and sustainability is possible and beneficial. Because of their skill and knowledge within the area of business intelligence systems, they urge the necessity of creating deeper apprehension of the system, and thereby increase the probability of applying sustainability in better decision-making. Consequently, the deeper understanding of the system will enable managers, with the support of information technology staff, to link economic, ecologic and social objectives in business intelligence system (Yeoh & Koronios, 2010; Davenport & Harris, 2007). A superior managerial driven approach towards business intelligence has been applied at Schenker AB, says Maria Magnusson, and both Inger Uhrdin and Thomas Svahn states that such a development is important to achieve a system that will be integrated with sustainability strategies and goals. These thoughts are also in line with research conducted by, among others, Mukherjee & D'Souza (2003) and Moss & Atre (2003).

There is a general tendency of generating profit as the main objective in numerous enterprises, and sustainability is often seen as a cost, says Thomas Svahn. Therefore resistance could easily emerge when trying to implement sustainability through business intelligence. A similar pattern and tendency is discovered at Schenker AB, where sustainability is not closely enough linked with business objectives in order to achieve its integration through business intelligence. Consequently, sustainability integration in business intelligence is prevented, which could be an explanation to the absence of a complete sustainability practice through business intelligence today.

5.2.2 STRUCTURED AND UNSTRUCTURED DATA

The empirics on structured and unstructured data tell something about the ability to analyze and structure different types of data. Firstly, the respondents expressed that plentiful structured data, in line with the structured data described by Lim et al (2012), is available in Schenker AB business intelligence system. The structured data is frequently used in corporate decision-making, thus, Negash (2004) and Baars & Kemper (2008) states that solitary structured data is not sufficient in order to capture all strategic information.

Maria Magnusson confirms the existence and awareness of unstructured data. Minelli, Chambers & Dhiraj (2013) and Shim et al (2002) describe unstructured data as data that an organization has limited control of, and Maria Magnusson urge the importance of improving the adoption and structure of unstructured data in the business intelligence system (Harbison & Ryan, 2009). Subsequently, business decision-making could be improved. This is also in accordance with Blumberg & Atre (2003), which states that it is essential to combine structured and unstructured data, as they are equally important.

Since unstructured data is gathered externally, companies make decisions based on information they do not own and cannot control the inflow of information (Negash, 2004). Thomas Svahn, in alignment with Harbison & Ryan (2009), reckons that skillful data scientists are crucial to analyze and structure unstructured data in order to minimize erroneous decisions. The fact that sustainability mainly consists of unstructured data makes it even more important in the consideration of implementing sustainability through business intelligence. Thomas Svahn adds the fact that sustainability experts within an organization need to be assisted by skillful data scientists to solve

the problem of integrating sustainability, in the context of unstructured data, in business intelligence.

Aside from the technical challenges of analyzing and structuring unstructured data, there is, in accordance with Thomas Svahn, also a challenge in implementing sustainability stepwise. These thoughts correspond with Borking et al (2011), who states that an iterative system adoption is satisfactory for corporate commitment and understanding. Accordingly, the system could handle sustainability in conformity with other already established business intelligence applications.

5.2.3 BIG DATA

The interviews resulted in a vague connection between Schenker AB and usage of Big Data. Inger Urhdin explains Big Data as not required in the organizations' line of business today. Although, Big Data has attributes that can help Schenker AB manage unstructured data in order to discover new values, which is discoursed by Chen, Mao & Liu (2014), in sustainability decision-making.

Even though, Schenker AB does not employ Big Data, it may be utilized, for instance, in real-time route planning; to reach the desired destination as timely and eco-efficient as possible. In consistent with McAfee & Brynjolfsson (2012), this utilization will be based on evidence rather than intuition, and therefore, the decision made will be better.

In order to reach a complete triple bottom-line practice through business intelligence, Big Data should be applied efficiently and with quality, according to Manyika, McKinsey Global Institute, Chui, Brown, Bughin, Dobbs, Roxburgh & Byers (2011). This would lead to competitive advantages and enhanced sustainability knowledge within the company. Hence, it is motivated to consider managing Big Data at Schenker AB.

5.3 BUSINESS INTELLIGENCE AND SUSTAINABILITY

5.3.1 BUSINESS INTELLIGENCE AS A TOOL FOR SUSTAINABILITY

Most respondents recognized a possibility to use business intelligence for sustainability. However, they acknowledged the challenge to find appropriate economic, ecologic and social measures and methods for every business unit in order to seize what is important and relevant (Briassoulis, 2001). In accordance with Mikael Witthoff and Anders Bükk, a major issue is to distinguish how to measure and understand the measures. An initial solution was given by Inger Uhrdin, who claims that building an interactive system with the possibility of illustrating desired key figures and deciding mutual definitions will create homogeneity within the organization. Monica Holm adds the importance of putting the sustainability objectives in relation to what is achieved. Consequently, operating the system becomes simple because of the ability to manage all levels of information consolidation within one solitary system. Further, this is a solid request and pattern found during the interviews. The interviewees require a flexible system that would allow easy handling and explicit display of sustainability data. In accordance with Melville (2010), it will create a holistic understanding of the system, its components, and the outcome, and is, in line with Inger Uhrdin, a criterion for implementing sustainability through business intelligence. Furthermore, with the support of business intelligence an organization would be able to understand the outcome of previous decision situations and transmit knowledge to benefit in future decision processes (Borking et al, 2011)

According to Petrini & Pozzebon (2009), a more refined informational system is necessary for future sustainability efforts. Several respondents, who state that the triple bottom-line through business intelligence must be handled to allow for closer connection to strategies and goals, affirm the research. Thereto, system development is needed to fit the particular area of business in which Schenker AB operates.

Schaltegger & Synnestvedt (2002), states that linking sustainability, shareholder and stakeholder value could be problematic and raise resistance since the understanding of sustainability and its benefits is poor. However, Inger Uhrdin explicates that a well-established flexible system, with many users, would allow economic, ecologic and social efforts to grow within the company and evolve into affecting corporate strategies and goals. Creating a unified system will fulfill social aspects when users feel involved in the system process and transparency emerges. We tend to agree with the fact that internal commitment and transparency will also result in external satisfaction and acceptance. Thereby, a company could link sustainability, shareholder and stakeholder value, to benefit sustainability work.

Monica Holm, though, lightens the issues with implementing the triple bottom-line through business intelligence discussed by Petrini & Pozzebon (2009) and Figge et al. (2002). In accordance with Figge et al. (2002), numerous corporations struggle to find a reasonable way of measuring and displaying sustainability. Monica Holm considers the complexity of sustainability as a problem for integration through business intelligence. The different integration alternatives supported by Henri & Journeault (2010) would not be sufficient in the implementation of the triple bottom-line at Schenker AB because of the complexity of sustainability matters. A business intelligence system would, in this case, not be able to illustrate sustainability in an adequate way.

5.3.2 SUSTAINABILITY MANAGEMENT AND COMPETITIVENESS

Thomas Svahn argues that numerous enterprises lack sustainability concepts within their corporate control system. In line with Briassoulis (2001), companies lack knowledge of measuring the consequences of sustainability practice, and therefore they do not employ sustainability in business systems, but produce a sustainability report as a tool for sustainability management. However, Thomas Svahn contemplates, in correspondence with Briassoulis (2001), that companies are forced to integrate the content of the sustainability report into a business intelligence system. This is yet supported by Petrini & Pozzebon (2009), as they demand elaborate and more frequently updated informational support in management control systems. Further, Thomas Svahn suggests for instance to embrace sustainability monitoring similarly as economic monitoring, which corresponds with the research of Reinhardt (1998) who claims the importance of focusing on where sustainability efforts could be profitable rather than if sustainability is profitable. This could create opportunities for further possible sustainability areas of application, since corporations would prevent getting tangled up in the discussion of whether sustainability is profitable or not.

Additionally, Inger Uhrdin explains that competitiveness could be achieved through enhanced knowledge and motivation, due to a control system that consists of proper economic, ecologic and social metrics. In conformity with the four levers of control constituted by Simons (2013), a solid business strategy is required to accomplish the sustainability objectives. To obtain a thorough sustainability penetration, management control with a proper set of tools is required through business intelligence. Subsequently, sustainable decisions and competitive advantages are attained.

Mikael Witthoff brought up an interesting opposition to the argument advanced by Thomas Svahn, regarding the customer/consumer responsibility in driving sustainability demands. Mikael Witthoff states that competitiveness is not acquired through greater external sustainability communication. The background to this statement is based on the fact that customers tend to focus on transport prices rather than sustainable transports. His argument for competitiveness is instead when the company can take advantages of reduced cost via minor ecologic impact and superior social conditions, which is in alignment with the sustainability advantages mentioned by Grecu & Nate (2014). Furthermore, it corresponds with Merchant & Van der Stede (2012), who discusses the two perspectives of business competitive strategy. The low-cost orientation refers to the reduced cost caused by minor ecologic impact, for example less fuel consumption and efficient route planning,

and superior social conditions, such as lower health, safety and labor costs. The differentiation orientation could be explained as more developed products and services, which creates added value and distinguishes the products and services from competitors. Customers would, in this case, be inclined to pay a higher price for a sustainable product or service. Nonetheless, during the interviews we found that the customers of Schenker AB are not yet ready to pay additionally for sustainability. Both Thomas Svahn and Mikael Witthoff arguments could be explained by the research of Crittenden et al. (2011). The authors clarify that sustainability benefits should be communicated to all stakeholders and competitiveness is reached through an enlightened customer. Through managing the triple bottom-line and be aware of the benefits, corporations could achieve the competitiveness mentioned by Mikael Witthoff, and thereby companies could accomplish the customer demands described by Thomas Svahn. Furthermore, a complete sustainability cycle will be generated, where business intelligence could be the tool to enhance sustainability efforts, satisfy the stakeholder demands and achieve economic, ecologic and social matters within every process and decision.

Moreover, Monica Holm emphasizes the significance of showing company prominence in sustainability matters to stakeholders in order to increase reputation, improve customer relationship and outshine their competitors (Grecu & Nate, 2014). She further explains, in consistence with Kiewiet & Vos (2007), that enterprises should pursue sustainability whether it is profitable or not. This analysis is also confirmed by Matten & Moon (2008), who explicates the main objective with sustainability as contributing to the wide societal well.

Werbach (2009) discourses a common occurring phenomenon, which is the tendency of managing sustainability apart from other management. During the interviews, a pattern was identified regarding the degree of sustainability in management control from higher managerial levels. Schenker AB has sustainability incorporated in strategies and goals, but tends to lack sustainability management control, in the context of the triple bottom-line and the success factors for "sustainable business intelligence", throughout the organization. Although, Werbach (2009) considers managing sustainability cohesive with other objectives is possible and Crittenden et al. (2011) and Grecu & Nate (2014) confirms several competitive advantages of a triple bottom-line practice.

6 CONCLUSIONS

This chapter reconnects to the purpose and research questions of the thesis. A brief conclusion regarding Schenker AB and its sustainability efforts is drawn. Thereafter, success factors for sustainability management are presented, followed by general conclusions. Through the conclusions we can answer the research questions and fulfill the purpose of the thesis. The chapter closes with further research proposals.

The main purpose of this study is to explore what managerial actions are necessary for the implementation of sustainability, in terms of the triple bottom-line, through business intelligence. Furthermore, previous research of implementation success factors is advanced in an attempt to contribute with managerial business practices for sustainability.

In order to fulfill the purpose, two research questions were outlined:

- *What is necessary, from a managerial perspective, for an organization to implement sustainability, in the context of the triple bottom line, through business intelligence?*

To support the overall research question, the following question will be answered:

- *Is business intelligence a tool for sustainability, and are there any benefits of combining the two?*

6.1 SCHENKER AB

The general understanding of the triple bottom-line on managerial levels at Schenker AB is wholesome. A well-established business intelligence system is operated and great efforts are made on improvement and development of the system. Consequently, there are future intensions of using business intelligence system.

During the interviews, we have apprehended that sustainability is an important subject and much effort is focused on advancing a triple bottom-line practice. Moreover, managers and other employees are striving for sustainability, and is thereby a great prerequisite for the implementation of sustainability through business intelligence.

Further we recognized following future challenges for Schenker AB in their sustainability implementation and business intelligence practices:

- Improved collaboration and communication between business units.
- Enhanced bottom-up communication
- Create speaking-partners for sustainability and business intelligence
- Find champions for the triple bottom-line through business intelligence
- Improved stakeholder communication
- Education and training in business intelligence, as well as, sustainability
- Incorporate sustainability through business intelligence stepwise
- Create a unison system and link sustainability to every project and decision
- Every decision is based on information gathered from one solitary system

- Find link between profitability and sustainability

- Create shared definitions of economic, ecologic and social key figures

- Improve and automatize consolidation of unstructured data

- Manage sustainability with proper management control

- Update sustainability processes

6.2 SUSTAINABLE MANAGERIAL SUCCESS FACTORS

We suggest the following managerial actions as necessary to encounter the challenges mentioned above; likewise benefits in combining sustainability and business intelligence are presented simultaneously:

Top management – Top management is, in accordance with previous research conducted by Poon & Wagner (2001) and Yeoh & Koronios (2010), the most critical success factor for implementing sustainability through business intelligence. We agree that top management has to allow for corporate champions to support and push sustainability development into business intelligence, and assigning time for communication and motivation. Furthermore, top management has to provide sufficient resources and incorporate sustainability in strategies and goals for business intelligence (Daily & Huang, 2001). Additionally, we consider management control as an important aspect of top management, since management control systems often lack sustainability concepts. Therefore, management control should strive for involving all three pillars of the triple bottom-line equally as a pre-condition in every decision. Flexibility and spontaneity is as well important from top management, as it would allow bottom-up communication, increase the probability of overall organizational commitment and, perhaps, decrease the inertia in communication.

Championship – We discovered that champions for the triple bottom-line through business intelligence are scarce. Still, it is crucial to appoint champions to motivate and diffuse sustainability efforts through business intelligence (Chenoweth, Corral & Demirkan, 2006). Appointing champions will result in improved bottom-up communication, as the champions have authority and trust from top management and can interact with both higher and lower organizational levels. In contrary to Wixom & Watson (2001), we see that championship is vital, even though sustainability is by its nature extensive and intangible. Currently, Schenker AB lacks pronounced champions for sustainability in business intelligence. Therefore, we suggest that either appointing champions for sustainability in business intelligence, or support collaboration between champions in the two areas. As a result, communication and collaboration across business functions will improve and further enhance the understanding for sustainability and usage of the system.

Communication and culture – Communication and culture are a profound necessity in all enterprises to diffuse awareness of mission and vision, and unite the organization to strive for common goals (Alvesson & Svenningsson, 2008). Improved communication and collaboration between business units is necessary in every implementation phase. Especially, the relationship among the information technology units, top management and sustainability personnel has to progress in order to implement the triple bottom-line via business intelligence. Furthermore, a speaking-partner between business units, as indeed can be resembled with a champion, has proved to be useful in communication at Schenker AB. A speaking-partner can enrich the bottom-up communication and enable interaction between business units (Nohria & Beer, 2000). As a suggestion, Schenker AB could assign a speaking-partner concerning business intelligence and sustainability in order to aid sustainability implementation through business intelligence. Moreover, it is important that the speaking-partner has authority and influence with top management.

Today, information is collected and analyzed from different systems, thus, there is a risk that decision-makers base decisions on dissimilar information depending on which system is utilized. As a consequence, decisions do not proceed from similar corporate information and foundations. Previous research has not focused on the source, as a system, of information. This study contributes with the fact that one unison business intelligence system would help the organization to manage projects and objectives with similar information, regardless of business level or location. Thereto, shared problems could be handled and solved comparably. Hence, one solitary business intelligence system is a tool for sustainability.

Research concerning implementation pace, conducted by Yeoh & Koronios (2010), Borking et al. (2011) and Simons (2013), indicates that a convenient pace is compulsory to avoid frustration and increase understanding for the implementation purpose. We would like to further stress the significance of handling the triple bottom-line through business intelligence stepwise, because of the intangibility of sustainability and its lack of development in business intelligence. Hence, it is of outmost importance to educate the personnel in sustainability and business intelligence to convey the advantages with the system and create motivation for future efforts. Accordingly, a greater result could be achieved when the motivation for using the system is boosted (Merchant & Van der Stede, 2012). This study also indicates that stakeholder education and communication is necessary to convince and motivate sustainable behavior. Through business intelligence potential profitable stakeholders could be identified and attracted to the corporation. This is a first step towards a better societal awareness of sustainability matters. If organizations succeed with an efficient educational process, business intelligence could be a powerful instrument for sustainability.

In addition, this study indicates that sustainability practices have to be updated frequently in order to find new efficient methods of approaching economic, ecologic and social matters. Business intelligence could be a tool for this procedure and be beneficial in diffusing sustainability practices throughout the organization.

Resources – Resources are seen as a matter of course in every company. We consider resources as a fundamental success factor in all commitments. Therefore, we do not address appreciable attention to resources as a success factor, but rather apprehend it as an axiom and focus on other managerial aspects. We are, although, aware that resource planning is vital for implementation success, but would rather concentrate on more addressable factors as resources are restricted. As a conclusion one could say that abundant resources generate abundant possibilities, if correctly handled.

Link sustainability to business objective – Sustainability goals and strategies must be integrated in corporate objectives. A superior managerial driven approach towards business intelligence is important to achieve a system that is integrated with sustainability strategies and goals (Mukherjee & D'Souza, 2003; Moss & Atre, 2003). We further propose, in addition to previous research, that economic, ecologic and social features should be incorporated and influence every project and decision, and be seen as an asset rather than an obstacle. As a result, sustainability is treated similarly to other business intelligence applications, and the system would be able to benefit sustainability matters.

Clear relationship between sustainability and profitability – It is crucial to find and display the connection between profitability and sustainability to recognize the value of sustainability implementation through business intelligence. If this relationship is vague or non-existent; authority to develop and resources would not be provided, and motivation would fail. Even though corporations struggle to find this connection, we believe that it is more present than apprehended. Sustainability efforts would not, necessarily, be more costly than other commitments, as

sustainability practice actually involves making operational processes more efficient. Greater attention should be addressed to discover where sustainability efforts are profitable, rather than if sustainability efforts are profitable. In the short-term we can see a conflict, as sustainability implementation is considered as a substantial investment. However, in the long-term perspective, the connection would bring economic benefits through, for example cleaner and innovative production methods, lower safety and health costs, reduced employee turnover and stronger stakeholder relationships. By implementing all three pillars of the triple bottom-line through business intelligence, benefits with business intelligence described by Ranjan (2009), Moss & Atre (2003) and Davenport (2006) could be incorporated with sustainability. The incorporation could increase reputation through better and faster stakeholder communication and service. Likewise, new innovative methods could be identified, since the business intelligence system would recognize internal inefficiencies.

Define key figures for sustainability in business intelligence – Management control must be operated based on understandable and relevant key figures. This thesis implies the importance of defining relevant sustainability key figures for the specific business, which is managed by focusing on the areas where the company has greatest impact. Employees that make decisions based on these key figures have to understand the purpose of the figures, in order to achieve a successful management control in desired direction. The economic, ecologic and social key figures should be manageable within the business intelligence system and interpreted on mutual grounds. Accordingly, decision-making through business intelligence will be facilitated and all three pillars of the triple bottom-line will be regarded.

Previous successful implementations and business networking – Sustainability implementation is often associated with high costs and risks. If a corporation fails to relate sustainability implementation to profitability, the implementation would not be desirable. Hence, it is vital to find and demonstrate previous successful and profitable sustainability implementations through business intelligence. This could be seen as a method for internal and external conviction for future procedures concerning sustainability in business intelligence. Moreover, this research designates that business networking is crucial for the extent of knowledge. Collaborations between, for instance, educational institutions and corporations are further seen as helpful in convincing internal and external parties.

Incorporate unstructured data – As sustainability principally consists of unstructured data, our research found that the incorporation of unstructured data in business intelligence has to be improved. Sustainability information is often treated apart from other business information. Although, we perceive that business intelligence is a tool for gathering and analyzing economic, ecologic and social information, but the challenge is to structure the unstructured data. Competent data scientists and sustainability experts are crucial to analyze and structure unstructured data in order to minimize erroneous decisions. This should be managed by dividing the unstructured data into separate levels of difficulty: easy, medium and hard. Thence, the major focus should lie on automatizing the most manageable information first, and handle the least manageable information manually. In the process of structuring unstructured data, organizations will develop necessary skills and tools to handle all levels of unstructured data. Basing decisions on evidence rather than intuition will result in better decisions and move the corporation in the desired direction. Research concerning Big Data states that companies, with the support of Big Data, can handle additional levels of unstructured data and further improve decision-making (McAfee & Brynjolfsson, 2012). We believe, in accordance with McAfee & Brynjolfsson (2012), that Big Data is the future of decision-making.
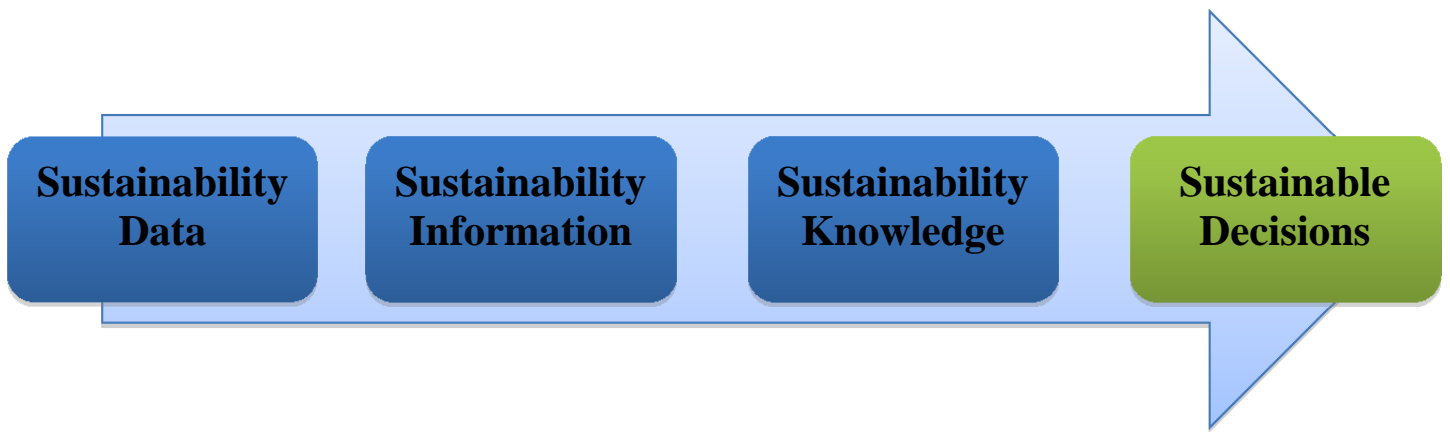
FIGURE 6-1. Sustainable Business Intelligence, modified after Thomas Svahn (2014)

6.3   GENERAL CONCLUSIONS

The investigated subjects, in combination, are still immature and we consider future research and discussion as necessary. Is business intelligence more inclusive than what it is operated for today? The question might not be what is necessary to implement sustainability through business intelligence; it might rather be to extend the business intelligence term to include all three pillars of the triple bottom-line. Subsequently, being "business intelligent" in business decisions should include sustainability consideration. We believe that corporations should embrace the possibility to practice business intelligence as a tool for sustainability and to commence a discussion of the usefulness of business intelligence within the area of sustainability, which is correspondingly seen as the major contribution of this study.

We initiated this thesis with negligible prior knowledge in the area of business intelligence. Since sustainability is a subject of interest, we were able to investigate how to implement sustainability with the aid of a business intelligence system. The approach is legitimate, as the research is within the framework of management control.

During the process of completing this thesis, our knowledge evolved within the two researched subjects and, thereby, we were able to adjust the structure of the applied theoretical framework. Accordingly, the creation of the theme of the thesis was facilitated and resulted in strengthened analysis and fruitful conclusions. A case study was an appropriate method to apprehend practical experiences, as business intelligence in conjunction with sustainability is scarce.

Currently, the three elements of the triple bottom-line are not yet equally integrated in business intelligence to have significant effect on corporate decision-making and management control. Nonetheless, the majority of the respondents considered sustainability implementation through business intelligence as possible and beneficial. Hence, further research is motivated regarding the conjunction of the two subjects.

6.4 FURTHER RESEARCH PROPOSALS

The thesis process has raised numerous areas of discussions and we acknowledge the magnitude of the researched subjects. The following topics are not covered within the frame of this thesis, but could be investigated in order to further comprehend and develop the area of business intelligence in conjunction with sustainability.

- **Sustainable success factors through business intelligence:** This study has advanced previous success factors for implementing business intelligence in an organization. There is a possibility for further research in business intelligence in conjunction with sustainability to discover more specific success factors, perhaps through a technical approach.

- **Investigate other corporations:** In order to apprehend a unified picture of what is necessary to implement sustainability through business intelligence, further similar studies have to be conducted at other companies and business areas. Studies in the researched area are scarce.
  It would be interesting to investigate previous successful sustainability implementations via business intelligence. To develop additional success factors and find patterns, one could study a successful company and attain deeper knowledge in the implementation processes. We believe that this type of research will be more common in the future, since the interest for sustainability implementation increases.

- **The usability of Big Data:** We believe that Big Data could be a valuable source to collect, structure and analyze sustainability information. The data collected will provide information based on evidence and will result in improved decision-making. Additional research could involve discovering the benefits of applying computerized systems to collect economic, ecologic and social information and practice sustainable business.

- **The value of sustainability implementation:** A more mathematical or investment related approach could be taken to capture the value of implementing sustainability through business intelligence. If appropriate methods are employed to calculate the value, companies could obtain grounds for sustainability investment in business intelligence and, thereby, enhance the level of certainty in the process of implementation.

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Interviews

Name	Title	Role	Corporation	Date
Thomas Svahn	Chief Operating Officer	Business Intelligence expertise	Advectas AB	8/4 – 2015
Maria Magnusson	Manager for IT Development	Technological approach to Business Intelligence.	Schenker AB	22/4 – 2015
Anders Bükk	Chief Accountant	Office view of sustainability	Schenker AB	24/4 – 2015
Mikael Witthoff	Internal Auditor	Operational view of sustainability and Business Intelligence	Schenker Åkeri AB	27/4 – 2015
Inger Uhrdin	Head of Strategic Projects & Business Intelligence	Managerial approach to Business Intelligence	Schenker AB	5/5 – 2015
Monica Holm	Environmental coordinator	Corporate sustainability expertise	Schenker AB	8/5 – 2015

APPENDIX I – Interview guide

Depending on background and knowledge, we used different interview guides for each interview. The degree of exhaustive answers in each of the two subjects varied among the interviewees. The following interview guide is an example from one interview at Schenker AB.

Questions about Sustainability:

How do you define sustainability and how are your sustainability practices?

Are there any benefits with sustainability efforts?

What is difficult in measuring sustainability?

Can competitiveness be reached through sustainability?

To which degree is sustainability integrated in corporate goals and strategies?

Who has the greatest responsibility to push sustainability development within the company?

Do you think it is important with a supportive employee for sustainability?

How big is the pressure from top management to produce sustainability decision basis?

How does the sustainability communication work?

Questions about Business Intelligence:

Does the business intelligence system provide you with relevant information to take sustainable decisions?

To what extent do you have the possibility to influence the design of business intelligence system?

Are there any personnel that strive for business intelligence development?

Questions about Sustainability in combination with Business Intelligence:

What is necessary to implement sustainability through business intelligence?

How do you perceive the relationship between profitability and sustainability?

Are you provided with sufficient resources?

Is it possible to monitor your/Schenker AB sustainability efforts? Is it possible through business intelligence?

APPENDIX II – Transcription

The following transcription is an example of one of the interviews conducted at Schenker AB. The transcription is in Swedish as the interviews were performed in Swedish.

Transcription: Mikael Witthoff, Schenker Åkeri AB

S=Simon Högnelid
O= Oliver Widal
M= Mikael Witthoff

S: Jag såg att du hade vårt underlag där, det som är, det som du kan ha nytta av där är ju att vi besk river vår syn på hållbarhet där och vad vi utgår ifrån i vår uppsats, så det stämmer fortfarande överens med vad vi sysslar med. Det som vi har ändrat, vi hade en frågeställning från början som var att hur man kan sprida hållbarhet genom BI, nu har vi ändrat den till hur man kan implementera hållbarhet i BI istället, för att få in…

A: Alltså ni vill ha in de aspekterna i BI lösning så att säga

O: Alltså få in information så att man kan skapa nya nyckeltal att styra efter dom är väl det vi försöker och hur man kan göra det och vem som har störst ansvar i det.

S: Vi har ju pratat lite om hållbarhet, vi tänkte bara höra från dig hur du ser på hållbarhet?

M: Schenker åkeri, vi är ett åkeri, vi kör lastbilar och ser man liksom på den strukturen som vi har så är det väldigt mycket chaufförer och transportledare, vi är väldigt "handson"-folk så att säga, när vi driver de här diskussionerna så gör vi det på en ganska tydlig nedbruten nivå så att det är saker som folk kan relatera till. Vi pratar mycket om skador och tillbud på chaufförerna, det är ju väldigt riskfyllt arbete, farligast i Sverige sa arbetsmiljöverket, x antal dödsfall i chaufförskåren. Så ur arbetsmiljösynvinkeln så är det mycket "handson", chaufförernas arbetsmiljö ute i verkligheten, fordon, hanterar gods hos kunder och sådana saker. Ser man på miljödelen utav det hela så är det bränsleförbrukningen, det är ju det absolut största miljöpåverkan, det är ju sådär att transportnäringen är ju en av "The bad guys" i miljödebatten

S: det är just därför att Schenker är ett bra företag att intervjua i och med att man påverkar miljön på ett så påtagligt sätt.

M: Det är ju också så att det är en tacksam diskussion att föra i våra ledningsgrupper, för att en sparad liter diesel, eller vad det må vara, det ju pengar, det är ju pengar på sista raden, rent krasst ekonomiskt. Och samma sak, en skadad chaufför, som måste vara hemma och ha rehab och sådär är ju också pengar för du får ju ta in en hyrchaffis istället som producerar sämre, som inte får lika mycket gjort, plus att han/hon är ju dyrare då för att den är inhyrd. Det är ju en tacksam diskussion att föra på en ganska krass ekonomisk nivå. Sen har vi väl haft svårt att sätta siffror på det här, liksom här måste vi göra något, har inte riktigt haft de beslutstöden. Och vi sliter litegrann fortfarande kan man säga, det är ju så, när man ser på ett Åkeri i Sverige idag så har ett stort åkeri 16 bilar eller mer, vi har flera hundra, byggs väldigt få system för att hantera det här. Det var det vi märkte när vi började kolla på de programvarorna, stapelprogramvarorna för bränsleuppföljning, inte byggda för åkeri i vår storlek, utan byggda för mindre åkeri.

S: Vad är det för problem?

M: Oftast så följer du en bil, säg att den här bilen har högre bränsleförbrukning än vad jämlik bil har, en enkel analys vi börjar med. Vi vill prata med chauffören, massa registerkontroller. Om en bil går dåligt, och man vill ta en diskussion med chaufförerna, då måste man klura ut vilken chauffför man ska prata med, eller så är det fel på fordonet. Det är inte riktigt systemen uppbyggda för, inte för storskalighet. Har man tio bilar kan man gå igenom det en gång i veckan

S: Det är tiden det tar att bearbeta som är stora problemet?

M: Ajemän. Vi har ganska bra koll på hur mycket bränsle drar de olika fordonen, när en chauffför tankar så sätter de in ett betalkort och sen ett fordonskort, så vi får alltid nummerplåten på bränslefakturorna från de stora oljebolagen. Så att vi har bra koll på hur mycket bränsle vi gör av med och hur mycket bränsle de olika bilarna gör av med. Därifrån är det klurigare. Vi har haft otaliga projekt för att jobba med detta.

S: Det gör ni fortfarande?

M: Ja det gör vi, jag menar bränsleförbrukning är och förblir vårt stora miljöaspekt, så det är ju mål satta kring detta och vi jobbar med övergripande månadsuppföljning och de jobbar med det ute på driftorterna.

S: Om man ser till hållbarhetsarbete inom en organisation, vem tycker du har det största ansvaret till hållbarhetsarbete?

M: Det är VD och ledning, det finns ingen annan, om inte de är där och visar väg så kommer det inte hända något. Sen är det tacksamt med några eldsjälar ute i organisationen, men om inte VDn säger att det här är ett prioriterat område kommer det inte hända något.

S: Känner du att det finns eldsjälar för hållbarhet och BI ute i organisationen?

M: Ja, när det gäller BI och de BI-verktygen, som vi har tagit fram, så har vi haft ett par eldsjälar som har vart verkligen drivande här på huvudkontoret, i den förra ekonomichefen och den förra VDn egentligen, som var med och byggde upp och drev det här. Och det får man säga att det har de lyckats bra med, användandet har spridits ut i organisationen, vi sitter ju väldigt decentraliserade, allt från Kristianstad och Malmö upp till Skellefteå och Luleå, men ändå har man förståelse för verktygen och man använder dem där ute. Sen har vi fått göra en del utbildningsinsatser för att folk ska lära sig att använda dom. Ur den synvinkeln har vi haft definitiva eldsjälar. Ser man till miljöbiten har man vacklat lite, det har känts så ogripbart, det har varit svårt att angripa detta. Men så har det poppat upp folk med bra idéer och lösningar. Vi hade en kille i Stockholm som vi rekryterade in, han hade jobbat med utbildningsfrågor och utbildning av chaufförer, och föreslog ett utbildningsprogram och utbildade då masterdrivers ute på orterna, en chaufför på varje ort blev instruktör för sina kollegor. Det slog olika väl ut på olika orter, men exempelvis i Linköping slog det väldigt väl ut. De hittade en kille som blev jätteengagerad i detta och körde en runda med lastbil, och så fick kollegorna kommentarer av instruktören, och så körde de samma runda igen och mätte skillnaden hur mycket bränsle hade gått åt. Där kom andra grejor in, mycket handlar om att de ska tänka innan och planera, och då kommer man in på arbetsmiljön också. Kan de jobba lugnare så får man en bättre arbetsmiljö också, och det slog otroligt bra ut. Att vi fick så bra resultat i Linköping var just att den här personen tyckte att det var så roligt att köra, kände att han fick lite extra liksom, så det var jätteroligt. Så visst, som du säger, eldsjälar där ute är viktigt, men får de inte backning av ledning eller resurser eller tid, så antagligen går de någon annanstans där de får gehör för sina idéer.

S: Hur tycker du det är med resursallokering, känns det som att saker och ting hamnar på rätt plats i rätt tid, läggs det tillräckligt med resurser på BI och hållbarhet.

M: Ja, det är ju en väldigt tight bransch, det är väldigt små marginaler, man har inte mycket att röra sig med, men på det hela får jag väl säga att man utnyttjar sina reseurs bra, klart att det finns marginella saker man kan göra annorlunda, men på det hela bra, hos oss ska jag säga för hur det ser ut i Schenker för övrigt har jag svårt att säga. Det är ju fortfarande sådär att godset ska komma fram i tid och vi får inte spendera för mycket pengar och sådana saker. Jag kan säga så, det finns en förkärlek att välja en billigare lösning, för att jobba med miljö om man säger så, då är ju det tacksammare så att säga. Vi kör mycket på RME, biobränsle istället för diesel, sen ändrade de skattesatsen och då blev RME plötsligt dyrare en diesel, men då sa vi det att vi fortsätter köra på RME för att det är bättre ur miljösynvinkel. Så det finns ju bevis på att man väljer miljö framför den hårda pengarna, sen var det många andra faktorer som spelade också då. När vi för dialog med oljebolagen är det svårt att vända kappan allt för lättvindig, någonstans finns det ju en hård ekonomisk verklighet också.

S: Vi för diskussionen att det handlar om att koppla lönsamhet och hållbarhet för att hållbarhet ska funka. Vad är viktigt för att man ska komma till stadiet där hållbarhet är lika viktigt som lönsamhet?

M: Aa, det där är jätteintressant fråga, det kom en undersökning för ett tag sedan om vad transportköparna värderar, om de kan tänka sig att betala mer för en miljövänligare transport, och det är ju väldigt få som har lust med det. Det klart att så länge miljö och ekonomi går hand i hand så är det ju vackert, och i viss mån så är det ju så, det är ju billigare att köra miljövänligt. Men som du säger så kommer man till de här knäckpunkterna, det blir dyrare ska vi göra det ändå. Då tror jag man behöver någon som säger att vi kör på miljön. Jag tror att vi behöver ganska grundläggande förändring i samhället egentligen, som viktar det, för alla ska ju ha lön och mat på bordet, leverantörerna ska ha sitt, köper vi en miljövänlig bil från Volvo så är inte den billigare för det, de rabatterar ju inte det.

S: Är det lagstiftning som ska till för förändring?

M: Aa, precis, man ser ju i storstäderna och miljözonerna att du inte får köra inne i staden med för gamla lastbilar, det ska vara en speciell miljöklass, och det driver ju vårat då, när vi kör i Stockholm så måste vi ha en viss lastbil med rätt miljöklass för att köra inne i staden, annars får vi betala böter, och det ser ju inte bra ut i pressen, och det driver ju vårat investeringsprogram, fordon som kör lokalt i städerna sätter vi Stockholm. Vi tar de gamla bilarna från Stockholm och sätter de i Kristianstad exempelvis. Det är en viktig faktor. Ska man vara seriös liksom, det krävs skatter och lagstiftning som driver detta, det måste bli för dyrt monetärt. Tyvärr.

S: Hur tycker du hållbarhetsfrågan har inverkan på företagets beslutsfattande?

M: Jo, den finns med som en av flera parametrar, det gör den, inte alltid, ibland får man påminna folk om att det på det, men förvånansvärt ofta så är det med, kanske inte att man tänker på miljö och arbetsmiljö, men att man har med ett par aspekter av det i iallafall. Åtminstone när det är större frågor.

S: Har du exempel?

M: Ja, vi har ju gjort ett par grejor. VI hade en tvätthall i Kristianstad förut, man ville stänga ner den, alternativet blev ju då att köra till en annan tvätthall och då kanske utsläppen ökar och hur såg deras miljö ut där dom tvättade, hade de alla tillstånd och vad hände med utsläppen som blir när man tvättar? Där gick man igenom ganska noggrant då, och så trixade man lite med sitt upplägg med hur man körde bilarna så att man kunde tvätta mer på vägen, med lite mera aktiv styrning kunde styra chaufförerna att efter ett visst stopp så får du stanna och tvätta och det gör du på ett ställe på vägen. Med lite mer aktiv styrning fick man till det bra ändå. Men som sagt, i grunden, i

chaufförs och åkeri verksamhet, så är det ganska farligt sett ur arbetsmiljösynvinkel. Arbetsmiljöverket säger att det finns en ganska hög tröskel i branschen som helhet, man har en hög acceptansnivå. Då får man, särskilt för mig i min roll som revisor, så får man påminna folk att har ni tänkt på det här nu.

S: Hur fungerar kommunikationen inom Schenker åkeri, men också med högre instanser, hur funkar det om ni har en hållbarhetsfråga eller idé om ni vill föra den vidare?

M: Ja, man jobbar med det och har lite sådana här samverkansgrupper, det finns bland annat en central arbetsskyddskommitté som bara är till för att titta på problem och utbyta erfarenheter mellan enheter, så man kan ställa frågor till kollektivet som är med där, på samma sätt har alla miljösamordnarna träffar då och då där man utbyter information. Till och från kommer saker på intranätet, med lite nyheter om olika saker, så försöker man pusha ut det i organisationen. Man har också börjat med innovationspriser. Det är styrt från Tyskland. Något som förbättrar på ett större sätt kan man nominera in till priser, det är ju lite prestige och det uppmärksammas ju till och med på global nivå. Man har lite sådana grejor, sen kan vi alltid bli bättre, och det någonting som både vi intern och våra externrevisorer att det måste var större utbyte mellan våra distrikt, för oftast är det samma problem man har eftersom det är samma verksamhet vi kör på olika ställen, det är ju ganska naturligt då att ett problem som finns på ett ställe men inte på ett annat, så är det något man gör bättre på det ena stället. Där har vi arbete att göra, men nu är vi iallafall medvetna om det. Men det är samma sak där, måste allokeras resurser till att göra det jobbet, det är ju bara ledningen som kan sätta till de resurserna, igen faller det tillbaka på vad ledningen väljer att göra.

S: Hur integrerat är hållbarhet i företagets mål och strategier?

M: På Schenker åkeri skulle jag säga att det är väl integrerat. Här är vår målsammanställning som vi gör månadsvis och de översta målen är hur väl vi levererar i tid, reklamationer på godsskador, fordonskador påverkar både miljö och arbetsmiljö förutom att det är kostnader, sen är det arbetsmiljö och miljömål; e-fakturor och förnybart bränsle. För vår del skulle jag säga att vi har hållbarheten på en väldigt direkt nivå. Från hela företaget och ner till de individuella driftsorterna där ute, det är vår struktur. Där ute har de ju en metodik tavel-möten och att man för upp daglig styrning, samlar avdelning och går igenom hur gick gårdagen eller morgonen? Samma saker man pratar om som på månadsmötena. Arbetsskador, sjukfrånvaro, godsskador, kanske inte utsläpp. Det är ändå ganska mycket för vår del. Vi är ganska nöjda, sen som ni såg, vi är inte hemma på alla grejor, så det finns ju arbete att göra, men det är uppe på agendan

S: Vi pratade ju om hur man ska komma dit att man jobbar för hållbarhet och kopplar det till lönsamhet, kan man bli konkurrenskraftig genom att vara hållbar.

M: Ja det kommer man kunna, i viss mån så är man ju det idag också. Om man ser på bränsleförbrukning. (Ett stort åkeri i USA) Chefen där sa det att när bränslepriset är som högst, det är bra för oss. Han menar på att de var så stora att de kunde jobba med hela sin flotta och planera den effektivt och så hade de volymrabatter på bränsle, det fanns ingen som köpte bränsle lika billigt som dom, och ingen kunde optimera sin trafik lika mycket. Den som är duktig på bränsle och miljö och arbetsmiljö, den har ju en konkurrensfördel för den har ju lägre kostnader. Sen är ju nackdelen att de åkarna som konkurrerar med chaufförer från Balkan, som jobbar på slavkontrakt och stjäl diesel, så kan vi vara hur miljövänliga som helst, dom är ju ändå billigare. Det slår ju ut botten på hela branschen.

O: Men du tror man kan kapa kostnader och bli mer konkurrenskraftiga? Du tror inte att vi kommer få fler kunder om vi är det?

M: Jo, det tror jag säkert, det beror ju mer på, det är ju mer en policyfråga, hur mycket utav de där pengarna vill jag behålla inom företaget och hur mycket vill jag ge tillbaka till min kund. Om jag förhandlar med kund x, och han säger att konkurrenten är billigare, men titta på bränsletillägget då, då är vi billigare. Så om man väljer att inte ta ut hela den minskningen av kostnadsbasen mot kunderna så kan man ju hålla ett lägre pris. Sen är det ju så, att vara miljövänlig i sig och säga det att välj oss för vi är miljövänliga, då hamnar man ju i diskussionen vad är det kunden köper. Jag har jobbat med transporter i 15 år och det har hänt två gånger att kund har valt miljövänligare alternativ trots prislappen.

S: För att BI ska vara nyttigt ska man kunna ta del av den också.

M: Precis, egentligen har vi två plattformar, det ena är qlikview men där är licensekostanden en aspekt, många har en qlikview licens men inte alla. Den andra plattformen presenteras all data i Excel.

S: Hållbarhet i kombination med BI, vad måste göras för att implementera hållbarhet i BI?

M: För vår del, på våra miljöaspekter, är kopplat till fordonen, krävs smarta system som för data från fordonen in i analysverktygen. Det finns i mångt och mycket idag, men fordonstillverkarna har lite sina egna standarder. Det är inte alltid man kan jämföra en Mercedes med en Volvo med en Scania. Man kan titta på data i deras system men det är inte alltid dom låter folk dra ut data till ett externt BI-system, dom skyddar sin egen data, ett sätt att hålla kvar kunderna. Vi jobbar med alla tre eftersom vi är så stora. Vi vill inte beroende av en leverantör, och då sitter man där med tre olika analysverktyg som inte talar riktigt samma språk, svårt att jämföra mellan fordon, vi kan inte använda det i ett gemensamt BI-system. Det är en svaghet. Leverantörerna plockar data från våra system för att analysera hur deras produkt sköter sig. BI-systemen som vi har kört med är ganska flexibla, så att man får mätetal som man själv gillar och vill styra på, men det är ett problem med deras system.

S: Vad skulle du vilja ha ur ett BI-system för att förbättra ditt hållbarhetsarbete?

M: Man ska vara lite krass med det, du får ju ännu bara ett mätetal, det slutar ju inte där, man måste göra något med det, man måste analysera och se vad betyder det här, är den här trendkurvan viktig för mig, det måste man också bestämma. Det är inte riktigt intelligence än, det är intelligence först när en människa har analyserat det och bestämt att det här är viktigt. Innan dess är det bara statistik, bra statistik säkerligen, men bara statistik.

S: Vad tycker du är svårast med att mäta hållbarhet?

M: Det var ju en intressant fråga, det svåraste är ändå processen att bestämma sig för vad det är man vill veta, vad tror vi spelar roll för våran verksamhet. Plocka fram mätetal är billigt och lätt idag, det är förståelsen av verksamheten som är det svåra. När folk med kunskap om verksamheten och hårdvaran och om personalen säger att det här är ett viktigt mätetal, det här visar det här. Det är ju det steget som är viktigt.

S: Då är det viktigt att kommunicera ut detta så att folk vet vad man mäter och varför.

M: Precis, jag kan ju på sin höjd ge generella tips om så här fungerar mätning, det är ju verksamheten som själva som måste bestämma vad som är viktigt för oss. Det är också viktigt att man begränsar sig. En KPI ska ju vara ett nyckeltal, det ska vara representativt för stora delar av verksamheten, att då ha 50 KPIer då är det inte nyckeltal längre, det är ju inte poängen. Poängen är att snabbt få en bild över såhär mår vi idag, och det får man inte med 50, utan kanske 15.

S: Har ni KPIer som ni kan se i BI-systemen?

M: Nej det har vi inte. Vi har olika rapporter, ganska krassa, numerära. Vi har KPIer på ute i dagliga verksamheten, på whiteboarden, men inte i BI-systemen. Jag är inte säker på att jag tycker att det är bra. Mna kan få allt för seniora chefer att reagera för kraftigt på ett kortvarigt KPI. Det är en risk med den typen av daglig projicering av KPIer, att folk överreagerar.

S: Men hållbarhetsKPIer kanske är bättre i sådana fall?

M: jag gillar ju långsiktiga trendkurvor på hållbarhetsKPIer, för att normalt sätt gör du inte åtgärder och så blir det en drastisk förbättring eller försämring, så att långsiktiga trender tycker jag är tacksammare att följa, jag är inte intresserad av kortsiktiga svängningar. Men å andra sidan, behöver jag gå in varje dag och kolla på dom, nej. Det räcker att gå in en gång i månaden, och vill jag ha det absolut senaste av något får jag beställa upp det. Normalt sätt behöver du inte. Iaf får man vara försiktig med hur man väljer att mäta.

S: Mäta utsläpp/anställd?

M: Det blir såhär, för att det är så komplexa system, så att någonstans får du vikta ett utsläpp mot ett annat. Pappersutskrift är också ett utsläpp, och då får du vikta utsläppen mot varandra, vad är de värda. När vi gjorde om våra miljörapporter, så sa vi att vi fokuserar där vi faktiskt gör skillnad, det blir lustigt när man för diskussion med en annan typ organisation och dom frågar vad vi gör för energiförbrukningen, det är inget vi lägger fokus på. Det är lätt att hamna i fällorna att mäta saker som är lätt att mäta, men jag tycker det var modigt av ledningen att säga det att vi fokuserar på bränslet, för det är svårare att visa på. Det är ett svårare mål att jobba med, men man får inte backa för de besvärliga diskussionerna.

S: Vi får tacka för din tid.