Strategic Business Intelligence at Toyota Material Handling Europe

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Abstract

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Business Intelligence (BI) is as an academic subject a rather unexplored research field and within the business context, BI leads an ambivalent existence. BI is foremost used either as a term capturing other intelligence terms or as a denotation for decision-support systems. Within this Master Thesis, BI is therefore approached as an umbrella concept covering both these offshoots. The Thesis is centered on a Case Study conducted at Toyota Material Handling Europe (TMHE) and the initiated process of defining and enhancing Strategic Business Intelligence. TMHE has divided their BI in Strategic and Operative BI, where the latter has been in focus historically.

The Case Study indicates that it is neither pragmatic nor illustrational to define BI as an umbrella concept and that BI is too complex to be described only in one dimension (i.e. in Strategic and Operative). A new structure is proposed in which BI is described with three frameworks (Activities, Categories, and Processes); in order to better capture the complexity of the subject. As a way to improve the BI work within TMHE, an information needs analysis was conducted among the top and middle management using a modification of the World Mapping Method. The outcome of the analysis was suggestions of potential areas for coordination of information needs. To improve issues of handling of unstructured information within TMHE, there is a need for change of the organizational culture. The concepts of Wiki, RSS, and Enterprise Search, all connected to Enterprise 2.0, are seen as tools that could help the organization.

Keywords
Business Intelligence, BI, Strategic Business Intelligence, Operative Business Intelligence, Information Needs Analysis, Unstructured Information, World Mapping Method, Information Handling, Enterprise 2.0, Wiki, RSS, Enterprise Search, Toyota Material Handling
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Thank You All.

Stockholm, October 2008
Jon-Erik Olsson & Jimmy Sandell
Executive Summary

Business Intelligence (BI) is as an academic subject a rather unexplored research field, and within a business context, BI leads an ambivalent existence. BI is foremost used either as a term capturing other intelligence terms or as a denotation for decision-support systems. Within this Master Thesis, BI is therefore approached as an umbrella concept covering both these offshoots. The Thesis is centered on a Case Study conducted at Toyota Material Handling Europe (TMHE) and the initiated process of defining and enhancing Strategic Business Intelligence. TMHE has divided BI in Strategic and Operative BI, where the latter has been in focus historically.

The Case Study indicates that it is neither pragmatic nor illustrational to define BI as an umbrella concept and that BI is too complex to be described only in one dimension (e.g. in Strategic and Operative). Therefore we propose a new structure in which BI is described by three frameworks (Categories, Activities, and Processes), in order to better capture the complexity of the subject. The Case Study also evidently shows that the division of BI in Strategic and Operative lacks clarity and meaning within the company.

The categories framework provides a way to recognize all activities performed in the company that could be labeled as intelligence work, and we recommend dividing the BI work in the four categories: Market Intelligence, Competitive Intelligence, Macro Intelligence, and Internal Intelligence. We believe that this division will lead to a better overview and acknowledgment of the work done, something we found necessary due to the company’s functional structure and lack of transparency.

The duality of work methods separates continuously intelligence work within the corporate functions, from ad hoc and sometimes cross-functional studies performed by different groups. The latter is also an additional ambition for Strategic BI and therefore expected to have a more prominent role in the future, which is why the need for differentiating the way of working increases. By applying the framework of activities we see that this will help TMHE to relate to BI work as well as a way to confront the found anxiety among our respondents of BI as either tools and applications or as something solely for the TMHE Management Team.

We mean that a run-through of the existing BI work within the organization is necessary, which is to be performed within the framework of processes. We do not believe in, and have not found appropriate theoretical support for, one general BI process. Instead the processes ought to be based on the activities performed today locally in the corporate functions, and to be evaluated from the point of view of what BI is to support. Questions that need to be addressed are: who is to do the work, when is it to be done, what is to be the output, and in what format (e.g. reports, work shops or presentations)? We recommend the use of firm deliverables; meaning, in accordance with the discussion above, standardized intelligence products tailored to suit the target audience.
As a way to improve the BI work within TMHE, we conducted an information needs analysis among the top and middle management of central functions using a modification of the *World Mapping Method*. The information needs were categorized in the different categories proposed in our model above, and the outcome of the analysis was suggestions of potential areas for coordination of information needs. The most evident categories of information needs with an unsatisfied information supply today can all be referred to the category Macro Intelligence. We thus recommend Business Planning Department to investigate how these information needs ought to be supplied and we also see this finding as a support to our structure. However, foremost we see that the information needs analysis is to be used as a basis for discussion with a twofold applicability: firstly as a highlighter of information gaps, and secondly as a highlighter of areas of improvements from the perspective of information handling.

Finding and gathering of information is today dominated by interaction within the personal network, which is an effective but time consuming strategy. For example, information on issues that has not been touched upon before is perceived to be difficult to find. This is partly due to the complex structure of the intranet, which results in that it serves more as a location drop than as a natural source of information.

We see that the new BI structure would increase the transparency in the organization, however, in order for this to happen we see it as a necessity that the output of the BI structure is made available to the rest of the organization (to the extent that this is possible). In order to reach an effective information handling, we also see the need for people taking power of their own information supply. This is because one cannot know all information needs of another person, and because this strategy ensures that information is gathered in a time and location that suits the user. To improve issues of handling of unstructured information within TMHE, there is a need for change of the organizational culture. The concepts of *Wiki*, *RSS*, and *Enterprise Search*, all connected to the buzzword *Enterprise 2.0*, are seen as tools that could help the organization both to facilitate BI work and to enhance information handling.

Wikis provide a tool, but maybe more important a different way of working, aiming at improving collaboration, information sharing, and creativity among its users. The primary area for use would be as a digital notebook, where information and files could be structured and shared with others, enabling the creation of a common view of information in a living document. We see that Wikis would be especially useful for any team our group within TMHE, but especially useful for BI groups that handle a lot of unstructured information. We see that the use of an RSS tool will provide good support for monitoring changes and adding of information on the intranet and Internet in general and in BI areas as Competitive and Macro Intelligence in particular. Thus it is possible to avoid having to manually track the changes of information sources. Enterprise Search platforms provide a powerful tool for finding unstructured information located in different information systems in an organization. Through the use of a contextual search engine, the search result will be custom tailored to suit the intentions and the profile of the user. We see that this tool could help to overcome the issues experienced when not being able to find information on the intranet because of its complex structure.
Populärvetenskaplig beskrivning


Vi har därför dels undersökt hur BI-arbetet ser ut inom TMHE idag, samt synat uppdelningen i operativ och strategisk i sömmarna i och med de ovan nämnda oklarheterna, som ofta omhuldar detta ämne. Vi har även genomfört en informationsbehovsanalys med utgångspunkt i Per Frankelius World Mapping Method, bland top- och middle management på företaget. Analysen skedde främst för att hitta inom vilka områden företaget saknar eller har en svag informationsförsörjning idag, samt för att hitta förbättringsområden utifrån ett koordineringsperspektiv.

Specifikt för strategisk information är att den ofta finns ostrukturerad inom eller utanför företaget, varför hantering av denna information är av stort intresse för dem som jobbar med BI. Vi har på grund av detta även studerat hur informationshanteringen ser ut idag inom TMHE med syftet att kravställa hjälpmedel som skulle kunna underlätta detta arbete.

Undersökningens resultat pekar på att uppdelningen i operativ och strategisk inte är en fördelaktig uppdelning, dels eftersom begreppen i sig är svåra att definiera och dels för att en enda dimension visat sig vara för fattigt för att göra begreppet rättvisa. Vi har därför tagit fram en modell som genom tre olika perspektiv (aktivitets-, kategori- och processbaserat) bättre kan beskriva detta komplexa begrepp. Vi har även tittat på hur detta skulle kunna struktureras inom TMHE, samt placerat in de informationsbehov vi funnit i behovsanalysen inom våra föreslagna kategorier. Vi har även genom analysen kunna peka på områden som behöver höjd beredskap utifrån våra respondenters önskemål.

Vi presenterar även tre förslag på lösningar som skulle underlätta hanteringen av ostrukturerad information inom TMHE. Dessa är alla knutna till begreppet Enterprise 2.0 (jfr Web 2.0) som koncept som alla har gemensamt att användaren sitter i förarsätet och att interaktivitet och samarbete främjas. Vi föreslår att TMHE bör överväga att i framtiden använda sig av Wikis, RSS samt att implementera en Enterprise Search plattform.
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1 Introduction

This chapter gives an introduction to the subject Business Intelligence, which together with a problem description, leads to the purpose of the Thesis. After the purpose follows our delimitations and last but not least the outline of the Thesis, including how the work has been divided.

1.1 Background

Business Intelligence (BI) is a term with many meanings, but it is foremost used either as a term capturing other intelligence terms or as denoting systems support tools for decision-making.

As many business concepts, BI is sprung out of military intelligence in an Anglo-Saxon environment, which has had effect on the view of how to organize and manage BI. The extensive use of the term by consultancy agencies has further affected the lack of conformity. However, independent of on what level or in what context, the overall purpose of BI can be simplified as delivering support to business decisions.

Despite the fact that Business Intelligence is becoming more important and recognized by companies and organizations, it is still an academically unexplored subject. Due to the modest amount of research; semantics, division, usefulness, and efficiency are still up for debate. However, the concept of Business Intelligence has attracted much attention during the last decade and today it has a place in many companies on the boundary between technology and industrial business. The problem of organizing and making use of the continuously growing amount of information in today’s organizations is a never-ending challenge. One of the major challenges for companies is also how to make the best use of their BI department. Questions on how the work ought to be formalized, structured, and organized still haunts top management.

1.2 Problem Description

In order to be competitive, an organization must know and carefully understand not only their own operations, but also their industry and business environment in order to predict and adapt to possible threats or opportunities. Toyota Material Handling Europe (TMHE) has until now been focusing mainly on Tactical and Operational Business Intelligence, but under the guidance of the Business Planning Department (BP), the goal is to develop, establish and implement a structure and methodology to handle Strategic BI.

Since the organizational changes following the acquisition of BT Industries by TICO in the year 2000 and the initiation of the integration process between the two companies, Strategic BI is an area that is still in its infancy. Both companies have a tradition of setting high business goals and to be able to reach those goals, effective strategies must be developed, therefore, an increased focus on strategic intelligence by TMHE is necessary. Considering that the Material Handling is a mature market it is crucial for TMHE to have a highly developed Strategic BI if they are to increase their market share.
TMHE believes that experience, knowledge, and skills gained from the integration projects could be generalized to help challenge and develop their strategies. There is also a challenge in handling the vast amount of unstructured information that is produced, received, and collected in personal computers, databases, email servers, external hard drives etc., as it is of great strategic importance to ensure that this information will be stored and easily accessed in the future.

Furthermore, TMHE sees an opportunity to create a more efficient and accurate intelligence ability and to establish a function to provide appropriate input and support in time for the annual business planning process. BP is currently defining and developing the ability within Business Intelligence, with accent on Strategic BI.

1.3 Purpose
The purpose of this Master Thesis is to contribute to the initiated process at Toyota Material Handling Europe of defining and enhancing their ability to support functional strategic work through Strategic Business Intelligence.

1.3.1 Discussion of Purpose
The starting points of investigation are top and middle management’s roles along with the handling of information, and to identify important needs to be met according to these points.

Today, Business Intelligence at TMHE is divided into the constituents Strategic and Operative BI. The purpose of this Thesis is to take part in the process of defining and enhancing their Strategic BI, but in order to be able to enhance and define it is necessary to have the entirety in mind.

Business Intelligence would be of no use if there was no need for the outcome produced. To know what decision-support and information is needed by the managers is thus essential. Therefore is an information needs analysis is to be seen as a natural part in the Business Intelligence process.

As described in the background, Strategic Business Intelligence is to a large extent performed on unstructured information that is produced, received, and collected in e.g. personal computers, databases, email servers etc. The issue of unstructured information is thus tightly tied to the issue of information handling in general, since an ineffective or unsatisfying information handling not only will make the effort of finding the unstructured information harder, it can also make structured information unstructured. This issue is also emphasized by TMHE.

1.3.2 Research Questions
In order to fulfill the purpose, the following three research questions, with adherent sub questions, have guided our work:

1. How is the division of Business Intelligence within TMHE affecting the prospect of deploying and enhancing the company’s visions for Strategic Business Intelligence?
   - What intelligence work is conducted today within the company and how does this relate to the division made?
• Is this a fruitful division or what needs to be improved?

2. What information gaps and what areas of coordination can be identified regarding the information needs of our target group\(^1\) for fulfilling their roles and responsibilities?

3. What are the needs to be met in order to improve the handling of unstructured information within TMHE?
   • How can today’s information handling within the company be characterized from the activities of finding, gathering, and sharing?
   • What conceptual systems support solutions could be found to meet the needs to facilitate improvements and what are the necessary organizational requirements?

1.3.3 Delimitations

The main focus for this Master Thesis has been given to central functions of TMHE, defined as Finance, Product Planning, Sales, Marketing, and Business Planning. Therefore we do not intend to investigate the corporate functions Supply, Logistics, Legal, and Human Resources. The Supply organization is still diverse and less centralized, the Logistic function is recently formed under construction, and from the perspective of the scope of this Thesis, Legal, and HR are viewed as support functions to the business. The decision has been taken in agreement with our Steering group at TMHE.

In the choice of suitable system solutions these are presented only on a conceptual level, therefore we do not look into costs of an eventual implementation process. Enterprise 2.0 platforms and distributors mentioned are chosen from the sake of convenience and are only to be seen as examples.

We have not gone into detail regarding the process of creating intelligence, from which follows that we have not judged or examined the identified information needs from the standpoint of how potential information gaps could be filled or if it is possible to achieve.

The foremost purpose of the theoretical framework is not to propose new definitions within this field of research.

Knowledge Management (KM) is a discipline that overlaps the area of Business Intelligence to a certain extent. Karl Wiig, of many seen as the founder of KM (Liebowitz, 2000) defines KM as the systematic, explicit, and deliberate building, renewal, and application of knowledge to maximize an enterprise’s knowledge-related effectiveness and return from its knowledge assets (Wiig, 1997). We have, on advice from our academic contacts, chosen to avoid digging deeper into this discipline, partly because it would render material for a Master Thesis of its own. However since there are significant overlaps between the disciplines, we have touched upon areas normally found in KM, one example is information handling.

\(^1\) Top and middle management of central functions within TMHE
When discussing decision-support one inevitable stumble across the discussion within Organizational theory about the rational decision process. The model for rational decision-making has been criticized for being unrealistic. The real decision-makers often only have fragmentary knowledge of the consequences of different alternatives and they can only imagine the outcome and they are not likely to think or know about all possible alternatives to choose from. Other objections are that the conditions surrounding the decision can be such that the model is impossible to apply and that the decision-makers assume to be isolated individuals or organizations (Holmblad-Brunsson, 2002). This is relevant to this field of study partly because of the inherent connection between Business Intelligence and rational decision-making and partly for the discussion of what information decision-makers inquire and what information they actually need. However we have chosen not to dive further into this aspect of due to the purpose of the Thesis.

The Thesis also touch upon Strategy theory, however we do not have the ambition to fully cover this huge discipline.

1.4 Thesis Outline

Below follows an outline of the structure of the Thesis, to assist the reader through the Thesis.

- **Introduction**
  The introduction gives a description of the subject and provides a background to the Thesis. Also contained in this chapter are the purpose, purpose discussion, research questions, and delimitations.

- **Company Presentation**
  This chapter gives the reader an introduction to the object for the Case Study, Toyota Material Handling Europe in general, and the assigned BI actors, responsibilities, and division in particular.

- **Theoretical Framework**
  In this chapter, theory covering Business Intelligence, Information Needs Analysis, and Information Handling is presented. The theoretical framework also contains a section describing conceptual systems solutions for handling unstructured information. It ends with a section to be seen as a summing-up of the previous presented theory regarding Business Intelligence and it aims to give an overview of the most important concepts and clarify the intended use of the chapter’s four sections.

- **Method**
  In the method, a description of our method for approaching the task is presented. It consists of scientific approach, qualitative and quantitative research, case studies, a discussion of the information needs analysis and last but not least critique of the chosen method.

- **Case Study**

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2 The target audiences for this Thesis are the initiator of the project (TMHE Business Planning), our respondents (target group), and our academic readers.
This chapter contains the empirical results from the Case Study performed at TMHE. It first gives a view of the current situation in the company followed by a description of the views and activities of Business Intelligence, the results from the a questionnaire investigating the information needs of our respondents, and last the experienced information handling situation within the organization.

• **Analysis**
  In this chapter, we analyze the findings from the Case Study through the theoretical framework in order to answer our research questions and draw conclusions.

• **Conclusions**
  The conclusions drawn from the analysis are summarized and presented under the categories Business Intelligence, Information Needs Analysis, and Information Handling.

• **Recommendations and Next Steps**
  This, the last chapter of the Thesis, contains our recommendations to TMHE and the next steps to be taken in order to follow these recommendations.
2 Company Presentation

This chapter aims to provide the necessary background information to our Case Company, Toyota Material Handling Europe.

2.1 Toyota Industries Corporation and BT Industries

In 2000 Toyota Industries Corporation (TICO) acquired the Swedish forklift truck producer BT Industries (BT). After the acquisition, both corporations continued to live independently side-by-side until 2005, when TICO announced that an organization for all material handling operations, called the Toyota Material Handling Group (TMHG), was to be formed (TMHE Company Presentation).

TMHG was created to be able to further benefit from the synergies between BT Industries Group and Toyota Material Handling Company, and the goal for the new organization was set to be the “undisputed number one” in material handling (TMHE Company Presentation; Hyltberg, 2007).

TMHG is divided into four regions, each represented by a local organization. The regions are: Europe, North America, Japan, China and International (containing the remaining markets of the world. The different regions are in general autonomous and are in charge of their own strategies and operations and have their own manufacturing, marketing, and service companies as well as regional administration offices (Ellison & Gruszka, 2004; TMHE Company Presentation).

2.2 Toyota Material Handling Europe (TMHE)

Toyota Material Handling Europe is the operational organization for TMHG in Europe. The organization mainly consists of BT Europe (BTE), BT’s European entity, Toyota Industrial Equipment Europe (TIEE), and parts of BT Industries, the corporate overhead of the BT structure. The Headquarter is located in Brussels, Belgium. TMHE has market and sales companies in most European countries including Russia and Turkey (Hyltberg, 2007; TMHE Company Presentation).

![Organogram of Toyota Material Handling Europe](adopted_from_TMHE_Company_Presentation)

Note that TMH International does not have their own manufacturing and that there are factories located in China but not yet incorporated under TMH China.

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3 Note that TMH International does not have their own manufacturing and that there are factories located in China but not yet incorporated under TMH China.
One of the main objectives for TMHE has been the integration of the operations of former BTE and TIEE in the respective European markets as well as on the European Office level. From the time of the acquisition in the year 2000 until the formation of TMHE in 2005, BTE and TIEE were run separately, using their own distribution channels. The work of integrating the operations is an ongoing process; it has been completed in several countries, but not even started in others. The work is coordinated by the Business Planning Department, located in Brussels (Hyltberg, 2007; TMHE Company Presentation).

2.3 TMHE Business Planning

Business Planning is sometimes referred to as President’s Office and it used to be common in large companies to have a staff function for the management team. The establishing of BP within TMHE is a return to this idea, also practiced by Toyota, which is built upon the necessity of having certain amount of autonomy in large companies. With the autonomy follows a need for coordination which will be the main responsibility for this group. As the right hand of the president of the company one of the responsibilities is also to prepare material for board meetings and to perform analyses on behalf of the president. In addition the Business Planning Department should be acting as a helping hand to the management team when a special focus is needed in certain areas (Ellison, 2008).

The role and responsibility of the Business Planning Department is to account for the mid term (three to five years) and long term (five years and further) planning. The Mid Term Business Plan is updated annually and divided into budget, growth plan etc. BP also has the responsibility for coordinating and handling strategically important projects i.e. critical, organizationally horizontal, etc. There is a large amount of projects in the project portfolio within the organization, which call for attention from management. BP also has the responsibility for strategic business intelligence in order to serve decision support to top management. Finally, BP is the window for global communication within the TMHG. There is a management committee three times a year where the management of all regions meets. BP’s mission is to be the first internal partner for TMHE managers in facilitating change and business planning (TMHE Company Presentation; Ellison, 2008; TMHE Intranet).

2.4 TMHE IS/IT Organization

For historic reasons IS/IT is located under CFO; within TICO the IS/IT department has always been placed within Finance and that pass for the other regions as well. Within the BT Organization, IS/IT used to be the only cross-functional department and therefore many cross-functional questions ended up as their responsibility to coordinate. The structuring of IS/IT within TICO was mixed and therefore the situation was revised in 2005 and a year later was the Promotion and the Supply structure created. The intention was to have one ordering (Promotion) organization and one executing (Supply) organization working next to each other (Sivenius, 2008).

2.4.1 IS Promotion

IS Promotion is assigned with the overall responsibility for IS/IT within TMHE and their focus is on the company’s IS/IT Strategy. Other responsibilities are enabling business innovation and assist with business process change. IS Promotion also
manages and coordinates the Project Portfolio for projects with any kind of IT involvement. Besides these responsibilities IS Promotion aims to act as a guarantor securing that the developed applications are usable and that they are supported and that they follow the guidelines and architecture of the rest of the company (TMHE Intranet; Sivenius, 2008).

2.5 Business Intelligence at TMHE

The division of Business Intelligence within TMHE between Business Planning and IS Promotion is in accordance with Figure 2. This division was presented at a seminar in the beginning of 2008.

![Figure 2: TMHE Business Intelligence (TMHE Presentation Material B)](image)

**Business Intelligence & Analysis** is one of Business Planning’s five stated areas of responsibility. Within this area the aim is to develop a structured approach to Business Intelligence within TMHE. BI within TMHE consists of the two main parts, Operative Business Intelligence and Strategic Business Intelligence where the overall concept coordination and the Strategic Business Intelligence are communicated as responsibilities of Business Planning. BP defines the aim of Strategic Business Intelligence as “to provide our top management with high quality basis for strategic discussions and decisions, both in and outside the annual Business Planning cycle” (TMHE Intranet).

The function **Process and Application Coordination** within IS Promotion is responsible for Operational Business Intelligence within TMHE, which is briefly described as the coordination of projects, resources, and applications. Process and Application Coordination has one position working full-time with the collection of BI needs in the sense of IS-tools from different functions and coordination of these needs in order to avoid duplication of work and for the company to be resourceful. They have monthly meetings with analysts from different business areas and units as well as they receive updates and status from ongoing projects. This position is working almost exclusively with operative and tactical users, and less with strategic reporting (TMHE Intranet; TMHE Presentation Material A).
Overall the members of the Process and Application Coordination organization are encouraged to look outside the company for new solutions, new functionalities in order to be innovative and pick up on new trends; ask other companies working with BI-tools, e.g. if working with Microsoft’s platform for BI, they should try to learn and exchange ideas about these tools (Fürst, 2008).

Apart from the responsibilities for Business Intelligence assigned to Business Planning and IS Promotion intelligence work is performed within different corporate functions. However the only department using the intelligence terminology is Market Planning (within the corporate function Marketing, see Figure 1, p.21), who has communicated Market Intelligence as one out of three main areas of responsibilities. Market Intelligence within TMHE is defined as “gathering, analyzing, and supplying information about the competitive environment” (TMHE Intranet).
3 Theoretical Framework

This chapter begins with a section on Business Intelligence, which also contains a case example from another industry. It is followed by a section with theory of information needs analysis and after that a section of information handling theory is presented. The third section is an extensive passage covering systems support for handling of unstructured information. The chapter ends with a section summing-up the previous four, where our model over how BI ought to be structured also is portrayed.

3.1 Business Intelligence

This chapter begins with an exposition of the intelligence terminology together with important influencing and affecting actors. The Swedish BI literature is put forward and we state how we approach the concept Business Intelligence within this Thesis. BI is then discussed as a process and as an activity and as connected to governance levels. In the last part a case example by GIA covering BI within ABB is presented.

3.1.1 Intelligence Terminology

The intelligence terminology has a diverse history and it is still considered to be in flux (Brouard, 2006). New terms emerge as the intelligence discipline matures within the corporate setting and as an academic subject. But whether or not one is using Business Intelligence, Competitive Intelligence, Competitor Intelligence, Market Intelligence or Corporate Intelligence, the purpose of all intelligence terms often is simplified as delivering support to business decisions. According to one view, Competitive Intelligence (CI) is regarded as having the broadest scope of the intelligence activities, covering the whole external operating environment of the company and targeting all levels of decision-making, i.e. strategic, tactical, and operative, while others refer to Business Intelligence as the most comprehensive term (GIA, 2004). Yet another adjacent concept is Environmental Scanning, defined by Brouard (2006), as an informational process by which an organization stays attuned to its environment in order to make decisions and then act in pursuit of its objectives. To summarize, this is a relatively new area of research and no generally accepted conceptual framework exists yet.

3.1.1.1 The Influences from Consultancy Agencies

The term Business Intelligence was promoted by Howard Dresner of the Gartner Group in the late 1980s, and described as a set of concepts and methods to improve business decision making by using fact-based support systems (Power, 2003). Business Intelligence tools have also had a strong influence on the development and defining of the subject. BI tools often refer to types of application software designed to report, analyze, and present data. This has led to that BI sometimes only is seen as the software tools for decision-support. Solberg Søilen (2008) insists on a clear division between BI and CI, arguing that BI embraces technical software solutions, whereas e.g. CI incorporates managerial aspects and MI marketing aspects. Turban et al. (2008) explain that CI often involves the BI initiatives utilized in most organizations, but with its own tools.

4 See Glossary
Consultancy agencies have thus come to play an important role in making Business Intelligence into a buzzword, whilst they have also contributed to the obscurity of the term. We have noted this phenomenon with some of the companies we have been in contact with. FAST Search, for example, defines BI as unified and mined data, which has been made accessible for monitoring, alerting and reporting (Sutija et al., 2007).

Another example is Microsoft, who typically focuses on their product range when defining Business Intelligence. Under the heading: *How does BI work?*, BI is subdivided by Microsoft into *Data Warehousing, Reporting and Analysis, and Performance Management*, which also reflect on how the company interprets and uses the term (Microsoft, 2008). As for BI, the word *Business* was put to exclude public, governmental, and military usage. Rafael Lukawiecki, Senior Consultant within Data Mining, deprecates this notion since the techniques, especially decision support, are legitimate and used within the other sectors, one of the most mature users being public health care. Lukawiecki (2008) therefore makes a point of using the acronym BI as a less categorical term. This trend has been evident among the consultants we met during this study.

### 3.1.1.2 Developed in an Anglo-Saxon Milieu

As with many academic areas, the American influence is strong and the theoretical context could be described as Anglo-Saxon. All terms presented are English terms, which is a proof of in which context they have emerged (Hoppe, 2002). It also reflects in the literature used for this Thesis, which consist foremost of American and Nordic literature. Despite the Western focus the notion made by Westling (Sigurdson & Tägerud, 1992) of the existence of differences in working with intelligence between countries, ought to be taken into account. The main focus from the American point has often been on the concepts Competitive Intelligence or *Competitor Intelligence*. As a result of this attitude, the aim for CI (and BI) has often been viewed only as decision-making support and pro-active actions for CEOs and other executives (Hoppe, 2002).

### 3.1.1.3 The Historical Connection to the Military

One can also discern a close relationship to military- and CIA related analogies for methodology and course of action within the American literature. Kahaner (1997) originates the techniques of CI from political and military intelligence agencies during the Cold War era, and his texts are permeated with war terminology such as: “Competitive Intelligence as the latest weapon in the world war of economics, which pits nation against nation” (Kahaner, 1997: p.17). Kahaner (1997) also defines Competitive Intelligence as a program for gathering and analyzing information about the competitors’ activities, however he also includes general business trends for further the company’s goal.

Another evident consequence of the connection to military intelligence American literature often expresses that CI or BI is something *within* the law. Pollard (1999) defines CI as: “the output of a systematic and *legal* [our remark] process for the gathering and analyzing of information about the current and potential competitors of a business” (Pollard, 1999: p.3). Sammon et al. (1984) claim that American managers regarded CI as either unethical behavior, illegal spying or as an invitation to antitrust litigation. This notion is also picked up by Hasanali et al. (2004) who point out that CI, on the account of its mystical allure, has kept top management distanced from CI for fear of being accused of espionage. As a comparison, SCIP’s definition from 2008 is: “a
necessary, *ethical* [our remark] business discipline for decision making based on understanding the competitive environment” (SCIP, 2008).

Hoppe (2002) argues that the military connection affects the description and organizing of Business Intelligence. Military intelligence has become a norm which has been applied on new organizations. This explains why the focus is on BI as a compartmentalized function for delivering decision-support for top management. Military organizations have a more explicit and well-developed order of decision and command. A decision taken at a high hierarchical level is broken down and executed as an order on lower levels. Civilian organizations have a more complex and political affected decision- and power structure. Therefore the decision process is difficult to trap; hence is the organizational acting not always in line with the decisions made. A developed BI-theory should have taken these aspects in consideration according to Hoppe (2002).

### 3.1.2 Business Intelligence as a Managerial Support

Gilad & Gilad (1988) propose a threefold usage for the term Business Intelligence: to denote a process, as an organizational function, and as a product, i.e. the activity of BI, carried out by individuals or by an organizational unit, produces the product BI. They use Greene’s definition which states that the BI product is: “processed information of interest to management about the present and future environment in which the business is operating” (Gilad & Gilad, 1988: p.1). This rather broad definition captures that the BI product does not consist of whichever information, but *processed* information. It also highlights the fact that *management* has an essential role in BI. Management decides what will be in the scope of BI by determining what information *they* want. In addition, the involvement of management affects what the BI process will produce; i.e. is the result intelligence or merely an addition to an ever-growing library service, containing nothing but gathered data. Lastly, according to Gilad & Gilad (1988), BI is dependent of the environment of the company; the present environment foremost for Operative BI and the future environment for Strategic BI. The object of a formalized BI system is to shift the focus from short-term tactical intelligence to better use of strategic intelligence for the decision-making process. A prerequisite for this transformation is a vigilant attitude towards historical data. Simple extrapolation from historical data is foremost an indication of past performance with little or no ability to provide a representation of the future state of things (Gilad & Gilad, 1988).

This view expresses a rather static top-down use of BI centred on the management of the company. This is also reflected in the view of Gilad & Gilad (1988) on decision levels. The authors’ uncomplicated division in Strategic BI and Operative BI is possible due to their statement that the management makes two kinds of decisions: strategic decisions with long-term impact, and operational decisions that have immediate, short-term impact.
3.1.2.1 A Different Approach in Swedish Literature

The Swedish tradition descends from the late Prof. Stevan Dedijer. In 1962, Dedijer, native of Yugoslavia and former paratrooper and agent, established the Political Institute of Research at Lund University. The subject of research was Social Intelligence and Dedijer was the first to give academic course offerings within the Intelligence field during the 1970s and he worked hard to near the academic sphere with the corporate, and how to explicitly work with intelligence (Sigurdson & Tågerud, 1992). However, the breakthrough as a Swedish research subject did not come until the end of the 1990s and was preceded by a research project established by the Swedish Institute of System Development (SISU) in mid-1980s (Hoppe, 2002).

Within the Swedish BI research parallels can also be made to military intelligence. Sandström, former commissioned officer, was the first to publish in Swedish in 1988. Mikael Thorson, former SISU-employee, is another example, as he served as an officer of the reserve within the Swedish Military Intelligence (Thorson, 2008).

In contrast to the American literature, the Swedish ditto often comes from a more company based perspective, with a greater focus on organizational learning for the entire organization and not just for the executive level (cp. 3.1.2). Hoppe (2008) sees a tendency towards a Swedish school of research with a freer attitude of the subject in comparison to other countries, although the research within this field is still too modest for one to be able to talk about academic schools.

However it is also important to distinguish between how organizations like to be perceived and how they actually act. Hoppe (2008) refers to empirical studies showing that American organizations are not as formal as they usually want to appear. Swedish organizations on the other hand often like to appear more democratic than they can live up to.

3.1.2.2 Terminology and Division

When it comes to the terminology among the Swedish authors it is complicated by the lack of an adequate translation. This has led to the use of the English intelligence terms. Sandström for example still uses Business Intelligence, despite the fact that he would prefer a Swedish terminology Pagels-Fick (1999) also adopts the term Business Intelligence in absence of a corresponding Swedish term and he states that competitor-and market analysis constitute the foundation of BI. Solberg Søilen (2005) uses Private and Public Intelligence, which he states are broader than the scope of CI or BI. The Public Intelligence is the gathering of information for interest of regional and local government. The opposite is Private Intelligence which includes Business and Non-profit-organization Intelligence. Nelke (2008) prefer the term Competitive Intelligence, but then people tend to confuse the meaning with Competitor Intelligence. BI on the

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5 Other important Swedish academic researchers within this field are Sven Hamrefors (1999), who is now responsible for a research program within this field of study at Mälardalen University (MHD), Per Frankelius (1999), who wrote his Ph.D. about the development of Pharmacia, and Magnus Hoppe, Ph.D. Candidate finishing his thesis at Åbo Akademi University, who also is associated at the project at MHD. From the perspective of the trade and industry important achievements have been made by Göran Pagels-Fick, with experiences from Ericsson Telecom and Vinnova, Margareta Nelke, from Tetra Pak, and Hans Hedin, who is one of the leading international consultants within this field.

6 Solberg Søilen (2005) uses these terms as the English translation of the Swedish term “omvärldsanalys”.
other hand is easily mixed up with internal figures, a focus primarily made by companies selling business solution system (Nelke, 2008).

### 3.1.3 Umbrella Concept

As has been showed, Business Intelligence is a term with many meanings and interpretations. However, within the scope of this Master Thesis as a background and the division within TMHE in mind (see Figure 2) we have approached BI as an *umbrella concept* covering everything from computerized decision support systems (business analysis systems) and data mining, to Competitive Intelligence, Market Intelligence, and Environmental Scanning.

![Figure 3: BI as an Umbrella Concept](image)

This notion is backed up by Turban et al. (2008) who state that BI “is an umbrella term that includes tools, databases, applications, and methodologies [...] the process of BI is based on the transformation of data to information, then decisions, and finally to actions” (Turban et al., 2008: p.9). Even though we do not adopt, what we believe, is a linear simplification of the term and although it has predominance towards software solutions, the word *methodologies* opens up the meaning. The authors also view BI as both technological and managerial.

The broader meaning of Business Intelligence is also supported by Pollard (1999) who discusses the different forms of intelligence and dedicates the components *Competitors, Markets, Customer, Suppliers*, and *STEPP factors* to BI. STEPP stands for sociological, technological, economic, politic, and physical environmental (see Table 1).

<table>
<thead>
<tr>
<th>Focus</th>
<th>Competitor Intelligence</th>
<th>Competitive Intelligence</th>
<th>Business Intelligence</th>
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<tbody>
<tr>
<td>Competitors</td>
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<tr>
<td>Markets</td>
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<td>Suppliers</td>
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<tr>
<td>STEPP Factors</td>
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<td>X</td>
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</table>

*Table 1: Business Intelligence components (adopted from Pollard, 1999)*

Since there is no universal explanation of what exactly Business Intelligence is, there are many attempts to define BI, and many organizations adopt their own explanation in order to fit their business and its unique needs. Thorson (1997) presents a model of division made by Olveng & Sterners and Salmon-Sörensen & Sandström, which is putting BI at the top in a hierarchy of other intelligence terms.
Hannula & Pirttimäki (2005) make the same notion as we do; as they are referring to BI as “an umbrella concept for other intelligence related terms” (Hannula & Pirttimäki, 2005: p.35).

### 3.1.4 Business Intelligence as Activities in a Process

Sandström (1988) define BI as prognosis and activities for explaining the need of information and to gather, arrange, analyze and distribute information about the competitive factors of the market, e.g. business’ conditions, customers, competitors, and suppliers. Further on he states that the BI-function constitutes a company’s all-embracing ability to identify and solve problems and challenges of the future, by gathering and analyzing business information. Therefore intelligence is the refined information product for looking into the future. Sandström (1988) concludes that, in the long run, it is impossible to do profitable business without a well-operated BI-function.

Hamrefors (2002) defines BI as observations in order to identify environmental changes that might come to affect the processes and freedom of action of an organization. Hamrefors (2002) explains the use of different terms as an outcome of the environment of the companies. Therefore in USA, where the focus has been on the competitiveness of the organizations, CI is the most common term. Hamrefors (2008) perceives BI as an organizational quality rather than a division in different usage.

#### 3.1.4.1 The Intelligence Cycle

The most common description of how intelligence work should be structured is the Intelligence Cycle (see Figure 5). This cycle has been adopted by many authors and organizations and once again the connection to the military is evident. CIA for example states on their website that “When we’re tasked with a specific project, we follow a five-step process called the Intelligence Cycle” (CIA). The cycle’s five steps are rather self-explanatory as in Planning & Direction, Collection, Evaluation, Analysis & Production, and Dissemination.

However the Intelligence Cycle is, as all models, only to be seen as a simplification used for description. From this point of view the model can be looked at as merely depicting an ideal flow of information within an organization. Hoppe (forthcoming b) is even more severe in his critique: “The point is that the intelligence cycle does not portray reality […] It’s doesn’t provide the whole picture, and therefore we can’t use it as the only reference point for research on intelligence.” The problem, according to Hoppe (forthcoming b), is that there are no alternatives available with the objectives to
recognize how intelligence effects an organization and how the members of the organization act in their every-day work.

Figure 5: The Intelligence Cycle (adopted from CIA, 2008)

3.1.4.2 Generic and Decision-Orientated Business Intelligence

Pagels-Fick (1999) also starts from the intelligence cycle, seeing BI as a process, but in order to describe different intelligence work he sets out two different activities: Generic Business Intelligence and Decision-Orientated Business Intelligence (see Figure 6). The object of Generic BI is to continuously and professionally build a knowledge base with regards to the driving forces of the business and the stakeholders of the company and their relative competitiveness. This activity is thus not to throw light upon specific questions, but to cope with the generic intelligence work within the organization. In order for the collected information to become useful it has to treated and analyzed. This activity results in descriptions, observations, identified threats, business opportunities etc., brought to different groups of decision-makers as news flow with preliminary consequence analysis.

Figure 6: Generic BI & Decision-Oriented BI (adopted from Pagels-Fick, 1999)

The Decision-Orientated BI is, in contrast to the Generic BI, situational. In this case the decision-makers identifies their own topics and specific questions concerning e.g. threats and opportunities, future products, new ways of marketing, new customer segments and markets, competitors’ behavior, intentions of the lawmakers or whatever
might be viewed as important for the future of the company. The object of the Decision-Oriented BI is specific analysis tied to a certain decision or as incentives and initiatives in changing processes. Sometimes it is well-defined questions and sometimes it is briefly described areas, which calls for a different approach (Pagels-Fick, 1999).

3.1.4.3 An Active Role for Business Intelligence in the Business Planning Process

Pagels-Fick (1999) criticizes the traditional approach of BI as it is showed in the upper table in Figure 7 below. One of the explanations for the focus in this division is the already highlighted connection between BI and consultant agencies that in many cases commercialize on one or more of these steps and therefore nurse this image. Pagels-Fick (1999) asserts that the BI-function should not be satisfied with presenting proposals but more actively act as a partner in the business planning process.

![Figure 7: An active role for BI in the business planning process (adopted from Pagels-Fick, 1999)](image)

Instead the BI work ought to embrace both tables in Figure 7. BI-function should start a dialog over their results with other functions within the organization. The BI-function can also act as an initiator of change and even follow-up on the recommended changes because of their unique knowledge of the analysis and arguments which motivated the change in the first place. Because of this, social abilities as well as the ability to listen, make quick analysis, negotiate, and affect will be of great importance (Pagels-Fick, 1999). In addition seniority is highlighted as important aspect for the success of the BI worker (Hoppe, forthcoming b).

3.1.4.3.1 “Scratching Backs”

In the empirical material collected by Hoppe (forthcoming a) one of the informants stresses the importance of scratching backs as a description for the necessary relationship between members of an organization or a company for a fruitful intelligence work and embracement of information to take place. Sharing of information, regardless of if it takes place on strategic, tactical or operational level, calls for incentives. On a personal level, all types of information could be perceived as sensitive information. This phenomenon puts a constraint on the transfer of information which increases with the size of the company. If somebody from another part of a big organization ask you to give him or her all information that you regard as valuable on certain topic the natural reaction may be hesitation. Here the importance of personal
networks and the scratching of backs come into play as an incentive to share and exchange information.

3.1.5 The Importance of Having a Common View of the BI Work
According to Pagels-Fick (1999), a common source for suspense is visualized with the description of the levels in the Figure 8 (below). The orderer of intelligence (e.g. the management team) may be expecting the BI-function only to provide basic information as support on the lowest level in the organization hierarchy, while having the valuation of the information and the discussion of the company and the strategic directions behind closed doors. The provider of the information on the other hand may be expecting to be participating in the discussion of the critical business issues of the company. Therefore it is important that the orderers show consideration for the provider of decision support and is explicit with their expectations.

![Figure 8: Decision-support can be given on different levels (adopted from Pagels-Fick, 1999)](image)

3.1.5.1 Mandate to Act and the “Not Invented Here” Syndrome
If the BI-workers ought to be involved in the way prescribed by Pagels-Fick (1999), they may need to have the mandate to act or as Meyer (1991) puts it: “Your intelligence officers must have the courage and sheer bureaucratic power to get through to you when you need them” (Meyer, 1991: p.46). However, even if they get through, they might be affected by the “Not Invented Here” syndrome (NIH-syndrome). NIH-syndrome is defined by Katz & Allen (1982) as the tendency of a project group of stable composition to believe it possesses a monopoly of knowledge of its field, which leads it to reject new ideas from outside to the likely detriment of its performance. The NIH-syndrome is especially common within the R&D community where groups tend not to believe that a group from the outside can produce information that is relevant for the group.

3.1.6 Business Intelligence and Strategy Work
Frankelius & Rosén (1993) argues that many companies support the management of internal information with different solutions, but that very few have developed skills and structured methods when it comes to handling of external information about e.g. the competitive environment. Hoppe (2002) has acknowledged a frustration among BI workers for the difficulties to implement BI processes on a strategic level; it often stays as an operative business support rather than a strategic ditto. Mats Björe, BI consultant
and CEO for Infosphere AB, calls this phenomenon for Business Information in contrast to Business Intelligence, i.e. that too much effort is put on delivering information instead of intelligence in a strategic sense (Hoppe, 2002).

3.1.6.1 Strategy
Strategy is another debated term with its origin within military terminology, which then has spread to other disciplines. According to Gilad, Strategy is the underlying discipline for CI in contrast to Information Management (Hoppe, 2008). The aim of this section is not to provide a clear-cut definition of this broad and well-studied subject, but to serve as an introduction and as a background to the BI-terminology used within TMHE today. We also wish to widen the discussion to level of governance connected to the strategy pyramid.

3.1.6.2 Implementing Flexible Strategies
During the 1970s the focus was on developing strategies, but since then there has been a shift towards the process of implementing strategies. As a consequence strategic decisions must be made continuously. According to Tyson (1990), this process change also brings a new requirement of a continuous stream of information.

From a postmodern viewpoint Hamrefors (2002) argues that the traditional way of interpreting strategy as the ability to apprehend the landscape one is currently in and to find the general direction of this landscape, is about to change. This construction is sprung out of military tradition and is build upon the idea of an objective landscape that can be described. Hamrefors (2002) means that in today’s society, rather then describing actual landscapes, the strategist of the company has to be able to paint pictures of possible landscapes; landscapes that do not yet exist, but might come to exist depending on the actions taken by the company. According to Hoppe (2008) this can also be seen as an entry of an actor oriented perspective in the description of Business Intelligence.

Pagels-Fick (1999) uses the term strategic flexibility which refers to the importance of having a strategy for how to make changes at short notices to a low cost due to a changeable surrounding. This demands short implementation times and/or project division for easing adjustments in the process of time.

3.1.6.3 Strategic, Tactical, and Operational
The Strategy Pyramid divides decision-making and operations (e.g. Business Intelligence work) in companies into the three levels Strategic, Tactical, and Operational. Bakka et al. (2001) have incorporated the common leveling of management into the pyramid (see Figure 9 below) in order to describe the work.

Altogether this figure constitutes a common description of the different governance levels within a company. Moving down in the pyramid there is an increasing precision in the objectives and the practical executions of the decisions (Bakka et al., 2001).

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7 For more information on Infosphere AB, see: http://www.infosphere.se
Figure 9: Management Levels (adopted from Bakka et al., 2001)

3.1.6.3.1 Dangers of Division
This leveling model is, in conformity with the discussion about the Intelligence Cycle (see chp. 3.1.4.1), only a simplified picture. It is important to note that e.g. operative management is not always executed only at the lowest levels in the organization or that strategic management is executed only at the highest level; it is a matter of discrepancy in weighting (Pirttimäki, 2007).

3.1.6.3.1.1 Balance between Strategic and Operative
According to Ansoff (1987) the overall balance between strategic and operative decisions is ultimately determined by the environment of the company. In a situation where the demand is growing, technology is stable, and customer demands and preferences change slowly, a company can remain successful by focusing on the operative activities, and letting its products, markets, and competitive strategies evolve incrementally. In this type of environment most companies have their main focus on operative decisions and the implementing of strategies are through collaboration among R&D, Marketing, and Production organizations. If the environment changes i.e. if demands changes or approaches saturations or if there is a technological revolution, companies have to start focusing on strategic activities in order to remain successful or to survive.

3.1.7 Different Frameworks for Structuring BI – A Case Example
In 2004 the Business Intelligence capabilities at the power and automation group ABB had been a neglected part of the business due to a period of weak financial performance. The BI activities were characterized by poor coordination and transparency, lack of ownership and responsibility as well as no recognition from top-management (GIA, 2008).

In order to overcome these issues and to create a commonly shared understanding of the competitive environment, a model consisting of three different frameworks was proposed. The first framework was the standard intelligence cycle (see Figure 5), which was to provide a basic structure for the on-going BI activities. The second framework was a division of the areas of BI where ABB were active (see Figure 10 below).
The third framework was a division in Strategic and Operational Intelligence (see Figure 11 below) with the intention of finding the common denominators between the highly diverse businesses within the ABB Group, otherwise the structure would be too complex (GIA, 2008).

3.1.7.1 The output of the Business Intelligence

In order to reduce complexity and create the common picture of what intelligence was delivered, ABB wanted to put a focus on standardizing of BI products (for examples, see Figure 12 below). These different products are to be delivered through different channels and media, e.g. live presentations, seminars, workshops as well as reports of different format, content and frequency (GIA, 2008). Pollard (1999) emphasizes the importance of being able to deliver tailored and targeted intelligence products, as an
outcome of Business Intelligence. These are not to be too generalized while at the same being in a format easy to embrace. Besides from being tailored, Tyson (1990) stresses the importance of delivering the products in time, in order to maintain the trust for Business Intelligence as a provider of support. The importance of actually delivering intelligence and not only data or information was also emphasized in the ABB Case Study (GIA, 2008). Hoppe (forthcoming b) stresses the importance of creating a communication plan for delivering the results of intelligence and that all available channels should be used. He argues that it is also important to make the results available and not hidden if this it not absolutely necessary.

Figure 12: Examples of standardized BI products at ABB (GIA, 2008)
3.2 Information Needs Analysis

This section begins with a discussion of the difference between information needs and information wants, which leads into a walkthrough of two methods for capturing information needs. Last but not least the importance of filling the gaps with information or intelligence is addressed.

3.2.1 Information Needs and Information Wants

A study performed by the Global Intelligence Alliance (GIA) indicates that the issue of identifying the critical information needs is the most difficult operation facing the BI function of the organizations participating in the study (Global Intelligence Alliance, 2005). This is in line with previous research in the area; Goodman (1993) presents a theory called The Anomalous States of Knowledge which states that information seekers often are not able to define their actual information needs. She claims that they might be able to identify existing problems, and that information is needed to overcome these, but not being able to specify further which information is needed (Goodman, 1993). Pirttilä (1997) divides information need into the two categories conscious and unconscious, where conscious needs are the needs perceived. But since a part of the information needs are unconscious, she argue it is impossible for the decision-makers in question to express or specify further their actual (true) information need, independently of which method used.

3.2.1.1 Difficulties of Finding Actual Need

The major difficulty lies in the issue of knowing what information actually is needed, and not just wanted by the managers. This issue is acknowledged by Ghoshal & Kim (1986) who claim that there are often broad gaps between the information managers want and the information they need. At the same time managers often receive vast amounts of information that they neither want nor need, as well as they receive information they do not want but do need, without knowing it.

Even when the information needs of a decision-maker is revealed, it is important to have in mind that the business environment of an organization today is ever changing. This means also that the focus of the decision made is dynamic and aligned to the direction of the environment, implying that also the need of information to support the decision-making is evolving over time (Pirrtimäki, 2007).

3.2.1.2 What Intelligence would be of Most Value?

Pollard (1999) argues that it is important to avoid asking managers to make a wish list of what intelligence they need, because of what is described above, that managers often do now know what their actual needs are. He also claims that they might list requirements just to avoid looking ignorant or because they think it sounds useful. To avoid these problems it is important to try to define “what intelligence would be of most value?” It is also possible to try to relate the intelligence needs to the specific business objectives or key success factors (Pollard, 1999). One definition of the actual

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8 In the GIA report, the term Competitive Intelligence (CI), not Business Intelligence (BI), is used. However, it is stated initially in the GIA report that CI is a wider definition than BI (Global Intelligence Agency, 2005). For further elaboration on this, see chapter 3.1.1 on page 25.
information need of a company is the information needed in order to achieve the organizational goals (Frankelius & Rosén, 1993; Pirttilä, 1997).

Figure 13 below illustrates the relation between received information, information wanted and the actual information need of managers.

![Diagram showing the relation between received information, information wanted, and actual information need](image)

**Figure 13: Actual needs for information together with information received and wanted by managers (adopted from Pirttilä, 1997, p.46)**

### 3.2.1.3 Information Wants
Pirttilä (1997) describes information needs and wants as on different organizational levels or perspectives. She defines information wants as an expressed request to receive information by an individual or organizational group. Information needs on the other hand can be defined as those either articulated or tacit information requirements that organizational groups or individual participants must have in order to achieve organizational goals or to improve performance. She argues that because of the issues facing the identification of information needs, it is possible to look at the wants instead. One argument for focusing on information wants, despite the fact that it is a poor substitute, is that it is possible to achieve, in contrast to the information needs that Pirttilä (1997) argues never can be supplied.

### 3.2.2 Methods for Capturing Information Needs
In the search for methods for capturing information needs we choose to focus the only methods known to us, these two are: *A Disciplined Approach to CI Analysis* by Gilad et al. (1993) and the *World Mapping Method* by Frankelius (2001). This section contains a description of these methods.

#### 3.2.2.1 A Disciplined Approach to CI Analysis
Gilad et al. (1993) acknowledges that there are no proper methods for conducting information needs analysis why they proposes a method called *A Disciplined Approach to CI Analysis*, which aims at being a substantial method for identifying competitive blind spots and information gaps that need to be filled to support the strategic decision making.

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9 Pirttilä (1997) uses information demands instead of information wants. We do not make a distinction between these terms and use wants for the sake of consistency throughout the thesis.
A Disciplined Approach to CI Analysis is a four-step method where the first step is to identify a specific decision to study or manage. Then all categories of competitive intelligence that are classificatory for this type of decision is to be identified after which the key players for the implementation and making of the decision are identified. Last but not least, each category is rated with regards to its importance and availability for the key players (Gilad et al., 1993).

Importance and availability is to be rated on a five-point scale whereas for availability; 0 means no availability and 4 means complete availability. When rating importance we have that 0 is considered a need of no importance and 4 means a need of critical importance. The ratings are then to be used to calculate an "availability index" (AI). According to this index, information/intelligence is to be seen as adequately available to the manager if AI is equal to, or exceeds the value of the importance assigned the specific category. Categories that are rated as of critical importance need to get the rating of complete availability in order to be seen as sufficiently available to the manager (Gilad et al., 1993).

![AI Matrix (adopted from Gilad et al., 1993)](image)

Categories with an importance rating of 3 or 4 are usually emphasized for the analysis in order to cover the availability of information that is considered most important, which will stress the intelligence gaps with the largest potential impact (Gilad et al., 1993).

### 3.2.2.2 The World Mapping Method

A method that shares some features with A Disciplined Approach to CI Analysis, is the World Mapping Method, first developed by Per Frankelius and Carl-Gustaf Rosén in the early 1990s. The method has been incrementally developed since, and is described in Frankelius (2001). The purpose of the method is threefold; to give a new theoretical view on what affects competition of organizations, to provide a practical tool for conducting analysis of information availability and needs, and to highlight and define the strategic information gaps of an organization and provide methods for how to cover these (Frankelius, 2001).

A major point of this method, which distinguishes it from other methods and theories, is that it states the importance of realizing that the business environment and the factors that affect competition are unique to every organization. According to Frankelius
(2001), it is not possible to generalize that e.g. customers is an important factor to all companies.

3.2.2.2.1 Not Having Preconceived Ideas of Factors Affecting the Company

As a result, Frankelius challenges traditional economic theories including Michael E. Porter’s Five Forces model, in which Porter states that industries are being influenced by supplier power, barriers to enter, buyer power, threat of substitutes, and degree of rivalry. Frankelius (2001) on the other hand emphasizes the importance of not pointing out what factors that could be important and affect the competition of the organization, in advance. Even though a factor like customers probably will be considered important in many cases, other factors in the environment of the organization, which may not have been obvious at first, might be as important. He names these factor X. He exemplifies from a study of the pharmaceutical company Pharmacia where factor X were e.g. potential fusion partners, academic research projects, certifying institutes, conferences and other events about DNA-technology, and environmental organizations.

If taking customers as an example, it is also important not to limit the analysis and see customers as static; as a "black box". Instead it is important to see customers as dynamic processes that interact with other processes in their own environment, why it is important to focus on the customers’ environment as well (Frankelius, 2001).

3.2.2.2.2 The Method as a Practical Tool

The aim of the method is not only to cover the theoretical aspects of competition and the factors affecting competition, but also to provide a practical tool for conducting the actual analysis. Another object of the method is to highlight and define the strategic information needs of an organization and to provide methods for how to cover the gaps (Frankelius, 2001).

The idea is to perform the practical part of this method as a group exercise, or a focus group, including the key players relevant for strategic decision-making. It is divided into eight different stages (Frankelius, 2001). For us the first five are relevant since we do not aim to investigate how to fill the eventual information gaps found.

1. Reassessment of the Perspectives
2. "Creative Discharge"
3. Analysis 1: Significance
4. Analysis 2: Knowledge
5. Meltdown
6. Information Seeking
7. New "Map of Business"
8. Action

List 1: Stages of the World Mapping Method (adoped from Frankelius, 2001)

3.2.2.2.3 Reassessment of Perspectives

This first step is about challenging the current thoughts and beliefs that the management of the company possesses about the business environment. Frankelius (2001) means that the business concept and the core competences of the company direct what factors in the business environment that are important. Because of this, the business concept and the core competences should be the starting point of the discussion.
This part of the method is intended to be carried out in a group, consisting of the management team. The idea is to make the managers realize that there might be other factors than the traditional that have effect on the company. Since different models and theories affect our way of thinking and our view of the surrounding environment, a walk-through of the most common and important of the traditional economical models and approaches is then done to give a necessary foundation. The essence of the method is to realize the importance of what Frankelius (2001) describes as “What you least expect can be the most important” (i.e. the factor X). All together, these points of discussion aim to provide new perspectives, important to have in mind for the next steps of the method.

3.2.2.2.4 "Creative Discharge"

The second step is the first practical step of the method. Substantially, it is a brainstorm, where the members come up with as many factors (that affects the organization in any way, direct or indirect) as possible. It ought to be based upon the outcome of the first step. It is important that all possible factors are let through, no matter of time horizon or level of "craziness". As discussed in the previous step, it is important to realize that the factor that seems to be the craziest also can be the most important. Criticisms of the ideas are not allowed at this stage (Frankelius, 2001).

Another step can follow from the first brainstorm, where the factors affecting the first factors are identified. The important thing is that every factor is to be broken down into as much detail as possible. A deeper analysis and discussion of what is meant by all identified factors can also be done (Frankelius, 2001).

3.2.2.2.5 Analysis 1: Significance

From the "creative discharge” a numerous amount of factors that could be affecting the organization are brought to the surface. Each of these factors is to be analyzed, with regard to significance. This is also done as a group activity, where everybody is encouraged to criticize and argue for his/her point of view. The importance of each factor can be categorized as of critical importance, of medium importance (affect a company positively or negatively) or of small importance. Then a circular map is drawn where the factors are to be placed (see Figure 15 below). Some factors from the brainstorming can be cleared out of the picture, if they are considered having no or a very small effect on the organization. The analysis can also be widening to view importance on different time scales (long or short) (Frankelius, 2001).

![Figure 15: Map of significance (adapted from Frankelius, 2001)](image-url)
3.2.2.2.6 Analysis 2: Knowledge

The second step of the analysis is centered on the current knowledge about each factor. Two aspects of knowledge are considered, the level of knowledge, as well as the reliability of the knowledge. There are two possibilities: to look at the level of knowledge in the organization, or to look at the inflows of knowledge to the organization. Often the latter is the best. In this part of the analysis, no respect is to be given to the importance of the factor (Frankelius, 2001).

![Classification of knowledge](image1)

Figure 16: Classification of knowledge (adopted from Frankelius, 2001)

The level of knowledge is to be classified as high, medium, and low. The classification is done according to the same procedure as with importance (see Figure 16 above). Every decision should be motivated. High level means that one or many persons within the organization know enough about something to express one’s thoughts. Low level means that there is no knowledge or that the knowledge is not reliable (Frankelius, 2001).

3.2.2.2.7 Meltdown

In this stage the results from the two analyses are merged into the same circular map in order to visualize where the effort has to be put, which is illustrated in Figure 17 (Frankelius, 2001).

![Meltdown of analysis](image2)

Figure 17: Meltdown of analysis of significance and knowledge (adopted from Frankelius, 2001)
3.2.3 Filling the Intelligence Gaps

In the same way as nature abhors a vacuum – A business abhors an intelligence vacuum

Pollard (1999)

3.2.3.1 Running the Risk of Blind Decision-Making

The gap between needed and available information is illustrated in Figure 13. Pollard (1999) states that the gap between needed and available intelligence needs to be filled with evaluated intelligence, otherwise it is automatically filled with either conscious opinions based on judgment or speculations: “I know” or “I think I know”. or with passive assumptions: “I know I probably do not know. I’ll fill the gap with assumptions” or “I’ll just rely on others to do the work for me”.

When companies are relying mostly on opinions or assumptions or both in order to close intelligence gaps, they run the risk of blind decision-making. The best way to cope with these challenges is to have a structured approach when identifying and filling the gaps with evaluated information collected in an appropriate way. This is of course not an easy task to perform and it requires understanding and effort from top management (Pollard, 1999).

3.2.3.2 Superstition Leading to Path Dependency

Hamrefors (2002) discusses the issue in terms of superstition\textsuperscript{10}. He gives an explanation from the field of Cognitive Science, arguing that human beings have a constant desire to understand the environment; an understanding that gives a feeling of well being. This is stemming from the way the brain works and how memories are stored. But when there are no stored memories to back up the situation being confronted with, it is harder to understand. In situations where it is not possible to receive immediate feedback of whether the actual world corresponds to the expectations based on previous knowledge or not, the brain uses superstition as a short-cut to achieve understanding. This is also a self-increasing process (Hamrefors, 2002).

Hamrefors (2002) argues that if being at an arm’s length distance to a certain situation observed in the environment of the company, there is an imminent risk that this will result in a self-increasing process that is generating superstition, which can be hard to break loose from. If this distance is kept too long, the ability of making correct judgments of the environment and its changes will decrease. It will also aggravate the understanding of what factors that affect the environment. This self-increasing process could eventually lead to \textit{path dependency}, i.e. that the solutions of tomorrow are dependent on the track chosen today. This is beneficial to a certain extent, because one is expert in his or her area, but when one is not being able to understand what is happening in the environment, it may lead to an end similar to the end of the manufacturers of mechanical calculating machines when the electronic computer was introduced, Hamrefors (2005) concludes.

\textsuperscript{10} Translation of the Swedish word ”vidskepelse”. Superstition: an irrational belief that an object, action, or circumstance not logically related to a course of events influences its outcome (The American Heritage, 2008).
3.3 Information Handling

This section contains theory on different approaches, strategies, and culture of information handling.

3.3.1 The Importance of Personal Networks

Hoppe (forthcoming b) stresses that the personal network is crucial for transfer and creation of intelligence and knowledge. Even though all sources of information and intelligence have values; text-based information does not have the same power to penetrate as the meeting face-to-face. Ricoeur (1993) also discusses the issues of transferring meaning through text-based information. He argues that a document or a text does not contain a meaning in itself. The original meaning of the document can only be retrieved in the context of when it is written (or perceived by the author). When sharing a text, it is de-contextualized, and then re-contextualized when retrieved by the reader. A truthful re-contextualization is most likely to happen when it is transferred face-to-face by the creator of the information to the reader. Because of this, Hoppe (forthcoming b) emphasizes the importance of utilizing what he describes as arenas in an organization, where knowledge is created or exchanged. Examples of arenas are public events e.g. conferences, third party organizational think tanks, regulatory organizations, internal or external R&D-groups, sales meetings, discussion groups etc.

3.3.2 Information Sharing versus Information Hoarding

When discussing information sharing, Achterberg (2001) emphasizes the importance of having a business purpose of information sharing so that it is not shared just for the sake of it. Such sharing does neither support business decisions nor support innovation, even though she acknowledges that a corporate culture that supports information sharing in general is ahead of one that does not. She argues that it is rather the engineer’s problem-solving conversations by the coffee-machine that should be captured and shared in order for the organization to benefit from their expertise.

Achterberg (2001) also highlights the issues restraining information sharing in an organization. Information hoarding is a phenomena existing because information and knowledge could mean power. She means that it is often not the senior management that sits on the knowledge or information that is needed in order to meet the changing business environment, but people further down in the organization, and that information hoarding then is a sign of lack of trust. She means that it is important to revise how to encourage and provide incentives for the “hoarders” to share their information.

3.3.3 Should Information be Pushed or Pulled?

When organizing information handling in an organization it is important to reflect over how the distribution of information within the organization is carried out. There are two contrasting strategies for the acquirement of information: Information push and Information pull. Information push is when information is sent (pushed) to the user/reader/recipient, without being asked for. Information pull on the other side, is when a user actively searches for information (Hamrefors, 2005; Telleen, 1996).
3.3.3.1 Issues of Information Pull
Hamrefors (2005) argues that if relying solely on information pull, there is a risk that the user searches for information that is in line with the knowledge he or she already possesses. People have a tendency to prioritize information that confirms knowledge they already have gained. This implies a risk to miss out on important opportunities or threats. Therefore he argues that e.g. information systems need to contain functionality of induced push, meaning that information relevant to the subject in matter should be viewed along with the information searched for. This information might not have thought about by the user, but is relevant to the subject and thus it might be needed. There are pros and cons with both strategies and in order to maintain an effective work situation, there must be a balance between the strategies (Hamrefors, 2005).

3.3.3.2 Issues of Information Push
Telleen (1996) describes a common situation in organizations where the responsibility of ensuring access and visibility of information does not lie in the hands of the user of the information, but in the hands of the creator (whether this is another worker, department or team). It is thus the responsibility of the creator to distribute the information to the recipients (a push mentality). The problem is that there is too much information in organizations today, why it is impossible to process and to know to whom it ought to be distributed.

O’Hara (2008) points at another perspective of the push and pull phenomena. He argues that when information is pushed to the recipient, there is an imminent risk that the timing and context of the information is wrong; meaning that it can not be assimilated optimally. Contrasting to this is, if using pull strategy, when the recipient decides where and when a certain piece of information is wanted or needed. He means that this leads to more efficient use of information.

3.3.3.3 When the User is in Control of the Information Supply
This is in line with Telleen (1996), who advocates a pull mentality where the control of the information flow is left with the user instead of with the creators. One example of technology to promote a pull mentality, that is mentioned by him is technology agents where users can specify different information sources for tracking, and where the agent reports whenever a change is made to the information source (for more information, see Real Simple Syndication, chapter 3.4.3). The user is in control of what is monitored and when he or she will embrace this information.

<table>
<thead>
<tr>
<th>Push mentality</th>
<th>Pull mentality</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know what you need - and I'll send it!</td>
<td>I know my mission and audience</td>
</tr>
<tr>
<td>I don't know what you need - so I'll send it all!</td>
<td>I make information available on demand</td>
</tr>
<tr>
<td>I don't care if you need it - I'll send it anyway!</td>
<td>I measure and improve information usefulness</td>
</tr>
</tbody>
</table>

Table 2: Differences in push and pull mentality for the role of a publisher of information (adopted from Telleen, 1996)

3.3.4 A Change from Centralization to Decentralization
Telleen (1996) sees a possibility with new technology to switch the control of electronic information management from the assigned publishers to the creators of the information. When users can retrieve and view needed information in an easy way when
they need it, there is no longer a need to send information just-in-case. Thus can
publishing be separated from automatic distribution of for example reports, meeting
minutes, forms and other documents. However, a new information infrastructure is not
enough to shift of control of the electronic information management, a shift in attitude
and culture is also necessary. Telleen (1996) separates the earlier role of information
manager to three different: firstly, as a technology provider that delivers tools to allow
information creators to publish themselves. Secondly, the role of a creator of
information is to publish, not distribute (see Table 2 above for the differences in
mentality that applies to the role of a publisher). Thirdly, the user of information must
take the responsibility for determining and following the changing information needs as
well as actively gather information when needed (see Table 3 below for the differences
in push and pull mentality for users of information).

<table>
<thead>
<tr>
<th>Push mentality</th>
<th>Pull mentality</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Someone needs to tickle me</td>
<td>• I set up my own ticklers</td>
</tr>
<tr>
<td>• Someone needs to tell me what information is available</td>
<td>• I know how to find information when I need it</td>
</tr>
<tr>
<td>• Someone needs to tell me what information I need</td>
<td>• My job is to determine what information I need</td>
</tr>
</tbody>
</table>

Table 3: Differences in push and pull mentality for the role of a user of information (adopted from Telleen, 1996)

3.3.4.1 Enterprise 2.0 Brings a Change of the Role of the User
According to Stenmark (2008), the decentralization of the control of information is
central in a concepts like for example Web 2.0 and Enterprise 2.0 (further discussed in
chp. 3.4.1), even though the primary focus might be put on the technology aspects of the
concept, like Wikis and Blogs. Thus, he means that the concept is more about the shift
of the role of the user, i.e. a changed behavior, rather than about the technology in itself.
It is about drivers that change how people interact with each other. It is also important
to distinguish Web 2.0 from Enterprise 2.0, even though many argue that the
development of intranets follows the development of the Internet. However the
differences in attitudes and norms make the technologies work differently, Stenmark

3.3.4.2 Industrial Organizations and 20th Century Mindsets
Stenmark (2006) argues that many industrial organizations are shaped by a mindset
stemming from the 20th century, built upon the concept of central control (with central
authority, established hierarchies, and standardized structures). When information
infrastructures such as company intranets were created, they came to reflect the norms
and attitudes of the past. He means that the information is owned11 and maintained by
an information elite that often do not have anything to do with the work tasks of the
information users. Stenmark (2008) uses the cliché “information is power” when
describing the situation in many organizations today, where the organization (and thus
the management) knows (or think it knows) what information its members need and
they control the access.

11 According to Loshin (2001) information ownership means the control of information as an enterprise
asset. This control is including not only the right to access, create, modify, package, derive benefit
from, sell, or remove information but also the right to give others access to the information.
3.3.4.3 Enterprise 2.0 Requires a Shift in Norms and Attitudes
The norms and attitudes that control the traditional industrial organizations are however not the same as the norms that are the foundation for the Web 2.0 concept. Here, information is created from a blank page by interaction between individuals who also uses and needs this information, why it could be argued that the information is owned by the users (Stenmark, 2008). Stenmark (2008) claims that if an organization wants to take a step towards Enterprise 2.0; it also needs to reconcile with the idea that information ownership should be distributed among all employees. The difficult part of turning an organization into Enterprise 2.0 will thus be the shift from a non-democratic top-down perspective of information ownership towards a democratic bottom-up perspective.

3.3.4.4 From a Centralized to a Decentralized Approach
Telleen (1996) discusses differences in intranet implementation strategies in the context of a shift in management from a centralized to a decentralized decision-making. Intranet implementation in the context of centralized decision-making will be characterized by a mentality, where the decision of which departments to participate as well as which functions to be developed within each department will be taken centrally. If contrasting this situation to a decentralized decision-making approach, the implementation of an intranet will then be seen more as a providing the infrastructure for a utility available to everyone, where all departments and functions decide for themselves what to use the system for, i.e. a mentality (Telleen, 1996).

3.3.5 When Change Meets Resistance
These changes, or paradigm shift, of information sharing is likely to meet resistance, not so much because of the changes in technology as for the changes in organizational culture. Telleen (1996) recognizes three different types of resistance: from those who do not understand the shift, from those who fear to lose power (because information is power), and from those who realize that the shift is inescapable but who are slowing the progress to gain time to re-position. He means that resistance is likely to be unsuccessful in the long-run, and also emphasizes that the management have an important task in stimulating diversity and mixing of ideas instead of gatekeeping the information.

3.3.5.1 A Generation Shift will Bring a Change in Corporate Culture
If an organization discourages the use of Web 2.0 or social media because they do not understand the concepts, there is a risk that this attitude repels young adults, which could be a major issue for the future, argues Stenmark (2008). Hansson (2008) contrasts this, when arguing that the change in corporate culture is a matter of generation shifts in the organizations. When the generation of people born in the 1980s and later, gets out in the working life his will change how information is shared and what tools are used. He means that the tools and concepts of Enterprise 2.0 are an essential or natural part of their everyday lives, why they will demand to be able to use these tools also in their work (Hansson, 2008). Stenmark (2008) shares this belief when claiming that the organizations of today are changing towards Enterprise 2.0 from below, when hiring young people. He argues that the young generations are brought up with the public Web and have different attitudes to new technology in general than older generations. This young generation is, according to him, active participators on the Web, through chat
services, discussion boards, commenting, photo and video sharing, file and music sharing etc. He finds it likely that they will bring this behavior to their workplaces, which will have an impact on the corporate information environment.
3.4 Systems Support for Handling Unstructured Information

This chapter will give an overview on how innovative technologies can help to enhance the handling of unstructured information by facilitating collaboration and information sharing. The technologies in primary focus are Wiki-, RSS-, and Enterprise Search solutions.

3.4.1 Web 2.0 becomes Enterprise 2.0

The term “Web 2.0” was first stated at the O’Reilly Media Web 2.0 conference in 2004, but as a buzzword it is still being frequently used. Summarized it can be defined as an agglomerate of Web technologies and concepts that point at enhancing information sharing, creativity, and collaboration among its users. The foremost examples of Web 2.0 concepts are e.g. Wikis, Blogs, social-networking sites, and video-sharing sites (Wikipedia 2008a).

Another buzzword alluding to Web 2.0 is Enterprise 2.0. Basically Enterprise 2.0 is a term promoting collaboration and information sharing in an organization by applying Web 2.0 concepts like Wikis and Blogs (Pettersson & Pettersson, 2007). Another definition is given by McAfee (2006), who rather than listing the concept technologies, specify six key components Enterprise 2.0 solutions should contain:

- **Search**
  No information system is of any value if its users do not find the information they are looking for. Intranets are often using menu layouts reflecting the organizational structure to aid navigation. However, a recent survey by Forrester Research claims that only 44 percent of the respondents were satisfied with how to find what they were looking for on the intranet (McAfee, 2006). A study performed with 600 American companies shows that knowledge workers spends in average 3.5 hours per week looking for information within the organization without finding what they are searching for. Because of this they spend another three hours re-creating this information, even though it exists within the organization (IDC, 2005). McAfee (2006) means that in order to ease the information retrieval, an effective search engine is needed.

- **Links**
  McAfee (2006) argues that hyperlinks help to build a good structure of online content as well as guiding to the most important information. He means that the best pages are also the most linked a theory that e.g. Google uses when prioritizing search results. The difference in companies and organizations is that it is difficult to maintain a rich link structure when the content and links are being published by a small group of intranet administrators.

- **Authoring**
  In order to enhance the quality and create convergent content, McAfee (2006) believes that the information on the intranet should be created by a large group of individuals rather then a small. He states that “most people have something to contribute, whether it’s knowledge, insight, experience, a comment, a fact, an edit, a link […]” (McAfee, 2006: p.24).
• **Tags**
  Today most categorizations of information in information systems are pre-defined by an expert (i.e. taxonomies). McAfee (2006) instead advocates *folksonomies*, which means a categorization system that is developed over time by the users of the information system. One example of folksonomies is *tagging*, i.e. one-word descriptions of the information in question. Many tags can be attached to for example one web page. McAfee (2006) argues that the advantage of folksonomies over taxonomies is that they better reflect the information structure that people actually use instead of the structure that was planned for in advance.

• **Extensions**
  Extensions means that there is functionality in the information system to automate some of the work and to find patterns in the way the user uses the system or in the information retrieved by the user. McAfee (2006) takes one example from the online shopping site Amazon.com, which has a function that by analyzing the purchases made by others, gives recommendations like “if you liked that, by extension you would like this”.

• **Signals**
  In order to keep track of changes or updates of information in a system, which can be cumbersome in an environment characterized by a fast growing information amount, McAfee (2006) highlights technologies that provide signals whenever something is updated. One technology is called RSS (see p.55), which generates a feed of information that keep track of updates of a specific information source, e.g. a blog. The users choose themselves which feed to subscribe and the point is that they do not have to constantly visit the web page to see if there are any changes. Instead, all changes to websites they are interested in will be presented in one location.

### 3.4.1.1 Mature Concepts

Even though some of the concepts have been around since the mid-nineties, it is not until in recent years that the technology is in step with the concepts. Rickard Hansson, CEO of Mindroute\(^{12}\) (a developer of an Enterprise 2.0 platform), explains that despite the recent hype of concepts like Blogs and Wikis, the technology is mature. He thinks that the changed behavior of the users prove that the need is there. Traditionally the Open Source community has run the development of Web 2.0 (and thus Enterprise 2.0 technologies), but Hansson explains that today there are several commercial actors in the market. Among the commercial solutions, he explains that the two most used Enterprise 2.0 internationally platforms are Confluence\(^{13}\) by the Australian company Atlassian and the American company and platform Socialtext\(^{14}\). An upcoming actor that is currently primarily situated on the Swedish market is Mindroute and their platform Incentive\(^{15}\). Besides from these pure Enterprise 2.0 platforms, traditional intranet providers like e.g. Microsoft are latching on to the trend by building in such features in their current intranet platform (Hansson, 2008).

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\(^{12}\) For more information, see: [http://www.mindroute.com](http://www.mindroute.com)

\(^{13}\) For more information, see: [http://www.atlassian.com/software/confluence](http://www.atlassian.com/software/confluence)

\(^{14}\) For more information, see: [http://www.socialtext.com](http://www.socialtext.com)

\(^{15}\) For more information, see: [http://www.mindroute.se/pages/subpages.aspx?id=incentive](http://www.mindroute.se/pages/subpages.aspx?id=incentive)
3.4.1.2 Seamless Integration of Technologies
When talking about Enterprise 2.0 platforms, these are made up by a seamless integration of the different core technologies, Wikis, Blogs, RSS, and Mashups\textsuperscript{16}, into one single interface. Hansson (2008) means that it is when combining these, it work at its best. He argues that one blog post might generate a new Wiki page as well as an edit in a Wiki page might generate a new blog post. RSS feeds provide a simple way of keeping track of what is happening in the Wiki, in Blogs as well as in other information sources (e.g. competitors’ websites etc.) and thus is a simple tool for conducting scanning of the business environment\textsuperscript{17} (see chp. 3.4.3). The information in the RSS feeds might also generate both blog and wiki posts (Hansson, 2008). Referencing is one important cornerstone of Enterprise 2.0. By giving detailed references to sources and referencing to other documents for further reading or discussion, a context that makes it easier to embrace the information is given as well an overall structure (Pettersson & Pettersson, 2007).

3.4.2 Wikis
The core and perhaps the most used technology in an Enterprise 2.0 platform, is the Wiki. The Wiki concept was invented by Ward Cunningham in 1994, when he wanted to create a fast and simple platform for publishing on the Internet as a reaction to the complex process of producing information by programming HTML pages that needed to be uploaded to a server. Cunningham’s Wiki concept was centered on the possibility to create, edit, and link pages directly through the web browser with no more than one click (Buffa, 2006).

3.4.2.1 Wikis are Header Based
Simplified, Wikis can be defined as a “header based” or “topic based” information system, where information can be added, edited or deleted from a web browser. Header/topic based means that the information is structured by certain keywords, that also make up the header of each page (one page per keyword). References to other Wiki-pages, in form of hyperlinks to the specific keywords, compose the total information structure and thus the context of the information (Pettersson & Pettersson, 2007).

3.4.2.2 Hyperlinks are Central
The references (hyperlinks) are being used for either referencing to either an existing page (topic) or to a page/topic that still is to be created. References consist of so called WikiWords (see Figure 18), which is two or more words run together, with initial capitals. If the topic linked to (keyword) does not exist in the database, a new page with that keyword as header is created when clicking on the WikiWord (Buffa, 2006). In modern Wikis it is possible to assign any choice of text as a hyperlink to represent the WikiWord (Hansson, 2008).

Figure 18: Example of how to use hyperlinks

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\textsuperscript{16} Mashup is one kind of extension, see p. 50.
\textsuperscript{17} Hansson (2008) is using the Swedish word “omvärldsbekakning”, which can be translated to scanning of the environment factors of the organization (meaning business environment, legal environment etc.).
3.4.2.3 Wikis are Simple Easy to Use

There is thus no need of knowing of the URL\textsuperscript{18} of other pages, one only need the topic of a page to create hyperlinks. WikiWords is one component of the new simple markup language WikiML, Cunningham proposed for use in Wikis. The fact that Cunningham’s Wiki meant that in order to publish web content, all you needed to do was to click \textit{Edit}, type in text and WikiWords. No programming skills were needed neither advanced computer knowledge; these are probably the main reasons to the success of Wikis. The success of Cunningham’s own Wiki (named WikiWikiWeb) was immediate and it soon grew exponentially (Buffa, 2006). Hansson stresses the importance of usability, and describes that most corporate Wiki systems does not require knowing WikiML. He means that if launching an information system that is meant to be open for anyone, it also has to be usable by anyone. It does not matter if you are a service technician or accountant, it should be obvious how to use the system. He makes a comparison to email which is a technology that everyone knows how to use and argues that Wikis must as easy to use. Because of this, corporate solutions have more advanced user interfaces with for example WYSIWYG\textsuperscript{19}-editing, making them more intuitive to use (Hansson, 2008; Buffa, 2006).

3.4.2.3.1 Wikipedia

The probably most known and popular Wiki is Wikipedia\textsuperscript{20}, first launched in January 2001. It is a free and open encyclopedia, where volunteers write all of the content. No formal peer-review of the material is done, and all articles can be edited by anyone. The main idea is by making all articles open for editing, corrections of erroneous information will be done by the Wikipedia community. This has led to criticism of having systemic bias and inconsistencies and also that consensus is being favored over credentials. This does however not affect its popularity, which is steadily rising and Wikipedia is today the largest and most popular reference work on the Internet (Wikipedia, 2008b).

3.4.2.4 Corporate Wikis

The corporate world differs in some essential ways from the world outside the organization. This also demands more of enterprise systems than systems and solutions available on the public Web (Buffa, 2006).

3.4.2.4.1 Important Features in the Corporate Environment

Buffa (2006) mention four features that are of more importance to an enterprise system than to a system available on the public Web:

1. User authentication
2. Versioning system
3. Possibility to attach files to every Wiki page
4. Notification system indicating what is updated, deleted or added

Hansson (2008) also reckons the importance of user authorization and different access rights for different levels of members in the organization. Even though the aim is to keep the idea of open access to the possible extent, he explains that in some cases it

\textsuperscript{18} Uniform Resource Locator (URL): the correct notion of e.g. a web address like: http://www.toyota-industries.com

\textsuperscript{19} WYSIWYG = What You See IS What You Get.

\textsuperscript{20} For more information, see: http://www.wikipedia.org
might be necessary to limit the access and gives Wikis for product development and the management team as examples. The company could be harmed if information on a new product reaches the market too early as well as the management team does not want discussions from for example board meetings etc. to be public (Hansson, 2008).

A versioning system that keeps logs of the history of changes made to a document is important to ensure security of the information. This enables the possibility of rolling back to an earlier version of the document if being subject to misuse or sabotage (Pettersson & Pettersson, 2007; Buffa, 2006).

It is important to establish policies for how to use a Wiki before it is launched. It is usual to have a common, global, policy that is valid for all different Wikis in the organization, but it is also common that smaller “sub-Wikis” (e.g. departmental Wikis, project Wikis etc.) establish their own policies (Hansson, 2008).

3.4.2.4.1.1 Quality of Information

One common worry by managers is the inability to control and guarantee the quality of the information. On the public Web, information can be published anonymously which cannot be accepted in a corporate Wiki, Blog or intranet. Not being able to be anonymous provides a self-control preventing users from undesired and prohibited behavior as well as keeping the discussion on a serious level (Stenmark, 2008; Hansson, 2008). Hansson (2008) means that no one wants to publish uncertain material under ones real name and take email as an example. It is possible to send whatever you want to everybody in the organization, but this is not done because people fear what others might think and how they will react. On the other hand, he means that by having signed every post and edit with the own name this become an incentive for contributing, a possibility to show what knowledge and information one possess. He also points at the possibility of subscribing to an RSS-feed of information created or commented by one single individual, if finding his or her work especially interesting.

3.4.2.4.1.2 The Difference between Intranets and Wikis

Regarding the information in a Wiki, Hansson (2008) means that it has to be seen as a workplace, where no information automatically can be taken as “the truth”. That is the difference from for example an intranet, where it should be possible to consider information as reliable, because it needs to go through instances in order to be approved for publication. It is important that a central policy for the Wiki is set up, stating what to expect from the content, in order to achieve consensus between all users. This does not, however, imply that the information in a Wiki is not reliable, in fact, the quality of the final output from the Wiki will probably be better because it has been discussed and questioned in a different way, and exposed to more members of the organization.

3.4.2.4.1.3 The Emerge of an Information Hierarchy

Hansson (2008) predicts that when Enterprise 2.0 technology has had its real break through and is a part of everyone’s modus operandi, an “information hierarchy” will be created along with the classic organizational hierarchy. He explains that those who are the true experts, regardless on where in the physical organization they are or on what level will make up this information hierarchy. One aspect is also that there are lots of people that might not be verbal in meetings etc., who will have a better chance of sharing their knowledge to a greater audience (Hansson, 2008).
3.4.3 Signaling through RSS Feeds
As described, Enterprise 2.0 ought to contain Signals. The widespread technology for signals within the framework of Enterprise 2.0 is Syndication. RSS (Real Simple Syndication) is the name of the most common protocol and the standard convention is to refer to RSS when talking about Syndication. RSS is an information gathering system where software, on your desktop or via a web site, polls websites looking for updates on published information and the point is that the user is free to choose what RSS feeds to subscribe to. The feeds are presented in the user’s RSS reader either as entire or excerpts of information-posts, together with links to the original posting. These updates are marked as new in the user’s reader, in order for the user to avoid looking at already read articles. Generators of RSS are e.g. online newspapers, which typically have several feeds or lists of pages, corresponding to the different categories of information they publish. RSS feeds are also closely connected to Blogs, Wikis, intranet etc. (Gilbane Report, 2005).

The basic concept of RSS is illustrated in Figure 19, where the feeds from different web pages are collected and able to read in an RSS reader.

Figure 19: Basic concept of Real Simple Syndication (RSS)

3.4.4 Enterprise Search Platforms
Enterprise Search platforms provide an improved search experience in comparison to traditional search engines like for example Google. In this part technologies and concepts of Enterprise Search platforms will be brought into light.

3.4.4.1 Traditional Search Methods are Ineffective
The average knowledge worker spends a quarter of their time searching for information. Even worse, they are not successful a third to a half of the time. Klemp (2008)

Traditional web search engines are based on keyword search. Keyword search matches the words contained in the query explicitly to those indexed by the search engine. No attention is put at the context of neither the keyword nor the user. The ranking model is instead based on a concept called Page Rank. This means that relevancy is determined by how many pages are linking to the given page and it works well on the open internet where the amount of pages is enormous. The concept is built on the argument that pages link to pages with good quality content, and if many pages link to the same page, a lot
of individual sources have acknowledged the quality of that particular page. This concept does not work as good in an intranet context, where hyperlinks are few and often unreliable. In a corporate environment where there is a need for efficient retrieval of relevant content keyword search is not precise enough (Autonomy, 2008).

3.4.4.2 A New Generation of Search to Better Suit the User

The new generation of search engines, to which Enterprise Search platforms can be categorized, is centered on the user. Klemp (2008) used the catchphrase “User is King” to describe the idea that user is, and should be, in control of his search for information. He means that the search engine should be the tool to serve the will of the user.

Klemp (2008) describes that Enterprise Search platforms rest on four pillars that are interconnected with each other (the order does not reflect any internal hierarchy).

![Figure 20: Pillars of Enterprise Search (adopted from Klemp, 2008)](image)

3.4.4.2.1 Understand Intent

In order to provide relevant search results it is important to understand the intent of the user; to understand the question the user is asking the system. This can be done through Natural Language Processing (NLP) and linguistic analysis. NLP makes it possible to type in questions or phrases as queries instead of just keywords. The technology will identify and strip out irrelevant terms, as well as for example group idioms such as “home run”. The linguistic analysis is used in order to for example avoid word-sense ambiguity, e.g. to separate between the color, the fruit, and the company orange (FAST, 2006; Autonomy, 2008).

The enterprise search engines will thus make sure that “what you need is what you get” instead of “what you ask for is what you get”, which is the case with traditional search engines according to Klemp (2008). An example could be the following question/query: “Which companies work with forklift trucks?” Traditional search engines would provide search result of pages containing the actual words companies, forklift trucks. While an enterprise search engine would deliver documents containing the actual companies working with forklift trucks.

3.4.4.2.2 Provide Contextual Relevance

Enterprise search tools are used in a variety of contexts, e.g. corporate intranets, commerce sites, portals, extranets, file servers etc., which all have different objectives as well as user groups with different needs. In order to provide accurate and relevant search results in all of these contexts, relevance models and ranking abilities need to be flexible (FAST, 2006).

Relevance is thus something individual; what is relevant to one user might not be
relevant to another, even though they are working in the same area. In order to be able to provide relevant results from the indexed content, the search engine have to know the user and its needs. One way of working around this is to use search profiles, containing information on the user’s work position, interests, and vocabulary. The search profile will also be based on information on what previous content has been browsed, consumed or contributed by the user. This profile is continuously updating and will thus improve the ability of finding relevant material. When doing a search, the search profile of the user will be matched against a profile of the found material. This can be illustrated with an example: If a network technician does a search on the acronym ATM, a search system using adapting search profiles will then be able to rank search results containing “Asynchronous Transfer Mode” before those containing “Automatic Teller Machine” (Westerholm, 2008).

3.4.4.2.2.1 Ranking model

In order to provide information with contextual relevance to the user, a search engine uses a ranking model. Examples of parameters that are used to rank documents are illustrated in Table 4 below:

Table 4: Parameters used for ranking documents (adopted from FAST, 2008)
3.4.4.2.3 Understand Content

An Enterprise Search engine needs the ability to index, interpret, and understand the content of the source data. This is done in two steps; firstly the aggregation of information where information is pulled from multiple sources, and secondly the processing of information. The processing step includes different analyses, conversions, transformation as well as enrichment of the original content to a format ready for indexing (FAST, 2006).

There are different methods for analyzing the content. Text mining with linguistic analysis such as automatic language detection, lemmatization (connecting all forms of a word, such as run, runs, ran, and running to the base form run), and analysis of synonyms in order to be able to relate to words in a broader term, are used (FAST, 2008). Text mining techniques that are not language dependent is also possible to use, where words are treated as more abstract symbols of meaning and where statistical analyses of occurrences of words are used. These analyses can be complemented by linguistic analyses such as semantic parsing or sentiment analysis (which makes it possible to determine if the sentiment of the document is positive, negative or neutral), for improved search results (Autonomy, 2008).

A semantic index is used in order to narrow searches to paragraphs or single elements. In traditional search engines, meta-data is only aligned to whole documents or database entries, but in an enterprise search engine it is possible to pick out certain parts of a document. This is done by identifying and assigning entities to the content. Entities are in many cases pre-defined to a certain extent, e.g. names, addresses, phone numbers, company names, geographic locations etc., but can also be customized to suit the individual case. This information is also used for automatic generation of taxonomies, used for search and navigation of the material. Other functions in order to create structure of the information is for example automatic hyper-linking between documents of related content as well as automatic clustering of documents of different types (FAST, 2008; Autonomy, 2008).

There are also technologies available for supporting the analysis of multimedia such as audio, video or images, which can be used for searching information (FAST, 2008; Autonomy, 2008).

3.4.4.2.4 Facilitate Dialogue

The last pillar aims at involving the user in the search process for further improvement of the search experience. One way of facilitating dialogue with the user is for example by providing real time content analysis and automatic categories (based on e.g. the entities extracted, or categories identified) that can be used to refine and narrow the search (Klamp, 2008; FAST, 2008). It is also possible to tie the unstructured information from the search results to structured content from e.g. databases (e.g. product names, size or manufacturer could be integrated with unstructured information like product descriptions) (Autonomy, 2008).

Another interesting feature of some Enterprise Search systems is the possibility of connecting the search engine to a catalogue of expertise, containing the employees of the organization together with their skills. When searching for information, experts within this area will be showed along with the search result. This is a way of improving
the collaboration, exchange, and increase of knowledge within the organization. The profiles of each member will also be updated continuously by the system, taking the information that is being searched for and contributed by each individual (Autonomy, 2008).

3.4.4.3 Technological Overview of an Enterprise Search Engine

Most Enterprise Search platforms are built on similar concept, with three central components: a crawling/indexing engine, a query engine, and a ranking/relevance engine (DuPont, 2007).

![Diagram of an Enterprise Search System](image)

**Figure 21: Schematic Overview of an Enterprise Search System (adopted from FAST, 2006)**

In the schematic overview presented in Figure 21, point 1 represents the retrieval of content from various information sources. The links between the Enterprise Search system and the information sources are called *connectors*. Most systems support retrieval of content from almost all sources available in a company today; whether it is file servers, shared drives, email-, ERP-, and CRM systems, Internet sites or almost any XML content. It is also possible to customize connectors if necessary. Point 2 is the “content processing”, where the content extracted from the information sources is analyzed (by linguistic-, statistical analyses etc.) and stored in a structured way in the search index (illustrated by point 3). There is support for a variety of file formats, e.g. different text, spreadsheets, PDF, movie, audio, and picture files. Point 4 is representing the “query and relevancy engine”, which is analyzing the queries to find the relevant content in the search index. This point is tightly connected to the result engine/interface, represented by point 5, where an interaction is carried out with the user, which is why queries can be changed in real-time (FAST, 2008, Autonomy, 2008).

3.4.4.4 Acknowledging the Importance of Security

When being able to index all information sources in an organization it is obvious that there are high demands on the security model, since there are information that should not be visible to everyone. An authorization system is thus crucial in order to verify what information a user is entitled to see. It is also important that the connectors that retrieve the content from the information sources also include the built-in access model of that source and that the relevance engine complies with the permission levels of the documents (FAST, 2008).
3.4.5 Implementing Enterprise 2.0

This part describes the relation between Enterprise 2.0, intranets, and email as well as how an implementation process can be carried out.

3.4.5.1 Enterprise 2.0 and Traditional Intranets – Replacement or Complement?

There are different opinions whether Enterprise 2.0 platforms will replace company intranets based on traditional Content Managing Systems (CMS) or not. The Gilbane Report (2005) states that this will not be the case, but that it is likely that CMS platforms will contain Enterprise 2.0 features (Gilbane Report, 2005). Hansson (2008) is of a similar opinion and refers to Wikis as intranet enhancers. He means that if a company is able to combine intranets with Wikis, this will give an information source like nothing else, where it will be possible to find both more unstructured information from the Wikis as well as official and strategic documents from the intranet. McAfee (2006) is of a similar opinion when stating:

The intranet 2.0 or the Enterprise 2.0 does [...] not have to replace the old intranet. Although different in structure and approach, the new applications can be added to and integrated with channels already in place, slowly transforming the intranet towards a 2.0-state.

Hansson (2008) believes that company intranet is still going to be the official location for managed content; whereas Wikis will fill the role of storing unstructured information that otherwise is spread all over the organization. He describes Wikis as a birthplace for information and ideas, later to be put on the Intranet when developed into a mature information product. To him, everything on the intranet is to be seen as complete or finished, whilst the content of a Wiki is permanently under development (Hansson, 2008).

In the Gilbane Report (2005) it is also stated that there is nothing preventing Enterprise 2.0 technologies from replacing project management tools, even though these call for structured features like to-do-lists and milestones etc. (Gilbane Report, 2005). This is also acknowledged by Hansson (2008) who means that a Wiki is easy to set up and use for example before a project “goes sharp”. Later a traditional (and formal) project management tool could be used. He thinks that it would be easy to migrate into the project management tool because all information is already in place. Hansson (2008) explains that it is also possible to connect different project management plug-ins to the Wiki tool; to be able to provide a more complete solution. He means that traditional project sites and project management tools are rigid and not fast enough to use, especially in the initiation phase of a project. “The Wiki becomes your whiteboard, notebook, and post-it notes, but in the digital world” (Hansson, 2008).

Hansson (2008) means that there are a lot of issues discussed in a project that never reach finalization (an official document) and thus never become transferred to the area of managed content. This might still be valuable information that can give answers to questions and provide background material for someone in another project, with similar questions.

Everything that is put on the intranet can be classified as finalized information products. But normally there is no place for documenting the ”journey” to the finalized material. In meetings, notes are made in personal notebooks, on whiteboards, in Word-files on
personal laptop etc. Hansson (2008) means that this is the real strength of the Wiki. He sees it is a digital tool for handling unstructured notes. It is easy and quick to set up and intuitive to use. If using a Wiki for handling the everyday information in a job, it will not only be saved in a more structured way, it will also be available for others to take part of (Hansson, 2008).

3.4.5.2 Wiki and RSS – Replacement for Email?

Thomas Davenport (in McAfee, 2006) did a study on knowledge workers where 26 percent felt that email was overused in their organization, 21 percent felt overwhelmed by it, and 15 percent felt that emailing were declining their productivity (McAfee, 2006). Buffa (2006) describes similar situation at the Insight and Foresight division of Nokia (a department specialized in technology watch). Email was their primary collaboration tool at the time and they were experiencing severe difficulties in finding and structuring the information because they simply got too many messages. In order to get rid of these problems, the division decided upon using a corporate Wiki solution. Together with this solution, instant messaging is used for small issues (Buffa, 2006).

![Email versus Wiki (Buffa, 2006)](image)

Figure 22: Email versus Wiki (Buffa, 2006)

Figure 22 illustrates the difference between using email as a collaboration tool versus using e.g. a corporate Wiki. In the email case, the same information is sent between different persons and the information is stored in each individual mailbox. If someone wants to take part of a piece of information, first of all, he or she needs to know of its existence, and then it needs to be asked for. If emailing a document to different recipients, all changes made need also to be mailed to everyone, and if everyone are making changes there will soon be confusion of which version is the right (Buffa, 2006).

3.4.5.2.1 Using the Wiki as a Central Node of Information

In the Wiki case, the Wiki is a central node of information where the information is kept. Whenever information needs to be shared, it is put in the Wiki, and thus possible to read and edited by others immediately. There is no need of handling different versions of a document, since the version on the Wiki always will be the newest. Most corporate Wikis also have versioning system enabling to browse which edits have been made to a document and also to roll back to earlier versions if desired (Buffa, 2006).

3.4.5.2.2 Notifications via RSS

If having centralized information sources and distribute notifications of changes via e.g. RSS feeds instead of by email, this can reduce issues of overloaded email inboxes significantly. Another usage is when someone is new on a position and lacking the required personal network for accessing necessary information. It is possible to
subscribe only to the feeds that are important to one self, or those which are needed for the position/role and then choose to read these when wanted. A lot of time is saved when not having to browse all different project sites, web sites, intranet etc. The RSS reader also provides offline access to enable use when it suits the user (Gilbane Report, 2005).

3.4.5.3 The Use of Viral Marketing for Spreading the Word
The biggest challenge when implementing a Wiki is to enable people to use and contribute to it. Hansson (2008) describes a tendency to believe that because everybody has the chance to put in information and contribute, they will. According to him this will not happen. There has to be a strategy for how to engage people to participate actively as well as how to roll out the Wiki in the organization. He does not believe that it is possible to force people to use a tool like a Wiki. He thinks that the most efficient way is to find what he refers to as the enthusiasts\(^{21}\) and then use the concept of viral marketing\(^{22}\) to spread it within the organization. If one enthusiast use the Wiki frequently in meetings etc., eventually other people will pick up and it will be spread by itself, according to Hansson (2008). Stenmark (2008) describes that the research community is of the same opinion:

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Unlike most traditional software platforms, a success factor for Web 2.0 seems to be to just leave it to the users to develop as they see fit. IBM concludes that big internal campaigns and push models are not the way forward when it comes to introducing social media; a hands-off approach is much more likely to be useful [...].
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3.4.5.4 Not a Heavy Investment
Normally the risk of failure when implementing new IT or IS solutions is seen as a threat associated with big costs. However, this is not the case with Enterprise 2.0 since the technology can be tested easily and at a low cost. The approach is: “succeed or fail quickly – and therefore cheaply” (Stenmark, 2008). The actual implementation of the technology is neither to be seen as expensive (Hansson, 2008).

3.4.5.5 Evolutionary not Revolutionary Approach
One effective strategy when implementing a Wiki is to introduce it in a certain part of the company; maybe in a project, team, virtual organization or smaller department. It is an advantage if this group is meeting-, noting-, and knowledge intensive, according to Hansson (2008). He takes customer support as an example of a group that is common for a first implementation of a Wiki in an organization. This because there are always new questions or new solutions to both new and old issues that create a lot of information which can be used more efficiently if put in a Wiki. He mentions that another common startup-Wiki is organizational dictionaries, to share a common view on the different concepts and definitions in the company. If being able to point at a successful implementation of a Wiki in the own organization, Hansson (2008) claims it will be easier to launch Wikis in other parts as well (cp. viral marketing). A slow, gradually implementation approach is also promoted by McAfee (2006), and Stenmark (2008) advocates “an evolutionary rather than revolutionary approach to Web 2.0.”

\(^{21}\) Translation of the Swedish word "eldsjäl" used by Hansson.

\(^{22}\) Viral marketing is a marketing technique that uses already existing social networks in order to increase brand awareness or increase sales. People recommend a product (or service) voluntarily (Wikipedia, 2008e).
Hansson (2008) acknowledges the issue of getting people to start using tools like Wikis, especially in areas that possess competence different from the rest of the company. There is an important difference from public Wikis like e.g. Wikipedia, where the user group consists theoretically of the entire Internet user group. This is not the case in corporations where certain departments and bases of competence are rather small. Therefore it is less possibility that more people possess the right knowledge to be able to react on a certain topic. Another issue is that people are used to being served with information in their email inboxes. He explains that often the mentality is that if they have not got certain information in the inbox, the have not been notified on the subject. He means that this is something that is slowly changing and makes comparison that if someone stumbles upon a question or problem they need to get solved: The first thing one does is to Google it and find a solution or an answer. When a corporate Wiki is mature, this will make the same change in the enterprise that the Wiki will become the enterprise’s own Google, according to Hansson (2008).

Basically it is a transformation from a push to a pull strategy of information retrieving. The classic intranet has a top-down structure where information is being pushed from above (Stenmark, 2008; Hansson, 2008), while Enterprise 2.0 demand more from the user, he or she needs to self actively search for information, and this changed behavior will take time (Hansson, 2008).
3.5 Practical Use of Chosen Theory

This section is to be seen as a summing-up of the previous presented theory regarding Business Intelligence and it aims to give an overview of the most important concepts and clarify the intended use of the previous four sections. What is new is a model for structuring BI within TMHE, which is built upon what was presented in the BI theory.

3.5.1 Business Intelligence Theory

As seen throughout the opening section in the Theory chapter the intelligence terminology is still in flux. The focus in this Thesis has been on the term Business Intelligence, which is used either as a term capturing other intelligence terms or a denotation for decision-support systems. The term is studied from the perspective of its history and development. Firstly, as used by consultancy agencies and how this has affected the lack of conformity. Secondly, as sprung out of military intelligence in an Anglo-Saxon milieu and how this has lead to a top down view and affected the language used and the idealized view on structuring in company contexts. With support in the theoretical framework and with the situation and division at TMHE in mind, we approached BI as an umbrella concept covering both of these offshoots. However the theoretical framework is focusing on BI as an activity from the perspective of the initiated process of defining and enhancing Strategic BI at TMHE.

As an intelligence term BI can be seen either as something only for the management of an organization or as a process enhancing organizational learning for the entire organization. The latter is supported by Hamrefors (2008) who sees BI as an organizational quality rather than as a division in different usage. In accordance with Sandström (1988) we focus on BI as the ability and the activity to identify and solve problems and challenges. With this in mind, it is natural that the work is to be locally met, but also as Pagels-Fick (1999) emphasizes, that BI is more than the search for information. The BI function ought to act as a partner in the business planning process and initiator of a discussion over the results with other functions within the company. Hence are social abilities crucial and the necessary intra-organizational relationships can be interpreted from the description of “scratching backs”. The importance that the orderers show consideration for the provider of decision support and is explicit with their expectations is also put forward and relevant for our Case Study.

Business Intelligence has a clear connection to Strategy, both as a concept and as an ideal prerequisite for decision-making. The necessity of having a high degree of flexibility has effects on the strategy work and information handling. Due to the use of the terms Strategic and Operative within TMHE, the strategy pyramid is included to nurture a discussion about dangers of using these dividers.

3.5.2 A New Model

In order to capture the comprehensiveness of BI work, we have developed a new model for a BI structure. It is built on the model presented in case example (p.35), which consist of three different frameworks. The idea with the new model is also to have three

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23 In some corporate documents Operational Business is used. However TMHE does not make a difference between operative and operational as a divider and therefore Operative BI and Operational BI will be used interchangeably.
frameworks, however more explicitly tied to the BI theory presented and adapted to suit the history and the current situation of our case company. Our three frameworks are therefore: Activities, Categories, and Processes.

3.5.2.1 Framework of Activities
For the activity framework we have embraced the division of Business Intelligence made by Pagels-Fick (1999) as two different activities: Generic BI and Decision-Orientated BI (see Figure 6). This is the conceptual division in the way of working with Business Intelligence that holds both the different nature of the work together with the possibility to have dynamic target groups.

3.5.2.2 Framework of Categories
The framework of categories is the categorization of the areas of BI within a company. This framework is the one most inspired by the case example, but with the addition of a fourth category (see Figure 23 below). This framework could be accused of being a blind proposition from our side, but the categories (Market-, Competitive-, and Macro Intelligence) are neither fixed nor content-predestined. The idea is that the categories should to be practically filled by the company, rather than be theoretically pre-defined. The assigning of work to the categories is developed in the Case Study. Moreover an intermediate goal with the information needs analysis is to test the categorization on current information needs among top and middle management. However the point with the categories is not that they are self-explanatory, but that the company has to make an active decision of what BI work that ought to be performed to meet the business need. What the framework of categories offer is a structure that makes the BI work more visible.

The category Macro Intelligence is often summarized with the PESTEL-framework (cp. STEPP-factors, p.29), i.e. Political, Economical, Societal, Technological, Environmental, and Legal (Hedin, 2008). The addition of Internal Intelligence was made since we felt that the internal operations e.g. financial analysis and support activities were left out of focus without this category.

The categorization was done in consultation with Hans Hedin of Global Intelligence Alliance (GIA), who besides from the other categories also acknowledges Supply Chain
Intelligence. We thus make a reservation regarding this category, which is an area that has been delimitated from the scope of the Thesis. In our model we picture the Supply related intelligence work incorporated in the competitive and internal categories, but we are not foreign to the idea of adopting Supply Chain Intelligence. The reason for why this has not been done is because the Case Study does not cover the question of how substantial this area is within TMHE.

3.5.2.3 Framework of Processes
The third framework in the new model is the process oriented. This can be compared to the framework in the case example, constituting of the model referred to as the Intelligence Cycle (see Figure 5). However with the critique of this model in mind we have chosen to tie this framework to the processes aiming to structure important questions of what is done, by whom, and what the outcome will be. We also highlight the importance of delivering tailored and targeted intelligence products, stressed both by the case example and by Tyson (1990) and Hoppe (forthcoming b). In the case model one framework constitutes of Strategic and Operational Intelligence, terms we avoid using because of their current state as dividers of BI within TMHE. However we admit the use of an axis ranging from operative to strategic, but do not aim to make a division by using these terms.

3.5.3 Information Needs Analysis
The theory covering information needs analysis is to be seen as a highlighter of the issues and challenges surrounding an information needs analysis and as a walkthrough of the chosen methods. This section is foremost as a background to the part in the Method chapter (see chp. 4.5.6), where the practical use of the methods are presented.

3.5.4 Information Handling
The section Information Handling is connected to the Thesis’ third research question and is to be seen as support for us to be able to investigate how the handling of unstructured information can be improved. It thus serves as an introduction and necessary background for the section covering Systems Support for Handling Unstructured Information (see chp. 3.4). In this section three concept technologies (Wiki, RSS, and Enterprise Search) were presented together with the prerequisites for implementing these. Based on the findings of the Case Study, a discussion of what use these concepts could be for TMHE is carried out in the Analysis chapter, together with an analysis of the organizational prerequisites.
4 Method

This chapter begins with our scientific approach, which is followed by an introduction to the Qualitative Research method and the Case Study and how they are suited for this Thesis. Later the course of action is described together with how our material has been collected and then the information needs analysis is presented and discussed. At the end is our critique of the chosen research methods.

4.1 Scientific Approach

The idea with social constructions is on many points a backlash to Descartes’ philosophy of the Age of the enlightenment and that individual and social phenomena ought to be studied through the subjective consciousness of individuals, and not only through observable behaviour. It has developed along two principal lines whereas one is based on the hermeneutic tradition (Wikipedia, 2008d).

Hermeneutic research emphasizes the importance of studying the entirety. In contrast to the objective of the natural sciences it dissociates from the idea of gaining knowledge through reduction. The knowledge gained from the studying of detail is not valid for the entirety, thus this has a meaning beyond the inward-bound elements. This is illustrated with the elements below which are grouped differently and in spite of the fact that the inward-bound elements have the same meaning, they change the meaning of the entirety depending on how they are assembled (Patel & Sibelius, 1987).

![Figure 24: Elements (adopted from Patel & Sibelius, 1987)](image)

The hermeneutic tradition is built upon the idea that there is no knowledge beyond the individual’s experience of the reality. The human being and the reality is two sides of the same coin; mental processes and actions are therefore the result of social interactions between humans. The only thing one can know about the reality is how humans create and understand the reality and their acting in the reality. In these processes also the language is seen as interpreted, negotiated, and rephrased (Alvesson & Sköldberg, 1994; Wikipedia, 2008f).

We approached this project with the humble quest to investigate the entirety and to the utmost extent avoid to get caught up in describing inward-bound elements. Even though this is a natural starting point we believe it is a necessary scientific approach to, throughout the project, take a step back in order to see the meaning of the elements in their current context. Research founded on interpretation is a deprecation from research as the discovery of a true state of mind. It is also the insight of communication; and thus researchers as communicators of their interpretations of the entirety that constitutes the research object.
4.2 Qualitative and Quantitative Research

We have chosen a qualitative research method since it suits the purpose of this Thesis. The objective of a qualitative approach is to interpret and understand phenomena, whereas the objective of a quantitative approach is to measure and explain (Patel & Sibelius, 1987). The essential difference prior to the selection of data for these methods is that the quantitative selection method uses a selection as a model of the population, i.e. a representative selection. The qualitative selection method on the other hand, seeks a selection withholding as many qualities as possible (Eneroth, 1984).

Since the quantitative research generates a number or a datum value, the selection on which they are based has to be representative. A qualitative method aims to give an idea or a concept about a phenomenon. Consistently, for the concept to cover as many aspects as possible, it is important that the selection is made to highlight as many aspects as possible. If the selection is random, the risk of missing the less common qualities increases since the selection will be dominated by the most common ones. If the strategy of hand-picking a selection with as many qualities as possible is maintained, the variation of qualities left to chance is effectively reduced (Eneroth, 1984). Strategic selections are also to prefer if the selection is small (Halvorsen, 1992).

Due to the time limitations of the project and the occupation of our target group of respondents the selection of respondents had to be rather small. Thus in order to capture the qualities of the defined central corporate function, we had to apply a qualitative approach.

As discussed earlier (see 3.1), Business Intelligence is still an immature subject. This is something that also speaks for our choice of a qualitative research method. Brouard (2006) states: “In the absence of a generally accepted conceptual framework for environmental scanning, it is appropriate to use a qualitative research strategy and a field strategy. A qualitative approach is an appropriate methodology to study an emerging and ill-defined concept like environmental scanning” (Brouard, 2006: p.42). This statement coincides with nature of Business Intelligence, but is also suitable since we touch upon and uses term environmental scanning.

4.3 Case Study

This Thesis is built upon a Case Study conducted at Toyota Material Handling Europe. Case studies typically combine data collection methods such as archives, interviews, questionnaires, and observations. The resulting analysis is then quantitative, qualitative or a combination thereof (Eisenhardt, 1989).

A case study implies that a small number of objects, e.g. patients, companies, trades, decision making processes, are being investigated in a number of different aspects. As a research method, case studies have a long history in areas such as analyzing decision-making processes within companies and within psychoanalysis, but the method has spread and today it is universally applicable (Eriksson & Wiedersheim-Paul, 2001). The purpose of the Thesis has connections to the decision-making process within TMHE.

As a research and investigation method the case study has been used in four different purposes (Eriksson & Wiedersheim-Paul, 2001):
1. **As an illustration.** In situations where other methods are used, a case study could serve as an “empirical gesture”. The case study might act as a pedagogical clarifier.

2. **As an aid to create hypotheses.** When the subject matter is unknown and the case study acts as a part of an exploratory research, or a finder of a new angle of approach on an already studied subject.

3. **As a method for change.** E.g. in an organizational process of change. The researcher has to gain explicit knowledge about the organization and its stakeholders. It is also necessary to adopt a language and concepts understanding rather than causal relations.

4. **As an aid to create theories.** This is the most controversial aspect of case studies. From Glaser & Strauss (1967) a work method was developed where data was used as indicators for as many concepts as possible; every new indicator is compared with all previous ones. Gradually, as the theory evolves the comparison devolves into referring to new indicator against a set concept. Eventually the theory stabilizes, and a successful theory formation is characterized by a small number of concepts that still can be related to a large number of situations without losing anchorage.

For this particular study both the first and third purposes are appropriate. We hope to clarify the situation as it is today within TMHE and their efforts with Business Intelligence and information handling and with our outside view we hope to bring light to the most apparent issues the company is facing. The third purpose as a method for change can also be argued for as we are to deliver recommendations to TMHE for apposite next steps.

Case studies can also be characterized as particularistic, descriptive, and heuristic. Particularistic means that case studies focus on a particular situation, event, phenomenon, or program. The case is interesting for what it exposes and for what it might represent (Merriam, 1998). Shaw (1978) states that case studies “concentrate attention on the way particular groups of people confront specific problems, taking a holistic view of the situation.” (Shaw, 1978) In the TMHE case the particular group is the top and middle management of central functions within TMHE, and the specific problems (challenges) are their information needs for fulfilling their roles and the handling of unstructured information.

Descriptive means that the study is made in depth and that the description is extensive and thick. The term thick description is borrowed from the anthropology; and a thick description of a human behaviour is one that explains not just the behaviour, but its context as well, such that the behaviour becomes meaningful to an outsider (Merriam, 1998).

Heuristic means that the outcome of the case study can improve the understanding of the object and that the study can serve as a mind-opener to new ideas, and to earlier unknown relationships. Another outcome is insights on the background of the current

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24 Defined according to the delimitations of the Thesis.
state (Merriam, 1998). The heuristic aspect together with the two discussed purposes of a Case Study is of great importance for the Thesis.

Bell (2006) argues that a Case Study enables the researcher to devote the attention to a certain event in order to create a deeper understanding. This statement also comports with the purpose of the Thesis and is connected to the descriptive characterization of Case Studies.

4.4 Course of Action
The process of carrying out this Master Thesis was divided into Planning, Execution, and Completion. Then the work was conducted through four phases: Pre-Phase, Collection Phase, Compilation Phase, and Completion Phase. The different phases consisted of key-activities and served as a status check for the progress of Thesis (see Figure 25).

![Figure 25: High level time plan](image)

The project begun with a kick-off meeting at TMHE in Brussels with a company presentation and a workshop were the phases and the key-activities were discussed together with the scope of the Thesis. The majority of the activities were performed in Uppsala and at TMH Sweden in Bromma.

4.5 Data Collection
In order for us to fulfill the purpose of the Thesis we had to make use of both primary and secondary data. The primary data has been collected through interviews and the secondary data through the literary pre-study and foremost in the literature study.

4.5.1 Primary and Secondary Data
Data can be generalized into primary and secondary data. Primary data is the data that the researcher is collecting themselves using methods primarily observations, interviews or questionnaires. This often creates credibility issues that do not arise with secondary
data. Secondary data consist of data that is neither collected directly by researcher nor specifically for the researcher, and therefore it is given a secondary purpose in the new research (Befring, 1994; Lundahl & Skärvad, 1999).

Both the primary and the secondary data have been examined from a comparable and reliability perspective before being used. However, the data has also been interpreted by us as researchers; a phenomenon which is impossible to avoid according to the hermeneutic viewpoint.

4.5.2 Literary pre-study
The literary pre-study had a threefold purpose: firstly as a part of the Pre-Phase for us to approach and familiarize our self with the diverse subject of Business Intelligence, secondly as a starting point for us to begin the process of problemizing and building our theoretical framework, and thirdly to introduce us to THME through presentation material and via the Intranet of the company.

4.5.3 Literature Study
The purpose of the literature study was to build the theoretical framework of the Thesis. This chapter follows the overall structure of the Thesis and is therefore divided in Business Intelligence, Information Needs Analysis, and Information Handling, with an additional section covering systems support for handling unstructured information.

4.5.3.1 Business Intelligence
The material for this part is written literature from this emerging field of study. It also includes literature connected to the BI-subject and connected to organizational theory appropriate for our Case Study. However we have also searched for primary sources through contacts with researchers working with Business Intelligence.

4.5.3.2 Information Needs Analysis
The major part of the material covering the information needs analysis is built upon literature covering this type of analysis. However we have also made use of our academic contacts in order to discuss our Case Study.

4.5.3.3 Information Handling
This section is primarily made up of literature regarding theories of information sharing, information ownership, distribution/retrieval of information, and how organizational culture affects information handling. These areas all fall under the broad area of Knowledge Management.

4.5.3.4 Systems Support for Handling Unstructured Information
The overview of information systems for improving the handling of unstructured information is built on literature and Internet sources. It also contains primary source material from an interview made with a provider of system solutions.

4.5.4 Interviews
The primary data for this Thesis was collected through interviews. Kvale (1997) draws an allegorical description of the interviewer as a traveler in a foreign country, seeking
knowledge through conversations with its inhabitants and returning with tales and information for interpretation and usage. This may seem like a juvenile depiction, but it captures the struggles of the interviewer and the characteristics of the method. For us the process of writing this Thesis has, in a literally sense, been a journey. A journey from Uppsala, via Mjölby to Brussels and back again. But moreover a cultural trip with a Swedish company acquired by a Japanese company forming a European business region with a new management team placed in Brussels.

Bengtsson et al. (1998) present three different qualitative methods for gathering data: interviews, observations, and document analysis. Interviews then can be divided into group- or individual interviews, and between one or more interviewer. As this Thesis is co-written, one of the advantages we have had is that all interviews were performed in pairs with two interviewers.

Befring (1994) stresses a better response rate on sensitive questions as well as a higher validity when using interviews instead of questionnaires. The interview process also advocates a scope for more detailed answers.

4.5.4.1 Degree of Structure

Interviews can be ranged, according to how they are structured, in structured, semi-structured, and unstructured interviews. A structured interview is basically a questionnaire, which is mediated or administered by a researcher. This type of interview is used for a variety of reasons but can often be used to increase response rates and the quality of answers for questionnaire style research (Assarson & Svensson, 1996; Bell, 2006).

At the other end of the formality scale, unstructured interviews are to be placed. With an unstructured interview the strategy of the researcher is to ask as few questions as possible, in order to let the respondent talk as freely as possible. Interventions are only made to refocus the discussion or when additional insights are sought after. This technique enables the respondent to re-establish the parameters of the discussion, a process in which the respondent indirectly reveals what is important. This type of interview is used to achieve a holistic understanding of the respondent’s perspective and is the favored e.g. in historical research (Assarson & Svensson, 1996; Bell, 2006).

In between these two approaches, semi-structured interviews are the most used technique in qualitative social research. Here the object of the researcher is to gather certain information that later can be compared and contrasted with information from other interviews. Usually the researcher produces a schedule for the interview, in which a list of questions the researcher wants to find out is stated (Assarson & Svensson, 1996; Bell, 2006).

4.5.4.2 Executions of Interviews

In order for us to familiarize with TMHE in general and with our TMHE-respondents and their roles and responsibilities in particular, telephone interviews (Interview I) approximately 30 minutes long, was performed 2-4 weeks before the second round of interviews. These interviews (Interview II) were all, except for one, performed face-to-face, and lasted between 1-1.5 hours. Interview II focused on the respondents’
information needs together with their view and expectations on Business Intelligence and Environmental Scanning, and unstructured information and information handling.

In this qualitative study we have used the approach with semi-structured interviews. This level of structure has given us the opportunity to prepare a question master for more than one respondent and corporate function and then be able to lead the conversation towards more specified circumstances that may or may not be within the scope of the Thesis. Two days before the interviews we sent out a distilled form of each specific question master, as an outline for the upcoming interview. This agenda highlighted the scope of the interview and presented the areas we wanted to cover. We kept the opening of the interviews unstructured in order for us to discover areas that we did not have prepared questions for and to promote more talkative respondents. In Interview I this was done by letting the respondents elaborate on their previous work experiences and their current work descriptions, and in Interview II it was done with an exercise on needs connected to their roles and responsibilities within TMHE. After that we went back to our semi-structured question master with the possibility of adding and subtracting depending on the outcome of the initial part.

4.5.5 TMHE Respondents

Most of our respondents are Senior Managers, Directors or Vice Presidents within TMHE. A list of the respondents is presented in the References (see p. 155).

We have treated our respondents at TMHE anonymously, and therefore the respondents will not be quoted by names and remain anonymous in the empirical part of the Thesis report. The material from the interviews is handled as aggregated answers or as e.g. “one respondent emphasizes…” We have also tried to be sparse with quotations and the used quotations are referred to only as one respondent. We informed the respondent in advance and this procedure was made in order to increase openness and willingness to answer and to enable them to speak more freely about the topics discussed.

4.5.5.1 Additional Respondents

We have done one additional interview outside of TMHE in order to learn more about a specific topic. Also this interview was recorded and performed via telephone. The additional interview was carried out with the CEO of Mindroute AB, in order to gain knowledge on the concept of Enterprise 2.0 and corporate Wikis.

4.5.5.2 Recordings

After approval from the respondents a computer was used for recording the interviews in order to elucidate and minimize the risk of misquotes and misinterpretation. We are aware of the inhibiting effect a tape recorder may cause, but in this particular case we believe that the advantages outweigh the disadvantages and since we did not use an actual tape recorder, the disturbing effect Ejvegård (1996) refers to was not evident. Time and place was chosen from the sake of convenience, in order for us to cluster the interviews, but foremost to match our respondents’ traveling schedules. We purposely overestimated the time requirement to secure the interviews from time shortage.
4.5.5.3 Transcription of Interviews
All interviews were transcribed in the language used during the interview and later sent to the TMHE respondents in order for them to have the opportunity to reply the document with their reviewing if they wished to make clarifications or changes or if they did not agree with the transcription and had questions concerning the transcription.

4.5.6 Information Needs Analysis
In order to map the information needed by our target group, we performed an information needs analysis. This information needs analysis was carried out as a gap analysis. Gap analysis is a general method for comparing the current situation with a desired future state, where the gap in between represents the room for improvement. Central for the analysis are the two questions: “Where are we?” and “Where do we want to be?” The method is applicable to a wide range of areas, and in this case, since it is related to information needs, the questions would rather be: “What information does the TMHE top management have? and What information do they need?” (Hedin, 2008)

4.5.6.1 Modifications and Practical Use of the World Mapping Method
The World Mapping Method (WMM), as described by Frankelius (2001), is primarily intended for organizations in need for strategic change of direction or for those that are in the process of making major changes in their organization strategies. To be successful in this work, they need to look outside the organization to identify factors in the business environment that are of strategic importance. The purpose of this Thesis is not to develop the strategies of TMHE, but to assist in defining and enhancing their ability to support functional strategic work through Business Intelligence, where one part is to conduct an information needs analysis.

4.5.6.1.1 Used Stages in World Mapping Method
We will not use the World Mapping Method to its full extent and we also have practical limitations that prevent us from using it the intended way. Performing the information needs analysis in a group, we found impractical. First of all, our background knowledge of each respondent and their work was limited, which is why we needed to obtain a better picture in order to know what to focus on for the actual needs analysis. Our respondents all have busy schedules and it would be impossible for us to gather them all for a group exercise. Instead, as is described in 4.5.4.2 (p.72), we performed two interviews with each respondent in order to capture their information needs.

These two interviews can be seen as a substitute for the first two steps of the WMM, Reassessment of the Perspectives and Creative Discharge (see 3.2.2.2.4), to the extent that when having analyzed the interviews, we had a comprehensive list of factors, or information needs. However even if the outcome can be considered as the same as from the first steps of the WMM; the focus of the actual interviews was different. We had e.g. no possibility to go through classic economic models. Even if we agree with the idea of “reassessing the perspectives” we are dubious if it would be possible to change structures created during years of operations in just a couple of days.

4.5.6.2 Organizing of Information Needs in Mind Maps
From the two rounds of interviews we identified information needs which were then assembled into a dirty list of the total gathered information needs. Thereafter we
constructed mind maps with the software Mind Manager\textsuperscript{25}, containing all identified information needs of the respondents in order to fulfil their roles within TMHE. Separate mind maps were created for each respondent. The maps also contained graphical descriptions over from where the respondents were supplied and who they supplied with information. Yet another mind map was drawn with explicit needs to be met by BP. Our ambition was to assemble the individual maps into one comprehensive mind map with arrows connecting each need with a respondent in order to identify overlapping needs. However the first set of maps turned out to be too complex and therefore impossible to aggregate in a sufficient and purposeful way. They are also not practically presented in the format of a report and were therefore foremost used as a tool for us to be able to structure identified information needs.

4.5.6.3 Prioritizations of Information Needs
In order to perform step number three, four, and five in the World Mapping Method (\textit{Analysis of Significance}, \textit{Analysis of Current Knowledge}, and the Meltdown of these), which aim at pointing out information gaps (our definition) of major importance for the respondents and to be able to highlight room for improvements regarding coordination of information supply, it was necessary to find out our respondents’ prioritizations regarding importance and satisfaction of each information need. Some of these prioritizations were possible to get out from the interviews performed, but in order to get all prioritizations in a structured manner; we decided to construct a questionnaire from the extracted list of information needs, to be send out to the respondents.

4.5.6.4 Construction of the Questionnaire
The questionnaire (see Appendix 3) is to be seen as a structured interview and thus a part of our qualitative approach. The risk raised by Befring (1994) of having a poorer response rate when using a questionnaire had a less effect since we had already interviewed all respondents twice. In addition we phoned all respondents and explained the background of the questionnaire before sending out the document.

In order to make the questionnaire tangible we decided to structure the needs under six different groups: 1. \textit{TMHE} (containing needs for internal information), 2. \textit{Sales} (internal sales-specific information), 3. \textit{Customers}, 4. \textit{Market}, 5. \textit{Competitors}, and 6. \textit{Technology, Industry, and Economy} (a broad group containing scanning of activities in the business environment, industry development etc.). These groups were then subdivided into categories with more explicit needs. The categories were to be rated as the respondents need for information on that specific category. The next level of detail was outspoken needs from the respondents.

4.5.6.5 Rating of Needs
In step three, four, and five of the World Mapping Method, each found factor is to be rated with respect to significance\textsuperscript{26} and knowledge\textsuperscript{27}. In our questionnaire, we have exchanged the category “knowledge” (see chapter 3.2.2.2 for details on WMM) for

\textsuperscript{25} For more information on Mindjet MindManager, see: http://www.mindjet.com
\textsuperscript{26} Translation of the Swedish word “betydelse”; meaning the significance of the specific need.
\textsuperscript{27} Translation of the Swedish word “kunskap”; meaning the current level of knowledge in the organization about the specific need.
“satisfaction”, meaning to what extent the information supply of a specific need is satisfied instead of what level of knowledge is existing about the particular need.

### 4.5.6.5.1 Rating Scales

In *A Disciplined Approach to CI Analysis*, described in chapter 3.2.2.1, Gilad et al. (1993) are using a five-point scale for rating importance and availability with the purpose of being able to calculate an AI Matrix (see Figure 14) from which it is possible to see if a certain need is adequately available or not (if the calculated AI equals or exceeds the importance of that specific need). Seen from a theoretical point of view this gives more options for analysis and would be favorable, but being more pragmatic, Per Frankelius (2008) argues that it is not possible to rate importance in more than a three-point scale. This is because respondents in general lack the necessary knowledge about each factor in order to do this judgment. It is also possible to use only a two-point scale, because if having the intention to identify information gaps, the needs of interest are only those, which have been rated “of major importance”. A two-point scale would only give the options to rate if a need is of minor or of major importance (Frankelius, 2008). In the WMM, a three-point scale is used (Frankelius, 2001).

### 4.5.6.5.2 The Rating Scales Used in the Questionnaire

Considering the arguments of Frankelius (2008), we concluded that a three-point scale was sufficient to meet the purpose of the questionnaire, where information gaps was defined as an information need rated as of major importance with an unsatisfied information supply by at least one respondent. We also emphasized that the respondent was to rate the needs for information from the perspective of his role/roles within TMHE.

### Figure 26: The two scales used for rating the information needs

From the extensive list of needs extracted, we are primarily interested in the needs that are considered of major importance to our respondents in order to find the gaps. A higher detail of scales increases the uncertainties affected by subjectivity, and considering the diverse background of our respondents, we wanted to limit the options as much as possible. If using a more detailed scale, the issue of defining what is to be seen as of “major” or “critical” importance would also front us. Since we will only look at needs with the rating of major importance, it would also be possible to use a two-point scale with the categories “of minor importance” and “of major importance”. There is however a risk that the needs in-between these categories (those of medium importance) would rather be classified as of major importance than of minor importance, meaning we would have needs classified incorrectly as of major importance. One risk of using a three-point scale, according to Frankelius (2008), is that respondents tend to choose the one in the middle as a compromise, but since we rather find the needs that the respondents think clearly makes the difference, this risk may actually be to our advantage. This tendency among the respondent limit the risk of the result being a wish list.

### 4.5.6.6 Importance of Specific Information Needs

Needs with the same rating of importance are not to be contrasted to each other. This would require additional measurements such as e.g. a cost/benefit analysis. This implies...
that we treat a need that is rated “of major importance” by only one respondent in the same way as a need that is rated “of major importance” by three respondents. We argue that due to the diverse background of our respondents, we simply have no possibility to judge whether a critical need for one respondent in e.g. the Product Planning function is to be rated higher or lower than a critical need for three respondents in the Sales function. This analysis is not within the scope of this Thesis.

4.5.6.7 Satisfactory Information Supply

The same is partly to be said about the rating of satisfaction. If a need is fully satisfied according to one respondent and rated as unsatisfied by another respondent it is not given that the first respondent is supplied with the exact need of the second respondent. Our initial intention was to break down the needs between and under the two interviews in order to be able to pinpoint as explicit needs as possible. This would reduce the risk of having diversified interpretations of needs. It should be observed that in spite of this intention it was not easy to achieve due to the breadth of the needs, but also since we had limited opportunities to perform follow-ups.

Another aspect of the category satisfaction is that it can have been interpreted differently by the respondents. If somebody has a satisfied information supply, it has an inherent question of how the respondent would like to be supplied, which is not telling us whether the information is available or not, or if the respondent know that the information can be gathered if needed. However with the purpose of investigating the company’s information handling we still think this is an interesting measurement even though one has to be aware of this aspect.

4.5.6.8 The Importance of Setting High Requirements for Top Ratings

Frankelius (2008) points at the importance of setting high requirements for what is considered “of major importance” as well as if a need is “fully satisfied” and that this should be connected to from what viewpoint the respondent answer the questions, e.g. from the viewpoint of what is strategically important for the entire organization, or in our case from what is important in the viewpoint of the role/roles of the respondent.

When it comes to importance, we cannot make a general definition for what is to be considered “of major importance”. This is due to that our respondents were asked to answer our questions from the viewpoint of their role/roles within TMHE. Since our respondents represent different functions and positions, the need for information will differ and so will the opinions of what is important. If we would define “of major importance” to what is considered of critical importance for the specific role (meaning that it is only information that is needed in order to be able to perform the work at all), there is a risk that different environmental factors affecting the organization as a whole (and not just their role) will be neglected.

A need ought to be marked as fully satisfied only if the supply of information is secured. It is important to note that a need for information could be met for the moment (the necessary information is available at the moment) without being classified as fully satisfied. This is because a fully satisfied information need, requires continuous supply of information to be secured, meaning that there are sources of information that can always be accessed.
However it is difficult to guarantee that our high requirements for top ratings are conformed to. We have highlighted these aspects when presenting the questionnaire and we have endorsed our respondent to contact us if having any questions regarding the questionnaire.

4.5.6.9 Reverse Matching for Finding Room for Improvement

We argue that it is of interest to further investigate what happens to the list of information gaps when it is compared with a list of the same needs rated as of major importance but with a fully satisfied information supply, in order to be able to discuss areas of improvements for information handling within TMHE. This new list we refer to as a filtered list of information gaps (our definition) and it is represented as [3-1] – [3-3] (see ratings in Figure 26); meaning the list of information needs that is the result of subtracting the list of information needs rated as of major importance (3) with fully satisfied information supply (3) by at least one respondent, from the list of information needs rated as of major importance (3) with unsatisfied information supply (1) by at least one respondent, i.e. the information gaps.

As seen above we have put a restriction on the needs that have been rated as having a fully satisfied information supply of. The restriction is that they also have to be rated as needs of major importance for the reverse matching to be legitimate. One can argue for and against this restriction but we mean to say that an active interest of information, i.e. if a respondent rates a need as of major importance for his role/roles within TMHE, sharpens his requirements on the information supply. Another aspect is that this approach limits the risk of respondents being fully satisfied with the information supply of needs that are of minor or medium importance for them.

One can picture a situation where somebody is fully satisfied with the supply due to his particular position or personal network within the company, but that the need is not of importance for his role/roles, but we argue on that it is only valid for exceptional cases and that it is be better to have a restrictive approach due to the layers of interpretation.

With support from the mind maps and foremost the interviews it has been possible for us through this activity to comment on areas where coordination of important information to the management within TMHE seems to be needed.

4.5.6.10 Compilation of the Questionnaire

The responses from the questionnaire were compiled and sorted after our queries: need of major importance with an unsatisfied information supply and need of major importance with a fully satisfied information supply.

<table>
<thead>
<tr>
<th>Need</th>
<th>Importance</th>
<th>Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology shifts</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 27: Example of Table for Compilation of Questionnaire (adopted from Frankelius, 2001)

4.5.6.10.1 Declines
Information needs in the questionnaire left unrated have not brought about any action from our side; these have just been noted as not treated. No follow ups have been made, except for assurance of cases where we suspected that the respondents had mixed up the scales. The not treated information needs have not been a major problem for the outcome of the questionnaire since it is not objecting with the aim of the questionnaire. Categories left out are likely not to be of major importance for the respondents.

4.6 Critique of Chosen Method

When writing a Thesis, one should always bear in mind that research results are always a consequence of the methodology used (Stein, 1996). There are of course pros and cons with all research methods. However, the choice ought to be made according to the subject matter and the pros should always outweigh the cons (Merriam, 1994).

4.6.1 Case Studies

Case Studies call for a nuanced and detailed set of data on the subject matter. This often opens on to access problems, and the investigator may have difficulties finding out what is relevant and what is irrelevant. Other restraints derived from the investigator’s lack of experience are questions like: “How should the data be collected? Who hold key information? How should the data be interpreted?” (Eriksson & Wiedersheim-Paul, 2001) We have been aware of these risks and we have tried to minimize them by performing the Literary Pre-Study in order to gain knowledge about the topic and the line of business in general and TMHE in particular. In addition we tried to form an opinion on the state of the art by searching recent and current research performed within in this field of study. Early on we also contacted researchers and faculties working with Business Intelligence and because of its position in the boundary country between Information Technology and Business Studies we sought corresponding academic contacts. Since BI is close connected to providers of IS/IT solutions we also meet with two consultancy firm and attended two seminars on the areas of BI and Enterprise Search. The risk of having the wrong set of respondents with lack of- or no knowledge of the subject and unable to answer; is immediate since we had little knowledge of the company before the start of the project. Therefore, in order to find the appropriate respondents, we were guided by our Steering Group which consists of the Director of Business Planning (Sponsor of the project), the Manager of TMHE Market Planning Department, the Manager of Process and Application Coordination (IS Promotion), and finally our TMHE Coach (Manager Business Planning and Owner of the project).

Another disadvantage linked to Case Studies is the fact that the investigator sometimes devotes too much effort to description. While doing so it is easy to loose track of what is actually important for the analysis. There is always a risk of either simplifying or exaggerating certain factors. In comparison to quantitative research, the guidelines for gathering and analysis are not as strict. As a result, the influence of the researcher is immense (Merriam, 1994). We have tried to avoid this pitfall by having a close connection to TMHE, which by default is not interested in a report heavily devoted to description. This contact has been through three meetings with our Steering Group (Early Steering Meeting, Mid Steering Meeting, and Before End Steering Meeting), and Check-point meetings every- or every second week with our TMHE Coach.
4.6.2 Qualitative Research – The Interview Situation

The use of qualitative interviews is associated with special challenges and as an interviewer one always run the risk of affecting the respondents. It is also important to be aware of that the respondents’ self-consciousness though they might be interesting in formulating their own image or the organization’s image of the truth. Furthermore, the respondents can be held back by the organization’s policies. Therefore, according to Repstad (2007), it is important to be related to the subject matters, especially when the respondents consist of managers and decision-makers at the top of an organization. Once again we rely on our Literary Pre-Study together with our Literature Study, but we have also been helped by the fact that this still is an immature field of study. The risk of affecting the respondents is impossible to insure against, but since we have had the advantage of being two present during the interviews, we hope we have been able to discover and correct such behavior. Another active choice from our side was to perform the round of phone interviews with all our respondents in order to have a better understanding of the role and the functional background they were coming from, as well as the potential heritage of earlier work experiences from other positions within Toyota or BT.

We have had the ambition to meet our respondents before the actual interview as way to introduce the project and our self. When it comes to facilitating the process of scheduling the interviews with the proposed group of top and middle management within TMHE, we were helped by an introductory letter co-written together with the Sponsor of the project.

4.6.3 Reliability and Validity

Generally reliability and validity are concepts foremost connected to positivism and quantitative research methods. Nevertheless these are important terms for the qualitative research (Merriam, 1994). Reliability measures the concordance, consistency or repeatability of outcomes e.g. it refers to the accurateness of the data collected (Haas, 1991; Halvorsen, 1992). In a study with good reliability the outcome is affected neither by who is conducting nor the circumstances under which they are conducted (Lundahl & Skärvad, 1999). The use of a question master, the recording of the interviews, and the transcription procedure were all carried out in order for us to have high reliability and to avoid misinterpretations from our side and to clear uncertainties. However, even if a measurement is consistent and reliable, it is not necessarily valid.

Validity is the accuracy of a measurement of the true state of a phenomenon. A problem with validity arises when researchers work on both a theoretical and an empirical level. On the empirical level data is gathered and processed, and on a theoretical level the problem is formulated. However, when the data is interpreted and conclusions are drawn the question remains: “Will the collection of data give answers to the research questions?” (Halvorsen, 1992) In our case: Did the interviews provide us with the right information and knowledge to fulfill the purpose? The mapping of suitable respondents for the purpose of this Thesis was under the guidance of our Steering Group and by involving our academic contacts in the process of preparing for the interviews we hope to have gathered valid material. The use of the Case Study methodology also involves the use of multiple sources of data to gain the fullest understanding and to improve validity through triangulation i.e. data analysis on synthesized data from multiple
sources (Homepage of University of California). As stated we have used of multiple respondents within the organisation and multiple data collection methods (interviews, questionnaires, documents etc.).

4.6.4 The Presented Methods for the Needs Analysis

Both the World Mapping Method and A disciplined approach to CI analysis have different aims, not within the scope for this Thesis, than what we have used them for. Since we only have taken the best plums out of the two methods and made modifications, it is not for us to criticize these methods in general, but also that was never our intention with this activity.
5 Case Study

In this chapter we present the empirical findings from our Case Study. It begins with a section describing the current challenges within TMHE, much referring to the ongoing integration project. This is followed by a section where the assigned BI actors within the company are portrayed. Thereafter the respondents’ views on BI are presented; building up for a section with a historical run through of BI within TMHE. Then the result from the Questionnaire is presented and the chapter ends with a section examining information handling within TMHE.

5.1 Current Situation within TMHE

This opening section of the Case Study contains views and opinions from the respondents on the current situation within TMHE. It aims to give an updated and nuanced picture to the one described in the Company Presentation (see chp. 0), but also to serve as an introduction to some of the issues related to this Thesis that TMHE is facing today which will be elaborated further in the up-coming sections. The section ends with part describing the increased focus on strategic work and a presentation of TMHE’s newly established Mid Term Business Planning process.

5.1.1 Issues of Merging Two Companies

Many of the respondents have explicitly expressed the different backgrounds of Toyota Industrial Equipment Europe (referred to as TIEE or Toyota) and BT (BT Europe and parts of BT Industries) and the effects of their heritages on the new organization. Notable is the usage of “we” or “the company” as a reference to either the former BT or Toyota organization.

5.1.1.1 Differences between Toyota and BT

A difference brought forward is that Toyota was more sales related in contrast to BT. In order to match the different figures still they have to puzzle together information manually in excel files. The disadvantage, one respondent points out, is that information is presented in different formats, creating different data, and with different structures follows the danger of not observing the same issues and risks with respect to sales and planning procedures.

Similar thoughts are expressed by another respondent who draws attention to information challenges TMHE is facing. He stresses that data is available at an aggregated level on volumes on markets etc., but one challenge is to understand all the collected market data and to understand the data in the same way. An example is that Toyota wishes to measure the business in a different way to the historic way that BT has been measuring; another originates from the change from a calendar year to different fiscal year country wide, which is also not consistent on a global level.

The TIEE organization has had a different European structure in comparison to BT. The situation has therefore been different with regards to openness and information handling and sources of information. BT has also had the advantage of having companies using the same business system, whereas TIEE has had different systems in different countries. Before 1998 BT had a different structure, but since then the company has been acting as a European organization and learning how to handle wholly owned subsidiaries.
5.1.1.2 Increased Workload due to the Integration Project

The Integration project begun in 2005 and has been an upheaval journey for both companies. It has also led to an increased workload for everybody involved. One respondent expressed his fear for employees leaving the company due to this. Another respondent verifies that the current situation is still strained and that everybody is putting in more effort. He means they have not reached a normal workload yet and that they are still struggling with routines and organizational changes.

Lack of communication is highlighted as an issue today within the company by our respondents. One expressed explanation for this situation is the integration process and the work that the establishment of the new organization has resulted in. Another is the process aspect; the lack of platforms where they can structure and exchange information about the business. One respondent feels that there is no time for bridging between departments about sources of information. They never brainstorm about how to connect what is performed by the different departments, not even within each function.

It has been noticed how people do not take time to shift focus from their own work. An example is that a pushed newsletter with information only has been opened by 16 percent of the receivers. One respondent relates this to people being overloaded by work at the moment. The same discussion can be applied on the sales companies and the ambition from the central organization to gather more information. One respondent explains: the sales companies are busy with their own operations and he notices when they complain; there is a pain threshold for how much information they can ask for centrally without them needing to add resources locally.

5.1.1.2.1 Reaching New Targets

All respondents are aware of how far they are from reaching the business targets of TMHE. One respondent asserts that the integration of the two companies is the biggest change that the material handling industry has witnessed, and that everybody did not realize the effects of merging two distribution networks. At the end of the day the change is to be done by people working in the company and that change is never trouble-free or uncomplicated. Today TMHE is a stronger unit and together with the growth of the market they have increased their sales, but so far the integration has not led to the increase of market shares that they had wished for. They have actually lost market shares and first of all regaining these shares and then increase further in order to meet their targets will be tough, one respondent summarizes.

5.1.2 TMHE – A Company with a Functional Structure

When investigating information handling and information transfer as a part of improving the BI work within TMHE, it is of interest to study the structure of the company. One respondent is very clear on describing TMHE as a company with a functional structure; functional supply of products, functional product planning, functional R&D, functional marketing, logistics, after sales, and sales department. He misses coordination and feeding of information between functions; that they lack someone in the orchestrator role.

Another respondent expresses the same problem and argues that they know a lot of things within the organization, but have poor knowledge about what other departments are doing, sometimes they stumble across things that they did not have a clue they knew. One respondent metaphorically describes the situation as when all islands are big enough the
perceived need for communication with others decreases, whereas if the islands are small you automatically feel the need for interaction with others.

The TMHE governance is built upon a high level of autonomy, the same is to be said about TMHE relative to TMHG. One respondent brings forward that they are aware of the problem with wanting employees to take initiatives and be autonomous and therefore building little kingdoms of their own and then being upset when they feel somebody else is touching upon what they regard as their own property. This has of course a major impact on information handling and the view of a BI-function.

5.1.3 Different Cultures Working Together

Much could be said about the cultural differences between East and West in general and between Japan and Sweden in particular and the effects this might have on the integration between TIEE and BT, but there are also interesting similarities. According to Solberg Søilen (2005), Swedes are sometimes referred to as the European Japanese, referring to the countries’ homogenous, conflict-shy, and authoritative culture.

However, according to the view of one respondent the authoritative culture is far from similar between BT and Toyota. The Toyota culture is more top-down orientated and no challenging of the management view occurs. This has resulted in a situation where the European part of the company also has been more controlled from the top. Notable is that the majority of the members of the TMHE management team originate from the former BT organization, which always has been characterized by an opened climate, the respondent continues.

The Japanese way of handling information differs from the Swedish ditto, according to one respondent. He means the Japanese part of the company is great at gathering information, but not as good at actually using the information as they gather more then they are able to process. There are no systems for handling this information; instead the locating of information is tied to people. This is also why they prefer to receive information as raw data and not as analysis, in order to have all access, the respondent summanize.

5.1.3.1 Cooperation Outside of Europe

One respondent explains that within his area there are no formal or annual meetings with the other TMHG entities and that he sometimes misses the synergy between all entities of the world. He is aware of the existing differences, but he still feels it is strange that they do not work together more.

The cooperation with Toyota Motors Company (TMC) regarding Product Planning is not highly developed. One respondent believes it will improve in the future, but that they are living in two different worlds in comparison to TMC’s R&D organization. He resembles the situation with a race: If one is approaching the finishing line, another is at the starting line, and a third has come halfway; then it is hard to say “let us run together”. They try to pick up ideas, but the size of TMC makes it almost impossible to find the right channel or person. If they do, his view is that they are very open with sharing of information, but that the language barrier is a huge problem:

There you can find the best R&D personnel in the world, but they do not speak English. It is also time-consuming and their focus is foremost on the Japanese market.

TMHE Respondent
5.1.4 Increased Focus on Strategic Work

Historically the decentralized BT organization has not had a formal or developed strategy process. Since the majority of the members of the current TMHE management team originate from the former BT organization, it both has had an influence on the current situation and on the development of the new organization as well as what experiences they refer to. One respondent acknowledge that the business planning process used to be managed by a small group of people. Another respondent expresses that they historically did not put much effort into the work with strategy. Today, after the merge and the duplication of size, they intend to broaden the process in order to formalize and structure it in a better way.

When it comes to information as support for planning activities and strategic work the cultural differences between TIEE and BT is also highlighted. One respondent describes TMHE as coming from two different planning heritages and exemplifies with foreseeing sales numbers. He thinks this is the interesting thing about bringing the Toyota culture and the BT culture together; one being bottom-up starting to build with the small blocks and the other top-down breaking the aggregated picture down. By being aware of differences of the companies he thinks co-existence of both approaches is possible and useful depending on the situation; sometimes you want a quick answer and sometimes you want the complete picture built up by all small parts.

Another respondent is convinced from personal experience of how they work and what type of questions they ask, that they need to devote even more time to strategic thinking. Today, nine out of ten questions are operational. This situation is probably not unique for TMHE, but he is afraid that their CEO is in the same position since he has noticed that some of the Vice Presidents are much to operative. It is easier to take on operational issues than to actually sit down and discuss: "What should we be doing? What do we wish to accomplish? How do we want to work?" This is the type of strategic questions he inquiries.

5.1.4.1 Strategic Decision-Making

The same discussion could be applied on the work with Business Intelligence. Some respondents claim that the company has had, and to some extent still have, an old-fashioned way of thinking. The focus has been on monitoring the operative aspects of the business, i.e. facts and repetitive information on operative and tactical level with most users among controllers and middle management. Therefore they feel the company needs to improve Business Intelligence in order to use for strategic decision-making instead of relying on gut feeling. The analysis ought to be based on gathered information of competitors, the market, and the internal operations and to be connected to TMHE’s business goals.

One reason for the operative focus, according to one respondent, is that they have not been able to solve the issues of secrecy and confidentiality; how to handle this information, but also due to a reluctance, which he thinks is about to change with the new management and the Mid Term Business Planning process.

5.1.4.2 The Mid Term Business Planning Process

One important strategic process within TMHE is the new Mid Term Business Planning process (MTBP), which is to concretize the path forward for TMHE on a five-year term. This year is the first time that the company realizes the MTBP to its full extent. Today it consists
out of four modules that stretch from June to October with different focus. The four modules equal four different meetings.

![Module Flowchart]

**Figure 28: The Mid Term Business Plan (TMHE Presentation Material C)**

The purpose for the annual MTBP is to have a Business Plan by the end of November every year. In between the modules the idea is that the VPs respectively are responsible for anchoring the process and today there are no guidelines for how this ought to be done (TMHE Presentation Material C; Johannesson, 2008).

The first and the second Module serve to create a TMHE SWOT (Strength, Weaknesses, Opportunities, Threats) based on inputs in the form of various internal and external factors affecting the organization. These inputs can be categorized as intelligence, which is provided by the different corporate functions. Notable is that this work is done ad hoc today and that there are no processes or structures for providing this input. At the present moment the responsibility sits with each functional owner to decide what material to bring to the meetings. The outcome of the first and the second Modules lays ground for the upcoming strategic discussions in the third and fourth module (Johannesson, 2008).

### 5.1.4.2.1 Content of Modules

The first module (see Figure 29) has an overall objective as giving a background view of the market development. The macro economic outlook aims at describing a forecast of the development of the macro economy in the terms of five to ten years. Technology shifts aims at giving a briefing of how technology shifts affect the general material handling market. Influencing market development shows what other factors than the economy and technology affects the market. Lastly, market volume scenarios are presented (Johannesson, 2008).

![Module Details]

**Figure 29: Modules and input (adopted from TMHE Presentation Material C)**
The second module (see Figure 29 above) aims at describing the competitiveness of TMHE through external and internal analysis. The external analysis starts with a market forecast which delivers an official picture for how TMHE believes the market will develop; this is followed by an analysis of the development of the customer base, e.g. trends, segments, importance etc. After the customer analysis follows analysis of competitors, truck position, and suppliers. An internal analysis comes after the external, where the internal processes are mapped. The module is finished with a concluding SWOT-analysis where all identified factors are prioritized (Johannesson, 2008).

Threats or opportunities that are identified in the second module may need to be further investigated. These inputs are presented in module three (Johannesson, 2008).
5.2 The Assigned BI Actors within TMHE

Today Business Intelligence within TMHE is divided into Strategic and Operative BI. With the Assigned BI actors within TMHE we refer to Business Planning and IS Promotion, who are the responsible organizations for each category. This section begins with a part covering the respondents' views of Business Planning, which is followed by a corresponding part about IS Promotion.

5.2.1 The Role of Business Planning

Business Planning’s role is to understand the effects on the entirety; a picture they are lacking today according to one respondent. BP is assigned to guide the management team through the processes leading up to a mid term business plan, but also to try to make the sacred time of the top management as valuable as possible. One example is to try to make the right analyses at the right time, and if the result is controversial, to have traceability and a clear logic, otherwise time is wasted on discussions on the degree of truthfulness.

According to one respondent there are primarily three different categories of information for BP to gather. Firstly, they should gather information from the functional databases. Secondly, they have directions from top management to gather more information by projects. Lastly, more general information ought to be gathered, e.g. from the Internet etc. The first step would be for BP to make an overall map and grasp the availability of information and the information quality level of the individual information warehouses developed by each function. As a complement to the internal information he would like to see an information source for external information registered and that automatic news release could be set up to access and get the latest information or data from a reliable source. In order to make it reliable he emphasizes the importance of getting the total information quality level. One way to verify information is to find “double-information”, if it can be done in a timely manner and if finding gaps or missing information areas, BP should think of how to cover these, he finishes.

5.2.1.1 Business Planning as Supporting the Functions – Not with a Life of its Own

One respondent views BP as a project based organization and he points out the need to distinguish between the role of the functions, and the role of supporting the functions. For him BP is not a function, it is there to support the functions in running the business. He likes the role that they can play when they ask good questions, but he also feels that they need to be careful not to create a function within a function. That is not what BP is about at all. He is of the opinion that TMHE needs a Business Planning Department at the moment, to support them on the many projects they have running, there it is extremely useful, but it is very dangerous to create a Business Planning organization with a life of its own, he concludes.

Another respondent points out that it is impossible for BP to be the provider of certain information, not only due to insufficient knowledge, but also because of the lack of nearness to e.g. the production sites. This intelligence has to be created locally and be more selective in order to dig deep into certain specialized questions.
5.2.1.2 Mandate to Act Cross-Functionally and the “Not Invented Here” Syndrome

In order to be able to perform their tasks it is necessary for Business Planning to have the mandate to act as cross-functionally as they are meant to do; both for the members of the group and for the functions they are set to support. A company with a functional and highly autonomous structure also risks having functions that are reluctant to involvement from other parts of the company, an aspect which makes the question of mandate even more important. Another phenomenon that might come into play with the cross-functionality of BP is the “Not Invented Here” syndrome, manifested as an unwillingness by a group to adopt an idea or product because it has its origin somewhere else since they believe they possess a monopoly of knowledge of their field.

5.2.1.2.1 Recognized Through the Integration Project

Two of the respondents refer to Business Planning’s role in the integration project and mean that not only has this work given the group a platform to rely on and methods of working, but also they have been recognized as a fleet-footed and overachieving group. For the work with the Strategic Business Intelligence, one respondent explains that BP is facilitated by their close connection to the head of each function. This daily contact gives an authority to ask for information from different parts of the organization. The fact that the group receives new project requests also indicates a trust for the work performed, he argues.

However there is also an ambiguity of the responsibilities of BP. One respondent explains that they do not have any contact with BP and that people within his department do not understand what they are doing and what is next for them now when the integration project is in its final step.

5.2.1.3 As Owner of the Concept Coordination of Business Intelligence

There are two different viewpoints of BP owning the concept coordination of BI within TMHE, according to one respondent. Functionally he thinks it is a good decision due to the history of the president of TMHE as the former Director of Business Planning. This is an assurance, he believes, of a long-term investment in this group, a group that will stay put in the future and given the necessary resources. The other point of view, the respondent continues, is that BP so far has been more of a trouble shooter and has not yet had a strategic function. If it would have been another company where this function was put in place and given these responsibilities he would have been very hesitant, but the specific conditions under which BP exists makes it different, he concludes.

5.2.2 IS Promotion – A Gatherer of Needs

The connection to IS Promotion among the respondents are foremost through the appointed IS Coordinators or the IS Board. In order to meet the needs for collaboration from a process perspective, the position IS Coordinator was established in 1999. This is a way to give important areas and processes a structure for meeting cross-functionally. As the company grows it is even more important to have an ownership over the applications within the functions and somebody who is responsible for the process and a forum for exchanging ideas between the processes in order to avoid silos. The IS Coordinator-structure is a virtual

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28 IS Board is a forum consisting mainly of the vice Presidents. On a yearly basis IS Board decides upon budget and the TMHE IT plan and thereby makes priorities in the IS/IT area.
organization for defining the roles and responsibilities between the business and IS/IT and between different management levels and the supply. THME does not have many cross-functional structures and therefore this structure is important. Most functions has a locally based IS Coordinator who is helping the process owner with the gathering of business needs and who is working together with the Application Specialist in order to meet the need as fast as possible. The Applications Specialists are experts on the existing applications. The IS-Coordinators report to Vice Presidents or Directors within respective area.

The usage of the IS Coordinators varies, but one respondent describes it as an excellent interface between the business and the business support, with demands coming from two sides. However one respondent inquires a structure within TMHE with appointed analysts as a complement to the IS Coordinators and the Applications Specialist, as he thinks analysts are the best gatherer of needs. Business Analyst would then be a core competence which he thinks is necessary for the future in order to have a tight integration and to hold together project from beginning to end. He also mentions that it would ease the process of coordinating and delivering of functional- and business needs and in order to be more agile towards the end user. Today he would describe the process as more ad hoc.

5.2.2.1 Separated from the Business

IS Promotion is only a tool for how to gain information – not what kind of information.

TMHE Respondent

IS Promotion has a close connection to IT Supply and the two organizations are still by some perceived as one. The effect is that the IS Promotion sometimes is downgraded as a tool provider. Another discussion is the relation between IS Promotion and IT Supply and the business. One example is the Application Specialists who support the process of finding the proper application. One respondent sometimes lacks their understanding of the different business areas. He means that it is easy for IS/IT to say: “okay, make your demands and we will take care of them.” However if this ought to be possible it is provided that they have a good knowledge about the business to make the right judgments and choices. He sees a risk of having to much distance between promotion and supply and e.g. the service market and rental. With the growth of the company different departments will be separated from each other. The entire IS/IT department has the size of a company of its own and sometimes he wished they had better understanding and knowledge. Another respondent sees a danger in IS/IT being self-generating, although he is aware of that they probably could say the same thing about other parts of the business.

5.2.2.2 IS Promotion and Business Intelligence

One respondent exemplifies from a good relationship and reliance to IS Promotion, but as for Business Intelligence he dislikes that the division equalizes Operative BI with IS/IT-systems. For him neither Movex nor Excel is an intelligent system. It is not intelligence until the Excel file is combined with an exploratory report and given a value. He does not have a better location for BI, but he is frightened by the will to regard infrastructure and systems as the solution.

One respondent is questioning whether the Operative Business Intelligence actually is within IS Promotion, he means that it is a question of definition. IS Promotion know how many salesmen TMHE has and they know the number of trucks sold, but the question: “How many
trucks are sold by each salesman?” is asked by the functions and IS Promotion is only there to provide the tool and connect the necessary sources of information. He uses a toolbox as a metaphor for the role of IS Promotion: a hammer can be used to a lot of things and it is the responsibility of IS Promotion to dispose their toolbox in order for the functions to use, and to coordinate and make sure it contains one hammer instead of three.
5.3 Respondents’ Views on Business Intelligence

The expectations on Business Intelligence from the respondents are not only heterogeneous; the question is also complicated by the lack of a clear definition to refer to within this field. This section contains the respondents’ views on the task for BI and how it ought to be structured, but also what they lack today within TMHE. With our broad approach we have not put any constraints on the expectations, nor have we presented how we interpret the term.

5.3.1 What is Business Intelligence?

This question is asked by one respondent who inquires that the ones working with Business Intelligence should maintain a definition. They also need to ensure that there is a structure, and that this structure is available for different profiles, according to the respondent.

Business Intelligence is defined by one respondent as structuring what is already there. He argues that most companies find out that they have a lot of unstructured knowledge, in a cabinet not being used. He makes a resemblance with an army in wartime, where every soldier is observing the enemy and reporting backwards. This information does not make any sense even to the one guy behind collecting this information. First at the center, where all information is gathered, it is possible to see the pattern. This is the difficult part, he concludes, and compares with smaller companies where this is done much easier with for example an informal meeting at the end of the week. TMHE is operating on a European level where all kinds of trends and changes are happening at the same time, and to actually see the real development that is going on, from a competitor perspective, or a customer behavior; to find the real pattern, that is a challenge. As well as motivating people to give information even though they sometimes do not know the importance of the information.

5.3.1.1 Business Intelligence as Coordination and Handling of Information

The coordination role is prevalent among the respondents and it is often connected to information, analysis, and cross-functionality. The coordination is also connected to resourcefulness and the expected task of avoiding duplication of work within the company. Another frequent theme is as an extra resource, e.g. for finding new potential in already gathered data from the corporate functions.

Information handling is another evident area of concern associated with Business Intelligence, e.g. as the handler of external information or to facilitate strategic use of operative information. The respondents also highlight the responsibility to act as an assurer of having the necessary structures and availability for different profiles at different levels in the company.

5.3.1.2 Looking Outside the Company

The most tangible expressed area is competitor surveillance. Inquired is the responsibility for monitoring movements and performance as well as decision support and alerts for Mergers & Acquisitions. One respondent states that the important thing is that the company has eyes and ears looking outside, studying developments and trends in the market. Particularly at a company level they need to look for opportunities for growth, or threats that might come to
their business. He also would like to see an improved ability to look out quickly at changes or trends of a competitor or supplier.

5.3.2 Keeping the Core Knowledge Local

With the broader use of the term, it can be argued that Business intelligence is performed in many of the functional areas of TMHE (see chp. 5.4.3). Consequently some of the respondents refer to the BI work performed within their line of the business. The corporate function where this is most evident is within Product Planning. The ambition for Business Intelligence within Product Planning is parallel with a number of main categories as a way to structure and catalogue the information, e.g. innovation, technology or market trends. Today Product Planning feels that they have the ability to answer these questions when they need, but that the information is tied to a certain number of people and there is a fear of losing these insights if they loose these employees. One respondent means that it is about owning the competence in some sense; to make the knowledge the property of the company and not just an asset for the individual or the function. Further on he is very clear on that they should not create new structures for capturing knowledge and information, this ability ought to be within the function where the core knowledge has to be. If that ability does not exist it needs to be built, he clarifies.

5.3.3 A Business Intelligence Function

Today there is no appointed Business Intelligence function or department within TMHE, instead the responsibility is divided and imposed on different departments. Some respondents therefore refer to the establishing of a function and a potential agenda and expected outcome, while others refer to the structures within the company today. Depending on how the respondents define Business Intelligence, different expectations of how and what it ought to contribute to the company were raised.

5.3.3.1 Implementing a Function

One respondent would like to see a BI-function, but due to the limited resources he is not sure it is possible today. His idea on how BI should be established within TMHE is that each operative function should be the core, and the local hub of information. Then it is important to find out about the availability and quality level of information in order to find lacking or weak areas and discuss how to cover them. This would be the task for those assigned to work with BI; to cover the weak areas or general areas and be the center of the total system. He thinks there ought to be defined periodical reporting from each function to top management. Another task is to store and maintain the summary information, periodical reporting, and self-gathered information.

5.3.4 Lacking Areas within Business Intelligence

If you are a Sales Director you want to know what the competitors are doing; to be able to act quickly; to win the war.

TMHE Respondent

One respondent connects BI with information transfer and according to him this information tends to get caught in Brussels or with service technicians and does not reach the local Sales Director. He feels they are lacking this ability in their Business Intelligence today. This
Information is sensitive, but in order to serve as decision support locally, this information has to be delivered to the right persons via the right channels at the right time.

The company would be very helped by input of strategic information in the Operational BI, one respondent argues. What tools, with what functionality are on the market? Would it be possible to have automatic reports for rumors about competitors’ sales directives? How to capitalize and take action on this information and how can it be delivered through the proper channels in order to hit the right people within the company? How should the sales fleet act when competitors are observed at the company’s customers? How is it possible to be timely with this sensitive information? These types of questions needs to be addressed in order to improve the situation, he summarizes.

5.3.4.1 Handling of Rumors

Today the gathering of unstructured information like rumors is not done in a structured way according to one respondent. Locally some countries are doing some work, but mostly it is gathered by sales managers. They have thousands of sales people out on the market everyday, which is an invaluable source of information. The question is how to best capture this information. Today it cannot be reusable because it is not stored in a system, which is why it also is very person-dependent and maybe does not reach whom it should.

Another respondent describes a situation where he receives notifications on rumors etc., almost every day. He thinks that this needs to be handled in a more structured way in order to be able to judge on the reliability of the information, i.e. if the information is received from different sources the reliability increases. Today the work of creating the whole picture is done manually and ad hoc, but in order to increase the potential of using rumors and unstructured information in a more efficient way, it should be handled differently.
5.4 Business Intelligence within TMHE

In this section Business Intelligence within TMHE is treated. It begins with a historical review of the use of BI leading up to the division and the vision for Operative and Strategic BI, which is examined from the respondents’ viewpoints. Then the result of an inventory of the intelligence work identified in the Case Study is listed in the proposed categories from our new model of how to structure the BI within TMHE. Lastly a new ambition within the frames for Strategic BI is presented.

5.4.1 History of Business Intelligence within TMHE

The ownership of Business Intelligence was historically held by the IS/IT Director under the CFO. The focus was primarily on developing tools and methods for report and analysis of structured data (statistics) combined from different sources. This decision-support was mainly used on operational and tactic levels. This was the only outspoken area of Business Intelligence in the organization, and the views on how Business Intelligence should be defined and performed were differing among and within the different corporate functions.

However, there were a lot of work conducted in the organization that could be categorized as intelligence work (e.g. within the fields of market-, customer-, competitor-, and technology intelligence). It was mostly conducted ad hoc, and sometimes collected on an aggregated level, e.g. before the annual meetings for reviewing the business plan, but not in a systemized and structured way (Hyltberg, 2007).

In 2006/2007 a study was carried out with the purpose of covering Business Intelligence at TMHE. The main conclusions and recommendations from this study were that there was no common view of Business Intelligence and that a clear definition and ownership of BI was needed. The study also suggested an assignment of a team to work with Strategic Business Intelligence, both continuously and with specific tasks as well as the introduction of a Business Intelligence Process which is a modification of the Business Intelligence Cycle (see Figure 5). It was suggested that the ownership of and work with the previous BI (the development of tools and methods for reporting and analysis of structured data) ought to stay where it was sitting, within the IS/IT organization (Hyltberg, 2007).

The current division of Business Intelligence within TMHE into Strategic BI and Operative BI (see Figure 2), was first discussed and presented by IS Promotion and Business Planning at a seminar in January 2008. The seminar was arranged by IS Promotion and it was the first time Business Intelligence were discussed in a cross-functional forum, and it had the positive effect of letting co-workers from different functions take part of other functions’ needs and requirements. The intention after the meeting was for BP and IS Promotion to start working closer together in order to continue the initiated work of defining their roles. However this has not been put into practice yet. Explanations such as heavy workload and that they have not found the proper forms for collaboration have been emphasized, or as one respondent puts it: “It is still the plan, but has not happened yet”.

29 By intelligence work we mean work and activities that are covered by the BI umbrella (see Figure 3).
30 The Study was a Master Thesis written by Peter Hyltberg in 2007 at the Institute of Technology, Linköping University with the title Business Intelligence at TMHE.
5.4.1.1 Vision for Operative Business Intelligence

The vision for the Operative BI was communicated as: “to deliver secure access to qualitative business information which is valuable and easy to understand to all stakeholders within TMHE and our business partners with the aim to improve our own and our customers’ competitiveness” (TMHE Presentation Material D).

5.4.1.2 Vision for Strategic Business Intelligence

The overall scope for Strategic BI presented at the seminar was to: “deliver decision support to TMHE management team, [to] provide input to the business planning process, challenge strategies, [and] increase organisational learning and knowledge sharing” (TMHE Presentation Material E). One communicated object was also to visualize information and data in new ways in order to facilitate discussions that will generate intelligence. Another focus area was to maintain the experience, knowledge, and skills from the integration project. Other highlighted tasks, connected more to information handling and knowledge management, were the building of knowledge and a shared view of TMHE’s business and market in Europe. Lastly, the formalizing of areas in order to enhance quality, timing, and facilitate learning within the company, were also brought forward. BP distinguished the input to the Strategic BI as coming from different sources in different formats and having different quality and reliability (cp. chp. 5.6.1). They presented the aim for deliverance of the following intelligence products: competitor analysis and profiles, monitoring of early warning and industry drivers, scenario based analysis, and input to the business planning process (TMHE Presentation Material E).

5.4.2 Respondents Views on Strategic and Operative BI

Most respondents acknowledge that there is a difference between Strategic and Operative BI; the problem is to find consistent definitions in order to make the terms into useful explanations. One respondent sees the distinction between Operative and Strategic BI, as the latter being more ad hoc, and more focused on competitor- and market analysis, whereas the first is about operative and tactical decisions. However, he also states that the Strategic BI is dependent of business information from the structured data collection.

One respondent describes the differences between the Operative and Strategic Business Intelligence from the perspective of confidentiality. The Operative BI handles all repetitive reports with analysis made on a weekly- or monthly basis; this information is reasonably well-defined and open. The Strategic BI on the other hand is more ad hoc and one-time on information as decisions support for e.g. new product segments or if TMHE ought to have a new sales channel or not. By default this information cannot be available for everybody, according to the respondent. He gives one reason: there is a tendency to act on this type of communicated information as something made to happen, which is why employees immediately start to work on what they think will be the effects of the change. Another type of sensitive information is the one coming out of the competitor surveillance. It is built on rumors and methods of intelligence work and not suitable for standardized and shared reports. He asserts that this difference calls out for two separated groups, and that the Strategic BI must be surrounded by certain confidentiality.
5.4.2.1 Critique of the Division

For many of the respondents the meaning of Strategic BI is unclear. One respondent even claim he does not know anything about the scope of Strategic Business Intelligence and that he misses a definition of what it means within the TMHE context. He receives little information and speaks seldom to Business Planning. BP collect information from his department, but not very frequently, and as BP’s focus lies on scanning the business environment, he sometimes lacks the focus on products (forklift trucks).

5.4.2.1.1 A Homemade Division?

One respondent criticizes the division as something “homemade within TMHE”. He does not understand it and he thinks that they did not want to merge all perceptions of BI within TMHE into one and instead they divided it into one part for top management and one part for the rest of the company. The respondent holds the opinion that:

If the strategic part on principle implies the TMHE management team, then it is not Business Intelligence. If it does not dissolve down to the next level, then it is no intelligence. If that is the case, there is no need for any advanced support systems, and then it is enough with weekly management meetings at the Headquarter in Brussels. However if the aim is a system, not an IS/IT system, but a general system for uniting and spreading of information with added value, then they need something else.

His line of argument is that if information is provided to the management team and they have an intelligent meeting; intelligent people drawing conclusions from this information which later is sent down in the organization as a concretized plan of action, then it is intelligence. This intelligence can later be labeled as operative or strategic, but he does not see the point of making this division.

5.4.2.1.2 Operative Reporting is Not Business Intelligence

There is also an awareness of the double use of the term Business Intelligence. One respondent comments on the issues of the division as a problem in the world of concepts. For him the operative reporting is not something he would like to call BI. It is merely a consequence of the providers referring to IS/IT tools as Business Intelligence. As a way to show that the ownership of the term and definition of BI is not exclusive to consultancy firms and BI-tool providers, TMHE decided to claim the ownership and, in conformity with the ambition in this Thesis, to give BI an all-embracing scope. To separate the different objectives the terms Operative and Strategic were used as prefix.

5.4.2.1.3 Strategic is Relative

Despite this ambition, the usage of the terms Operative and Strategic has led to a discussion on what they are actually trying to explain and divide, or as one respondent puts it:

Strategic is a relative thing. Sometimes a decision on a deal price can be strategic in a sense that you can gain entrance to certain customer, or to make sure that you will have turnover in service and parts for a longer run. So what is strategic, is strategic something that has influence in the coming years, then it can be like the price example.

It becomes even more indistinct when trying to apply the concepts on the company’s tools and applications for decision-support. One respondent draws the attention to a recent released application called Statistics, which claims to provide a 360 degrees view of a customer.
Depending on your profile you can see the customer from e.g. an aftermarket perspective, a sales perspective, a finance perspective or a rental/leasing perspective and it is possible to observe within which perspective profit is made. Rhetorically one respondent asks: “Is this a Strategic BI tool or not? […] it is used by management team on country level to make tactic decisions”.

5.4.2.1.4 Strategic Level versus Strategic Decision

Yet another level of confusion derives from whether one refers to the governance level Strategic or to a Strategic decision. Something TMHE lacks today, caused by heterogeneous data sources, is a system support where the performance within sales on a strategic level would be viewed as a traffic light, signaling green when a certain sales group has reached their sales objectives and red when they have not. The purpose would be for management to be able to break down the numbers and find the source. This type of tool is one ambition with the ongoing Enterprise Data Warehouse project running within TMHE and, according to the respondent, another area where strategic and operative run together.

5.4.2.1.5 Overlap between Business Planning and IS Promotion?

A different problem that has been experienced due to the division into Strategic and Operative is a perceived overlap of the BI-work between IS Promotion and Business Planning. One respondent means that both are working cross-functional and not explicitly with IT and he would thus prefer a closer connection between BI within Business Planning and the work with the Operative BI. The purpose would be to facilitate a shared view of the needs on strategic level as to the ones captured on operative and tactical level. A better coordination is therefore fundamental in order to improve the overall Business Intelligence work within the company according to this respondent. Further on he feels Business Planning has a false view of the role of IS Promotion. Their role is to gather and coordinate needs for operative and tactical users and act as orderer against IT-suppliers. They work mostly together with Directors, while BP work together with Vice Presidents; he thinks that this is the biggest difference. Otherwise they work with the same questions, the same project methodologies, and same information, only it is more aggregated. He argues that the needs process ought to be the one uniting BP and IS Promotion, in order to be able to match the needs on strategic level with the existing solutions on operative and tactical level and the IS/IT.

Another respondent also feels that the division between Business Planning and IS Promotion when it comes to gather internal needs of the company is indistinguishable. “Is it IT-factory in Mjölby or BP in Brussels?” He asks for a clearer definition of Business Intelligence in order to be able to divide the work and to have situation with less risk of dissension.

5.4.2.1.6 Respondents See a Need for Change

Because of the different views and opinions on Business Intelligence and the division into Strategic and Operative, some respondents call for a revision or clarification of the BI structure within the organization. They see a need for an increased focus on the strategic levels, since the focus so far has been mostly on the operative and tactical levels, and acknowledge the need for a discussion on how they ought to work in the future.

One respondent thinks that they should re-think the division and have a structure more closely connected to TMHE’s business model; with goals on different levels and with appointed
business analysts. He would like to see a structure with a Chief Business analyst coordinating the needs from VP-level, and then one within each function on Director-level, and finally analysts working locally on team- and department-level. The Chief Business analyst or Strategic Business analyst could be placed within Business Planning, which then would be a natural linkage to IS Promotion and improve the collaboration. He feels that they miss out on the necessary coordination and prioritizing of BI-needs on a strategic level, which could be helped by appointing this position.

5.4.3 Intelligence Work within TMHE

As described in the Company Presentation (see chp. 0), the only department within the organization currently using *intelligence* terminology to describe their activities (apart from IS Promotion and Business Planning), is Market Planning when stating that one of their responsibilities is *Market Intelligence*. However extensive work is done today in different functions that can be categorized as the various concepts falling under the umbrella of Business Intelligence. However, this work is neither labeled intelligence, nor performed according to a specified intelligence framework or process.

The following is a presentation of the identified intelligence work performed within the functions, which we have structured under the categories *Market Intelligence, Competitive Intelligence, Macro Intelligence*, and *Internal Intelligence*. The categorization is based on the model presented in the ending section in the chapter Theoretical Framework.

5.4.3.1 Market Intelligence

Within Market Planning, the area of Market Intelligence has a broad scope presented as the responsibility to: “gather, analyze and supply information about the competitive environment” (TMHE Intranet). The work is mainly conducted within two areas: competitor pricing and market analysis (including shares, size, and volume). The analysis of competitor price levels covers list pricing, market prices as well as the structure of pricing and it is analyzed in order to follow the price movements. Competitive prices are also monitored by the Sales organization. The part of Market Intelligence covering market size, volume, and shares, the market shares and the performance of TMHE and the company's competitors are analyzed both overall and within specific regions and segments. Product Planning is also doing certain analysis of market shares and market figures.

The cross-organizational Market Statistics Data Warehouse (MSDW), owned by Market Planning, is used by the functions for analysis of market statistics. It consists of statistics on TMHE’s volumes as well as the total market volumes and a large number of predefined reports are available. The Marketing organization also have the responsibility of performing market forecasting (of market sizes, volumes, turnover, and units sold) and producing market scenarios for the business planning process. Parts of this work are done in cooperation with the Sales organization, because of their knowledge of the capabilities of the distribution network. Other intelligence areas performed within the Marketing function are analysis of brand awareness, product perceptions, and press coverage, which demands a thorough understanding of the market.
Another important category within Market Intelligence is covering customers. Customer behavior is analyzed within the Sales function, whilst analysis of customer needs and wants is performed by Product Planning.

5.4.3.2 Competitive Intelligence

Competitive Intelligence is performed within a number of functions. The Product Planning function is a major actor conducting intelligence on competitors, but with a clear product focus. They are developing competitive overviews pointing out the competitiveness of TMHE in various segments and how to improve it further. Extensive analysis on products is done by analyzing market trends, doing customer and user investigations as well as asking MSCos and distributors. Trends within markets are also viewed upon, from a product perspective, e.g. which products are increasing or decreasing and on which markets. Competitor movements on these markets are also monitored, as well as competitor’s products (performance of individual and whole product ranges), where factors such as renewals of products, product technologies, target groups together with analysis of their strengths and weaknesses are taken into account. Some of the work is done together with BP. BP also looks at the positioning, strategic directions, and the financial performance of competitors. Analysis on the evolution of competitive networks is an area that is performed by the Market Intelligence team. Earlier, some financial benchmarking of competitors was done by the in-house bank, Toyota Industries Finance International (TIFI) and BP has plans to re-establish this cooperation. By regularly communicating with key customers, Product Planning is monitoring trends and changes in how material is handled.

Within the CFO organization of TICO, some BI-work is conducted with a focus on investor relations. Information of interest to TMHE is passed on down in the organization to BP, even though the contacts are only informal for the present moment. Mergers and Acquisitions is another area where TICO and TMHE are cooperating through BP.

5.4.3.3 Macro Intelligence

Regarding analysis and intelligence of external factors affecting the company, some work is done today. Market Planning uses an external consultancy firm for providing monthly economic forecasts on various scales, of the Euro-zone as well as individual countries. The forecasts are on one and five year terms.

Within Product Planning activities of scanning trends in technology and logistic theory are in focus. To stay updated on logistic theories they are for example visiting exhibitions, conferences or talking to experts. The scanning of new technologies is done within Product Planning by interacting with the engineers and technicians within the R&D department (in the Supply organization), who as experts are the most likely to find out about new technologies.

The scanning activities carried out by Product Planning are not structured and can be characterized as ad hoc. The studies are often on new technologies or trends in the logistic industry, and could be issues ranging from fuel cells to new lengths of the forks of the truck. Often these studies are done prior to the Decision Meetings held within Product Planning in order to decide on eventual investments in new products. These studies often need to bring diverse issues into consideration. In order to improve the abilities of picking up new technologies and innovation, there are plans within Product Planning of assigning a special team to monitor these.
There are also activities for scanning the environment ongoing within BP; for example there are initiated contacts with other actors in the logistics industry for cooperation on analyzing and forecasting of logistic trends.

There are areas of Macro Intelligence where the organization is lacking activities today, for example when it comes to monitoring of the socio-economic environment (e.g. legislations and politics), as well as analysis on vertical industries (e.g. manufacturing-, retail-, and logistics industries).

### 5.4.3.4 Internal Intelligence

Extensive financial analysis is performed by Business Control within the CFO organization. The Sales function performs analysis of sales performance and coverage in order to improve the sales process. The sales performance as well as sales support is primarily focused on KPI analysis. Sales Support is also assisting in factory planning by analyzing market forecasts to predict necessary production capacity.

Other important areas of internal intelligence activities are analysis on TMHE’s products, production capacity, profit, and service profitability, which is provided by Product Planning, Supply, and Sales. Business Control is also a part of this work as they are partly calculating the financial KPIs and personnel data.

### 5.4.4 Another Ambition for Strategic BI

TMHE has plans for securing people in a group within the area of Strategic Business Intelligence. According to one respondent, the members of this group should, apart from their regular responsibilities, have a role where they are performing technology watch. This group is also described as a virtual forum for Business Intelligence and will be established under the VP level where it is planned to support the management team with Strategic Business Intelligence. Apart from more repetitive activities like scanning (e.g. of competitors), Strategic Business Intelligence includes ad hoc activities (e.g. special studies on competitors or new technologies) that are looked upon as supporting the business planning processes, and is therefore a responsibility of the management team. However the management team is not able to perform these specialized tasks due to the time consumption of other responsibilities. In order to cope with this situation the company is planning to take action and plan to set up this new structure. Hence, on one hand the group is planned to act as a steering group for the overall BI and on the other hand to act as a task force, taking on extraordinary assignments. Today the latter are handled within each function or by BP.

### 5.4.4.1 Dynamic Focus and Composition

When this group has been established the ambition is that it will be, to some extent, self-regulatory on what projects to take on. They should also be able to staff each project with the expertise that is required and therefore hopefully do a better job. The suggestion is that the group should meet every two months to discuss what new projects should be started (e.g.

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31 Since this in the present moment is only a planned activity it neither has a set structure nor a name. Some of the respondents have referred to this as a BI-Forum, which is why we will use this term later on in the Thesis, even though this naming might never come to practical use.
What implications will fuel cells have on the material handling industry?) or where more resources are needed (e.g. Is there enough coverage of competitors?) The idea is that the group will sometimes look for new projects, and sometimes pick up tasks from outside. It could be something originated internally from the MSCos or externally from another industry. TMHE has already well-established contacts within the logistics industry (e.g. heavy truck industry and forwarding shipping agents), and for specific projects people could be brought in from the outside to participate. The limiting factor is time, but the company believes this is a chance to stay on the front edge.

One respondent connects the division of Business Intelligence to the plans for this group and sees it as the executor of the Strategic BI. Further on he argues that the time-perspective speaks for a group separated from the one working with Operative BI, since these groups will consist of people with different level of work experience. The repetitive Operative BI can be performed with less necessity of experience, whereas the Strategic BI implies know-how from the business and the ability to reason and argue from different roles and responsibilities within the company.

5.4.4.1.1 Importance of Not Having a Representative Assembly
The initiators stress how important it is that this is not a representative assembly; that other criteria are valued when staffing this group. One respondent emphasizes on securing the involvement of more then one function, but also that it is necessary not to loose the product focus. The purpose is to benefit from synergy effects from having people with different roles and responsibilities within the company to have a platform for meeting and working together. As one respondent expresses it, to be able to cope with technology shifts believed to be caused by the current environmental focus, and that it is necessary to have an early start in order to see new opportunities for the design of new products. He thinks this initiative will lead to more laboratory activities within TMHE.

A spillover effect of forming the group is making TMHE into a more learning organization where more people will come closer to a breadth of the business and as a way to pick up talented individuals within the organization. One respondent informs that three different management consulting agencies have called out for a high potential program within TMHE, where employees are highlighted early on in their career and guided.

5.4.4.2 A Cross-Functional Compliment
Foremost, the ambition with this group is as a way to give time and structure to questions of the business environment and as a cross-functional compliment to the work done by the functions today. Our respondents have also raised the need for a separate group with a particular focus on these questions. One is highlighting the need for looking at e.g. how sociological aspects will influence the material handling industry and their customers, or what influence economics, politics, and innovation developments in other industries, or even in their customers’ industries, will have on TMHE in the future.
5.5 Information Needs Analysis – Result of the Questionnaire

This section contains the result of the questionnaire, which is a part of the information needs analysis. It begins with important aspects that need to be taken into account when interpreting the result. Then the outcome of the questionnaire is presented as two lists and finally the result of the questionnaire is summarized in the six groups.

5.5.1 Varying Supply of Information

As discussed in the Method (see chp. 4.5.3.2), one has to be cautious with the outcome of this questionnaire. One aspect is the room for interpretation regarding the rating of satisfaction of information supply. It has been noted that within some of these areas the corporate functions have an extensive supply of information in those phases, when this is necessary, e.g. in pre-studies or specification work for an upcoming product update. This does not mean that there is information catalogued and continuously available for answering specific questions at any given time. According to one respondent, it is desirable with a secured supply of information for certain categories, while it is not necessary for others. For categories where there is a lack of information supply today, there are different ways to approach the problem. The need is either of a kind that does not need a continuous supply of information, and can thus be solved through analyses at certain times. Otherwise it needs the establishment of a continuous supply or sometimes even the establishment of a new function (e.g. innovation management) in order to provide the information.

5.5.2 Background and Overall Outcome

From the beginning of this study the questionnaire has been considered as a structured follow-up to the interviews and therefore as a part of the qualitative research approach, which is why we do not apply any quantitative research methods. We are even cautious with making ranking lists. As an example it would be dangerous to compare the number of identified needs in each category in order to place them in order of preference. First of all, the categories were made up in order to make the range of needs into a tangible questionnaire and no explicit specifications for each category were set. Secondly, the numbers of sub-categories are too closely connected to the qualitative nature of the interview in order to be made into comparable numbers. The treatment of the questionnaire’s system of categories was not fully homogenous among the respondents, which is something that does not affect the purpose of the exercise, but it excludes any numerical analysis.

Our scope, which includes five central functions of TMHE, together with our method of working with the information needs analysis, resulted in a both diverse and extensive list of needs. After the reconstruction of identified needs into the questionnaire, we still had a stretched list. This is why we did not add any other needs of interest to be rated, or areas of needs that were not touched upon in the interviews. One category of needs with no focus in the questionnaire, but that we would like to highlight as an important category, is internal financial analysis. We argue that the lack of focus might be due to the chosen method, i.e. that financial information might be a category of information needs taken for granted, but it could also be a result of the background of the Thesis. As already stated, the CFO organization is represented among the respondents. One corporate function not represented

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32 The questionnaire was filled out by 14 out of 16 TMHE respondents

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among the respondents due to the delimitations of the Thesis (see chp. 1.3.3), is the Supply organization. Therefore, also this important area had no particular focus in the questionnaire.

5.5.3 The Results in the Form of Two Lists

The questionnaires were compiled in order for us to be able to identify needs of major importance with an unsatisfied information supply, and needs of major importance with a fully satisfied information supply. The first operation led to the list of information gaps (see Appendix 1), i.e. the gathering of information needs within the Questionnaire rated as of major importance with an unsatisfied information supply for at least one of the respondents.

The second operation is what we have referred to as “reverse matching” (see chp. 4.5.3.2). The aim of this activity was to discern the information needs that none of the respondents rated as having a fully satisfied supply of. As discussed in chp. 4.5.3.2, we also put the constraint that the respondent needed to have rated the need as of major importance. We named this list filtered list of information needs (see Appendix 2) and to recapitulate, this is a list of needs rated as of major importance with an unsatisfied information supply by at least one of our respondents, and for these needs none of the other respondents have rated the need as of major importance with fully satisfied information supply.

5.5.3.1 List of Information Gaps

This list, even though it is almost half the length of the questionnaire, is still a rather extensive list of information needs. However this result did not come as a surprise, since the same respondents that were interviewed, also filled out the questionnaire. It was thus likely that the identified needs of one respondent would be rated as of major importance by that same respondent; otherwise he would not have brought up the need in the first place. The rating of satisfaction of information supply is more decisive, even though our interest during the interviews was on areas where the respondents lacked information today. The questionnaire was simply a way for us to have the interpreted information gaps manifested, but also indirectly to let the respondents rate other respondents’ information needs and thus cover needs that were missed during the interviews.

5.5.3.2 Filtered List of Information Gaps

The activity of “reverse matching” described above, more than halved\(^33\) the original list of information gaps.

5.5.3.3 Results within the Six Groups

5.5.3.3.1 TMHE

The TMHE group contains information needs referring to internal operations centered on the company’s products. This is the most numerous of the six groups in the questionnaire. When studying the list of information gaps one can note that only one out of the ten categories (bolded in the questionnaire, please refer to Appendix 1) in the questionnaire has disappeared. However most of them are no longer complete; meaning that one or more respondents have stated a fully satisfied information supply of these specific needs. The filtered list undergoes a major change and many of the categories vanish completely.

\(^{33}\) The list shrunk from 89 to 41 information needs, cp. Appendix 1 with Appendix 2.
5.5.3.3.2 Sales
This group refers to TMHE Sales operations. As within the TMHE group there is only one category that disappears in the list of information gaps compared to the questionnaire. The same reasoning as above also applies for the filtered list and because the Sales group has much fewer identified information needs, this leads to that the Sales group in the filtered list only consists of two entries.

5.5.3.3.3 Customers
The Customers group is about the same size as the Sales group and refers to the customers’ view of TMHE and the company’s products. Here none of the categories from the questionnaire has disappeared in the list of information gaps. It should however be noted that a numerical comparison is not fair since the different categories consist out of different number of sub-categories and specific needs. Notable here is a much less reduction of categories in the filtered list, if compared to the TMHE and the Sales groups.

5.5.3.3.4 Market
The Market group contains both a TMHE perspective and a more general market trends’ perspective. Differently from the other groups it consists of a few categories, with a number of subcategories. One of these categories is entirely lost and therefore contains no information gaps. When studying the two lists next to each other one can observe that many needs still appear.

5.5.3.3.5 Competitors
The structure of the group Competitors resembles to a large extent the ones within TMHE group. Also when it comes to the list of information gaps, the development follows the TMHE group. However when comparing the two lists for this group, one can see that half of the information needs stays; implying that for half of the identified information gaps, none of the respondents have a fully satisfied information supply.

5.5.3.3.6 Technology, Industry, and Economy
The last group is the one that stands out from the rest the most. For this rather long and diverse group a predominance of the information needs are rated as information gaps. Moreover when comparing the two lists one realize that most of the information needs gaps stays also in the filtered list.
5.6 Information Handling

This section contains different views of the challenges regarding information handling within TMHE today, as being experienced by our respondents. The main areas covered are unstructured information and the finding, gathering, and sharing of information.

5.6.1 Unstructured Information

Today there is no common strategy for handling unstructured information within TMHE. BP has acknowledged that unstructured information is an important part of Business Intelligence and has raised handling of unstructured information as a major challenge for the future.

Within BP a definition of unstructured information (note that there is no official definition within TMHE) is given by:

One cannot see a clear pattern in unstructured data. It is not easily read by a machine and does not have a defined structure with applicable rules. Unstructured information is usually captured in different formats such as emails, text documents, news articles, PDF-documents, voice recording, video, pictures, and ordinary web content. In addition to this data and information that seems to be structured, like excel content, could be considered to be unstructured if the handling or processing of the data is individual rather than automatic. Furthermore unstructured data is often stored in individual ways, e.g. in internal hard drives, on project sites or in personal folders, and not in common data warehouses and repositories with a defined structure. Lastly it should also be noted that the level of structure is somewhat determined by the level of system support, meaning that improvements in the IS area could support the activities to structure unstructured data and make it more accessible for an organization striving to share information and knowledge (Hyltberg, 2008).

5.6.1.1 Lack of System Support for Unstructured Information

For structured information there is modern and adequate systems support available within TMHE today. However when it comes to unstructured information, the current systems support is unsatisfactory. There is some support within specific areas, but there are no systems such as Competitor Analysis tools or Enterprise Search engines. The lack of systems support for the unstructured information makes it hard to make sense of loose pieces of information sent and collected across the organization, explains one respondent.

This is also acknowledged by another respondent who sees the need for some kind of expert system. He sees two possible solutions, one where the user puts in the information. It is also possible to have a more structured approach where there is someone in the center, who continuously monitors the press, the websites of the competitors, as well as websites of logistic theory etc., which is then put in a system. Then it will be easy for a user on a local level to see the benefits. He also wants the users to have the opportunity to add things themselves. If this is done, the users are in what is referred to as the “yes-loop”, where the interest from the users increases when they feel that they have the ability to affect the content. He states that you need both ownership and active input from the center in order to make the system work as intended.
5.6.1.2 No Coordination or Central Source of Information

The results of work in the organization are not stored in a central source of information today. Instead it is mainly stored on local hard drives or personal computers. A common view from our respondents is the need for coordination of information, even though the opinions differ whether this should be an organizational unit, or a central information system. The respondents give a clear picture of the corporate functions as information silos, where they are not aware of what the colleagues are doing in the other functions. According to several respondents information gathering from sources within the silos is also a time consuming activity. Perhaps an even bigger issue is that the information is often in different formats and uses different definitions. Before being able to assimilate the information and make analysis, it has to be processed, challenged, and/or re-structured.

One respondent gives an example of the work prior to the Mid Term Business Plan process, where there is information sitting within a number of departments and that it is not clear who is to provide this information. This could be a task for a central function; to coordinate and collect information.

Another respondent suggests a framework for coordination as to agree on certain formats and then let everyone put in everything they know about a certain topic. He compares this structure to a TMHE Wikipedia; to channel everybody into a central area to make a living document. It would then be easy to contact the author to ask to enlarge or change something, which then would be visible to everyone. He emphasizes that it is not a matter of sharing the information within the corporate functions; the primary goal is to work over the boundaries. Today information is put on local or shared drives; to be accessed by the own function primarily.

5.6.2 Finding and Gathering of Information

Today it is not possible to claim that you miss information. The information is in our systems, all information is there, but it takes a lot of effort to find it.  

TMHE Respondent

Our respondents give a view of that information is mostly found and gathered via the use of the personal network. The experiences of the respondents are that most information needed is available in the organization and that there are no actual issues of finding information. When they do not know where to find it, they know who to ask or where to go in order to get hold of the information. One respondent means that it is part of their job to know where to get the information and makes a comparison to a lawyer:

A good lawyer is a lawyer who doesn’t know all law, but knows where to find the law […] the same applies to some extent here. You can’t know everything all the time, you need to know how to answer […] you need to know where to find [the information].

The use of the personal network for finding information is also a chosen strategy, depending on scarcity of time and resources, according to one respondent. One respondent acknowledges the importance of personal networks for finding and gathering information and that it thus takes time to adjust for newly employed: “I’m not jealous at those coming new to the company.”
5.6.2.1 Hard to Make Sense of Available Information

Because of the great amount of information available, one respondent thinks that the real issue lies in making sense of all the information that is gathered and making sure to look at the right kind of information. There has to be a prioritization of resources in order to have a good balance between the planning and gathering roles, together with the need to run the actual business. The respondent gives an example that a market forecast would probably only be improved with about five percent even with unlimited resources.

You have to be pragmatic [...] there is only so much information you can gather, we only have so many resources to apply [...] at the end of the day our businesses is selling forklifts trucks, it is not doing economic forecasts, we have to be realistic in what we can do, use our best judgments.

TMHE Respondent

Another respondent is of the same opinion; he differs between the information that is really needed for doing their job versus information and knowledge that is interesting because it seems to be good knowledge to have. In many cases, he thinks that it is not even necessary to have much information at all, since this would not affect the decisions anyway. This is also acknowledged by another respondent who states that it often does not matter what information on e.g. competitors they receive, they will still have their projects and their lead times that are hard to affect. He thus sees a danger in overanalyzing the competitors.

5.6.2.2 Finding Information is a Time Consuming Task

Even if most respondents think there is no problem finding information, many agree upon that it is an unnecessary, time consuming, and tiring task.

We always have to dig. In the information age we are in today, we should be able to have it within a few clicks. Not sit down and think: This is what I need, send an email and then somebody says: I’ll work on it, you’ll have it in 2-3 days [...] It takes too much time.

THME Respondent

5.6.2.3 The Use of the Intranet

Even though most of the information gathering is done informally within the personal network, the company intranet, which is built on a Microsoft SharePoint platform, is seen as the official main source of intra-organizational information.

There is a huge amount of information that is accessible on the intranet today and many people have access to this information. There are different opinions of whether the intranet is used as intended or not. One respondent argues that the intranet is used properly, while another respondent stresses the problem that information is uploaded, but neither looked at nor accessed. He explains that instead people are relying on their personal contacts and knowledge of where to find certain information.

5.6.2.3.1 Organization and Management of the Intranet

The intranet is organized in a hierarchical structure reflecting the organizational structure of the corporate functions. According to one respondent, this structure is not good enough because it is not easy to find what you are looking for, if you do not know where to look. In order to find “deep” information today one needs to know where to go, since it is not possible to figure it out intuitively. Yet another issue is highlighted by another respondent: since the
intranet is structured according to the organization, there is a need for regularly reviews of the structure and content since the organization is constantly changing. One respondent explains that because of the structure today, and the difficulties of finding information, the intranet is not the optimal source of information if you are working cross-functional and thus need to investigate in many different areas and browse through different parts of the intranet.

One respondent thinks that they have to ask themselves where to draw the line, “what information does everybody need to have?” He gives an example where a Finance Director in Slovakia would like to have a forecast on a country level. He would not go to the European level of TMHE to ask for this information, he has better sources. If looking at the TMHE organization on the European level, the respondent argues that 95 percent do not need this information and those who need it knows where to find it. Rhetorically he asks: “Is it really necessary, even though it is possible, to share all the information with everybody?”

5.6.3 Information Sharing

An aspect of the cultural differences when it comes to information sharing is given by one respondent, who claims that there are two different views on how to share information: Is information shared to the extent of what is necessary to share, or is information shared to the extent of what is possible. This is illustrated with the example in Figure 30.

| Case 1 | You are going on a holiday with your family and you tell them that they have to be packed and ready by 8AM tomorrow morning. The only beforehand information they get is that they are going to a country where they can swim, the temperature will be around 25 degrees, but the evenings are cold, so bring a sweatshirt. |
| Case 2 | Tomorrow morning at 8AM we are leaving for Spain. We will stay in an apartment and spend time on the beach. The temperature will be around 25 degrees. Sometimes it will be raining and there will be cold evenings. We will also go to a certain restaurant which is why formal clothes need to be brought. |

Figure 30: Sharing information to the extent possible versus necessary

The respondent argues that the difference between the two cases is bigger than it might seem. With the extra information in the second case you will be more prepared and thus find it easier to adjust to new circumstances. He means that a conclusion on which one of these strategies for TMHE to choose has not been decided upon. He especially thinks it is important to have a common view within the management team, because their views will be spread in the company.

5.6.3.1 Heterogeneous Culture of Information Sharing

There is no common culture of information sharing within TMHE today. How data and information is to be shared both within the own function as well as with other functions is more or less up to each functional VP to decide. Some of our respondents experience that there are big culture differences between different managers when it comes to information sharing. One respondent explains that he is working in an environment where information sharing is based upon trust, and where his VP because of this, is sharing everything he can and has very few secrets. He describes the situation as the opposite within other functions of TMHE where practically nothing is shared. Because of this, he thinks it is difficult to know
what subjects are possible to talk about with people from other functions, since they may not have visibility on the same issues.

It is not only on the VP or manager level that information sharing is not satisfactory. One respondent thinks that the “right thinking” when it come to information sharing, does not exist within the organization today. He exemplifies with surveys; departments are making surveys, while other departments do not even know that these surveys exist. He states that information needs to be shared and if you make a survey, the minimum you can do is to inform the rest of the company. It is not done within TMHE today, but the problem does not seem to be that people are not keen to share.

It is not that they don’t want to do it; it is just not in the process. It is more a process problem, than a people problem. Everybody is looking at their own business and way of doing. If you need a survey, you make a survey, use the result, and move on. They don’t take the time to stop and look at the result and ask if someone could be interested in the results. It is not in the process thinking in the company today.

TMHE Respondent

Another respondent feels frustrated that information that could be of use to others is not made available even though there are no technological boundaries. He understands and agrees to that certain information that is of strategic importance should not be shared with everyone, but thinks that the different strategies of making information available are founded in the different cultures of the organization.

5.6.3.2 Lack of Communication

People are not communicating enough in order to share information, according to one respondent. Work is done in different parts of the organization, but this is often not known to anyone outside the own function or team. He means that a lot of opportunities to take part of the results or get inspired by this work are being missed out.

Another respondent emphasizes the importance of communicating efficiently in a large organization. He thinks there is a need for both formal and informal communication. Today the communication depends on individual management styles in the different corporate functions. He explains that there are huge amounts of information in the organization, on intranets, in news letters that are coming out weekly, via briefings etc., and that it is up to the employees what to take part of. He is of the opinion that they employ good managers to manage their people to communicate with others via the open communication routes available. If a manager is not able to do that, he doubts that over-structuring of things would help.

5.6.3.3 Reluctances of Sharing Information

One respondent describes the organization as being too restrictive generally when it comes to information sharing. He explains that it is often the case that someone says “I’m not sure if I want to publish this information. Who has access to it?” The respondent’s approach is that when two people know, it is no longer a secret. It is his responsibility as a manager to make sure that the information comes into the right hands. He argues that nothing is preventing him from emailing the information to the whole company anyway. Today he sees flaws in the sharing of e.g. economic reports, which are not always published internally. “If we did a good result, how many would know? Wouldn’t it be good to share? Wouldn’t it create a pride of
the company you work for?” He realizes that information is power, but he thinks that rather than trying to keep people out, they should work to give people access to information. However all information should not be shared. It is important to make as he calls it, “intelligent reports”. Then if someone wants to know all the details, it should be possible to contact the one responsible for the information.

Another respondent feels that the culture of transparency that is necessary for successful information sharing is not in place today. There is a tendency that people do not share information because they think that no one is to see that piece of information. He also means that people are reluctant to share certain information because it is not a hundred percent verified. Another reason for being reluctant to share information openly is given by another respondent. He sees a risk that people will misinterpret information he is producing, and therefore he rather have his colleagues asking him for the information, in order for him to be able to explain. One respondent claims that even though he would have the documents on a particular issue, he would still try to get a hold of the person responsible in order to make sure to get the right picture.

5.6.3.4 Ensuring Quality of Information

The integration project meant that several different information systems and different information structures were to be integrated as well as different views on how to look at data and information. This have raised the issues of ensuring information quality and how data and information is to be interpreted. Several respondents emphasize the importance of deciding how to look at and define data and what kind of information they want in the new organization, in order to “talk the same language” and being able to compare data and information from different parts of the organization. Today there is an ongoing discussion of which information is correct; another unpleasant consequence is the duplication of work.

At the same time as one respondent is criticizing the lack of willingness to share information, he feels ambivalent due to the fact that if one cannot trust and therefore need to question the information given, of what use will it then be? The latter is experienced by another respondent who often feels that presentations and reports sent to him have too much elements of uncertainty:

You get a PowerPoint presentation of 38 slides. After the fourth you start to ask questions like: What information is this? or What sources are being used? After another six slides you give up, the uncertainties makes it impossible to draw any conclusions.

The great challenge if collecting information centrally would be to keep it updated and secure the quality, claims one respondent. The work to ensure the quality of the information would be a task for the individual functions, because if you do not understand all the details of the data, you would not be able to question it. He states that it is crucial that you can trust that the information you pick out of the system is correct. Another respondent explains that a central source of information containing information based on different definitions and classifications is nothing more then a garbage can.

The ability to track raw data and the sources of information is of great importance according to one respondent. It is often necessary to get the overall picture, but at the same time be able to drill down on certain subjects or issues when required. “People don’t want the raw data,
they want the analyses.” Uncertainties can be avoided if using a proper reference system in order to conclude what information has been used.

One way of securing information is to make it open, claims another respondent. It will then be possible for anyone to access and question the information. If, for example, setting up a Wiki about product technology, the Product Planning function should have the responsibility to update and facilitate the information. He thinks that if someone has any opinions on this information they should turn to them to get an OK to edit.

5.6.3.5 Information Overload

I did not work Thursday. When I came back to work on Monday morning, I had seventy seven emails in my inbox. Isn’t it wonderful? […] When I was younger, there was a lot of talk about the so called information society. I tried to relate it to the concepts of the rustic society, the industrial society, but I never understood what the information society was. Now I understand…

TMHE Respondent

To be able to cope with the everyday bombardment of information and be able to embrace and make use of this information, it has to be easy to access, argues one respondent. A format where it is, for example, possible to flip up a certain slide and always know it will contain the same type of information. A standardized format is thus crucial, where it should be clear what affecting factors there are, what sources are used and what might be wrong or incorrect. According to him, it does not matter if a piece of information is incorrect, as long as it is known that it is incorrect.

5.6.3.5.1 Inefficient Use of Email

One respondent highlights the unsatisfying use of email. Today, information and reports are often sent in emails saying: “We just got the new monthly figures in, please find them enclosed in the attached file”. He thinks it could be made in a more efficient way by publishing the information in a central location, people would then learn to visit this from time to time to view the updated information. Today’s intranet offers this functionality, but is it not user friendly enough and tends to be more of a location drop.

Another respondent complains over the growing inflow of emails. He thinks that the information handling within the company needs to be revised. Today a lot of information regarding e.g. organizational changes are emailed to all employees, while other things, like e.g. economic reports are emailed to a limited list of recipients. This could be solved in a more efficient way; he is suggesting that the intranet should be used to a greater extent, and the information filtered to more suit the user. He would also prefer that more effort was put on analyzing to whom the information should be shared.

This is also acknowledged by another respondent who thinks that in most cases this information is not needed. He claims that the growing email inboxes is one of the biggest issues that they are facing and describes the situation as “desperate”. He desiderates new and effective ways of prioritizing, managing, and understanding emails, and also policies for how email is used and when to send emails.
6 Analysis

The Analysis chapter is divided according to the same structure as the rest of the Thesis, which is why it begins with the Business Intelligence section, followed by the Information Needs Analysis, and ends with a section covering Information Handling.

6.1 Business Intelligence at TMHE

In this the first section of the Analysis chapter, Business Intelligence is treated. First from the perspective of the current assigned BI actors, which is followed by a part where we discuss the development of BI within TMHE and present critique of the current division from the Case Study. Then we summarize the terminology discussion and highlight alternatives from our theoretical framework. It passes on to our proposal of how to structure BI in the future. With the new model in sight this section comes to an end with a revised presentation of the BI actors.

6.1.1 The Assigned BI Actors within TMHE

The assigned actors in the Business Intelligence structure of today within TMHE are Business Planning and IS Promotion and we begin the analysis with a summating discussion of these organizations separately.

6.1.1.1 Business Planning

BP is viewed by our respondents as project-based organization acting as a trouble-shooter with a cross-functional way of working; a picture in conformity with how the department is presented. Moreover the statements have centered on the importance regarding BP as a support to the other functions and not to create a Business Planning Department “with a life of its own”, as one respondent puts it (p.89). Consequently BP is not viewed as the provider of core functional competence or information, which is not to be mixed up with the confidence that the respondents have in BP within areas where they are included as a resource or given a certain task.

6.1.1.1.1 Not Suffering form the NIH-syndrome

With the ambition of this newly established group, as acting cross-functional in an organization characterized by autonomy, the “Not Invented Here” syndrome may come into play. Therefore we raised the question of mandate, which is linked to the status of BP and how the group is looked upon. The Case Study however shows little effect of the NIH-syndrome and BP seems to have gained the necessary recognition. Another plausible explanation is that due to the reorganizations there are not that many groups of stable composition yet. Nevertheless an equivalent to the strong NIH-syndrome within the R&D community (where there is a common belief that a group from the outside cannot produce relevant information) is the questioning of BP as a provider of certain information due to their lack of nearness to the production sites. Overall the questioning of BP as a gatherer of information is rather connected to the insecurity of what Strategic Business Intelligence means and thus what information is intended for gathering.

6.1.1.1.2 Known through the Integration Project

BP’s lack of seniority together with their supporting role during the integration project makes it natural, according to us, to view them only as a task force, which is why the
rest of the company may put restraints on BP’s further involvement. We think this is why some of the respondents have accentuated the supporting role, and are skeptical of assigning permanent task to BP. The ambiguity of BP’s responsibilities is mainly due to the fact that all respondents do not have a connection to BP in their every-day work. BP has foremost been connected to the integration where they had a prominent position, for which they have been known and acknowledged. However this close connection also has raised the question of what will be their next assignments when the project is ended.

The statements about BP resemble on many points the respondent’s opinions of BI. One explanation is the given connection to that BP has BI as one of their areas of concern. However when examining the identity we are bound to believe it has more to do with the similarities between the respondents’ relationship to the concept of Business Intelligence and the department Business Planning, i.e. an uncertainty of responsibilities.

6.1.1.2 IS Promotion

Historically, BT was an organization with a functional structure and with a governance model based on autonomy, therefore the IS/IT organization had an important part to play as the only cross-functional department. The new structure as of today within TMHE, with a Promotion and a Supply organization, is built upon cross-functionality in order to work properly. The orderer role of IS Promotion requires a closeness to- and an understanding of the business. They are aware of this critical relationship and the structure with IS Coordinators and Application Specialists was implemented to bridge the gap between the gatherer of needs and functional users who have the needs. Both “sides” are not perfectly happy with the situation as it is today and see potential of improvement. The obvious complain from the business’ side is deficient knowledge of the local operations and with a growing IS/IT organization the risk of them being self-generating has been raised. IS Promotion is aware of the delicate role of collection demands and the idea of having a developed structure with core analysts responsible for the gathering of needs was brought to light.

6.1.1.2.1 As the Manager of the TMHE-Toolbox

Despite the division in Promotion and Supply, with Supply as the supplier of tools, IS Promotion is still highly connected to these tools both literary and metaphorically and therefore perhaps less noticeable among top and middle management. As Pagels-Fick (1999) emphasizes, a common source for suspense is when the orderer of intelligence and the provider have different expectations on further involvement in the decision process.

One interesting statement on account of the tool connection is that the actual Operative BI is sitting within the operative functions, and that IS Promotion only is in charge of the toolbox. As the owner of the “TMHE-toolbox”, their responsibility lies in providing tools from the toolbox and managing its content; making sure they have the best possible set of tools (e.g. that they do not have several hammers and no hand saw). They are also assigned to the coordination role of finding new and comprehensive use for already acquired tools in the box. This is a much more truthful metaphor which does not simplify or downgrade the work as just being a tool. What is also important is the relieving illumination of that the actual intelligence work is performed within the corporate functions.
IS Promotion (Process and Application Coordination), foremost acting as a gatherer and coordinator of business needs for decision-support systems, does not engage in the intelligence activity prescribed by Pagels-Fick (1999) (see chp. 3.1.4.3). As a BI actor they are not acting as a partner in the business planning process, initiating a dialog over results with other functions within the organization. This is since they are not performing analysis for the business, and thus is their BI role far-off from the BI-function Pagels-Fick (1999) refers to.

### 6.1.2 Business Intelligence at TMHE

The result from an earlier Master Thesis study covering Business Intelligence at TMHE performed in 2006/2007 showed that there was no common view or definition of BI within TMHE. Despite the fact that these questions have been addressed since, our study shows that the situation within the company still resembles the one described in the first Thesis. Historically, the work labeled as BI was performed within the old IS/IT organization. The focus was internally on BI solutions and not on analysis of e.g. competitors or market trends. The labeling could be seen as an example of the influences from consultancy agencies and providers of tools and applications, since they were already a known element within the company and therefore something tangible to connect the term to. The actual analysis (though not labeled as intelligence) was performed within the functions. This description is also valid for what our Case Study has given at hand.

According to Ansoff (1987) the balance between strategic and operative utter most is determined by the environment of the company. Therefore the situation within TMHE with a historical overweight on operative questions, but with an awakened aim to strengthen the strategic ability, come as no surprise. There has been no technical revolution or dramatic change in the behavior of the customers, but the environment in which the company is operating has changed with the merging of BT and TIEE. The respondents have also expressed an increased focus on environmental questions, which are believed to affect the overall industry and therefore need strategic addressing.

### 6.1.2.1 Business Intelligence as a Function

There is still no appointed BI-function or BI-department within TMHE. Instead these activities are areas of responsibility for different groups within the company. There are work and activities that could be characterized as intelligence work and BI activities, but no complete BI-apparatus. The obvious risks with this structure, which also have been expressed by the respondents, are overlapping and duplication of work. This situation is noted to be contributing to the ambiguity of the activities of Business Intelligence. We have also noticed how this structure affects how the respondents approach the question of their expectations regarding BI within TMHE. Most of the respondents agree on the view of BI as a supporting tool for the company and how important it is not to create new structures. Rather they think it is important to have the competence locally, in contrast to having BI as a competence centre. Few respondents picture or ask for the establishing of a function, but nevertheless when they are asked to describe their expectations, some inevitable use a functional metaphor. The connection to the assigned actors does not come naturally, which also can be referred to the feeling of uncertainty regarding what is done and by whom.
6.1.2.2 Division of Business Intelligence

The integration project and the forming of TMHE has, besides from the forming of Business Planning and the new IS/IT structure, also had effects on the organizing of responsibilities for Business Intelligence. The outcome, which was presented at a seminar in the beginning of 2008, was a division of Business Intelligence in Operative Business Intelligence and Strategic Business Intelligence. The first category was communicated as a responsibility for IS Promotion (Application and Process Coordination) and the latter as a responsibility for BP. In addition BP has been presented as owning the overall concept coordination. The vague formulation concept coordination has not had any structural implications and seen from the result of the Case Study neither had any practical implications. Rather, we met confusion regarding the meaning of the division when we confronted the respondents with this statement, which confirms the discussion above about uncertainty.

6.1.2.3 Description Rather Than Division

The division of Business Intelligence within TMHE may from the outside seem clear. However, we mean that this is not a correct picture. With the division into Strategic and Operative BI, TMHE are using a definition of BI (even though this is not outspoken) resembling the umbrella concept adopted within this Thesis.

We interpret the division at TMHE as hasty and not done from scratch. It can also be argued that it is not an actual division, rather a labeling of activities present in the organization for several years (Operative BI), together with the labeling of a vision for something that was not present at the time in organization (Strategic BI). There are no sufficient definitions regarding the areas of responsibility for each respective part. One major issue, which we find as the reason for confusion among many of our respondents, is that several areas of intelligence work listed in Intelligence Work within TMHE in the Case Study (see chp. 5.4.3) are left out in a terminological no-man's-land. Our point is that it is not possible to structure something that does not exist, i.e. before taking all BI activities into account, is not possible to do a meaningful division.

One respondent acknowledged the conceptual problem with the division due to the consequence of providers referring to decision-support platforms and applications as Business Intelligence and that the division was a way to show that they owned the definition. This statement however only acknowledges the will with the term, and not how this is to be conformed to.

6.1.2.3.1 Lack of Agreements Due to Heavy Workload

The heavy workload surrounding the integration is mentioned as a reason for the lack of agreements on how to focus on the entirety for Business Intelligence within TMHE. The ambition at the BI Seminar was to continue the coordination process between IS Promotion and Business Planning through recurrent meetings between the responsible people in both organizations. “It is still the plan, but has not happened yet” (p.97).

We understand that the merge of the two companies has been an upheaval experience for the all parties involved and that time for structural discussions about Business Intelligence not have been the first point on the agenda. As it goes without saying that leisure always has been a prerequisite for contemplation and philosophical questions.
On the whole we have also experienced a questioning attitude among some respondents towards putting too much effort into questions concerning information handling and Business Intelligence, but we mean to say that this is furthermore an outcome of the lack of a comprehensive grip on intelligence work within the company. If BI is only seen either as tools and applications or as surveillance of competitors’ strategic intent and nothing in-between, this is an understandable attitude.

6.1.2.3 Operative Business Information?

When IS Promotion’s vision for Operative BI is compared with the scope for the Strategic BI presented by BP (see chp. 5.4), the Operative BI make show of being more of a information service, related to Björe’s use of ”Business Information” (p.33). IS Promotion’s vision is (with our remarks): ”to deliver secure access to qualitative business information […] to all stakeholders within TMHE and [to their] business partners with the aim to improve [their own and their] customers’ competitiveness“ (p.97). This is to be contrasted to BP’s aim (with our remarks): “to deliver decision support to TMHE Management Team” (p.97) and with the diverse scope to: “provide input to the business planning process, challenge strategies, increase organisational learning and knowledge sharing” (p.97). This comparison leads us to the question of overlap between BP and IS Promotion.

6.1.2.4 Overlaps between Business Planning and IS Promotion?

There is a perception of an overlap of work between Business Planning and IS Promotion among some respondents. The latter organization’s role is to gather and coordinate needs for operative and tactical users and act as an orderer against IT-supply. IS Promotion works mostly with directors, while BP works together with Vice Presidents, and therefore the role of BP is seen as the gatherer of demands on strategic level. For us this is an incorrect picture, partly due to an insecurity of BP’s responsibilities and partly due to an insufficient structure for gathering needs on all levels of the company. We mean that this is not to be done by BP because it is not the same kind of needs, and they also miss the competence and methods for gathering these needs that are sitting within IS Promotion. All the same, the responsibility for addressing this question could be argued to fall under the coordination responsibility of BP, even though this issue cannot be solved solely by this group. Another way of explaining the perceived overlap of work is that the target groups of Operative BI and Strategic BI are partly the same. Because of this, we see the importance of not focusing on target groups when making the division of Business Intelligence, but rather to take an all-embracing company focus on the activities.

“Is it the IT-factory in Mjölby or BP in Brussels?” (p.99) This statement is a significant mark of unclear roles. However we mean to say that the problem lies in overlap of the concepts Strategic and Operational and not in an actual overlap of responsibilities. As an example none of the respondents associates BP with systems support and the two organizations have very different work agendas today, that is not where the uncertainty lies.

We will not concentrate further on the need for a more sufficient structure for the gathering of needs and the expressed wish for appointed business analysts coordinating needs from VP-level, on director-level, and locally on team- and department-level, since this is not within the scope of this Thesis.
6.1.2.5 Critique of the Division from the Case Study

For many respondents the meaning of Business Intelligence in general and Strategic Business Intelligence in particular, is unclear. This is not remarkable, since not much effort has been put to communicate this division, which we think is needed if aiming at creating a common view of BI within the organization. A manifestation of this view is the critique of the division in Operative and Strategic BI as something “homemade within TMHE” (p.98). The objection is that if the Strategic part on principal only implies support to the TMHE Management Team, then it is not Business Intelligence, and for this activity it is enough with weekly management meetings at the Headquarter. “If it does not dissolve down to the next level, then it is no intelligence” (p.98). If the ambition is a process for adding value to information (i.e. make into intelligence) and unite and deliver this product, they are on the wrong track, one respondent argues.

This is connected to the question if BI is something solely for the management of an organization or if it is something enhancing organizational learning for the entire organization. The latter is supported by Hamrefors (2008), who argues that BI is to be seen as a process in the company denoting an organizational quality rather than a division in different usage.

As the Case Study has shown, the ambition for Strategic Business Intelligence is partly viewed as an activity and product for the Management Team and therefore nothing they wish to communicate throughout the company. This is of course an issue for the objective to deploy a clear definition of Business Intelligence, which both this Case Study and the one performed in 2006/2007 require. Also this adds to the fear touched upon above, that Strategic BI will be something exclusively for the top management, whereas the Operative BI (thus the tools and applications) is something left for the rest of the company. We mean that this fear is another result of the non-existing division, resulting in confusion among the respondents, but also that the current division leaves a gap that needs to be filled.

6.1.2.5.1 From the Perspective of Sensitive Information

References are made within the Case Study to the division as connected to confidentiality and that the Strategic BI handles sensitive information. We are aware of this notion and do not mean to say that all information is to be made available to everyone in the company at all times. However, as also has been acknowledged, there is sometimes an unfounded anxiety for making information available. The negative consequences of this attitude will be touched upon in the last section of the Analysis chapter.

Another angle of sensitive information is that it is easy to forget the individual perspective. From an individual perspective operational information can be as sensitive as strategic information is for the company. The point is that BI as “structuring what is already there” (p.93) and the challenge to motivate people to give information is dependent of a well-functioning internal information handling. From this perspective the relationship to the provider of the information makes it sensitive, irrespective of level. This is also where the “scratching backs” phenomenon, as a description of the necessary relationship between members of a company for a fruitful intelligence work to take place, comes into play. Sharing of information calls for incentives, and thus lack of incentives becomes a constraint on the transfer of information, which increases with the size of the company. This is an important aspect to have in mind when addressing
e.g. the handling of rumors as a lacking area within Business Intelligence today. In a large and disperse organization as TMHE it will, from a “scratching backs” point of view, be a major challenge to gather this kind of information and make it usable, especially if the aim is to implement a support system.

6.1.2.6 The Issue of Using Strategic and Operative as Dividers

The next level of confusion derives from the use of strategic and operative as dividers. Without a definition of what strategic and operative mean, these are problematic to employ as an explanation of a division of work for the even woollier concept Business Intelligence. “What is strategic?” (p.98) as one respondent asks.

The situation is further complicated by the image that the management levels mediate, which is common knowledge when asked to relate to the terms Strategic, Tactical, and Operational. Moreover, the problems arise when in conformity with Figure 9 of Bakka et al. (2001), the governance levels are incorporated. It is important to bear in mind the point made by Pirttimäki (2007); that Operative management is not only executed at the lowest level (i.e. operational level) of a company, and that strategic management is not only executed at the highest level (i.e. strategic level).

6.1.2.6.1 Strategic Level versus Strategic Decisions

We are not claiming that it is wrong to talk about strategic decisions or that strategic decisions are not made on a strategic level, but one have to realize the difference between strategic level and strategic decisions. A good example is the sales support tool that would be as a traffic light signaling whether the sales groups have reach their numbers or not (see chp. 5.4.2.1.4). As described this is providing decision support on a strategic level, but would not necessarily lead to a strategic decision (more likely to an operational or tactical countermeasure). This example once again brings light to the need for a revised needs gathering discussed above (see chp. 6.1.2.4), that indifferent of if the needs are on a strategic, tactical or operational level, these are to be gathered by the same function, using the same methods.

6.1.2.6.2 “Operative BI is not BI” versus “Operative BI as BI on Operative and Tactical Level”

If Strategic BI targets the strategic level in TMHE, it implicates that Operational BI targets operative and tactical level, however Operational BI as historically connected to IS/IT within TMHE equals platforms and applications and thus constitutes only a small part of the BI umbrella. This is an incisive summary of the Case Study, but it highlights the confusion of ideas that BI concepts result in within the TMHE context.

One example of this confusion is the statement that “Strategic BI is also dependent of business information from the structured data collection” (p.97). This is a good example for illustrating how the division puts the focus on the wrong questions. It can also be seen as yet another example of that the terms Strategic and Operative are not good to use as dividers, since the meaning of the terms are ambiguous.

6.1.2.7 A Concluding Terminology Discussion

One highlighted task for those working with BI is to maintain a definition of what Business Intelligence means; this is an appropriate question, but also significative for this subject in general and for the situation in TMHE in particular.
The most apparent question that needs to be addressed when approaching Strategic Business Intelligence is the one about definitions. This has already been highlighted as the most important one to solve, together with the question of ownership, but we mean to say that this work has not been given the necessary attention and the definitions made are not clearly enough, which is one evident result of the Case Study. This has, according to us, its root in the use of undefined terms to define a concept still “in flux” (p.25).

One aspect is that the Operational BI as description of tools and applications cannot lose their connection to “BI”, since it is a part of their everyday work with consultancy agencies and providers who are referring to- and uses BI. This is also something that TMHE was aware of when the division was made. The meaning of Strategic BI can on the other hand never be well-defined and clear to the many, if it is to been seen as the executor of Strategic BI within the framework of e.g. the BI-forum. Foremost this representation leaves behind a gap within the TMHE intelligence work. Thus the underlying cause, as we see it, is the use of Business Intelligence as an umbrella concept. The result of the Case Study shows, in conflict with the definition used in this Thesis, that even if it seems like a pragmatic grip to use the umbrella, it is not pragmatic for TMHE in their everyday work. It can be viewed as an understandable and natural grip because of the duality of the term, but this requires a clarity that is not there today.

6.1.3 Re-Thinking the Division – A New Model

With the acknowledged intrinsic problems of the division in Strategic and Operative BI discussed above, we see a need for a re-thinking of the division. In order to deploy a more comprehensive picture of BI it is necessary to realize that it is too complex to only be described in one dimension. Therefore the last part of this section will focus on what additional dimensions are needed.

6.1.3.1 Framework of Activities

A division that bears some resemblance with the conceptual division in Strategic and Operational BI is Pagels-Fick’s (1999) division in Generic BI and Decision-Oriented BI (see Figure 6). Pagels-Fick (1999) assumes a separate BI-function in his theoretical addressing and his division focuses on BI as a process with two different areas of activities: generic and decision-orientated.

The object of Generic BI (as to continuously build a knowledge base in regard to the driving forces of the business, for the stakeholders of the company to ensure competitiveness) has resemblance with the mission for the Operational BI within TMHE, even if Pagels-Fick (1999) includes analysis in order to build knowledge. Decision-Oriented BI is more situational and the object is specific analysis tied to certain decisions, or as incentives and initiatives in changing processes. Today, Business Planning with their scope and expected deliverance of intelligence products could be seen as responsible for both these activities (and that these are not conducted elsewhere), which we mean is a misleading picture.

The reason for using both concepts is to cover that Business Intelligence has this duality. In most cases the intra-functional work is self-explanatory as in Market Intelligence, Competitor Intelligence etc., but this would not cover the need for cross-
functional ad hoc studies and therefore a description of BI activities would not be complete without both activities.

However, the terminology in itself is not preferable according to us. All BI is per se decision-oriented, since the aim is to deliver decision-support. This is a process-based framework and thus describes the differences in how work is conducted, but without saying anything regarding the different areas that constitute Business Intelligence within an organization. Therefore we do not use these concepts as a description of the entirety of BI; still the division in activities is interesting for our Case Study.

6.1.3.1.1 BI-Forum Seen as another Way of Working
The plans for what we refer to as the BI-Forum (see chp. 5.4.4) serves as a good example of Decision-Oriented Business Intelligence. The Decision-Oriented BI denotes topics and specific questions that the management of the company views as important for the future and therefore wishes to have investigated. Sometimes it is well-defined questions (within the TMHE context it could be e.g. “What are the effects of a legislation on emission quotas?”) and sometimes it is broader areas (e.g. “What will a forklift truck look like in the future?”), which calls for different approaches, but are both project-based.

These types of exercises differ from the other BI in the way the work is performed, since it often calls for a cross-functional approach. It is also other types of problems and questions, and other groups ordering the analyses. TMHE has acknowledged the need for this way of working, and even if it is not put in place yet, we highly support the plan for establishing a BI-Forum. However, what is more important is that Decision-Oriented BI implies the existence of Generic BI. According to us this is only an activity (work is done but not labeled as intelligence) today within TMHE, which needs to be addressed and made visible within the organization, i.e. it is not possible to structure something that does not exist.

6.1.3.1.2 Generic and Decision-Oriented are not enough
Even though it is possible to divide the Business Intelligence activities within TMHE into Generic and Decision-Oriented, we argue that this is neither an unproblematic nor a useful division if it is the only one used, since it would not solve the issues discussed. This is because it is only covering one dimension (describing the differences in processes; how the work is performed, which frequency etc.) of the BI organization and does not say anything regarding which areas of BI (in the organization) that are covered. We argue that the Generic activities that are not structured today need to be highlighted, categorized by their constituents, and to have a more nuanced description.

6.1.3.2 Framework of Categories
The Global Intelligence Alliance describes in a Case Study a categorization of BI made by ABB. ABB divides their BI activities in the categories Market Intelligence, Competitive Intelligence, and Macro Intelligence (see chp. 3.1.7). Notable is that there are no watertight bulkheads between these categories and therefore intelligence topics can be applicable in more than one BI area. We mean that this type of categorization would fill the gap discussed above.
In Intelligence Work within TMHE in the Case Study (see chp. 5.4.3) together with the Information Needs Analysis (see chp. 5.5), we identified the intelligence work performed within TMHE, which we categorized (inspired by the BI-structure at ABB) in the four areas: Market Intelligence, Competitive Intelligence, Macro Intelligence, and Internal Intelligence. This is illustrated in Figure 32 below. For a more detailed presentation, please refer to Appendix 4.

It is important to notice that the categories do not reflect any specific corporate functions, but that the work within each category is performed by different functions. However, there are several points of contact, where the functions need to cooperate on a topic. A generalized map of where the intelligence work is performed, divided in the different categories is illustrated in Figure 31 below.

![Figure 31: Intelligence work performed at TMHE](image)

The category “Internal Intelligence” is different from the others since it contains activities that foremost turn inwards the organization. It could be argued that some of this work is not to be classified as, or highlighted as intelligence (for example the case example lacks an internal category). However, this internally focused work could also be argued to constitute a platform or background for other intelligence work and with an all-embracing approach we felt that this work was not to be left out. Foremost it consists of extensive financial analysis together with support activities such as Sales Support.

Within each category there will of course be the same needs as before, regarding applications and solutions for providing decision support. As already stated, we see this as an opportunity to discuss and run through the existing cross-functional structures in order to improve the gathering of needs on all levels and address those issues highlighted in the Case Study (e.g. the gathering of needs among top management).

### 6.1.3.3 Process Framework

As discussed above, we think that neither the framework of activities (Generic BI and Decision-Oriented BI) nor the framework of categories (above) severally, is enough to introduce as a complete Business Intelligence structure for TMHE. To complete the picture we also see a need for defining the processes that aim to structure important
questions of what is done, by whom, and what the outcome ought to be. We lack answers to these fundamental questions within the organization today.

By combining these three frameworks the new model provides an activity-based description easy to embrace. It is also a dynamic structure for mapping the activities of intelligence work performed, and to nurture a discussion of what should be performed in the future and by whom. The categories also encourage cooperation, and the inherent need for defining of the processes prevents overlap of work, which is a conscious grip because of TMHE’s functional structure; to avoid working in silos with members of the organization wearing blinkers.

We acknowledge the need for processes, but it is important to emphasize that the scope of this Thesis has not been to investigate the actual BI work in detail, which is why we will not be able to define or recommend what processes are to be covered. An easy way out would have been to adopt the Intelligence Cycle (see Figure 5) as it is presented in the case example, however with the critique in the Theoretical Framework in mind, we refrain to do that. The cycle, as a simple outline for an ideal flow, is too general to solve any real issues.

However, the theory acknowledges the importance of firm deliverables in the form of tailored intelligence products, as an outcome of the processes. The intelligence products are to be distributed in a timeliness manner using a channel or format preferred by the target group, e.g. a presentation, seminar, workshop, newsletter, report etc. For a further discussion on the outputs of the BI processes and the effects on information handling, please refer to chp. 6.3.3 in the next section of the Analysis chapter.

6.1.4 Applying the Model

Figure 32 below illustrates our BI model for TMHE. We argue that the four categories should constitute the body of the new BI structure. However, since the category Internal Intelligence contains activities that provide background and input to the other categories, this category is illustrated as an underlying layer.

![Figure 32: The new Business Intelligence structure within TMHE](image-url)
On the top of the model we have a coordinating layer mainly acting as a steering group for Business Intelligence within TMHE. The role of the steering group will be to maintain a valid definition of BI together with a viable BI structure. In order to accomplish that, we see that they have to ensure that the processes are up-to-date, have the right composition, and provide the intended outputs. On the table for the steering group will also be to ensure that the processes reflect the need for intelligence of the organization. It is important to acknowledge the difficulties of finding actual information and intelligence needs, as discussed in the theoretical framework (see chp. 3.2.1.1) and which will be addressed in the next section of the analysis.

As for the composition of the steering group, we see that it should contain members on a high level of the organization, with a current connection or interest to/in BI work. It is necessary, at least initially, to have a representative assembly to ensure that the TMHE BI is running in all functions. We also see that this steering group should not consist of more members than necessary, in order to compose a feasible structure and to avoid a wieldy group.

6.1.4.1 Not a Separate BI-function

It is important to note that this does not describe a separate BI-function. We think that it is neither feasible nor possible to establish a separate BI-function at the present moment. There is also disagreement in the theoretical framework whether this is desirable or not.

We still want to emphasize that we are of the opinion that the intelligence work should be carried out where the core competence and knowledge sits, thus in the corporate functions. The coordinating role per se, does not have the responsibility of aggregating information or intelligence, but we see the possibility that this task might be carried out in the coordinating layer. Depending on the development and will of the organization, we see that it is also possible that the coordinating layer could be re-organized into a BI-function in the future. If this is to be the case, aggregating and coordinating tasks will be lifted to this new function.

6.1.4.2 Changes of Assigned BI Actors and their Roles

The Business Intelligence structure as we define it, calls for some new roles as well as changes in current roles.

6.1.4.2.1 BI-Forum

We see the planned BI-Forum as playing an important part in the new BI structure. The current intention for this function is two-fold; to act as a steering group for the overall BI as well as performing ad hoc studies on behalf of the TMHE Management Team. We see no reason for changing these objectives, even though we raise a flag of warning that the composition of the steering group need to better reflects the total BI structure in order to act in the prescribed steering role in the, by us, proposed BI structure. This new role also means that the question mark surrounding Strategic BI as something secret, and intended for the Management Team only, can be met and straighten out. This will also make it easier to keep the ad hoc activities of the BI-Forum (the activities of the Decision-Oriented BI) separate and not communicated if necessary.
6.1.4.2.2 Business Planning

We see that Business Planning henceforth will have an important role. As the current owner of the overall concept, we see that they need to work closely together with the BI steering group especially when establishing the structure, but also in the future. Initially we see no reasons for changing this ownership, but in the long term the concept coordination ought to sit within steering group (where members of BP ought to be represented as co-opted members). BP is working with aggregation and coordination of information/intelligence today, and we see that this work should continue. At first we see that BP has an important part to play in the investigation of current structures, defining of processes, and defining of firm deliverables.

![Diagram of management levels]

Figure 33: Gathering of needs by IS Promotion

6.1.4.2.3 IS Promotion

The role of IS Promotion in the new structure will be as the lubricator of the Business Intelligence machinery. We have raised the question throughout the analysis of a revised structure for needs gathering regarding reports from BI tools and applications. Illustrated in Figure 33, we have that the gathering of needs should be performed on all management levels in the organization. Important to note is that the pyramid structure does not illustrate how the needs gathering work should be distributed, rather a description how it is likely to be distributed (i.e. with less demands on higher levels).

We also see that IS Promotion should be represented in the BI steering group, because they provide an important support to the BI work performed and if they are left out, there is a risk that the necessary support will not be provided. With a clear role defined in the new structure, we do not think that the confusion regarding the responsibilities of BI between BP and IS Promotion will prevail.

6.1.4.3 The Mid Term Business Planning Process as an Example

During the Case Study we have had an extra focus on the newly constituted Mid Term Business Planning process (MTBP). The input to the MTBP (see chp. 5.1.4.2) is done ad hoc today, and we see that this is a good example of a process and delivery from the BI apparatus.
Figure 34: Input to the Mid Term Business Planning Process

The input to the Mid Term Business Planning process should be in the form of firm deliverables, stemming from transparent and structured processes and not as today, ad hoc by each responsible VP. A discussion of how the Business Intelligence structure will affect the information handling within the organization will be covered in the last section of the analysis.
6.2 Information Needs Analysis

Within this section of the analysis the information needs analysis is treated. First the shift of focus is discussed, which is followed by theoretical remarks. Thereafter the result interpreted as the two lists is analyzed. Then the room for improvement through coordination is reviewed from the premises that the questionnaire is built on. The section ends with a walkthrough of the six groups, similar to the one in the empirical presentation.

6.2.1 Shift of Focal Area

Our initial intention was to identify the information needs for strategic decision-making through the top management’s planning processes. However this turned out to be a too vague and implicit formulation. Another aspect, discussed in the first section of the Analysis, is the lack of watertight bulkheads between operative, tactical, and strategic decision support, which is why it was hard to define the scope as “information needs for strategic decisions”. Instead it was rephrased into “information needs for fulfilling the roles of the respondents”. We mean to say that this shift was necessary, but also that it still serves the purpose of the Thesis. We are investigating the information needs of our target group (five of which are members of TMHE Management Team) and therefore their strategic responsibilities ought to be included in the found information needs. This approach is also connected to ideas of Pirttilä (1997) and Frankelius & Rosén (2002), that the actual information need of a company could be defined as the information needed in order to achieve the organizational goals, which we mean can be interpreted as the well-being of information supply for the management of central functions.

The purpose of the questionnaire was thus for us to be able to identify information gaps that are of great importance to fill, and also to be able to highlight room for improvements regarding the coordination of information supply. Both these purposes are tied to Business Intelligence and Information handling as well as to the role of BP as a cross-functional organization.

6.2.2 Filling of the Gaps

As discussed in the Method we have not set out to say how these information gaps should be filled or anything about the methods for gathering this information; how or even if it can be gathered. Neither can we, due to the nature of the information needs analysis, point out which specific information gap is most critical to fill. One important reason is the heterogeneous group of respondents and the criteria of fulfilling the role/roles of top and middle management of central functions within TMHE.

6.2.3 Finding the Actual Information Needs

A major theme in the theoretical framework covering Information Needs (see chp. 3.2) is the difficulty of finding out the actual information needs of the management. One might be able to see existing problems, and that information is needed, but that is not same as knowing which information is needed. Because of the unconscious information needs, Pirttilä (1997) even states that it is an impossible task to perform. Another discussion is about needed information in contrast to wanted information. Pollard (1999) raises the risk of making information needs analysis being nothing but the making of wish lists. Our approach, which

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34 Top and middle management of central functions within TMHE
has support in the theory, has been more pragmatic with a focus on information wants (instead of information needs), which makes the information needs analysis feasible.

### 6.2.4 List of Information Gaps

This is our modification of the third and fourth stages in the World Mapping Method; *Analysis of Significance* and *Analysis of Current Knowledge*. In the Analysis of Current Knowledge, the knowledge about each factor is discussed. In order to tie the result to information handling, we choose to investigate the supply of information. The questionnaire was then a way for us to manifest the interpreted information gaps through the rating system.

### 6.2.5 Filtered List of Information Gaps

The process of finding the filtered list of information gaps is our equivalent to WMM’s Meltdown stage. Foremost two points can be made with the activity of “reverse matching” (see chp. 4.5.3.2). Firstly these are areas of potential synergies, where an improved coordination and collaboration could reduce overlapping activities and thus where the effort needs to be put according to the outcome from the questionnaire. However, even if these are needs that the organization lacks supply of information for today, it is not possible to say if it is worth the effort of focusing further on fulfilling the needs. Further investigations need to see if it is feasible, as well as if the cost/benefit makes it worth the effort.

Secondly this activity is of interest in itself because it can be raised to the question of what information is in company today. The ability to answer questions when needed has been highlighted in the Case Study and almost used as an argument for the needlessness of a structure to ensure better information supply. However this strike a discordant note with the experiences that the members of the organization have poor knowledge about what other departments are doing, and that “sometimes they stumble across things that they did not have a clue they knew” (p.84).

#### 6.2.5.1 As a Catalyst for Discussion

We think it is interesting to see the “reverse matching” as a catalyst for discussion (initiated by BP) within TMHE about how information ought to be handled. What does it mean that the filtered list of information needs is half as long as the list of information gaps? Should these information needs be addressed since they are a demonstration of dissatisfaction, or is this merely a mark that people are never ever going to be satisfied (i.e. that an information supply always can be improved)? Is it of major importance for TMHE that our respondents are satisfied with the information supply of information that they value as of major importance for fulfilling their roles? Or should the result be interpreted from the view that even among the group that our respondents constitute, not everyone should be supplied with/have access to information to fill all identified gaps?

### 6.2.6 Cautious Interpreting of the Results

We are aware of the simplistic aspects of the questionnaire, which is a result of us having merged heterogeneous information needs of our respondents in order to make into a tangible questionnaire. This calls for cautiousness when displaying and interpreting the result, but we mean to say that it still serves as an interesting highlighter of needs of major importance with unsatisfied information supply. As underscored in the theory it is of great importance to try to fill information gaps, because otherwise they will be filled with assumptions and speculations or with the self-increasing process Hamrefors (2002) refers to as superstition.
Then again it is necessary to ensure that the added information also means added business value. This is of course easier said than done, but as expressed in the Case Study there is also the risk of overanalyzing competitors or market trends. As one respondent frame it: “At the end of the day our businesses is selling forklifts trucks, it is not doing economic forecasts” (p.109).

It is important to have in mind that we do not claim that the questionnaire contains all information needs, or to say that these are the most important ones. Evident in the questionnaire is the lack of internal financial analysis as well as supply-related information needs. The information needs analysis is to been seen as an initiating of the process of having a more resourceful information handling. It is also a way to bring forward information needs that might make the difference in the future, since they are weighted as of major importance by people in managing positions within the company. It is also important to realize that the questionnaire is only one part of the needs analysis, which in itself is one part of the threefold purpose of the Thesis, and it should not be viewed separated from the rest of the material. We see that the result from the Information Needs Analysis is to be used as a basis for discussion with a twofold applicability: firstly as a highlighter of information gaps, and secondly as a highlighter of areas of improvements from the perspective of information handling.

6.2.7 Coordination of Information Needs

As seen in the Case Study, the activity of “reverse matching” (see chp. 5.5.3.2) for finding room for improvements, more than halved the list of information gaps. Foremost this exercise serves as an illustrator of what an improved coordination of information supply, i.e. an improved handling of information, possibly could achieve. There is a potential that half of the identified information gaps could be filled or at least reduced, without more resources being dedicated to gathering and analysis, if the activities of other functions were shared with the rest of the organization.

One could argue that if we would have included all functions of TMHE, the filtered list of information gaps would decrease, while we loose areas of expertise available with the limitations made. This might be true for some of the needs, but if we would have included all functional we would also likely have identified a much longer list of needs. When we make a run-through of the information needs in the filtered list and compare with the excluded functions we do not find many given matches, and even if it could be done, the first list would still be an indication of lack of information coordination.

Given this list of needs and the delimitation to not make statements about the overall needs of TMHE, it is possible for us to discuss the result. Not to be wondered at, the categories undergoing major loss of needs are the internally based group TMHE and the functionally bounded groups Sales and Customers. The following three groups: Market, Competitors, and Technology, Industry, and Economy are to a higher extent externally focused which could explain the outcome. Most apparent is result of the matching within the last group, which contains needs with less given assigned owners, but also less specified categories of needs as well as specific needs. Below follows a walk-through of the categories in order to foremost highlight activities performed today within TMHE were an improved information handling would satisfy the target group in fulfilling there roles within the company.

6.2.7.1 TMHE (this part refers to internal operations)

The TMHE-group has clearly assigned categories which seem to provide information to a certain extent. Products (TMHE), Production capacity (factories), Order information,
Pricing are all categories of this type, which are closely connected to functions within the organization. The Current activities category is especially interesting from an information handling and information sharing perspective, since it somehow indicates the limit of what information is to be shared and stresses the discussion of how to treat sensitive information.

6.2.7.2 Sales (this part refers to internal operations)
The same reasoning as for the TMHE group is applicable within Sales. Here it is the Sales statistics and Sales KPI:s which are the evident categories.

6.2.7.3 Customers
The group Customers contains areas of information needs that could be referred to the remark about areas where the company has extensive supply of information in those certain phases when it is necessary. Still we mean to say that they call for attention, especially since this group contains a line of categories that are not affected by the “reverse matching”; meaning that they exists also in the filtered list. An exception is the TMHE Brand awareness and the Benchmarking of trucks sub-categories that resembles the categories within TMHE and Sales.

6.2.7.4 Market
Market trends is a diverse group which is fully satisfied, but still has categories where the respondents lack information today, but one also has to bear in mind that the trend concept has an inherent lack of being fully satisfactory. The one that stands out here is Market position TMHE with the sub-division Market shares that is fully supplied for one or more respondents.

6.2.7.5 Competitors
This group has a resemblance with the discussion within the Customers group where the company has extensive ad hoc supply of information of the competitors. However it is also possible to liken it to the situation within TMHE with categories that have assigned providers of information, and therefore these information needs are fully supplied for some of the respondents.

6.2.7.6 Technology, Industry, and Economy
As mentioned above this group is the one with the least information needs rated as of major importance with a fully satisfied information supply. However these mostly externally based needs are all rated as of major importance and could serve as a starting point for future analysis of the business environment and division of responsibilities both for the gathering and sharing of information.
6.3 Information Handling

In this the third and last section of the Analysis chapter, we discuss information handling within TMHE. First, the interconnection of unstructured information, Business Intelligence, and information handling is presented. Then the issues of information handling are discussed, followed by a part regarding how the new BI structure will affect the handling of information. Last but not least, the conceptual systems solutions are discussed and areas of implementation are proposed.

6.3.1 Unstructured Information, Business Intelligence, and Information Handling

The definition of unstructured information as used within BP (see chp. 5.6.1) does not include specifications of the content of information, which we interpret as it could be seen as a general issue and not something specific for single corporate function. Whether a piece of information should be classified as structured or unstructured is context-dependent; meaning that in one context (for one individual) a piece of information could be structured while it is unstructured in another context. Issues of unstructured information could thus be said to be a part of a general problem of information handling (sharing, finding, and gathering) in the different corporate functions. The discussion of unstructured information is especially valid for many of the Business Intelligence activities (e.g. competitor analysis, ad hoc studies, and analysis of the macro environment), where those assigned to perform these activities are subjected to try to make use of unstructured information. Another point of contact between Strategic BI and information handling is found in the objective for Strategic BI at TMHE, which includes the aim to: “increase organisational learning and knowledge sharing” (see chp. 5.4.1.2).

Thus, we see that there is a clear connection between unstructured information, information handling and Business Intelligence.

6.3.2 Issues of Information Handling

In the Case Study we have identified several difficulties regarding information handling experienced by our respondents, which are discussed in this part.

6.3.2.1 Information Finding and Gathering

Today, the use of the personal network is the predominate channel for finding and gathering information, among our respondents. The company intranet, which is the main intra-organizational source of information, is also used, but not to a comparable extent due to various reasons. Here it is important to note that the strategies of finding and gathering information may differ between different levels in the organization. This is because of the need for different qualities of information on different levels in the organization. Our respondents all belong to the top and middle management, where there is predominant need for aggregated information. According to our respondents, it is difficult to find this type of information on the intranet, which we believe contribute to the extensive use of the personal network for fulfilling their information needs.

6.3.2.1.1 Personal Networks and Information Pull

In the theoretical framework, it is emphasized that personal interactions provide the most effective way of embracing information as well as sharing knowledge and intelligence.
However, using the personal network for finding and gathering information is time consuming; according to some respondents it sometimes takes weeks before the information asked for is delivered. Even though the use of the personal network is to be seen as an information pull strategy (see chp. 3.3.3.1), which has clear advantages over information push according to the theory, the uncertainty of the time of delivery reduce these advantages. Receiving the information in the right time and location is the major benefit of information pull, according to O’Hara (2008).

6.3.2.1.1 The Risk of Searching in a Bubble
For efficient information handling when relying on the personal network, one have to know where to find certain information. This is acknowledged within the organization and one respondent even argues that it is a part of their job to know where to find information. This could also be connected to “scratching backs” (see chp. 3.5.1), which describes a phenomenon that personal relationships are of great importance for information sharing, and that people are reluctant to share information that is considered valuable to them, with people they do not have a relation to.

Considering the importance of personal networks for the information search and gathering, the size of the organization could be seen as a constraint. In larger companies it is of common reasons harder to cover the entire organization with the personal network. In this lies an inherent constraint of personal networks, that eventually a “roof” of the number of relations possible to maintain, will be reached. TMHE of today is a large and disperse organization with its roots in two different cultures, and because of the functional structure there is a risk of working in silos. We think that this might lead to something similar to the concept of “path dependency” (see chp. 3.3.3.1); a vicious circle, where the individual is mainly keeping track of the information that is within their network. If the personal network is limited (due to for example a functional structure and size of organization), we see that the information will primarily be collected from certain parts of the organization. Even though the information seeker acknowledge that he or she needs information from other parts of the organization, the information will be hard to retrieve. This is also highlighted by one of our respondents, who describes that it is hard to find information in new areas. He does not always know where to go or whom to ask, because they lack visibility of what colleagues in other functions are doing. With the ever-increasing amounts of information in today’s organizations, we think that it will only be more difficult to find the right information.

Thus, we see that there is a risk of missing out on information deriving from other parts of the organization. We also mean to say that this will conduce to a silo-like structure, since people will not access information to the same extent from parts of the organization where they do not have contacts. This type of organization will also be difficult to penetrate as newly employed, coming from another industry or organization; as one respondent puts it: “I’m not jealous at those coming new to the company” (p.109).

6.3.2.1.2 Issues of the TMHE Intranet
The intranet today at TMHE is holding great amounts of information, but it is also criticized for being more of a location drop than an actual source used when gathering information. This is partly because it is hard to find ”deep”, aggregated information. Beside the intranet, there is no central source of information in the organization that is able to give a common view and to avoid the information silos of today. One important explanation of the modest use is also the complicated information structure that reflects the organizational structure; an organizational structure that has changed a lot over the years, and is something that never can be seen as set
In stone. Notable is that the intention with the intranet is to serve as the main intra-organizational information source, and thus make information available not only within the corporate functions, but between these.

If analyzing the TMHE intranet from an Enterprise 2.0 perspective, e.g. using McAfee’s (2006) key components of an Enterprise 2.0 platform: Search, Links, Authoring, Tags, Extensions, and Signals (see chp. 3.4.1), it is easy to realize that these are all areas that the TMHE intranet lacks today. This is not surprising since the TMHE intranet is not built on an Enterprise 2.0 platform, or with this concept in mind. But the comparison serves as an illustration of areas that needs to be improved for a well-functioning intranet.

Users experience difficulties of finding the right information on the intranet which can be deduced from an inefficient search engine, inefficient structure of information (related to Links and Tags), a top-down authoring structure, and primary use of email to get notifications on updates of information (Signals). There is also no Extension functionality on the intranet today. This component could for example be used for coupling employees working with the same kind of questions. A prerequisite for this to work is an improved profiling of the members of the organization as a way to gain awareness of competencies and background of other members and what they are currently working with or have been working with.

Concluding this part, we argue that the intranet would be more used if having some of the features of an Enterprise 2.0 platform.

6.3.2.1.2.1 A Need for a Clear Business Purpose
Achterberg (2001) emphasizes the necessity of having a business purpose (and thus a need) of sharing information. We see that this is also one important area where the traditional intranet is failing. In order to meet the different needs and purposes of the various parts and levels of the organization, flexibility is needed. The intranet with its pre-defined structure needs to be able to squeeze all the needs of the organization within the same frame, which is why it is unwieldy. This could be contrasted to e.g. a Wiki that has a dynamic structure, and thus does not have a pre-defined overall frame where one has to squeeze in the needs; or rather it can be seen as having a frame that is possible to adjust to cover both new and old needs. This means that in a large organization like TMHE, it is unlikely that the intranet ever will be able to fulfill the needs of all users, if using the same approach as today.

6.3.2.1.3 Issues of Finding the Right Information.
Our respondents are unanimous in the view that there is a large amount of information available within the organization today and that the issue is thus not lack of information but rather to find and make use of the right information.
The issue could be illustrated with Figure 35 above. New information is coming into the organization all the time, but not in a structured way. It is added to the already great pile of unstructured information. For the individual information seeker (illustrated by the fisherman on the right hand side of the picture), it is impossible to get a good overview of what information is available. Thus, he or she is left only to ”fish” for the information searched for, which makes it hard to find the right information. There are some attempts of structuring information, in for example project management tools or in special projects, but this takes time and often is some kind of intermediary (which is illustrated by the diver) required.

6.3.2.2 Information Sharing

Above, we discussed how people are finding and gathering information within TMHE today, which per se is done according to an information pull strategy (the user searches actively for information). Information is also shared by putting information on the intranet, but, if looking at the overall information flow, a large part consists of information that is pushed to the individuals. This is mainly done through email (e.g. company newsletters, notifications of organizational changes, documents, reports, rumors etc.). Some of this is information asked for and wanted, but the view given by our respondents is that they are literally being bombarded with information to a point where it is almost impossible to embrace. According to Buffa (2006), TMHE shares this problem with other organizations and Davenport (in McAfee, 2006) points at an investigation where knowledge workers felt that email were overused to the extent that they were overwhelmed and declined their productivity, a situation that is also prevailing at TMHE. It is thus possible to connect the information push strategy of information sharing with the situation of serious information overload.

However, information push is not to be viewed as an all-bad concept. It is needed for example for alerting, or to highlight areas of information that is not known to members of the organization. Hamrefors (2005) argues for example that information systems should include functionality of induced push, that information relevant to the subject in matter should be viewed along with the information searched for. However with the situation described above, there is an imminent risk that the important alerts are drowning in the flooding river of information. We see that that there is a risk of getting a situation comparable to the classic fable “The Shepherd Boy and the Wolf” by the Greek philosopher Aesop; that important alerts are not taken seriously because similar messages are coming in all the time.
6.3.2.2.1 No Common Policies for Information Sharing

TMHE does not have any clear and common guidelines or policies when it comes to what information is to be shared, to whom this information is to be shared, in what form, and when this information is to be shared. We see this as one explanation for the issues experienced with information that is pushed across the organization.

The Case Study also shows that there are cultural differences between the different functions when it comes to sharing of information. One result of this is for example that some of our respondents feel that it is difficult to know whether it is possible to talk about certain subjects or not with colleagues in other functions, because they have a different view on what information is to be shared. This is also an example of the spread view among our respondents that they do not know what is done within other functions. Because of this, many also fear that the same work is done by different functions, which would add to the total workload and be an inefficient use of resources.

6.3.2.2.1.1 Sharing in order to be Flexible

In the Case Study two different views on sharing of information are presented: Is information shared to the extent of what is necessary, or is information shared to the extent of what is possible. The highlighted difference in if one is sharing to the extent of what is possible or not, is that with more details it will be easier to adjust to new circumstances. The point raised is that the Management Team needs to address and decide upon which route to take. This need was also acknowledged above with the discussion about what is possible to talk about as an example of that there exists no shared view today within this area. The adjustment to new circumstances caused by changes can also be connected to the change discussed in the theoretical framework, towards implementing strategies. Due to the changeable surroundings of today, Tyson (1990) argues that as a consequence strategic decisions must be made continuously. Pagels-Fick (1999) uses “strategic flexibility” as the ability of an organization to make changes at short notice to a low cost. With Hamrefors (2002) this change is seen from the angle of the strategists of the companies. He makes a parable to the strategists as landscape painters, who rather then describing actual landscapes; have to be able to paint pictures of possible landscapes. Thus, we advocate the strategy where information is shared to the extension possible, in order to ensure full flexibility. However, it is important to emphasize that information should be made available, not pushed to the final recipients.

6.3.2.2 Reluctances of Sharing Information

One respondent claims that despite the lack of a common information sharing culture, people are keen to share, but that sharing is not included in the processes, which is why it is not natural to communicate and share results and information. This can be contrasted to the view of some respondents that people are reluctant to share information because they cannot ensure the quality or that they fear that the information will or can be misinterpreted. We see that this fear of misunderstandings possibly bottoms in a lack of common definition of concepts in the organization. Achterberg (2001) means that “information hoarding”, which is used to describe the reluctance of sharing to the extent that no sharing is done, is a sign of lack of trust. This can also be interpreted from the point of view of “scratching backs”, that personal relations are conclusive for the sharing of information. Because of this we do not think that including information sharing in the processes just because the sake of it would provide the answer. This is also supported by Achterberg (2001) who emphasizes that information sharing should not be seen as a self-fulfilling purpose, but has to have a business purpose at its root. Once again one should note that if information sharing should be included in the processes, this
should be done by *making information available* (e.g. on the intranet or in a Wiki). Not by pushing it to individuals, which would aggravate to the situation of information overload.

### 6.3.2.2.2.1 Impossible to know everybody’s Needs for Information

If information would be pushed, it would be necessary to know the information needs of all colleagues in the organization. One respondent also stated that TMHE should put energy in finding out what information needed to be shared, in order to be able to structure the sharing. This thinking can be contrasted with the arguments of Stenmark (2006), who’s research points at that it is impossible to determine the structure of information use when having the “top-down” approach, since this only shows how the management wants people to use information, not how it is actually used. Therefore he proposes folksonomies instead of taxonomies (see chp. 3.3.4.3). He describes that the taxonomies are reigning in traditional industrial businesses because of history and that this permeates how the entire information handling apparatus (sharing, finding, retrieving etc.) work. In order to make a change from a taxonomical approach into a folksonomical ditto, the norms and attitudes of the organization also needs to be changed. But this is not done in a trice, which is why one has to be humble in one’s quest for change. For us it is initially about shedding light upon today’s situation and to raise the question and acknowledge that organizational culture is important to have in mind when dealing with issues of information handling.

### 6.3.2.3 A Concluding Information Handling Discussion

We mean that all the issues of unstructured information and information handling discussed so far can be related to issues of a misbalance in the relationship between information push and pull. An effective information handling requires a good balance of these both concepts. However, there are unfortunately no universally applicable rules for what is considered a good balance.

We see that the heterogeneous information sharing culture at TMHE needs to be transformed to a more homogenous, with clear policies for how information is to be shared. However, with clear policies we do not mean that it should be clearly defined exactly which, when, how, and to whom information is to be shared. We believe that people need to take the power of their own information supply, mainly because no one can possibly know what information other people need, but also in order to avoid information overload. In line with this, we have highlighted that information is to be shared by making it available, not by sending it to others. Ensuring transparency between the different corporate functions is also essential. In order to make this feasible it has to be clear what information can be shared and what information that cannot. Our standpoint is that information should be made available to the extent possible.

Considering that TMHE is a fairly new organization stemming from two different organizations, it is of great importance to set up cross-functional frameworks and structures for information and knowledge sharing, since the personal networks might not be fully developed over the organizational borders.

### 6.3.3 Information Handling and the New BI Structure

If looking back at the analysis of Business Intelligence at TMHE, we see that many of the issues experienced regarding information handling could be connected to the lack of structured BI work and output in the organization today. If having a well-structured BI apparatus with defined and communicated processes and outputs, we believe this will provide
a better overview of what is done, and who is doing what in the different functions; it will thus increase the visibility and the transparency in the organization.

It is also important that the output from the Business Intelligence apparatus is made available to the rest of the organization (except from maybe the direct input to e.g. the Mid Term Business Planning process). We see that this could be in the form of e.g. a BI portal, where the results from the different BI processes are collected and where it is possible to get an overview of what BI work is done within the organization. We believe that this can become an important source of information and thus become a good complement to the personal network. However, written reports are not the only intended output from the BI processes. We recommend, in line with the theory, that the output ought to be tailored intelligence products, but possible to distribute in various channels or formats. Beside reports the formats could be seminars, workshops, presentations etc., depending on the preferences of the target groups.

In the Theoretical Framework it is also emphasized that the most effective way of transferring intelligence is by meeting face-to-face. We see that if using the various suggestions of formats for the outcome, this can be seen as arenas where people can meet cross-functionally. Also the actual processes can be seen as such arenas. Thus, we see that a structured approach to BI will increase the cross-functional work, the personal networks, and also in the long run also the organizational knowledge.

6.3.3.1 Information Handling Could Reduce Information Gaps

In the Information Needs Analysis we have seen that more than half of the information gaps identified are information needs that other respondents have stated as having a fully satisfied information supply of. This is an indication of that better information handling could reduce the information gaps. In a perfect world with total control of information by the user, there would be no need for an information needs analysis. However, as this is an utopia these still serves a purpose, but maybe foremost (as discussed in chp. 6.2.5.1) as a catalyst for necessary discussion, that needs to take place within all organizations and which is highly connected to issues and questions of information handling touched upon in this section. Our point of view is that a new BI structure would help to improve the coordination of information, and thus reduce or fill information gaps.

6.3.4 Systems Solutions for Handling Unstructured Information

A classic pitfall is that any problem could be solved with a technological solution, without acknowledging the necessary needs for cultural changes, changes in the way of working or changes of the organization. Tools are merely a mean for reaching a purpose, but at the same time they can be a catalyst for change of the culture, organization or way of working. The need for the latter was analyzed above, but the inefficient search, gathering, and sharing of information within TMHE is also possible to analyze from a technological perspective. The theoretical framework covers technologies and concepts aiming at improving information sharing, creativity, and collaboration among its users.

6.3.4.1 Introductory Discussion of Systems Solution Terminology

The section covering Systems Solutions for Handling Unstructured Information (see chp. 3.4) is permeated with terms and concepts that are so called buzzwords. We see a danger in putting to much focus on the terms, rather than the concepts behind these. There is a risk that an eventual implementation of these concepts and technologies will meet resistance due to a lack of understanding of what these really mean. There is a risk that these are associated with the
hype of web activities like blogging and social networking, more connected to leisure and spare-time, than business value. In this Thesis, we are using the terms Enterprise 2.0, Web 2.0, Wikis, RSS, and Enterprise Search platforms merely as labels of concepts. It is the different approaches to information handling that these concepts provide that are central, not the technologies. The notion of Enterprise 2.0 (or Web 2.0) is something that is made up within the last four years, while e.g. decentralization of information ownership and the discussion of information push and pull are much older. Another risk with the usage of buzzwords that speaks for a modest use (which is especially valid with IS/IT buzzwords because of the furious pace in the IT industry), is that these are instantly replaced by newcomers. As an example, Web 3.0 already flourishes within the web technology community.

6.3.4.2 Scrap the Intranet in Favor for an Enterprise 2.0 Solution?

From the discussion above (see chp. 6.3.2.1.2), it seems like the Enterprise 2.0 concept is able to deliver ways for overcoming most of the issues related to the TMHE intranet. Thus, one might think that an easy solution would be to scrap the intranet and implement an organizational-wide Enterprise 2.0 solution instead. Unfortunately, there are important factors to consider before throwing out the current intranet.

6.3.4.2.1 Organizational Constraints

Firstly, the main constraint lies in the organization. TMHE is the result of a merge between two industrial organizations, both with a history lining back to the first half of the 20th century. In the theoretical framework, Stenmark (2006) argues that both the organization and information infrastructures in industrial organizations often are shaped by norms and attitudes stemming from the 20th century. The empirical study confirms that these norms and attitudes are prevalent within TMHE; there is a clear top-down approach of control, which also reflects on the organization and the control of the information systems and structures. According to Stenmark (2008) these norms and attitudes are not compatible with those essential for the Enterprise 2.0 concept. In order to make a successful implementation of e.g. a Wiki-based intranet, he argues that there must be a change towards, or at least an acceptance of the components of the organizational culture that Enterprise 2.0 requires.

Because of these contradictory cultures, it is likely that an eventual implementation will meet resistance. Telleen (1996) argues that the resistance is likely to be unsuccessful in the long-run. However, we see a risk that the size of the organization possibly extends this time-frame to an “even longer run”. This makes it even more important to have the support of the management for as Telleen (1996) stresses “stimulating diversity and mixing of ideas instead of gatekeeping the information” (p.48).

6.3.4.2.2 Not Ready to Use from Day One

A traditional intranet has a pre-defined structure and is filled with information and ready to use from day one; a Wiki is empty. The structure will be created dependent of what information is fed into the system. This makes it impossible to see an organization-wide implementation of a Wiki from day one. In TMHE, we do not see that a Wiki would be able to replace the intranet today, but we see that the functionality is needed and think that Enterprise 2.0 solutions are to be seen as enhancers or complements of the intranet. This is also supported in the theoretical framework, where McAfee (2006) also suggest that Enterprise 2.0 solutions can be integrated with traditional intranets despite the large differences in structure and approach.
Whether the Wikis will be able to implement organizational-wide or not in the long-run is not fruitful to discuss at the moment. TMHE is a large and complex organization and the Wiki concept needs to gain support from all different parts of the organization in order to be able to grow successfully. If looking at merely the structural problems of the intranet, a similar effect as a big and organizational-wide Wiki could also be achieved if implementing an effective search engine (see chp. 6.3.4.4 for a discussion on Enterprise Search).

6.3.4.3 Using Enterprise 2.0 as a Complement
From the discussion above we conclude that it is not feasible to replace the TMHE intranet with an Enterprise 2.0 solution. However there are many areas of work in the organization today, where we see that e.g. a Wiki would serve as a tool facilitating handling of unstructured information as well as collaboration. If focusing on Wikis, we see that the main strength lies in using the Wiki as a digital notebook. Because this notebook is shared with the colleagues, it enables a continuous discussion that is collected in one location as well as it provides a central location to put loose pieces of information, documents etc. When having all information on a topic collected in one location, it is possible for anyone with access to the Wiki, at any time, to elaborate on the information. We believe that using a Wiki as a central tool, and as a way of working, will help to provide a common view of the information. We also think that using a Wiki will help to ensure the quality of information. This is because it is open (to those with access), and thus that errors can be corrected by others, but also that the use of authorization control and the lack of anonymity means that information always have a sender. Altogether, Wikis are not rocket science, more of a new way of working.

6.3.4.3.1 Start Small and Use an Evolutionary Approach
Because of the necessary changes in attitudes the theory suggests an evolutionary (not revolutionary) approach for implementing Wikis. The idea is to follow the concept of viral marketing and let it the spread by itself within the organization, i.e. if it is successful in one group, other members of the organization will see the benefits gained from using a Wiki and will also request to use Wikis. Another advantage is that if it is not successful, it is easy to drop. This is because the Wiki technology does not call for heavy investments, since it is software that is installed on a server and ready to use, unlike intranets which are more a choice of platform and therefore done for a longer timeframe.

6.3.4.3.2 Examples of Areas for Application
Because of the intended use as a digital notebook together with the evolutionary approach we see that the best places to try implement Wikis are in smaller units, teams or projects that are meeting-, noting-, and knowledge intensive. This is also acknowledged by Hansson (2008).

6.3.4.3.2.1 BI Groupings Heavy on Unstructured Information
For teams or groupings of BI that are heavy on unstructured information, we see Wikis as a possible tool to use for effective structuring of information and at the same time being able to cooperate within the group, despite the possibility that the group members are not located at the same place or working within the same function. This will ensure a common picture and the advantage of always having access to updated information. We see Wikis as a possible tool for all teams or groups in the organization (virtual or physical does not matter), because of the easiness to use and to set up. If looking within the BI structure, an obvious example is the discussed BI-Forum (see chp. 6.1.3.1.1). The idea with this group is that it would be
working with situational tasks and investigations that need aggregation of information from various areas and sources.

Wikis could also play an important role in the continuously BI work for building up a knowledge base. If storing information in a Wiki, it is easy to update the information whenever necessary. This means that the latest information on a specific topic always is available, and thus not only published in an updated report at set dates. This also enables effective information gathering through information pull. Areas that would specifically benefit from using Wikis are groups working with competitor analysis and Mergers and Acquisitions.

For RSS there are several potential areas of application connected to the proposed BI structure (see chp. 6.1.4.). Monitoring activities regarding information available on the Internet or intranet, regardless of which category of intelligence, could be performed through the use of RSS tools, in order to avoid having to frequently visit each web site. Examples of sources are monitoring of press, sites containing logistic theory, competitors web sites, web sites of vertical industries, and information services of different institutions (political, economical etc.).

6.3.4.3.2.2 Wikis and RSS could Replace the Unnecessary use of Email
If seeing Wikis as a tool for collaboration and handling of information in any team or grouping in the organization, we see that Wikis could replace the use of email in many situations and thus ease the problem of information overload. This is if it is combined with the use of a RSS reader (please refer to the example described in chp. 3.4.5.2).

6.3.4.3.2.3 Handling of Rumors
The handling of rumors is acknowledged in the Case Study as a lacking area within Business Intelligence (see chp. 5.4) at TMHE. This would be an activity foremost within the Competitive Intelligence category and directly connected to unstructured information. Today there is no structure for handling (finding, gathering, and sharing) rumors within the company and the experience is that the information is stuck at wrong levels and without a well-functioning storing; it also is person-dependent. However, as already touched upon in the BI analysis, the implementation of a support system to ease this problem, we believe is easier said than done.

The major challenge, also acknowledged in the Case Study, lies in motivating people to give information even though they sometimes do not know the importance of the information. Seen from a different angle the importance of the information can lead to a “hoarding” behavior equally hard to avoid. The desirable state is a “yes-loop” as an incentive for people to provide information. However from the perspective of technicians and salesmen locally, this loop or a situation with “scratching of backs” is not easily established.

If a Wiki ought to handle rumors it requires to be organization-encircling, open for anyone to use, which imposes the delicate problem of user access and sensitivity of information. However a situation as the one described in the Case Study with a respondent who receives notifications on rumors almost on a daily basis and lacks the possibility to structure these notifications as a way to relate, process, and organize the information, a Wiki would serve as a good tool.
6.3.4.4 Enterprise Search Platforms
Another systems solution that has the potential of easing the handling of unstructured information within the organization today is an Enterprise Search platform.

6.3.4.4.1 Find Information in Almost All Digital Sources
Today, the only search tool available organizational-wide is the intranet search engine. Enterprise Search platforms are able to index almost all digital information sources that are able to connect to a network within an organization, which together with content from the Internet, make it a good tool for searching information.

Because e.g. file servers and project management tools are included in the search, we see an Enterprise Search tool as a possible way to increase the transparency between different functions. However, this also stresses the difficult question of authorization rights. Information that one is not supposed to have access to, should not be able to be found through a search tool.

6.3.4.4.2 From Content to Context
If using traditional keyword search, these engines are only able to search exact words (or combinations of words) in e.g. a text. Therefore a text containing all keywords searched for will be ranked high in the search result. Search engines like Google also rank pages according to how many other pages have linked to the page in question. However this does not say anything about the relevance of the page to the user (please refer to the ATM-example on p.53). An Enterprise Search engine on the other hand uses for example text analysis and search profiles of the user, in order to provide a search result that better match the context, as well as the intent of the user. In other words, make sure that “what you need is what you get” instead of “what you ask for is what you get”, as expressed by Klemp (2008).

6.3.4.4.3 Search the Intranet
If having the study performed on American companies (see p.50) in mind; showing that knowledge workers spent 3.5 hours in average looking for information internally without success, and that another three hours were spent recreating this missing information (even though it existed in the organization), it is easy to conclude that if information could be found in an easier way, money could be saved.

We are not sure if the example is applicable on TMHE as well, but there are serious issues perceived by our respondents, for example regarding the structure of the intranet. If not being familiar with the structure, information is hard to find, because the taxonomy does not reflect the searching pattern of the user.

In the theoretical framework, folksonomies are argued to better reflect the information usage pattern of the user, since it is built incrementally when adding, editing or tagging information. However, as discussed in chp. 3.4.5.1, an evident drawback is that this approach assumes that this structure is built from scratch and thus need to reach a critical mass before working effectively. Instead we see the possibility of using an Enterprise Search platform to find information on the intranet. Search has the advantage over menu structures (taxonomical or folksonomical), that it is possible to use direct questions, which is faster and more effective than to click through a hierarchical structure. Another important factor speaking for the use of search is that many people today are used to use search engines like Google for their personal information needs.
6.3.4.4 Applications of Enterprise Search within TMHE

Beside from overcoming the structural problems of the intranet, we see that an Enterprise Search tool would be valuable for knowledge workers in general and BI analysts in particular. Digital information is not easy to find today, if not knowing where to access it. Neither is a lot of information accessible to people outside the own function because it is saved on local disks. These are issues that would be able to overcome with an Enterprise Search solution. One direct BI-related example of use would be as a way of finding for example rumors on competitors (saved in e.g. the Sales organization).

6.3.4.4.5 Need a Thorough Analysis

From the description of Enterprise Search platforms in the theoretical framework and above in the analysis, it is easy to get the impression that this platform would provide a solution to the many problems experienced. However, we have not had the possibility to try this tool ourselves, neither have we had any possibility to examine if it would be possible to integrate this tool with the current information systems of TMHE (ERP, CMS, file servers etc.). In order to see if an Enterprise Search platform would be possible to implement, a thorough investigation of the aspects discussed above is necessary. As stated in the introductory chapter of this Thesis, we only look at conceptual solutions, which is how Enterprise Search platforms are to be treated.

An important aspect is also that Enterprise Search platforms, per se, needs to be implemented organizational-wide (because it needs access to the common systems of the organization), and thus cannot be implemented through an “evolutionary approach”. This makes the question of implementation more complex, which however is nothing we are going to discuss further as stated in the limitations of this Thesis.
7 Conclusions

In this the penultimate chapter of this Master Thesis we present our conclusions within the three areas Business Intelligence, Information Needs Analysis, and Information Handling.

7.1 Business Intelligence

7.1.1 Assigned BI Actors and Division
TMHE has divided their Business Intelligence in Strategic and Operative BI, where the assigned BI actors are Business Planning (Strategic BI) and IS Promotion (Operative BI). Business Planning also has the responsibility for the concept coordination of BI.

We mean to say that the current division was done in haste and has not been made from scratch, i.e. instead of a division we see it rather as a description of the BI present in the organization at the time together with the labeling of a vision for the future.

7.1.2 Intelligence Work Not Labeled as Intelligence
According to us the most apparent issue following from the division is the neglecting of areas of intelligence work left out in a terminological no-man’s-land. Our point is that it is not possible to structure something that does not exist, i.e. before taking all BI activities into account it is not possible to make a meaningful division. Also this does not stimulate transparency, which in a functional company like TMHE increases the risk for areas overlapping and thus duplication of work. We also conclude that the division therefore contributes to the ambiguity of the concept of Business Intelligence.

7.1.3 The Need for more than One Dimension to Describe BI
The result of the Case Study shows that it is neither pragmatic nor illustrational to define Business Intelligence as an umbrella concept and within TMHE we see that the division puts focus on the wrong questions.

We also conclude that Business Intelligence is too complex to only be described in one dimension (i.e. in Strategic and Operative). We also mean that Strategic and Operative are not good terms to use as dividers because it leads to confusion whether the divided BI areas mean to support decisions on a Strategic or Operative level or Strategic or Operative decisions, which is not per se the same.

Therefore we see a need for a structure with additional dimensions in order to better capture and nurture the BI work within TMHE. With the starting point that the current terms are consumed and with Operative BI connected to the needs gathering activities of IS Promotion, we propose a model based on the three frameworks: Activities, Categories, and Processes.

7.1.4 Additional Frameworks
The duality in work methods (activities) separates (today’s unlabeled) intelligence work within the corporate functions, from ad hoc (often cross-functional) studies performed by different groups. The latter is also an additional ambition for the Strategic BI and
therefore expected to have a more prominent role in the future, which is why the need for differentiating the way of working increases. This also makes it less delicate to have addressed studies for the TMHE Management Team performed.

In order to have an overview of the BI work within TMHE we argue that it needs to be given a structure in categories (categories); to give intelligence works an existence in the TMHE context (see Figure 36). Then it is possible to structure and easier to have transparency and avoid duplication of work. This is connected to how intelligence work is and ought to be practically performed (processes) and what the desirable outcome is. Here we would like to underscore the importance of firm deliverables.

7.1.5 New Assigned BI Actors
The establishment of a separate BI-function is currently not to be considered. The core competence is to be kept locally and the functional structure and the governance model built upon a high level of autonomy are hinders for such an investment to be taken into consideration. We see the forming of the planned BI-Forum as prerequisite for the proposed BI structure. The coordination of the new structure through a steering role ought to be as a developed responsibility of current planned two-fold aim for this group (as a steering group for the overall BI and as a task force).

![Figure 36: The proposed new BI structure within TMHE](image)

7.2 Information Needs Analysis

7.2.1 Information Gaps
We used the information needs analysis performed to be able to identify intelligence work within TMHE and as highlighter of information gaps among our target group. The information gaps are presented as a list in the Appendix 1 of the Thesis together with the filtered list of information in Appendix 2.

7.2.2 Areas of Coordination
When comparing these lists areas of coordination can be identified. There is a potential that half of the identified information gaps could be filled or at least reduced, without
more resources being dedicated to gathering and analysis, if the activities of other functions were better shared within the organization. The groups within the questionnaire undergoing major loss of needs are the internally based group **TMHE** and the functionally bounded groups **Sales** and **Customers**, which indicate that information needs within these groups have assigned suppliers, but that this information stays within the function. The last three groups (**Market**, **Competitors**, and **Technology, Industry, and Economy**) are to a higher extent externally focused which could explain that most of the information gaps remain open.

### 7.2.3 Need for Macro Intelligence

The group *Technology, Industry, and Economy* in the questionnaire is the one that undergoes the least change. This means that it contains information needs viewed as of major importance and that none within the target group has a fully satisfied information supply of today. These are information needs that all fall in under *Macro Intelligence* in our new BI structure and thus points at the importance to give more resources to this category in the future. A first step is to lay down where the responsibility for supplying this information is and ought to be and how it can be improved.

### 7.2.4 Information Needs Analysis as a Catalyst for Discussion

Another conclusion from the information needs analysis is the necessity of this activity as an inventory of information supply within an organization, and thus as a catalyst for discussing of information handling.

### 7.3 Information Handling

#### 7.3.1 Information Finding and Gathering

The finding and gathering activities within TMHE today are dominated by personal interaction within the personal network. Finding and gathering information through personal interactions is the most effective way of embracing information and transferring knowledge. One drawback is that it is time consuming, which also is the case within TMHE. The potential of the information pull strategy is thus limited by the factor that information is not delivered when asked for. Another drawback is the need to know whom to ask for information; with the size of TMHE we see a risk for missing out on information because not having a personal network covering all parts of the organization. Information that has not been touched upon before is also perceived to be hard to find.

Effective use of personal networks calls for arenas where information and knowledge can be exchanged, which we believe could be achieved with the new BI structure. Defined processes with a defined outcome will also improve the issues found with information finding and sharing.

The company intranet holds large amount of information today. However the complex structure (which reflects the organization) means that information is hard to find and results in that the intranet serve more as a location drop than as a natural source of information. The information on the intranet is also not experienced to be at the necessary level of quality (aggregation) to suit the needs of our respondents.
7.3.2 Information Sharing

Except for the information put on the intranet, information sharing is mainly done according to a push strategy, primarily through email, which easily leads to information overload situations. There are no common policies for information sharing, which also inflicts on the communication between the members of the organization since they do not share the same picture of certain issues. The lack of common policies (declaring what can be shared) together with a lack of trust and a fear of misinterpreting of information, is observed to result in reluctances to share information. We thus see a need for creating a common view or policy of what is to be shared or not.

In order to reach an effective information handling we see the need for people taking the power of their own information supply, because no one can know all the information needs of another person, and because an information pull strategy ensures that information is gathered in a time and location that suits the user. In order to make this possible there is a need for transparency between the corporate functions as well as that information is made available. We also see that if publishing general information regarding the roles and responsibilites of the BI structure within TMHE, this would enable a common picture.

7.3.3 Issues Rooted in Organizational Culture

The issues of information handling are deeply rooted in an organizational culture and ways of working characterized by a top-down perspective that cannot be changed over night. We think it is important for the organization to work towards a more bottom-up perspective of information handling, where the user takes the power of his or her information supply by primarily an information pull strategy. A concept with the aim of enhancing collaboration and information sharing is Enterprise 2.0, and as a way of catalyzing necessary changes we see the potential use of technologies and concepts from this area.

7.3.4 Wikis

Wikis provide a tool, but maybe more important a different way of working, aiming at improving collaboration, information sharing, and creativity among its users. We see that the primary area for use would be as a sort of digital notebook, where information and files could be structured and shared with others, enabling the creation of a common view of information in a living document. We see that Wikis would be useful for any team or group within TMHE, but especially useful for e.g. BI groupings that handle a lot of unstructured information. The implementation of Wikis ought to be done by an evolutionary approach, starting in small teams and growing through viral marketing. A Wiki is not a heavy investment and is thus possible to try out and drop if not working as intended.

However, since a Wiki starts as a blank notebook that is filled up incrementally, this makes it hard to replace the intranet as the main internal source of information, at least not in the near future. If being successful with an Wiki implementation, an information structure built on how information actually is used will emerge, as to be contrasted to for example traditional intranets, where information is structured top-down according how information is intended to be used.
7.3.5 **RSS**

We see that the use of RSS tools will provide good support for monitoring changes and adding of information on the intranet and Internet in general, and in BI areas as Competitive and Macro Intelligence in particular. Thus it is possible to avoid having to manually track the changes of information sources. Together with Wikis, RSS enables effective collaboration between groups of people where information can be shared through the creation of a living document. A spill over effect could be that the information overload caused by ineffective use of email, is reduced if sharing information through Wikis and RSS.

7.3.6 **Enterprise Search**

Enterprise Search platforms provide a powerful tool for finding unstructured information located in the different information systems in an organization. Through the use of a contextual search engine, the search result will be custom tailored to suit the intentions and the profile of the user. We see that this tool could help to overcome the issues experienced when not being able to find information on the intranet because of its complex structure. An Enterprise Search platform is an organizational-wide tool and requires integration with all existing digital sources of information, which makes the implementation process extensive.
8 Recommendations and Next Steps

In this the last chapter of the Master Thesis we present our recommendations to Toyota Material Handling Europe, based on the theoretical framework our analysis of the results from the Case Study. Last is a section about the next steps, which is how the recommendations are to be put into practice.

8.1 Recommendations

8.1.1 Business Intelligence within TMHE

In accordance with our conclusions we recommend TMHE to revise their division of Business Intelligence, since in our opinion it is neither illustrational nor suited to its purpose. Our proposal is a new structure based on three frameworks to acknowledge of the complexity of BI better.

8.1.1.1 Activities

Applying the framework of activities will help TMHE to relate to the different ways of working with BI and work as a way to confront the found aversion of BI as either tools and applications or as something only for the TMHE Management Team.

8.1.1.2 Categories

Yet another way to recognize all activities performed in the company that could be labeled as intelligence work, we recommend dividing the BI work in the four categories Market Intelligence, Competitive Intelligence, Macro Intelligence and Internal Intelligence. We believe that this division will lead to a better overview and acknowledgment of the work done, something we found necessary due to the company’s functional structure.

8.1.1.3 Macro Intelligence

The most evident categories of information needs with an unsatisfied information supply today can all be referred to our proposed category Macro Intelligence. We thus recommend BP to investigate how these information needs ought to be supplied and we also see this finding as a support to our structure.

8.1.1.4 Processes

We see that a run-through of the existing BI work within the organization is necessary. We do not believe in, and have not found appropriate theoretical support for, one general BI process applicable all over the company. Instead the processes ought to be based on the activities performed today locally in the corporate functions and evaluated from the point of view of what BI is to support. The information needs analysis performed in this Thesis could be used as a starting point for this discussion and as well as for a discussion on what information supply is insufficient or non-existent today.

Questions that need to be addressed are who is to do the work, when is it to be done, what is to be the output, and in what form. We recommend the use of firm deliverables; meaning, in accordance with the discussion above, intelligence products tailored to suit the target audience. The products can be in different formats, e.g. reports, work shops or presentations.
8.1.1.5 Steering and Coordination
Initially we recommend that the process of defining and developing the BI structure is to be under the responsibility of BP, but as we discussed in the Analysis chapter, we recommend that steering and coordination in the future ought to sit within the planned BI-Forum.

8.1.2 Strategic Business Intelligence
Whether or not the proposed BI-structure is taken on, we highly recommend the company to acknowledge the relationship between Strategic BI within BP and the ambitions for the BI-Forum also referred to as Strategic BI. The work performed by e.g. BI-Forum can be classified, in the same way as the input to the Mid Term Business Plan is classified, but then the responsibility for Strategic BI that sits within BP needs to be clearer (e.g. through the activities framework proposed).

8.1.2.1 The Relationship between Today’s Assigned BI Actors
For the relationship between Business Planning and IS Promotion to be improved and the perceived overlap of responsibilities to be made clear, we propose frequently scheduled meetings between these two organizations. This does not need to be a permanent arrangement, it only needs to be in place as long as the uncertainties of responsibilities and their relationship is present.

Another question that needs to be addressed and thus discussed, but demands an overall decision in the organization, is the BI needs gathering (i.e. for reports from tools and applications) performed by IS Promotion (Process and Application Coordination) today that needs to be overhauled. We recommend that the full ownership of this task ought to be given to IS Promotion, but with BP’s role as BI concept coordinator and with the group’s reprocessed relationship and nearness to the Management Team it is natural for them to initiate the discussion and to be seen as a way to set straight the responsibilities and to create a more united front within the company.

8.1.3 Information Handling

8.1.3.1 Make the Business Intelligence Output Available
To ensure transparency in the organization we see it as a necessity that the output of the BI structure is made available to the rest of the organization (to the extent that this is possible). We recommend establishing a BI-portal where BI related information and output is made available and visible. This could be in the form of a Wiki or an intranet page.

8.1.3.2 Implement Wikis
We recommend the use of Wikis as a way of working with unstructured information and to facilitate collaboration. We see that the best way of starting, is to use it as a common notebook, where loose pieces of information can be put into a context, be discussed, and elaborated on by a group of people. A group or a team that is heavy on unstructured information, meetings, and notes is especially suitable for a first implementation, and our suggestion is to start in Business Planning or the planned BI-Forum. The BI-Forum is a group that will be working cross-functional which puts requirements on the ability to collaborate, which a Wiki would ease. The situational BI character of the work also makes it suitable to use a Wiki. An example of a suitable first topic could for example be a special study of a competitor or a market, which likely will contain much unstructured information.
8.1.3.3 Use RSS
We recommend starting using RSS readers to keep track of information in the organization; both the information in the newly established Wikis, and content on the intranet, web pages of interest etc. This will help to reduce the effort put, for the individual BI worker, on keeping up-to-date, and making it superfluous to browse through these information sources oneself.

8.1.3.4 Implement an Enterprise Search Platform
Lastly we recommend TMHE to implement an Enterprise Search platform. We see that such a tool would bring major benefits and improvements to the overall information handling in the organization. It will enable information from e.g. shared hard drives to be found by people who do not know of this information in beforehand. It will also facilitate information finding and gathering in general, increase transparency and make flaws of the intranet surmountable.
8.2 Next Steps

- Address the proposed new structure on the next Management Team meeting or as a first point on the agenda for the first meeting for the BI-Forum. This decision needs to have support on the highest level in the company in order to be implemented and have real effect on the situation.

- The information needs analysis ought to be carefully examined by Business Planning in order to be used as a basis of discussion, as we see the starting point for implementing a new BI structure.

- The input to the Mid Term Business Planning process is a good starting point for the run-through of the BI work, and the assigning of roles, responsibilities and outputs within the process framework.

- Find time and place for meeting between Business Planning and IS Promotion.

- Our recommendation of a BI-portal is dependent on the decision of how BI is going to be structured, as well as the found outputs of the BI-work, and therefore needs to wait until these actions. A first step would then be to decide on the forms for this portal.

- For the implementation of a Wiki, the natural first step is to choose a group to test the technology and to investigate what providers of Wiki platforms are available on the market and what Wiki solution would suit the needs of TMHE.

- For RSS, we see that the first step is to investigate the availability of RSS feeds on e.g. the intranet today. If these do not exist, a dialog needs to be initiated with the responsible actors regarding the possibility of creating feeds.

- A discussion needs to be initiated regarding the feasibility of an implementation of an Enterprise Search platform. This is a question for IS/IT organization to investigate, but an already heavy workload (with the ongoing launch of M3 and the implementation of an Enterprise Data Warehouse), we understand that this project may have to wait.
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Larsson, Hans, Director Product Planning
Sivenius, Bo, Director IS Promotion
Tornerefelt, Jonas, VP Product Planning
Utterström, Michael, Senior Manager Sales Support
Walby, Craig, Director Product Planning
Van Espen, Hugues, Director Marketing & Communications
Van Leeuwen, Hans, VP Sales
Van Poecke, Steven, Manager Market Planning
Glossary

For this Thesis

**Business Intelligence** = BI = umbrella concept

**Information gaps** = information needs rated as of major importance with an unsatisfied information supply

**Central functions of TMHE** = Finance, Product Planning, Marketing, Sales, Business Planning

**Information handling** = the activities of finding-, gathering-, and sharing of information

**TMHE Case Study**

**BP** = Business Planning Department = TMHE Business Planning = Business Planning

**BT** = (originally “Bygg- och Transportekonomi”) = BT Europe and parts of BT Industries.

**CB trucks** = Counter Balanced forklift trucks

**CEO** = Chief Executive Officer

**CFO** = Chief Financial Officer

**MSCos** = Market and Sales Companies

**PP** = TMHE Product Planning

**Sales KPI:s** = Sales Key Performance Index (Order Intake, Rental, New Customer, Total Sales Funnel, Activity, Hitrate, Coverage)

**SWOT** = Strength, Weaknesses, Opportunities, Threats

**TICO** = Toyota Industries Corporation

**TIFI** = Toyota Industries Finance International

**TMC** = Toyota Motors Corporation

**TMHE** = Toyota Material Handling Europe

**TMHG** = Toyota Material Handling Group

**VP** = Vice President

**WH trucks** = Warehouse forklift trucks

**Concepts**

**BI** = Business Intelligence (used interchangeable throughout the Thesis)

**CI** = Competitive Intelligence

**CI** = Competitor Intelligence (the acronym CI is not used for Competitor Intelligence within this Thesis)

**IS** = Information Systems

**IT** = Information Technology

**KM** = Knowledge Management

**MI** = Market Intelligence

**NIH-Syndrome** = “Not Invented Here”-syndrome
Appendix 1

Identified Information Gaps

1. TMHE (this part refers to internal operations)
   - Market fit (Products (TMHE))
   - Product fit (Products (TMHE))
   - Production in units (Production capacity (factories))
   - Local profit margins (Production capacity (factories))
   - Profit (Where is profit derived within TMHE?)
   - Retail order (Order information)
   - Retail shipments (Order information)
   - Pricing
     - List prices
     - Retail prices
     - Discounts for each country
     - Share of special price requests
   - Business goals (Current activities (understanding, awareness))
   - Strategies (Current activities (understanding, awareness))
   - Synergy effects of the integration (Current activities (understanding, awareness))
   - Employee profiles (e.g. competence, work experience etc.)
   - Mid Term Business Plan objectives
   - Trends in customer complaints (products)

2. Sales (this part refers to TMHE sales operations)
   - Capability of the distribution network
     - Number of salesmen
   - Sales statistics
     - By product segment
   - Sales KPI:s
     - Hit rate
     - Coverage
     - Activity
     - Rental
   - Service profitability

3. Customers
   - Satisfaction
   - Demands
   - Needs
   - Usage of trucks
   - Customer segmentation
     - Costumer profitability segmentation
   - TMHE Brand awareness
     - Brand perception
     - Product perception
     - Press coverage
       - TMHE
       - By brand
       - Competitors
   - Trends
   - Benchmarking of trucks (customer surveys on drive speed, lift speed, comfort, safety etc.)

4. Market
   - By product segment (Market position TMHE; Market shares)
• By region within Europe (Market position TMHE; Market shares)
• Market trends (material handling)
  o In regions (within Europe)
  o In countries (within Europe)
    ▪ Specific local (country based) information
  o For different product segments
  o Market forecast
• Fluctuations on the American market (Relation between general market fluctuations and material handling industry)

5. Competitors
• Positioning
• Applications (Products)
• Strengths/Weaknesses (Products)
• Renewal pace (Products)
• Target groups (Products)
• Market shares
  o By product segment
  o By country
• Financial (Performance)
• Sales statistics (Performance)
• Pricing
  o Retail prices
  o Fleet deals
  o Price movements
• R&D (i.e. investments, location etc.)
• Strategic directions
  o Business model
  o Ownership structure
  o Competitive network (dealers and distributors)

6. Technology, industry and economy
• Monitoring of legislations
• Socio-economic environment in the countries covered by TMHE
• New technology and innovation
• Energy and Fuel support
• Solutions for material handling
• Coordination with Toyota Motors Company
• Trends in manufacturing industry
  o In countries
  o In regions
• Trends in logistics industry
  o In countries
  o In regions
• Trends in retail industry (shopping malls etc.)
  o In countries
  o In regions
• Economic outlook 5-10 years (Economic outlook)
• Market drivers e.g. Germany (Economic indicators)
• Transport forecasts (i.e. EU freight forecasts 2013, Volvo market forecast)
Appendix 2

Filtered List of Information Gaps

1. TMHE (this part refers to internal operations)
   - Discounts for each country *(Pricing)*
   - Synergy effects of the integration *(Current activities)* (understanding, awareness)
   - Employee profiles (e.g. competence, work experience etc.)
   - Trends in customer complaints *(products)*

2. Sales (this part refers to TMHE sales operations)
   - Capability of the distribution network
     - Number of salesmen

3. Customers
   - Satisfaction
   - Demands
   - Needs
   - Usage of trucks
   - Customer segmentation
     - Customer profitability segmentation

4. Market
   - In regions, within Europe *(Market trends)* (material handling)
     - Specific local (country based) information *(Market trends)* (material handling)
   - For different product segments *(Market trends)* (material handling)
   - Fluctuations on the American market *(Relation between general market fluctuations and material handling industry)*

5. Competitors
   - Positioning
     - Target groups *(Products)*
   - Pricing
     - Retail prices
     - Fleet deals
     - Price movements
   - Strategic directions
     - Business model
     - Competitive network (dealers and distributors)

6. Technology, industry and economy
   - Monitoring of legislations
   - Socio-economic environment in the countries covered by TMHE
   - New technology and innovation
   - Energy and Fuel support
   - Solutions for material handling
   - Coordination with Toyota Motors Company
   - Trends in manufacturing industry
     - In countries
     - In regions
   - Trends in logistics industry
     - In countries
     - In regions
   - Trends in retail industry (shopping malls etc.)
- In countries
- In regions
Appendix 3

Questionnaire

Instructions
Importance and satisfaction is to be rated on a 3-point scale from the perspective of your role/roles within TMHE. For importance we have that 1 is considered need of minor importance, 2 is need of medium importance and 3 is need of major importance.
When rating satisfaction; 1 is need unsatisfied, 2 is need partly satisfied, and 3 is need fully satisfied.
Please note that if a need is fully satisfied, the supply of information is secured.

Importance:
Please rate the importance of the information need as:

| 1 | Need of Minor importance |
| 2 | Need of Medium importance |
| 3 | Need of Major importance |

Satisfaction:
Please characterize the information supply in order to meet the need as:

| 1 | Need Unsatisfied |
| 2 | Need Partially satisfied |
| 3 | Need Fully satisfied |

Not Applicable (N/A):
Need of no relevance for your role/roles

1. TMHE (this part refers to internal operations)

<table>
<thead>
<tr>
<th>Products (TMHE)</th>
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<tr>
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<tr>
<td>Applications</td>
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<td>Specifications</td>
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<td>Product fit</td>
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</tr>
<tr>
<td>Renewal pace</td>
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<td>1 2 3</td>
<td></td>
</tr>
<tr>
<td>Product launches</td>
<td>1 2 3</td>
<td>1 2 3</td>
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</tbody>
</table>

| Production capacity (factories) | | | |
| Production in units | 1 2 3 | 1 2 3 | |
| Local profit margins | 1 2 3 | 1 2 3 | |

| Profit (Where is profit derived within TMHE?) | | | |
| By brand | 1 2 3 | 1 2 3 | |
| Factory orders | 1 2 3 | 1 2 3 | |
| Retail order | 1 2 3 | 1 2 3 | |
- Retail shipments
  - Pricing
    - List prices
    - Retail prices
    - Discounts for each country
    - Fleet deals
    - Share of special price requests
  - Current activities (understanding, awareness)
    - Business goals
    - Strategies
    - Synergy effects of the integration
  - Employee profiles (i.e. competence, work experience etc.)
  - Mid Term Business Plan objectives
  - Trends in customer complaints (products)
  - Web and Intranet user statistics

2. Sales (this part refers to TMHE sales operations)

- MSCos
  - Financial performance on country level
- Capability of the distribution network
  - Number of salesmen
- Sales statistics
  - Performance (# trucks into the system; # trucks out of the system)
  - By region (within Europe)
  - By product segment
- Sales KPI:s
  - Hit rate
  - Coverage
  - Activity
  - Rental
- Service profitability
3. Customers

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</table>

- **Satisfaction**

- **Demands**

- **Needs**

- **Usage of trucks**

- **Customer segmentation**
  - Costumer profitability segmentation

- **TMHE Brand awareness**
  - Brand perception
  - Product perception
  - Press coverage
  - TMHE
  - By brand
  - Competitors
  - Products
  - Trends

- **Benchmarking of trucks** (customer surveys on drive speed, lift speed, comfort, safety etc.)

4. Market

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</table>

- **Market size**
  - Regions (within Europe)
  - Trends

- **Market position TMHE**
  - Market shares
  - By product segment
  - By country (within Europe)
  - By region (within Europe)

- **Market trends** (material handling)
  - In regions (within Europe)
  - In countries (within Europe)
  - Specific local (country based) information
### 5. Competitors

<table>
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<td>▪ Specifications</td>
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<td>▪ By country</td>
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- For different product segments
- Historical review
- Market forecast
- Relation between general market fluctuations and material handling industry
  - Fluctuations on the American market
6. Technology, industry and economy

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<td>Transport forecasts (i.e. EU freight forecasts 2013, Volvo market forecast)</td>
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Appendix 4

This appendix is containing the categories of Business Intelligence indentified from the Case Study and the Information Needs Analysis, together with the identified function currently providing this intelligence. Please note that this does not indicate if the intelligence is provided to a satisfying extent, just if there is activity within the area today.

Market Intelligence
- **Customers**
  - Needs, demands, satisfaction, usage of trucks - *Product Planning*
  - Customer segmentation
  - TMHE Brand awareness - *Marketing*
  - Trends in customer complaints
  - Customer behavior - *Sales*
- **Market**
  - Market size - *Market Planning*
  - Market shares - *Market Planning, Product Planning*
  - Market trends within material handling industry (regions, countries, product segments) - *Market Planning, Product Planning*
  - Market forecasting - *Marketing*
  - Correlation between market fluctuations and material handling industry - *BP*
  - Market Scenarios - *Marketing, Sales*
  - Market Statistics Data Warehouse - *Market Planning*
- **Competitors**
  - Market shares - *Market Planning*
  - Pricing - *Market Planning, Sales*

Competitive Intelligence
- **Competitors**
  - Positioning - *BP*
  - Products (range, applications, specifications, strengths/weaknesses, renewal pace, target groups) - *Product Planning*
  - Performance
    - Financial - *BP*
    - Sales statistics
  - R&D (Investments, location etc...) - *Product Planning, BP*
  - Strategic directions - *BP*
  - Competitive networks - *Market Planning*
- Market position (of TMHE) - *Market Planning*
- Benchmarking of trucks - *Product Planning*
- Competitor overviews - TMHE vs Competitors - *Product Planning*
- Investor relations - *TICO → BP*
- Mergers & Acquisitions - *BP & TICO*
- Competitor movements - *Product Planning*
- Trends in material handling industry (by talking to key customers etc) - *Product Planning*
- Suppliers - *Supply*

Macro Intelligence
- Monitoring of legislations - *Legal, BP*
- Socio-economic environment - *BP*
- New technology & Innovation - *Product Planning, Supply*
- Trends in... - *Product Planning, Market Planning*
  - Manufacturing industries
  - Logistics industries
  - Retail industries
- Macroeconomic Outlook - *Market Planning, External consultants*
• Economic indicators - Market Planning
• Transport forecasts (EU, Volvo etc...) - Market Planning, BP (some work)
• Logistic theories - Product Planning

Internal Intelligence
• Production capacity - Supply, Sales
• Products - Product Planning, Supply
• Profit - Finance
• Order information - Sales
• Employer profiles - HR
• Current Activities - BP
  o Business goals
  o Strategies
  o Synergy effects from integration
• Extensive financial analysis of internal operations - Finance (Business Control)

Sales
  o MScos (financial performance on country level...) - Finance/Sales
  o Distribution network (capacity) - Sales
  o Sales statistics - Sales
    • Sales Performance
  o Sales KPI's - Sales
  o Service profitability - Business Control, Finance