

---

# **The Multi-Perspective Intelligence Framework**

*-a methodological approach for Technology Business  
Strategies at Ericsson Mobile Platforms*

---

Cecilia Johnsson  
Lisa Selander

Copyright © Cecilia Johnsson and Lisa Selander

Department of Business Administration  
Lund University  
Box 7080  
220 07 Lund

Research Policy Institute  
Lund University  
Scheelevägen 15  
223 63 Lund

Master thesis no 54/2002  
ISSN 1651-0100  
ISRN LUTVDG/TVTM--02/5054--/SE

Printed in Sweden  
KFS i Lund AB  
Lund 2002

## Abstract

**Title:** The Multi-Perspective Intelligence Framework – *a methodological approach for Technology Business Strategies at Ericsson Mobile Platforms*

**Authors:** Cecilia Johnsson and Lisa Selander

**Tutors:** Anders Granberg, Research Policy Institute, Lund University

Carl-Henric Nilsson, Department of Business Administration,  
School of Economics and Management, Lund University

Martin Jönsson, Technology Business Strategies, Ericsson Mobile  
Platforms AB, Lund

**Problem discussion:**

- How can the existing working process of Technology Business Strategies (TBS) be improved and become more efficient by the introduction of a more structured method of working?
- How can existing methodological approaches be adapted and used to support and structure the existing working process of TBS?
- Can the methodological approach developed for TBS be generalised in order to be applicable in other contexts?

**Purpose:**

The **practical purpose** of the thesis is to develop a framework for structuring the process of transforming information into road maps, core statements, decision support and marketing material at TBS. The framework should be adapted to TBS in that it satisfies the internal needs of the section as well as the requirements of the industry.

The **theoretical purpose** of this thesis is, with the TBS framework as a basis, to develop a generic framework for an intelligence creating process that fits an organisation operating in a dynamic, high technology industry.

**Method:**

We have been physically situated at the section TBS within Ericsson Mobile Platforms (EMP) in Lund. The abductive approach that combines the use of theory and empirical studies has been chosen. The theoretical study included relevant academic literature as well as interviews with acknowledged academicians. In parallel with the theoretical study, we have conducted an empirical study, which included non-standardized interviews at the section TBS and other departments at EMP, a workshop at

EMP, interviews inside and outside EMP and also articles in different newspapers and telecom magazines.

**Conclusions:**

We have identified a need for a structured method of working at TBS. The structured approach would contribute to satisfy the needs and help to improve the deficiencies identified in many ways, e.g. separate the continual work from the work initiated discontinuously, by identifying and defining the input to the process it can better be ensured that relevant input aspects have been considered in the analysis and the quality of the output will increase, a systematic approach handling the uncertain environment would promote more proactive work and finally, more focus will be put on the process rather than the outcome of the process.

In our inventory of possible methodological approaches, we found that no methodology alone included all necessary perspectives, but that a complete framework could be achieved by combination and adaptation. The result of this is what we call “The TBS-framework”, which is based primarily on business intelligence as the main-process and technological foresight serves to support the process by complementing the analysis step with a future perspective. The TBS-framework is based on the needs of TBS and the demands of the external environment that EMP operates in.

We are of the opinion that the TBS-framework can be generalised in order to be used in structuring and supporting an intelligence creating process, where information is gathered, analysed and communicated, in any organisation that operates in an industry characterised by dynamics and high technology. The generalised form of the TBS-framework, we call “The Multi-Perspective Intelligence framework” (MPI). The MPI-framework must, however, be adapted to the specific company where it is used.

**Key words:**

business intelligence, scenario planning, structured approach, technology roadmapping, handling an uncertain future, mobile telecom industry, dynamic and high technology industries, Ericsson Mobile Platforms AB

## Acknowledgements

Our master thesis has now come to an end. We have learnt a great deal about the mobile telecom industry, the theoretical framework we have been using as well as the working process at Technology Business Strategies, Ericsson Mobile Platforms in Lund. The experience has been interesting and enjoyable although the road taken has not always been straight. The experience in total has been very rewarding and the learning we have gained will be very helpful in our further development.

We would like to take the opportunity to thank our tutors; Anders Granberg, Research Policy Institute, for his insightful and intelligent advice as well as his kind attitude, Carl-Henric Nilsson, Department of Business Administration, for his advice and support and Martin Jönsson at TBS for his help and support during the thesis.

We would also like to thank Stefan Berggren, manager at TBS, for having us in the first place and we hope and believe that our work will be helpful.

Moreover, we would like to thank the employees at TBS and EMP for participating in interviews and workshop.

We hope you will find our work as interesting as we did writing it.

Lund, May 2002

Cecilia Johnsson

Lisa Selander

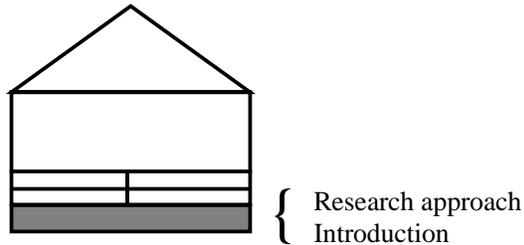
## Table of contents

<b>PART I. THESIS FOUNDATION .....</b>	<b>1</b>
<b>1 INTRODUCTION.....</b>	<b>3</b>
1.1 BACKGROUND .....	3
1.2 PROBLEM DISCUSSION.....	4
1.3 PURPOSE.....	7
1.4 DELIMITATIONS.....	7
1.5 GUIDE TO THESIS .....	7
1.6 DEFINITION OF CONCEPTS .....	10
<b>2 RESEARCH APPROACH.....</b>	<b>13</b>
2.1 WHAT IS METHODOLOGY? .....	13
2.2 BASIC ASSUMPTION.....	14
2.3 PROBLEM SOLVING TECHNIQUES .....	15
2.4 PRACTICAL METHODOLOGY.....	15
2.5 REFLECTIONS AND CRITICISM OF THE RESEARCH APPROACH.....	17
<b>PART II. THEORETICAL &amp; EMPIRICAL FRAME.....</b>	<b>21</b>
<b>3 OUTSIDE – A DYNAMIC LANDSCAPE.....</b>	<b>23</b>
3.1 INTRODUCTION.....	23
3.2 COMPETITION.....	23
<b>4 OUTSIDE – THE MOBILE TELECOM INDUSTRY.....</b>	<b>25</b>
4.1 THE INDUSTRY STRUCTURE.....	25
4.2 STRUCTURAL CHANGES IN THE INDUSTRY .....	26
4.3 SYNTHESISING DISCUSSION REGARDING THE OUTSIDE PERSPECTIVE.....	29
<b>5 INSIDE- EMP &amp; TBS.....</b>	<b>31</b>
5.1 EMP .....	31
5.2 TECHNOLOGY BUSINESS STRATEGIES .....	32
<b>6 INSIDE – TOOLS FOR HANDLING THE NEW COMPETITIVE LANDSCAPE .....</b>	<b>39</b>
6.1 INTRODUCTION.....	39
6.2 METHODOLOGICAL APPROACHES AVAILABLE.....	39
6.3 SYNTHESISING DISCUSSION ABOUT THE METHODOLOGICAL APPROACHES PRESENTED .....	42
6.4 THE BI-PROCESS AND THE TECHNOLOGICAL FORESIGHT PROCESS.....	44
6.5 ANALYSIS TOOLS.....	47
6.6 DISCUSSION CONCERNING ANALYSIS TOOLS .....	49
6.7 SCENARIO PLANNING PRESENTED FURTHER .....	51
<b>PART III. PRACTICAL &amp; THEORETICAL CONTRIBUTION.....</b>	<b>57</b>

<b>7</b>	<b>THE TBS-FRAMEWORK.....</b>	<b>59</b>
7.1	INTRODUCTION.....	59
7.2	STEP ONE: PLANNING AND FOCUS.....	60
7.3	STEP TWO: COLLECT.....	64
7.4	STEP THREE: INTERPRET AND ANALYSE.....	66
7.5	STEP FOUR: COMMUNICATE AND DISSEMINATE.....	70
7.6	THE CYCLIC NATURE OF THE PROCESS.....	70
<b>8</b>	<b>EXAMPLE OF APPLICATION.....</b>	<b>73</b>
8.1	INTRODUCTION.....	73
8.2	IMPROVEMENTS IN THE DECISION SUPPORT.....	73
8.3	APPLICATION OF THE SCENARIO METHOD.....	74
8.4	GUIDELINES FOR USING THE FRAMEWORK.....	81
<b>9</b>	<b>THE MPI FRAMEWORK.....</b>	<b>83</b>
9.1	INTRODUCTION.....	83
9.2	THE DEVELOPMENT OF THE FRAMEWORK.....	83
9.3	THE MULTI-PERSPECTIVE INTELLIGENCE FRAMEWORK.....	84
9.4	WHAT ORGANISATION COULD USE THE MPI FRAMEWORK?.....	85
<b>PART IV. CONCLUSIONS.....</b>		<b>87</b>
<b>10</b>	<b>CONCLUSIONS.....</b>	<b>89</b>
10.1	TO WHAT EXTENT HAS THE PURPOSE BEEN FULFILLED?.....	89
10.2	THE RESEARCH QUESTIONS.....	90
10.3	CONTRIBUTION TO RESEARCH.....	95
10.4	SUGGESTIONS FOR FURTHER RESEARCH.....	96
<b>LIST OF REFERENCES.....</b>		<b>98</b>
<b>TABLE OF FIGURES.....</b>		<b>102</b>
<b>APPENDIX.....</b>		<b>103</b>



## Part I. Thesis foundation

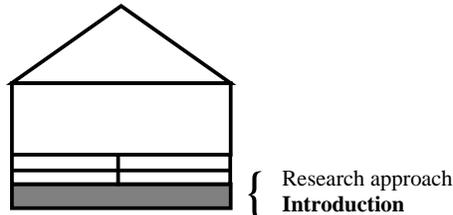


*Part I consists of two chapters, introduction and research approach. In the introduction chapter we will present the background to this thesis and discuss the practical and theoretical problem. This discussion results in a formulation of the purpose of the thesis. Additionally the delimitations will be presented and the chapter ends with a guide to the thesis and also a glossary where frequent used concepts and abbreviations are defined. In the second chapter we will present our research approach by describing our methodological approach, what we have done, how this have been done and why. The chapter ends with reflections and criticism to our study, to the theoretical frame used and to the empirical study.*

---



# 1 Introduction



*This chapter starts with a short discussion about the background to the thesis. Further, the theoretical- and practical problems of the thesis are discussed. Moreover the purpose is outlined and the delimitations are accounted for. After that we give a guide to the thesis by describing the structure of the report and give some reading instructions. Finally definitions of concepts are presented.*

---

## 1.1 Background

*“Today and in the future, companies that succeed will be those that know how to manage knowledge faster than competitors. It is not a question of getting new information; it is the ability to extract information from your existing business, to see trends and insights faster than your competition.” – Louis V. Gerstner Jr., IBM Chairman and Chief Executive Officer.<sup>1</sup>*

The business world of today is characterised by fast and discontinuous change, the competitors are fiercer than ever and rapidly changing technologies alter the rules of the game daily. This is a fact in general but particularly in industries based on high technology such as the mobile telecom industry. The changing business landscape has increased the importance of an ability to identify and analyse relevant information in order to be able form a picture of the future.

The message in the quote above is that having large amounts of information is not enough anymore. Neither is it enough to consider the present situation, organisations must also have an ability to identify trends and possibilities in the environment to form a picture of possible futures. One wrong business decision can destroy the success of a company and managers are therefore seeking new ways to make decisions and to build strategies. When it comes to decision-making and strategy building, the important matter is how information is analysed and how it is used, not the quantity available<sup>2</sup>. Therefore the ability of turning raw information and data into an actionable output is critical, especially for a company which vision is to be cutting-edge.

---

<sup>1</sup> At the Securities Industry Association’s annual convention, October 1997, as quoted by Grandy, “Power + Performance for marketing Databases”

<sup>2</sup> Kahaner (1996), p.15

Ericsson Mobile Platforms is a high technology company operating in an industry characterised by structural changes caused for example by the migration into the third generation of mobile systems. This means that the company is facing a dramatic change in an already dynamic market. The industry for mobile telecom has until today very much been characterised by the term hypercompetition, which was introduced in 1994 by D'Aveni<sup>3</sup>. The mobile telecom industry is characterised by fierce competition, short product life cycles, high speed of development and technology shifts, many different types of players, threats due to merging markets and uncertain and changing demand. This is typical for a market facing hypercompetition.

The dynamics of the industry together with the structural changes form a great challenge for a company like EMP, which vision is to lead the technology development. The challenge lies within that EMP has to create an understanding about the future in a world of great uncertainty in order to be able to make the right strategic choices that do not jeopardise the future of the company. To do this the company has to have a capability of identifying trends and driving forces that indicate how the industry is developing as well as the ability to develop cutting-edge technology.

## **1.2 Problem discussion**

We describe the problem studied both from a practical perspective and from a theoretical perspective, the former referring to the situation at the department *Technology Business Strategies* (TBS) at Ericsson Mobile Platforms (EMP) in Lund.

### **1.2.1 The practical problem**

EMP is a recently formed company with the ambition to lead the technology development of technical platforms for wireless devices. The environment EMP operates in is dynamic and characterised by structural changes. This environment forms a great challenge to a company which vision is to lead the technological development. The challenge lies within that EMP has to create an understanding about the future in a world of uncertainty in order to be able to make the right strategic choices that do not jeopardise the future of the company. This means that the organisation needs to develop a capability of identifying trends and driving forces that indicate how the industry is developing and to process information into an output that could help reduce uncertainty and to deal with irreducible uncertainty.

This thesis is carried out at the department *Technology Business Strategies* at EMP. The work of this department consists of identifying business opportunities and functionality for future platforms and also mapping the functions over time by deciding when they should be included in a platform.

---

<sup>3</sup> D'Aveni (1994)

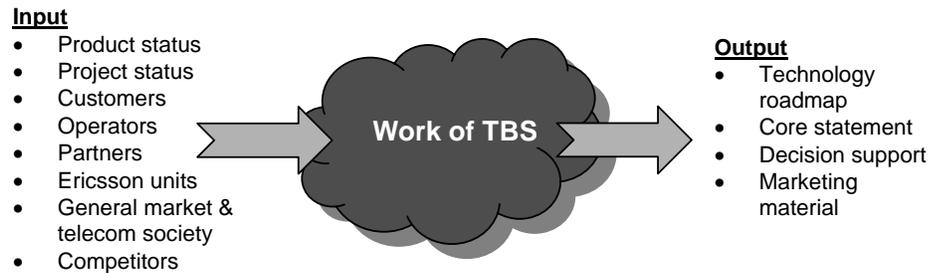


Figure 1-1. The input output transformation process of TBS

The working process could be seen as a “black-box”, represented by the cloud in figure 1.1, in which input is transformed into a useful output. The input consists of a large amount of data and unprocessed internal and external information as well as partly analysed information. The external input is information about actors such as: customers, competitors, operators, partners and also information about the general market and telecom society. The internal input is information from other Ericsson units and also about project- and product status. In the box this information should be consolidated, structured and analysed to result in a useful output. The outputs of the process are technology roadmaps, core statements, decision support and marketing material

The identified problem is that today, no common used or formalised methodology exists to handle this process at TBS. Everyone has their individual way of performing the process in order to get the best result. The problem with this is for example that the quality of the output is variable and that the process sometimes becomes inefficient and hard. To guarantee the quality of the final product of the process, and to make the work easier and more efficient, we see a need for a common used methodology that structures and supports the “black-box” process. The methodology must be able to handle the conditions of the environment as well as the internal needs of the section.

The questions that we have asked ourselves when working with this thesis are the following: *What general requirements do a dynamic environment put on this type of methodology? What are the needs of TBS and how general are these needs? Are there any available methodologies to satisfy these needs and to meet the requirements from the environment?*

### 1.2.2 The theoretical problem

In the article “*The fall and rise of strategic planning*”<sup>4</sup> Henry Mintzberg asserts that one of the traditional false assumptions of strategic planning is that the future is predictable by starting out from the present conditions in the environment. Mintzberg states that certain repetitive patterns, such as seasons, may be predictable but that forecasting of discontinuities, such as technological innovation, is virtually

<sup>4</sup> Mintzberg (1994)

impossible. Furthermore, Mintzberg states that instead of planning, strategy building should be a process where the manager consolidates information from all available sources, both the soft insights from personal experiences and the experiences of others in the organisation as well as information about the external environment, and then synthesises that information into a vision of the direction that the business should pursue.

This thesis focus on the part of the strategy making process that considers the information from others in the organisation as well as information about the external environment. More precisely it focuses on the process of transforming this type of information into a useful output referred to as *intelligence*<sup>5</sup>. One definition of intelligence is the following: *processed information of interest to management about the present and future environment in which the business is operating.*<sup>6</sup>

Different writers have proposed several approaches for the intelligence creating process that consist of collecting, consolidating and analysing information. We have made an inventory of different possible methodological approaches available. The different approaches we have identified are: Science & Technology Roadmapping, Technological Forecast, Technological Foresight, Monitoring and Business Intelligence (BI). We would like to emphasise that we focus on the *process* and the aspects included in the different methodologies, not on the product that is output of the process.

A challenge for companies operating in a high technology industry that is dynamic and unstable, which is the focus of this thesis, is the uncertainty and unpredictability of the future. A critical capability for a company acting in this type of environment is to identify forces that indicate how the industry is developing and to process information to an output that help to reduce uncertainty. We are interested in the requirements a dynamic, high technology industry put on the intelligence creating process, and also what the internal needs of a company that acts in a dynamic environment are. Furthermore, we are interested to examine if the available methods can meet these requirements and needs by including all relevant perspectives and all relevant aspects.

The questions we have asked ourselves when working with the thesis are; *are the methodological approaches identified appropriate for creating intelligence in an organisation operating in a dynamic, high technology industry? How can the methodologies be used to reduce uncertainty and deal with irreducible uncertainty?*

---

<sup>5</sup> Gilad & Gilad (1998), Sandström (1988), Kahaner (1996), Ashton & Klavans (1997), Pollard (1999)

<sup>6</sup> Green (1966)

### 1.2.3 Research questions

- ❑ How can the existing working process of TBS be improved and become more efficient by the introduction of a structured method of working?
- ❑ How can existing methodological approaches be adapted and used to support and structure the existing working process of TBS?
- ❑ Can the methodological approach developed for TBS be generalised in order to be applicable in other contexts?

## 1.3 Purpose

### 1.3.1 Practical purpose

The practical purpose of the thesis is to develop a framework for structuring the process of transforming information into roadmaps, core statements, decision support and marketing material at TBS. The framework should be adapted to TBS in that it satisfies the internal needs of the section as well as the requirements of the industry.

### 1.3.2 Theoretical purpose

The theoretical purpose of this thesis is, with the TBS framework as a basis, to develop a generic framework for an intelligence creating process that fits an organisation operating in a dynamic, high technology industry.

## 1.4 Delimitations

As mentioned previously, the purpose of this thesis is to develop a framework for structuring the process of collecting, consolidating and analysing information in an organisation operating in a dynamic, high technology industry, and also to adapt it to TBS in a way that it can contribute to structure the working process of TBS. We want to emphasise that the purpose is *not* to discuss the implementation of the methodological framework, neither in general nor at TBS. We think that this is a very extensive work that could constitute a master thesis itself.

Since we are interested in the *process* of transforming information, rather than the output of the process, we focus our analysis of the different methodological approaches on the steps in the processes and on the focus and perspectives included in the processes.

## 1.5 Guide to thesis

The thesis consists of ten chapters divided into four parts. In the following section we will discuss the target audience and present some different route maps to specific target audiences to ensure an as efficient reading as possible. After that the outline will be described to facilitate the understanding of the composition of the thesis.

### **1.5.1 Target audience and reading instructions**

We have identified three main target groups that could be interested in reading this thesis. First, we think that the thesis is of interest to university students within the fields of strategy and technology management. Another target group of this thesis is personnel within EMP at the department TBS. However the thesis could also be of value to managers of other Ericsson units experiencing the same problems or personnel working with business intelligence or as industry or business analysts. A third target group are consultants working with similar problems in organisations.

People within TBS and students are recommended to read the thesis in its entirety in order to ensure that all aspects about the recommended framework are understood. Other employees at EMP and other Ericsson units that are interested in the thesis from a practical point of view are recommended to read the introductory chapter, the chapter concerning the inside perspective of TBS as well as chapters seven through ten which include our developed framework both in generic and specific version, example of application and conclusions. Persons working with business intelligence are recommended to read chapter one and five to nine to get an idea of the theoretical framework used as well as our adapted framework and its application. People working as industry or business analysts will probably find it most useful to read chapter one as well as chapters three and four, which concerns a dynamic landscape and the mobile telecom industry, and the conclusions in chapter ten. Consultants working with similar problems are recommended to read the practical parts in chapter three to five, and also the generic framework in chapter nine as well as the conclusions.

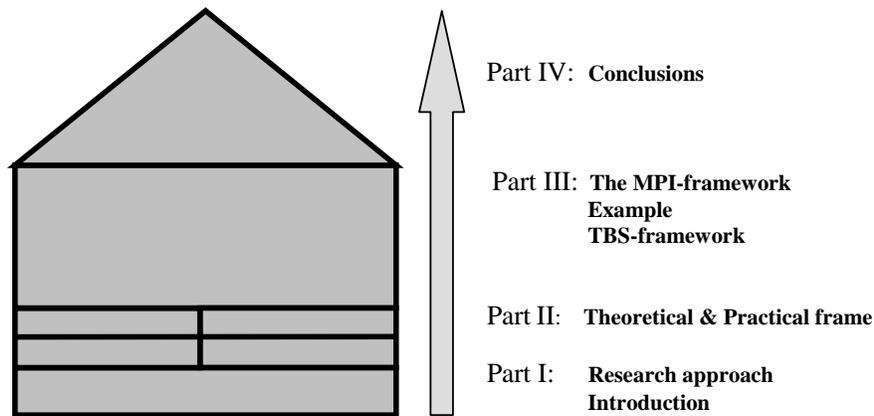
The chapters we think everybody should read are the introduction in chapter one, the TBS-framework in chapter seven, and the conclusions in chapter ten.

### **1.5.2 Structure of the report**

As stated earlier the thesis consists of ten chapters, which are divided into four parts. The parts and the chapters are presented in figure 1.1 below. Each chapter will start with a short presentation and an overview of the outline and content of the chapter. A small version of the figure will also be presented to facilitate the orientation for the reader.

## The Multi-Perspective Intelligence framework

---



*Figure 1-1: Disposition of the report*

Part I consist of two chapters: introduction and research approach. This part serves to set the scope and give directions for the rest of the thesis. The introduction contains the background to the thesis as well as problem definition, purpose and delimitation. The research approach includes a description of the methodology used in the study, both on a theoretical and practical level, describing our scientific frame of reference and the scientific problems we have faced, and our thinking and approach when conducting the study. Also reflections and criticism of our study from different viewpoints are discussed.

Part II consists of the theoretical and empirical frame of the thesis. This part includes theories about dynamic, high technology industries as well as a description and analysis of the mobile telecom industry, which is typical for a dynamic, high technology industry. The part continues with an analysis of the situation and the needs for a structured intelligence process at the TBS department. Tools and methodological approaches for structuring the process of creating intelligence are also presented and discussed. Here we develop and present a synthesised process for collecting, consolidating, structuring and analysing information.

After the empirical and theoretical frame has been presented, Part III follows which contains development of TBS-framework that is adapted to satisfy the needs of TBS identified in chapter five as well as the external requirements. This part also consists of an example where the TBS-framework is used, as well as guidelines that work as recommendations about how to use it. After that we develop “The Multi-Perspective Intelligence framework” that is a generic version of the TBS-framework. This part is the core of our practical contribution.

Finally, part IV includes our conclusions as well as suggestions for further research.

## 1.6 Definition of concepts

In order to facilitate the reading of the thesis we will here clarify some terms and abbreviations that are frequently used.

**2G:** The second generation technology of mobile communications. It is a digital technology and is mainly used for voice transmission but also, in a limited extent, data transmission like SMS (Short Message Service). GSM is one technology of the second generation.

**2,5G:** 2,5G is an enhancement of GSM, called GPRS, and includes improvements in the data transmission rates by introducing packet data.

**3G:** The third generation of technology of mobile communications. It differs from 2G in that the digital transmission is code divided instead of time divided. This means that the transmission rates are further increased which implies that for instance multimedia services such as downloading music and movies will be possible. UMTS is the accepted world standard for 3G.

**BI:** Business Intelligence

**Data:** This term means unconnected pieces of information<sup>7</sup>. It is the product of observations. Data becomes valuable when it is processed and transformed into useful form.<sup>8</sup>

**EMP:** Ericsson Mobile Platforms

**GPRS:** General Packet Radio Service, an upgrade of the GSM-network that enables high-speed packet data communications.

**GSM:** Global System for Mobile Communications, a standard for digital mobile telephony, today the world's most widely used mobile system.

**Information:** This term refers to ennobled data<sup>9</sup>. Information is created when data is arranged in a pattern for a particular use. The data is put in a context to become meaningful for a certain individual at a certain time<sup>10</sup>.

**Intelligence:** Intelligence is ennobled information that is used for example in a planning process or as decision support. Some form of selection, processing and dissemination must be done in order to make the information ennobled.

---

<sup>7</sup> Hedin (1992), pp.6-7.

<sup>8</sup> Ackoff (1989), pp.3-9.

<sup>9</sup> Hedin (1992), pp.6-7.

<sup>10</sup> Saxby (1990)

***MPI-framework:*** Multi Perspective Intelligence framework. The framework we have developed for TBS.

***Network system providers:*** A supplier providing a total infrastructure for mobile communications.

***Product:*** When the concept product is used in this thesis we mean the “product” EMP that licences to other parties. It is not a physical product, what EMP sells is the right to use their technical platform solution.

***TBS:*** Technology Business Strategies, the particular section within EMP where this thesis is executed.

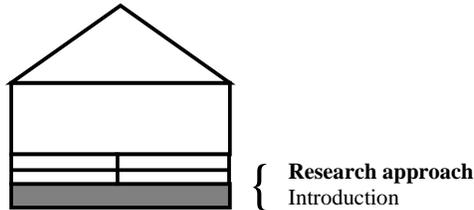
***Technology platform:*** The EMP technology platforms include complete component specifications, printed circuit board layout and software. Also referred to as platform.

***UMTS:*** Universal Mobile Communications System, the name on an international 3G, third generation of mobile communications, standard.

***Wireless device:*** A device that is wireless, meaning that it can communicate without the use of cables, using radio technology. An example of a wireless device is a mobile handset.



## 2 Research approach



*In this chapter the methodological approaches that have been considered while working with this thesis will be discussed. We hope this will give the reader a possibility to understand and evaluate what we have been doing and why, and also evaluate how our method has affected the result of our study.*

---

### 2.1 What is methodology?

Methodology is, according to Halvorsen<sup>11</sup>, a systematic way of examining the reality. It is a mode of procedure to arrive at new knowledge, not only the techniques used for data collection and analysis, but also embracing the research problem and the basic assumption of reality<sup>12</sup>. We will here discuss methodology with a model of Bjerke<sup>13</sup> as a basis, see figure 2.1 below.

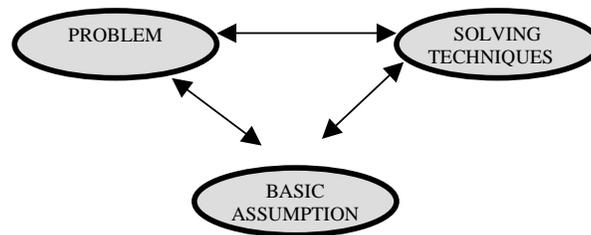


Figure 2-1: Methodology model

Bjerke means that a good methodology is characterised by a fit between problem, problem solving techniques and the basic assumption.

Our problem has already been presented in the problem discussion in chapter one, the technique used for solving the problem will be discussed later on, but now we will focus on the basic assumption, which is also referred to as paradigm<sup>14</sup>.

---

<sup>11</sup> Halvorsen (1992)

<sup>12</sup> Tranöy (1986)

<sup>13</sup> Bjerke (1981)

<sup>14</sup> Bjerke (1981), Morgan (1980), Nilsson (1994)

## 2.2 Basic assumption<sup>15</sup>

The paradigm is the assumption about how reality is basically constructed. This assumption influences the way a scientist looks at a problem and the attitude towards different solving methods.

According to the methodological theory there are primarily three different methodological approaches. These are: Positivistic, Systems and Hermeneutic approach, the names vary some between different authors but have similar meaning. *Positivism* is based on the assumption that there exists *one* objective reality that is independent of individuals. A further assumption is that the reality has an additive character, which means that the whole is the sum of the parts. The aim of research is to reconstruct reality and establish causal connections. The opposite view, the *Hermeneutic*, assumes that reality is a social construction, dependent on the actors. Followers of this view argue that humans create their own future and this means that there is no one truth to find about how things really work. In between these two different views we find the *Systems approach*. This view also, like the positivistic, believes in an objective reality, however this approach assumes that the whole differs from the sum of the parts. Reality must be considered as a system where the parts mutually interact, the relations come into focus.

We believe that there are truths to find about how different organisations and individuals interact, but not that we can find laws like the unchangeable laws of nature about how the world works, as pure positivists would state. Neither do we take a pure hermeneutic stance, which argues that human beings and organisations create their own future. We find ourselves in between of these general points and take a systems approach.

We do not think that the world is created of separate, unrelated forces. We look at the world as a system where every component has an influence of the rest and the only way to understand the system is to contemplate the whole<sup>16</sup>, not an individual, isolated part of the pattern. We also believe that the system is open, which means that we assume that the organisation is both affected and affects its surrounding environment. This makes the situation even more complex. This creates a situation where cause and effect are subtle, and where the effects over time of interventions are not obvious. For this thesis our basic assumption implies that conventional forecasting, planning and analysis methods are not fully equipped to deal with this complexity. In developing a framework for TBS our systemic approach will have a great influence when it comes to tools and analysis methods.

---

<sup>15</sup> Nilsson (1994), Bjerke (1981)

<sup>16</sup> Senge (1990)

## 2.3 Problem solving techniques

This is the part of the methodological triangle that is sometimes referred to as methodology alone. This area comprises the methods and techniques available to solve the research problem.

### 2.3.1 Theoretical vs. Empirical world

While carrying out this thesis we have found an *abductive*<sup>17</sup> course of action to be the best way. *Induction*<sup>18</sup> means development of theory based on empirical observations and *deduction*<sup>19</sup> is development of theories from theories. We found that neither of the two would be appropriate for achieving the purpose of this thesis and to fulfil solving our research problem. Instead we choose the abductive approach that combines the use of theory and empirical studies. We have used existing theories to describe and analyse the environment that surrounds the organisation and to formulate a framework for collecting, structuring, analysing and communicating information. Our purpose is though to develop a framework that fits in an industry that is dynamic and based on high technology. This result in that we, at least to some extent, aim to create theory by combining and use different methods as a complement. Therefore we also found it necessary to combine the theoretical study with an empirical study in order to identify the specific needs of this type of environment.

### 2.3.2 Quality vs. Quantity

When choosing the way of acquiring data for the research, one fundamental choice is between the qualitative or quantitative survey approaches. *Quantitative* research means that primarily historical data is examined where the answers searched for are the measurable type and can be expressed in numerical terms. This study has been developed in a *qualitative* stance since our research problem and purpose demands a context and interpretation of not quantifiable empirical information<sup>20</sup>. We found that this form was best suited for our thesis because it considers the future in a turbulent and dynamic industry with a high degree of uncertainty.

To gather information interviews and a case study have been performed, which we felt was the most effective way of collecting data. This has been done in parallel to the theoretical studies. A more thorough description of the interviews and the case will be presented below within the discussion about “practical methodology”.

## 2.4 Practical methodology

While working with this thesis we have been physically situated at the section TBS within EMP in Lund, this means that we have made the study as insiders, but with

---

<sup>17</sup> Alvesson & Sköldeberg (2000)

<sup>18</sup> Nilsson (1994), Alvesson & Sköldeberg (2000)

<sup>19</sup> Alvesson & Sköldeberg (2000), Nilsson (1994)

<sup>20</sup> Alvesson & Sköldeberg (2000)

another perspective and frame of reference than the personnel working within the section.

The first weeks we focused mainly on building our knowledge base about EMP and the TBS section and on creating a general understanding for the business of the company. This was done by informal, non-standardized<sup>21</sup> interviews with people that work in the section. These interviews were performed as a conversation with the interview persons to make them talk freely and give thorough answers to our questions. We also studied academic literature related to highly competitive, high technology markets.

The choice of theories has evolved gradually. Emphasis lies on different methodological approaches for the intelligence creating process, which we use as a basis when developing our framework for TBS. Literature concerning business intelligence, technological foresight and forecast, monitoring, science & technology roadmapping and other related literature was studied. In addition to this, scenario planning is considered as an analysis tool, which is incorporated into our methodological framework, and hence literature concerning this area was studied. The literature was found by searches on databases such as LIBRIS and EBSCO. Our tutors and other academic personnel at the Lund School of Economics and Management and Research policy institute at Lund University have also recommended relevant literature to us, which has been studied.

The material used as basis for our analysis of the structure of and structural changes in the industry of mobile telecom is interviews inside and outside EMP and also articles in different newspapers and telecom magazines. We have also studied theories and literature in the field of economics and business administration that treat this industry and structural changes on the market on a more general view.

To achieve a deeper understanding of TBS, a few persons that have worked at TBS for the longest period of time were interviewed. Since there are only a few persons that have worked at TBS for more than half a year, it was difficult to get a comprehensive view of the work performed by the section. The interviews were non-standardised as for the reasons mentioned above.

In order to get a picture of how the users of the output of the TBS working process valued the output, employees at the department of Technology Development and the department of Technology Strategies of EMP were interviewed. These persons had taken part of the material produced by TBS and were able to evaluate it in relation to their own work.

To be able to define the information and its format that is input to TBS working process, we conducted a workshop with employees from different sections at EMP. The participants in the workshop are all involved in either delivering information to TBS or employees at TBS. The participants were sent the material in appendix B in

---

<sup>21</sup> Lunddahl & Skärvad (1999)

advance and were asked to prepare individually. At the workshop a discussion about the input and its format took place and the result of it is presented as part of our framework.

When conducting interviews, both of us were present in order to better ensure that all aspects of the interview were taken into consideration afterwards. To get the best result from the interviews one person was responsible for the conversation and the other for taking notes. All interviews were performed in a non-standardised way in order to promote an open and free form of discussion.

The thesis was written continuously during the period and revised in order to reflect the progress of our work. The framework has been developed in a series of steps:

1. First, we analysed the external environment to be able to identify what requirements a dynamic, high technology industry puts on an intelligence process.
2. Second, we identified the internal needs of the section TBS.
3. Third, we made an inventory of different methodological approaches available that could satisfy the internal needs as well as meet the external requirements. In relation to this a generic intelligence creating process was synthesized from four business intelligence processes and one process for technological foresight.
4. Fourth, the “TBS-framework” was developed, this is a framework adapted and specified to the needs of TBS.
5. Last but not least we develop the generic Multi Perspective Intelligence framework by generalising the TBS-framework.

The TBS-framework has been used in an example to show its applicability. In this example, consisting of a decision support developed last year, scenarios were developed. The purpose of this example was not to develop an improved decision support, but to show how the framework including scenario construction can be used to support and structure the working process.

## **2.5 Reflections and criticism of the research approach**

Our study can be criticized from a number of different viewpoints, we have chosen three that we find relevant, which are presented below.

### **2.5.1 Criticism of theories used**

The business intelligence literature and the literature about scenario planning are based on many sources. We have tried to take many different authors into consideration to get a broad and nuanced picture of methods and techniques. When it comes to the literature on a more general level, when describing how competition has changed, the theories of relatively few authors are presented. This might lead to a narrow theoretical scope. Though we think that since we work in a high technology, knowledge intense company we want to concentrate on theories for this type of environment.

### 2.5.2 Criticism of empirical study

The interviews made are relatively few. The reason for this is that we are working in a newly founded organisation where only a few persons have worked within the section longer than half a year. This means that those few people have had large impact on our understanding of how TBS works and on shaping the framework. We have tried to lessen this impact by interviewing people outside the TBS section e.g. people working at departments that use the material produced at TBS. Despite the fact that we have tried to balance the information, the analysis made is mainly based on information received from personnel working within TBS. This might result in an analysis that is slightly one-sided, though we think that in order to fulfil the purpose of the thesis it is necessary to base the development of a framework on information received mainly from the TBS section.

### 2.5.3 Validity and reliability

According to Halvorsen<sup>22</sup> a problem with *validity* arises when scientists work on two different levels, a theoretical and an empirical level. On an empirical level data is gathered and processed, and on a theoretical level the problem is formulated, the data is interpreted and conclusions are drawn about reality. The question is: Will the data collected answer the scientist's research questions? Another problem that arises is *reliability*, which refers to the accurateness of the data collected. Arbnor and Bjerke<sup>23</sup> mean that the systems approach is not as concerned with the reliability problem since it is less quantitative in nature, this makes the reliability of this thesis a minor problem.

To address the problem in this thesis we think that it is important to get a sufficient amount of internal information in order to identify the needs of TBS. The fact that the organisation is very young and immature, and that very little material about the working process is documented further increase the need for internal information from primary sources. We have used three empirical sources: firstly, interviews with personnel within the section TBS, secondly interviews with other people that use the material produced at TBS, thirdly and finally, we have used secondary sources containing descriptions about the section and the roadmaps, which are the main output of their work.

The internal interviews have provided information, both on a general level e.g. the development in the industry and why EMP was founded, and on a section level, e.g. what the working process of TBS look like, what problems the personnel see in this process etc. These interviews have provided us with information that gives us the opportunity to analyse the need for a structured approach. The interviews with people in other EMP units have provided information about strengths and weaknesses that users have identified in the material prepared by TBS. This information has

---

<sup>22</sup> Halvorsen (1992) p.42

<sup>23</sup> Arbnor & Bjerke (1994) pp.251-253

contributed to the analysis of a need for a methodological approach. The secondary sources used served as a complement to the other sources mentioned above.

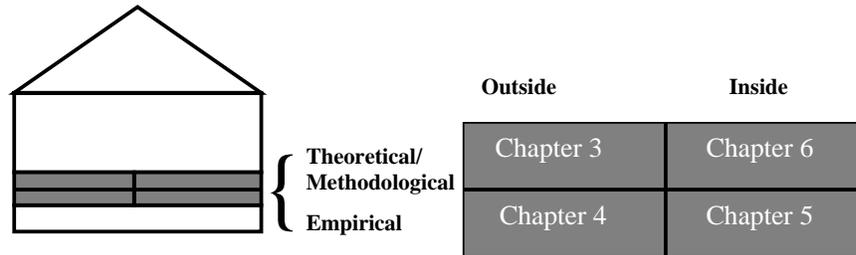
In our study the interviews have been critical for the accurateness of the data. Someone apprehends how the process looks like and then formulate this in his or her own words, and then communicates this interpretation of the situation to us. This means that there are several filters between reality and us. Our challenge has been to get as much correct data as possible through those filters.

To manage this we have used informal, non-standardized interviews but also talked to the users and arranged a workshop with participants both from inside and outside the section. We believe this approach has allowed the respondents to be creative and less affected by us. We also believe that by interviewing people that use the material produced by the section we get a better balance of the information, since we add one perspective to the internal information. These interviews could also be seen as a “check up” of the information to reduce the risk for incorrect analysis and increase the reliability of the thesis. The fact that we have been taking notes during each interview, as well as immediately writing down empirical data after the interview have also increased the reliability.

To sum up, we are trying to understand how a process works in order to identify the needs and shortcomings of TBS, how the surrounding environment affects the organisation, and what could be done to satisfy the internal needs as well as the conditions in the environment. We are not testing hypothesis but use existing theories to describe and analyse the situation within and outside the company. We need both the perspective from the employees within TBS as well as the perspective of the employees in other EMP departments. This leads us to a method based primarily on qualitative methods such as loosely structured interviews, but that also to some extent contain elements of a quantitative methodology.



## Part II. Theoretical & Empirical frame

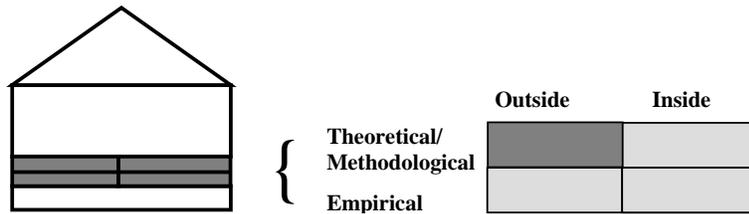


*Part II is constructed around four chapters that considers an external as well as an internal perspective, and includes both an empirical and a theoretical/methodological perspective. The part starts with chapter three that gives a general view of theories for high technology industries. In the fourth chapter the industry for mobile telecom, that is representative of high technology industries, will be described. After that, chapter five follows with a description of EMP and the section TBS that is a representative organisation of the mobile telecom industry. This chapter concludes with a discussion about the identified needs. Finally, the part ends with chapter six, where methods and tools to satisfy the internal needs and to meet the external requirements are presented and discussed.*

---



### 3 Outside – a dynamic landscape



*The purpose of this chapter is to introduce the reader to a dynamic landscape and to convey a picture of how the underlying assumptions have changed. The chapter starts with a discussion of how competition has changed in the new type of industries that are based on high technology and are knowledge intense.*

---

#### 3.1 Introduction

Our traditional understanding of how markets and businesses operate was passed down to us more than a century ago. These theories are based upon assumptions of diminishing returns, stable markets and a world in equilibrium, which is characterised by a slow and continuous change<sup>24</sup>. The theories are valid for an economy devoted to bulk processing with operations that are largely repetitive and where companies are heavy on resources and light on know-how. However, the world a company like EMP operates in does not look like that at all. This is a world with an economy that is processing information instead of resources, and with application of ideas instead of raw-energy. This world is characterised by instability and increasing returns<sup>25</sup>.

#### 3.2 Competition

The dynamic economy described above changes the rules on the market. The term “increasing returns” means that when the use of a certain technology starts, it creates a self-reinforcing cycle of positive feedback loops. In short, the phenomenon means that if a product or a technology has gained advantage over another on a market, it tends to increase that advantage and eventually lock in the market and make killing profits. In high-technological industries that are characterised by high complexity the term increasing returns<sup>26</sup> can often be applied. The complexity makes the development of new products extremely expensive. In order to lower the cost/unit, many units have to be manufactured. To accomplish this, it is important to try to create a favourable competitive situation, for example through proprietary standards that can lock the competitors out of the market.

---

<sup>24</sup> Arthur (1996), p.100

<sup>25</sup> Arthur (1996), pp.100-102

<sup>26</sup> Arthur (1996), pp.100-105

There are several reasons why high technology industries in particular are subject to increasing returns. First, products like telecommunications equipment are expensive and complicated to develop. This means that as the quantity increase the price per unit falls. Second, many high tech products need to be compatible with a network of users, this implies that when a particular technology gains prevalence it is likely to emerge as a standard. A third reason is that high tech products often require a training period and when the user has invested time and effort to learn a particular system he or she is likely to stick to that system or upgraded versions in order to avoid a new investment.

Several factors characterise a market with increasing returns: *market instability* (the market favours the product that has already got ahead), *multiple potential outcomes* (one could not say beforehand e.g. which would be the dominating operating system), *unpredictability*, the ability to *lock in* a market, the possible *predominance* of an inferior product and *large profits* for the winner.

This phenomenon changes the competitive situation on a market and affects the companies that have to change their behaviour in order to remain successful. On a dynamic and turbulent market with increasing returns static analyses are not enough, but have to be complemented or replaced by a dynamic approach. *High-velocity markets*<sup>27</sup> and *hypercompetition*<sup>28</sup> are terms that can be used to describe this type of environment.

High-velocity markets are unpredictable, changeable, and dynamic and the structure is instable. The overall market structure is unclear and the players on the market i.e. customers, competitors, suppliers etc. are shifting. Changes occur in non-linear way and it is difficult, if at all possible, to predict them.

Hypercompetition is a condition of rapidly escalating competition, competition to create new know-how and competition to establish first mover advantage. The aggressiveness and frequency of the dynamic movements of the players create a constant disequilibrium on the market. Short product life cycles, entry by unexpected players, new technology and redefinition of the market boundaries make the market unstable. Sustainable competitive advantages cannot be achieved since the competitors catch up with or outmanoeuvre each other to destroy the advantages created.

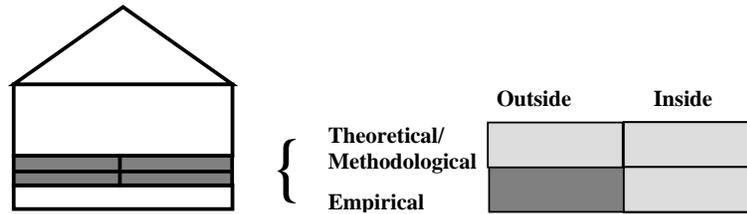
As is evident from the discussion above the high-technology industries are not static and will not behave in a predictable way. Companies therefore have to adapt their behaviour to these new prerequisites. The instability, unpredictability and new competitive situation demand for a fundamental new way of acting and thinking and for a new perspective to strategy. Ability to be flexible, adaptable and to be able to cope with uncertainties are critical factors for success as well as knowing both your own strengths and the competitors weaknesses. In the next chapter we will describe the mobile telecom industry that has the characteristics described above.

---

<sup>27</sup> Eisenhardt & Martin (2000), pp.1105-1107

<sup>28</sup> D'Aveni (1995), pp.45-47

## 4 Outside – the mobile telecom industry



*This chapter will give a description of the mobile telecom industry, which is representative of the dynamic landscape depicted in previous chapter. We will describe how the mobile telecom industry looks like today and how it is changing. The structural changes will be described by identifying predetermined element/trends and critical uncertainties that characterise the industry and thereby the external environment of EMP. The purpose of the chapter is to identify what requirements the environmental context puts on the framework we intend to develop.*

### 4.1 The industry structure

The main players within the traditional<sup>29</sup> mobile telecom industry are: *mobile handset manufacturers, operators and network system providers*. Mobile handset manufacturers and network system providers are often global players while the operators in the regulated markets are national. During the last years the telephone market have been deregulated which has led to increased internationalisation among the operators. Nokia, Motorola, Siemens, Samsung and SonyEricsson are the dominating mobile handset manufacturers. In 2001 they together had 71% of the global market.<sup>30</sup>

The mobile systems have developed from analogous systems to digital systems. NMT (Nordic Mobile Telephony ) is an analog system that counts as the first generation of mobile systems. The digital networks are defined as the standard of the second generation. Different systems are used in different parts of the world; in Europe GSM (Global System for Mobile communication) is the dominant technology. The technology of the second generation has been complemented by a new technique for packaging data; GPRS (General Packet Radio Services), which leads to improved transmission rate. This improvement gives the GSM system some characteristics of the third generation's systems and is therefore referred to as 2,5G. What differ the two generations are mainly the access to mobile wideband and the access to advanced functions such as real time video telephony, download of large amount of data e.g. movies and music.

<sup>29</sup> The industry for the first (1G) and second generation (2G) of mobile systems.

<sup>30</sup> Gartner dataquest (March 2002),

[http://www.gartner.com/1\\_researchanalysis/focus/telecom\\_fa.html](http://www.gartner.com/1_researchanalysis/focus/telecom_fa.html)

## 4.2 Structural Changes in the industry

It is a fact that the mobile telecom industry is changing, we will below describe a selection of trends and uncertainties that we have identified and that we think can, and some will, contribute to changing the industry structure.

One trend we have identified is that the roles of the players in the industry tend to become increasingly *specialised*. The reasons for this are twofold. It partly depends on that the competition increases as the products enter the maturity phase (this holds for 2G) of the product life cycle and partly because the technology becomes increasingly complex.

The increased competition has the consequence that companies have to reduce costs which means that economies of scale becomes more important. This has been achieved by outsourcing the manufacturing and design of the mobile handsets. The competitive situation has also led to that more companies choose to buy the mobile platform instead of developing it themselves.

The complexity of the technology means that the R&D-cost of developing a platform is very high. Only a few players will have the resources and the competence required to be at the front end of the technology development. This demands increased specialisation, which means that the industry enters a new phase where outsourcing of R&D becomes more common.

This *specialisation* leads to a *fragmentation of the traditional value chain*, which have long been dominated by vertically integrated players like Ericsson, Nokia, Motorola and Siemens. The fragmentation means that different players concentrate on a part of the value chain and become more horizontally divided. Examples of companies that earlier concentrated on the entire value chain, but now have developed in this direction are for instance Ericsson (EMP) and a division of Motorola, which concentrate on the development of mobile platforms.

An analogy can be drawn to the historical development of the computer industry. In the eighties this industry was dominated by a few large vertically integrated companies, like e.g. IBM and DEC. These companies handled everything from the chips to sales and distribution. The situation changed and players specialised in part of the value chain. Players like Intel made the chips, Compaq assembled the computer and put them on the market and Microsoft developed the operating systems and application software, see figure 4.1.

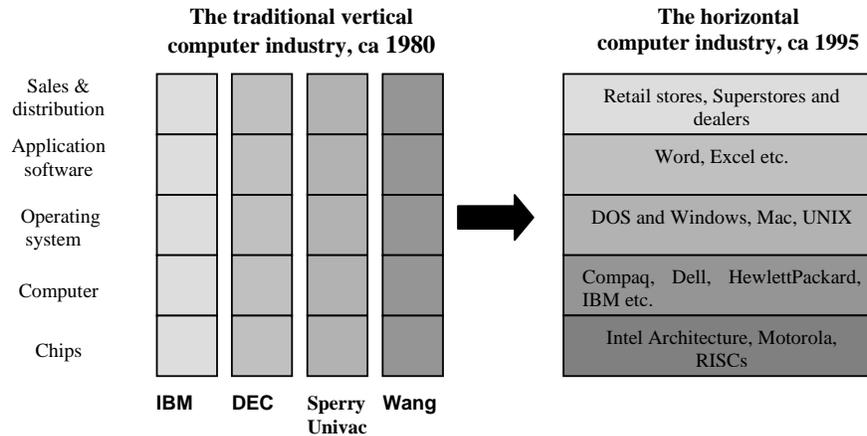


Figure 4-1: The transformation of the computer industry<sup>31</sup>

The comparison of the two industries can be made to some extent to get an insight of what might happen in the mobile telecom industry, but it is important not to equate the two industries. The development of the computer industry is not the key to how the mobile telecom industry will develop. Some of the conditions are comparable: the products are both technologically complex and the products must both be able to work in a network, but there are other factors that separate them: for instance that a mobile handset is more associated with a persons image which makes design more important. Though many see the development in the computer industry as the answer to what will happen in the mobile telecom industry, we think there are great uncertainties about how the industry structure will develop and that there is a risk of a locking about how the future may unfold.

One result of the increased specialisation and the value chain fragmentation is an *increased importance of alliances and partnerships*. Another reason for the increased importance of strategic alliances and partnerships is that the *product life cycles are decreasing*<sup>32</sup>. It is here important to emphasise that this is not valid for the whole mobile telecom industry since various parts of the industry change with different speed, e.g. it is not valid for the network systems that are more stable, but for platforms and handsets the lifecycles are decreasing. This means that *pre-market competition* and *timing* becomes more important since the market window also decreases. Time to market can be critical for a product's future profitability. Cooperation and specialisation can be one way to reduce time to market. Yet another reason for that alliances and partnerships have gained increased importance is that dominant logics and standards are very critical in the industry. By establishing alliances, different players with different know-how can cooperate to develop e.g. a

<sup>31</sup> Stankiewicz, lecture notes overheads part 1 and 2, 2001/2002.

<sup>32</sup> Hamel & Prahalad (1996), p.37

new technology with the purpose to be the base for the standards of tomorrow. By establishing standards other competitors can be locked out of the market or it can guarantee that the dominant standard will not be a proprietary solution. An example of this type of alliance is Symbian where the participants try to limit Microsoft's influence on the software for mobile handsets. Since there is a great uncertainty in the industry about what standards will become the dominant design in different areas of technology it is important that players like EMP are observant to find suitable partners in areas that are considered strategically important.

Another trend to be seen in the industry that also affects the structure of the value chain is *a convergence of different industries*. In the third generation, the mobile telecom industry and the IT-industry are growing closer to each other. The 3G-handsets combine the functionality of personal computers with the characteristics of the mobile handsets.<sup>33</sup> Also the media industry is converging with the telecom industry indicated by music, movies and other services that are already or will be provided in the mobile handsets. This indicates that the industries are converging and that the structure is changing.

Except for trends, which are known phenomena that affect the industry, there are also phenomena that could get various outcomes, uncertainties. Two uncertainties that we see in the mobile telecom industry are connected to *changing consumer preferences* and *technology push*.

Due to the complexity in the technology, product development in the industry is characterised by a strong *technology-push*, which means that the starting point for development of new products is a technology for which suitable applications are found to create business opportunities. For traditional consumer products, e.g. provisions and other commodities, the development starts with identified need on the market that the product will satisfy. The push-strategy is connected with uncertainty since it is difficult to predict which technology will be successful on the market. It is also hard to predict which technologies will be the revolutionizing ones, the ones that cause a technology shift in the industry. The fact that EMP does not have direct contact with the final customer makes the situation further complicated.

Another uncertainty that is worth noticing is *changing customer preferences*. This is partly connected to the technology-push aspect mentioned above, but also includes some other aspects. Customers' preferences change over time and since different players in an industry often specialise in different aspects this can cause a migration of the value in the industry. During the last years there has been a shift in the preferences about the products from technical parameters to the design of the handset. Earlier, parameters like battery capacity, size and weight, were seen as important and could be decisive for the customer. As the market matures (this holds for 2G), focus has been moved towards brand, design and services. Parameters that were earlier orderwinners<sup>34</sup>, i.e. a reason for the customer to buy the product, have become mere

---

<sup>33</sup> Carlbom (2002), p.1

<sup>34</sup> Hill (1993), p.36

qualifiers<sup>35</sup>, i.e. parameters that the customer requires to even consider the product. This is an uncertainty that can get various outcomes and therefore has to be considered and evaluated.

The trends and uncertainties discussed above are concluded in the following bullet points:

- ❑ **Increased specialisation**
- ❑ **Fragmentation of value chain**
- ❑ **Increased importance of strategic alliances and partnerships**
- ❑ **Shorter product life cycles – increased importance of pre-market competition**
- ❑ **Convergence of industries**
- ❑ **Technology-push**
- ❑ **Changing consumer preferences – migration of value**

It is important to clarify that a time perspective is vital when discussing trends and uncertainties. It is a fact that some parts of the mobile telecom industry, e.g. the network system providers, have more inertia than others and thereby change slower. Generally, the closer to the final consumer, the faster the structure changes and the uncertainty about the future increases. All the issues discussed above concern the environment surrounding EMP, which is indirectly connected to the consumer market, therefore they have a relatively short time perspective and will affect the structure of the industry during the years to come. It is in this relatively short time perspective that we discuss the trends and uncertainties in the industry.

### **4.3 Synthesising discussion regarding the outside perspective**

Some phenomena have been presented that contribute to change the structure in the mobile telecom industry. Some are known, i.e. it is possible to identify the outcome, and these are referred to as trends. Identification and evaluation of the trends, the changes they cause, and the implications they have on the particular organisation are essential to a company that will survive.

Except for the known phenomena (trends) that affect the industry, it is also affected by uncertainties<sup>36</sup>. The difference lies within that an uncertainty can turn out in many different ways and hence affect the company in different ways. The more uncertain the environment, the more important is the ability to evaluate their significance and to develop alternative and robust strategies. The ability to efficiently handle information to decrease uncertainty also becomes critical.

The trends and uncertainties that are described above; *specialisation, fragmentation of the value chain, shorter product life cycles, increasing importance of strategic alliance, the strong technology-push, convergence of industries and changing*

---

<sup>35</sup> Hill (1993), p.40

<sup>36</sup> Interview with Berth Eklundh, 2002-02-06.

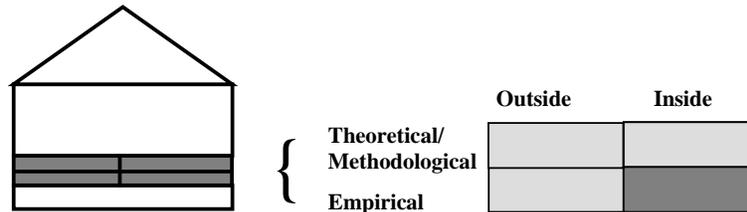
*customer preferences* all contribute to make the dynamic environment EMP act in more complex and uncertain.

Another phenomenon that characterises the mobile telecom industry is increasing returns, which means that a technology that gains advantage tends to increase it and eventually locks in the market. This phenomenon further contributes to make the market instable and unpredictable. Hypercompetition and high-velocity markets are two theoretical terms used to describe this type of dynamic marketplace that is unpredictable and the structure is changing.

To sum up, we can draw the conclusion that the mobile telecom industry has the characteristics of a hypercompetitive/high-velocity market, which means that it is dynamic, characterised by instability, and is thereby highly uncertain. This uncertainty has to be considered when formulating the strategy of a company.

At the heart of the traditional approach to strategy lies an assumption that executives, by applying a set of powerful analytic tools can predict the future accurately enough to develop a clear strategic direction. When the future is truly uncertain this approach is at best marginally helpful and at worst dangerous to the company. Another danger in this type of uncertain industry is that managers, since they cannot find a strategy that works under traditional analysis, abandon their analytical work and base decisions merely on pure instinct. Even in the most uncertain industries, like the industry for mobile telecom, there are some trends that could be identified and used as indicators of how the market will evolve over time. The ability to identify these trends, evaluate them and put them together in possible scenarios becomes a critical factor for success in an environment with the characteristics described above.

## 5 Inside- EMP & TBS



*In previous chapters we have presented general theories about high technology industries and also given a description of the industry for mobile telecom, which is representative for high technology industries. In this chapter a presentation of EMP will be given. EMP is a representative company of the mobile telecom industry. We will also give a description of TBS and the working process of the section will be mapped and presented. The chapter concludes with discussion concerning the identified shortfalls and needs of TBS.*

---

### 5.1 EMP

Ericsson Mobile Platforms (EMP) was established on September 1st 2001 after dividing the former Consumer Product Division of Ericsson into two new companies, EMP and Sony Ericsson Mobile Communication.

The establishment of EMP was a strategic decision from the Ericsson group with a clear ambition to accelerate the wireless industry by letting their technology be available to all players in the market. The company provides platform technology required to develop a complete wireless device, which includes system design, complete component specifications, printed circuit board layout, chipset and protocol software. EMP also offers support and service in customizing the platforms such as: integration, production and certification. It is important to note that EMP sells licensees so that customers are able to use the technology in manufacturing wireless devices, i.e. they do not sell physical components. The business scope for EMP is 2.5G and 3G technical platforms. Customers are manufacturers of wireless devices for example mobile handsets.

The background of the decision of forming the new company was that Ericsson, along with other players in the industry, experienced profitability problems. This, in combination with that the Ericsson group foresees a structural change in the industry lead to the decision. When the technology becomes more complex, mobile handset- and wireless equipment manufacturers have had a hard time in continuing to invest in technology to be at the front-end. R&D investments are very expensive, they are associated with high risk and only a few large players are therefore able to develop the latest technology. Instead, manufacturers become interested in buying open solutions. By licensing EMP technical platforms a player can launch their own

products with limited and predictable investments in R&D<sup>37</sup>. The handset manufacturers can focus on product differentiation such as applications, design, distribution and branding while EMP focus on their core competence which is the technology.<sup>38</sup> EMP's vision is to enable its customers to be first, best and profitable.<sup>39</sup>

*“We will provide instant access to cutting-edge technology, making it possible for all mobile handset and wireless device manufacturers to bring new advanced products to the market quicker and more cost efficiently.”*<sup>40</sup>

## 5.2 Technology Business Strategies

To give the reader a better view of the organisation and where the object for this thesis is situated, we will here present a figure showing EMP's basic organisational structure and TBS's organisational position. After that we will describe the main process of this department to give the reader an idea of what the people in this department do to add value to the organisation.

EMP is divided into four major functions see figure 5.1. One of these functions, Sales & Marketing, is further divided into two departments, where Product Management is one of them. TBS is organisationally situated as a subsection of Product Management. The entire organisational structure cannot be shown in figure 5.1 due to confidentiality reasons.

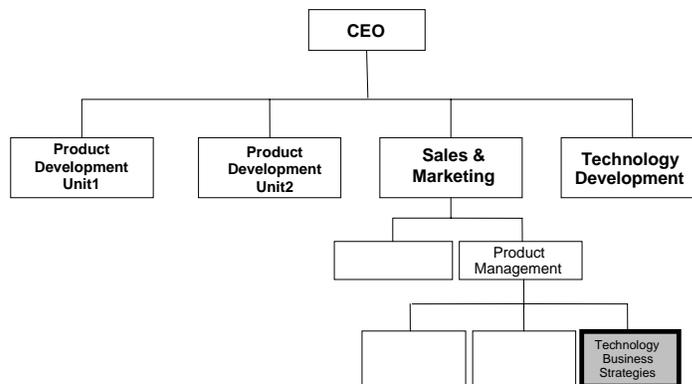


Figure 5-1: EMP's basic organisational structure and TBS's organisational position

The mission of TBS is to define and communicate technology strategies to make sure that EMP makes the right technology decisions in right time in order to optimise the business and sustain the competitive edge. Technology roadmaps are used as a tool to visualize and concretise the strategies. The roadmaps define functionality for different

<sup>37</sup> Carlbom (2002), p.1

<sup>38</sup> Augustsson (2002), p.100

<sup>39</sup> <http://www.ericsson.com/mobileplatforms/>

<sup>40</sup> <http://www.ericsson.com/mobileplatforms/>

technologies and map the functions over time by showing when they should be included in a product.

The work at TBS is illustrated by figure 5.2, where input is transformed to useful output.

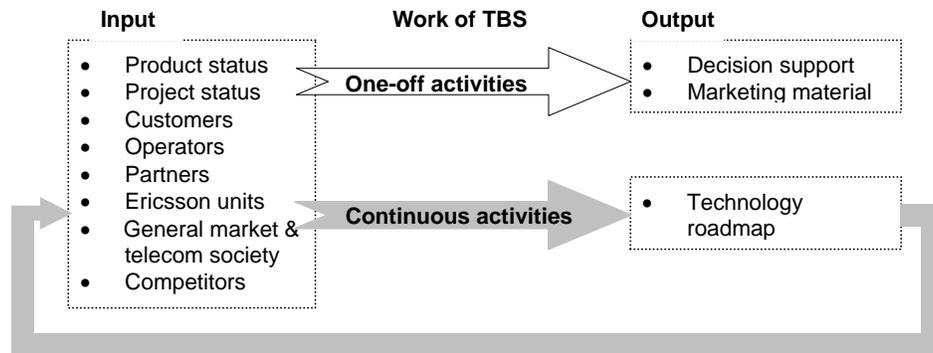


Figure 5-2: Input-output transformation done by TBS

The input consists mainly of large quantities of unprocessed information and raw data from sources described to the left in figure 5.2 which are: *product status, project status, customers, operators, partners, other Ericsson units, general market and telecom society and competitors*. The task of TBS is to consolidate, structure and analyse the information so that the output that is composed of one or more of the following: *a core statement, a proposed technology roadmap, decision support and/or marketing material*, are created.

The main activity is the development and the continual update and review of the technology roadmaps. The activities connected with the roadmap will be further described below and moreover a description of the other outputs mentioned above will follow.

Technology roadmapping at TBS is mainly used for defining functionality/technology for each generation (platform) and as a tool for communicating and coordinating the process of defining the platforms that are to be released in one to five years time by coordinating the product development with the expected market needs. The questions of for instance when a particular feature should be included in a product or when this product is due to be released, are supposed to be answered in the roadmapping process. These choices are based on market demand or expected market demand as well as the internal technological capabilities. Many of the features/functions also have their own lower level roadmaps, which are more detailed and show technical parameters and when the particular function is to be included in a platform or product. The roadmaps are used for both *visualising the future* and *planning*, but the main focus lies on the planning aspect. In the longer time perspectives, technology roadmapping is mainly a tool for visualising the future and determining what sort of

functions should be included in the products, while in the shorter time perspectives the focus lies on planning.

The process of constructing an EMP roadmap could be defined in four phases:

- i. First a vast amount of information has to be gathered. The first step in the process is to collect, evaluate and document the requirements and general view of each source. The technology roadmaps are based on information concerning both external and internal sources. External sources consist of information concerning the competitor situation, customer requirements, operator requirements, partner requirements, standardization and general market trends, see figure 5.2. Internal factors include business strategies, roadmaps of other Ericsson units and R&D. The evaluated information should be documented in a predefined format.
- ii. The second step is to further review the collected and evaluated information and if necessary request complementary information from the sources needed. The information is then distributed to the participants of the workshop held in step three.
- iii. The third step is to carry out a workshop with predefined participants with the purpose to evaluate the existing EMP roadmap in relation to the updated information. This should result in changes of the roadmap, if required, and identification the consequences of the proposed changes in other areas. Furthermore a list of required further investigations should be made.
- iv. The last step in the process is to develop and present the updated roadmap based on the output from the workshop.

The roadmaps have to be updated and reviewed continuously since the environment is dynamic and changes the assumptions on which the roadmap is based. A workshop with this purpose is therefore carried out four times a year.

The other three outputs presented in figure 5.2 above, *core statement*, *decision support and marketing material*, and their relations to the roadmap, will be described below.

**Core statement:** A core statement is a complement to the technology roadmap describing a particular technology, EMP's position towards the technology and its implications for the company concerning e.g. strategies and products. It includes the following elements:

- i. *Introduction.* Explains the purpose of the technology i.e. what justifies its existence.
- ii. *Strategic choice of direction.* In order to justify key decisions, a short text is needed to describe the strategic choices made, i.e. what is supported by EMP and what is not.
- iii. *Context.* A description of the technology's relations to other EMP operations and how it fits with the rest of the Ericsson group.

- iv. *Market window.* A description of when the technology is suited to enter the market and whether it will be replaced by another technology in the future.
- v. *EMP product offering.* How is the technology reflected in the product offering of EMP? Is it included in many products or only one?

**Decision support:** One of TBS's tasks is to drive implementation of the technology roadmaps. This means that decision support and recommendations has to be prepared for decisions made in EMP's decisions forums, Business Council and Technical Council. In Business Council decisions are made concerning issues that have implications for EMP's businesses and that might affect the company's cash flow. The purpose is to ensure that the product offerings are in line with the business objectives and to act as a co-coordinator for platform and customer products. Technical Council is subordinate to Business Council and focuses on decisions concerning more detailed technical issues. The purpose of this forum is to ensure that technology roadmaps support the product roadmaps and to coordinate activities such as standardization, technology studies and research.

**Marketing material:** The technology roadmap often forms the base when developing a material that could be used in interactions with customers and operators. This becomes particularly important since EMP works in a business-to-business environment. In order to be successful the material has to visualize the company's plans for the nearest future to make the external players interested in cooperating with EMP.

Apart from technology roadmapping, there are no other methodological approaches used by TBS, neither on the individual nor on the section level. The responsibility of doing their work to the best of their ability lies with the individual person and each person works in a way that he or she prefers. There is no way of guaranteeing that important aspects have not been left out in the analysis performed.

### 5.2.1 The users and target group of TBS output

The users and target group vary according to the type of output. Decision makers in Business council or Technical council use the decision support, while the marketing material is used by the Operator relations section and the Sales department in discussions with operators and customers. The technology roadmaps have many fields of application; they are e.g. used by the technical department, as basis for discussion when interacting with customers and operators, and to ensure coordination among the strategies of different Ericsson units.

Users of the output that TBS produces are generally satisfied with the results in relation to the number of employees at TBS, but they notice a shortage of personnel at TBS<sup>41</sup>. They are satisfied with the long term strategic level of the material presented i.e. the roadmaps, but often information about competitors is not conveyed to the

---

<sup>41</sup> Interviews Mats Melander 2002-04-19, Michael Kornby 2002-04-23.

users.<sup>42</sup> This is seen as a deficiency, since the competitive perspective can be used to determine whether the developed technology is good enough or if it needs more work. Also, the competitive perspective stimulates the work force.

### 5.2.2 Identified shortcomings and needs of TBS

In the present situation, the work at TBS is not *formally* structured, the output of the process is defined, but the work leading to the output is not structured or documented. There is a process chart available for the overall process that TBS is part of, but it is not detailed enough to show the work of TBS. The lack of structure depends mainly on that the organisation is relatively young but also on the fact the majority of the employees have not worked at TBS for more than half a year. Much of the work is done in an “ad hoc” manner when a particular task is required, this result in that it is difficult for the employees to plan how to use the time. The lack of a common process also means that every employee works differently from each other and that it is up to the individual person to do the best he/she can. There are of course certain elements of the working process, e.g. when identifying patterns of development that requires creativity rather than structure, that can never be formally structured but we think that TBS would benefit from the use of some common methodological approach. Below we will discuss some identified needs and shortcomings that indicate that there is a need for a structured process. These needs have been identified by the authors of this thesis, and are also the result from discussions with employees within TBS as well as persons that use the output. The discussion will be structured after the input, the process and the output.

***Identified needs concerning the input:*** To guarantee the quality of the work we think that it is important that all relevant aspects are considered in the working process. The lack of a structured mode of working implies that aspects are easy to forget. To cope with the quality assurance problem we have identified a need for *defining the scope of information* that is relevant to TBS and should be input to the working process. This is needed in order to ensure that every employee at the section have all relevant aspects in mind and do not accidentally forget some important aspects when producing the output.

In addition to this we think that in order for TBS to receive the relevant information from other sections, there is a need for *specifying the format* in which the information should be delivered. It needs to be determined when, where and how the information should be delivered. For this to succeed, we also see a need for formulating a clear *allocation of responsibility* for the areas of input to the process. If a person is responsible for an area of information it is a greater possibility that the information will be delivered as decided.

***Identified needs concerning the process:*** The first need identified when the process is considered is traced back to the fact that the organisation is relatively young and immature and that the process is unknown and have not been documented. Both we as

---

<sup>42</sup> Interview Mats Melander, 2002-04-19.

observers and the employees at the section see a need for a *mapping of the existing process* in order to be able to structure it and improve it. This will be helpful for the existing employees but also facilitate for newly employed persons at the section since a description of the process will give a faster understanding for what kind of work the section performs and how it is done. New persons will thereby faster be able to adapt to the section.

The employees at TBS are aware of the fact that their work is not structured. They are of the opinion that some sort of methodology would help them in their work. They see a need to *become more proactive* in their work and *increase their preparedness* instead of, like today, acting reactively to external events. If the fire department works with preventing fires instead of merely extinguishing fires their work becomes more efficient. We think that this could be valid also for TBS and that a structured way of working could help to achieve a higher degree of readiness.

We as authors of this thesis, and the employees at TBS have also stressed a need for *handling uncertainties* in a better way than today, especially since the market that EMP operates on is unstable and the future is unpredictable due to the reasons discussed in chapter three and four. To achieve this we have noticed a need for the section to *become more anticipatory*, rather than merely planning oriented, in their work in order to be better prepared for what the future might bring.

Furthermore, we have identified a need for *separating the working processes* of TBS since part of the work of the section is performed continually, i.e. the roadmapping exercise, and part is performed when needed and concerns unique issues, e.g. a decision support. The reason for this is that the processes differ quite considerably from each other. The process that is unique, also called one-off, has a start and an end, meaning that it has a limited lifetime, which the roadmapping process does not. Furthermore, the construction of the roadmaps is a special activity that requires a different approach than the other outputs.

The last need we have identified when the process is concerned is an *increased focus on the process* instead of merely focusing on the product. Our opinion is that by structuring the work leading to an output, a better balance between the process and the final product could be achieved. A better balance between product and process would be beneficiary to TBS since especially the roadmaps are of no use to the organisation if they are not communicated properly. Today the focus lies mainly on the outcome of the process, not on the process creating the outcome. We think that by an increased focus on the process many positive effects could be achieved. For example, involving appropriate people in the process of developing a technology roadmap could lead to better coordination both within EMP as well as with other Ericsson units, and also to a common learning process. This could also lead to a better communication and to ensure that different aspects of interest are included in the roadmaps.

***Identified needs concerning the output:*** In addition to the needs discussed above we have also identified a need for some form of *quality guarantee* of the output. This is

due to the importance of the work performed by TBS that for example serve to support important business decisions that could affect the future success of the company. A structured approach at TBS could contribute to a higher quality of the output and also to that the work performed becomes more efficient since the structured approach would in a better way promote a systematic and a more professional approach towards collecting information, structure and analyse it in order to produce the required output.<sup>43</sup> We think that reliable, well-tried approaches and tools could serve as a quality assurance of the work performed by TBS, similar to the assurance that standards such as ISO give the user.

Furthermore, we recognise a need for an *adaptation to the end user* of the material. In order to be able to adapt the output, we also see a need for *identifying the users*. The core statements are for example often directed towards the customers instead of the internal organisation. Also the roadmaps should preferably be more adapted to the end user. The customers need a specialised version of the roadmap in order for it to fill its purpose, it is not sufficient with a generalised view of the roadmap when the customers for instance want to discuss detailed matters.

The needs identified and discussed above are concluded in the following table:

Identified Needs of TBS	
<b>Input</b>	Define the input in the process
	Specify the format, when, where and how
<b>Process</b>	Define responsibility
	Mapping the existing process
	Become more proactive
	Increase preparedness
	Better handle uncertainties
	Become more anticipatory
	Separating the continuous process from the unique
	Increase focus on the process
<b>Output</b>	Some form of quality assurance
	Identification of users
	Adaptation of material to end user

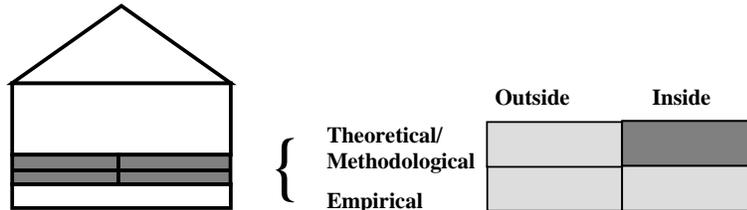
Figure 5-3: An overview of the identified needs of TBS.

In the following chapter a toolbox for satisfying the identified needs and to decrease the shortcomings will be presented and discussed.

---

<sup>43</sup> Pagel-Fick (1999)

## 6 Inside – Tools for handling the new competitive landscape



*In this chapter different methodological approaches will be discussed that could contribute to satisfy the identified needs at TBS and also meet the requirements of the external environment of a dynamic, high technology industry. A synthesising discussion concerning the appropriateness of the methodologies will follow. Additionally an inventory of different analysis tools will be presented and then a discussion of the different tools will follow.*

---

### 6.1 Introduction

In previous chapters we have identified requirements of a dynamic environment as well as internal needs in an organisation. In this chapter we will present different methodological approaches that could satisfy internal needs as well as meeting the external requirements.

### 6.2 Methodological approaches available

We have identified some different approaches that could be used to structure and support the process of gathering, consolidating and analysing information and form visions of possible futures. These are: *Science & Technology Roadmapping, Technological Forecasting, Technological Foresight, Monitoring and Business intelligence*. Each methodological approach will be shortly described below.

#### 6.2.1 Science & Technology roadmapping (S&T)

S&T roadmapping is a needs-driven technology planning process to help identify, select, and develop technology alternatives to satisfy a set of product needs. It is an iterative process that fits within the broader corporate strategic planning, technology planning, and business development context. S&T roadmapping is a tool for providing information to make better technology investments decisions by identifying technology gaps and identifying ways to leverage R&D investments.<sup>44</sup> It helps to identify product needs, map them into technology alternatives and develop project

---

<sup>44</sup> Bray & Garcia (1999), p.2

plans to ensure that required technologies will be available when needed.<sup>45</sup> The difference between roadmaps and other strategic documents is the exposure of the time domain for each element they contain.<sup>46</sup>

Three major areas of use of technology roadmapping are:<sup>47</sup>

- A help to develop consensus about a set of needs and the technologies to satisfy these needs.
- A mechanism for helping experts forecasting developments in targeted technology areas.
- A framework for helping to plan and coordinate technology developments within an industry or within a company.

Technology roadmapping connects the three areas: technology, products and markets. A technology roadmap can put stronger emphasis on any one of these areas, but the central part is often the connection between product and technology. Technology roadmaps can be further categorised by the approach towards the use of the roadmaps. They can either be seen as a tool for *visualising the future*, i.e. some sort of foresight activity, also called explorative methods, or it can be seen as a tool for *technology planning*, also called normative methods.<sup>48</sup>

Another aspect of great importance concerning technology roadmapping is whether the focus is on the process of creating the technology roadmaps or on the product of the process, i.e. the technology roadmap itself. A technology roadmap might not be of much value if it is not communicated in the organisation or if the members in the organisation do not commonly own and support it. In the process of creating and maintaining the roadmaps, activities that are seen as important are communication and active participation by employees from different parts of the organisation.

## 6.2.2 Technological forecasting

Technological forecasting is concerned with establishing outlines of technological advance and can be defined as “the prediction of useful technological capabilities”.<sup>49</sup> Forecasting is dedicated to gather data and focus lies on the product that is output of the process. The purpose of this activity is to predict and prognosticate events in the future. The methods used for forecasting include both normative methods, such as relevance trees, trend extrapolation and trend analysis, and more explorative methods such as analogies and Delphi-method. During the last decades, there has been a shift from predictions and prognosis, which are the focus of technological forecasting, towards technological foresight.<sup>50</sup>

---

<sup>45</sup> Bray & Garcia (1999), p.3

<sup>46</sup> Kappel (2001) p.40

<sup>47</sup> Bray & Garcia (1999), p.4

<sup>48</sup> Conversation Anders Granberg, 2002-04-26

<sup>49</sup> Lenz in Bright (1968)

<sup>50</sup> Gerybadze (1994), pp.131-140

### 6.2.3 Technological foresight<sup>51</sup>

The purpose of technological foresight is to make an inventory of structural changes and possibilities rather than mere predictions and prognostications. It is an explorative rather than a normative method. The shift from forecast to foresight means that focus no longer lies merely on the analysis, but on analysis integrated with planning and action. This is why technological foresight is a more active process than forecasting, in which possible futures are envisaged and attempts are made to shape the future in the form of these imaginary worlds. The focus has also shifted from the product to the process of the analysis and the learning process is emphasised.

### 6.2.4 Monitoring

*“Monitoring means scanning the appropriate environment for pertinent information. That information mainly pertains to a particular technology – technological monitoring – in which case one may want historical information on the technology’s development, current information of the state of the art today, and/or information pointing directly to future prospects.”*<sup>52</sup> As stated by the quote, technology monitoring refers to routine tracking and screening efforts to stay abreast of current developments and to detect trends.

### 6.2.5 Business Intelligence (BI)

The term BI is used to denote a *process*, an *organisational function* as well as a *product*<sup>53</sup>, this thesis concentrates on BI as a process. The BI process consists of the steps collect, consolidate, analyse and communicate, the process aims to refine information and data about the external environment to create an actionable output referred to as *intelligence*.

The definition of the BI product is: *“processed information of interest to management about the present and future environment in which the business is operating.”*<sup>54</sup> First, it declares that the emphasis is on processed information. We distinguish between data, information and intelligence. Data is the raw material that is composed of facts<sup>55</sup>. Information is being derived from data and is created when data is arranged in a pattern<sup>56</sup>. Intelligence is information that is digested, analysed and interpreted for the purpose of decision-making<sup>57</sup>. Second, the definition points to management as having a crucial role in BI by determining what will be the domain of BI and what information is of interest or relevance to its decisions.

---

<sup>51</sup> Gerybadze (1994), pp.131-140

<sup>52</sup> Porter et al (1991)

<sup>53</sup> Gilad & Gilad (1998), preface

<sup>54</sup> Green (1966)

<sup>55</sup> Gilad & Gilad (1998), p.1

<sup>56</sup> Mårtensson & Risell (2000), p.14

<sup>57</sup> Gilad & Gilad (1998), p.1

### **6.3 Synthesising discussion about the methodological approaches presented**

As shown in the previous subsections there are a number of similar methodological approaches or processes available that can be used to structure the process of gathering, consolidating and analysing information in order to identify market trends and handle the great uncertainty of a dynamic environment. We have discussed science & technology roadmapping, monitoring, technological forecasting and foresight and the business intelligence process.

We found monitoring to be an insufficient approach since this methodology focuses merely on watching and scanning the environment and disregards the analysis that we think is very important. Monitoring thereby corresponds only to the first steps in the process of creating intelligence.

Furthermore, we find the technology forecasting process to be insufficient and inappropriate for a dynamic environment since it is aimed at predictions and prognosis rather than to explore different possible outcomes of a situation, something that often is crucial in order to make the right decisions in a turbulent environment. It is therefore not suited for the type of environment that lies in our focus. Another shortcoming that we see in forecasting is that the focus lies on the product rather than on the process. When creating intelligence there are many positive outcomes of involving people in the process e.g. a collective learning process and improved coordination that are neglected by merely focusing on the end product.

When the science & technology roadmapping approach is concerned, we think that the processes available are very comprehensive and heavy and should therefore be used on a corporate level or at industry level, not in the daily work such as a process for intelligence creating. The roadmapping processes are also very specialised and are hence not appropriate to adapt to other outputs. Since we want the methodological framework that we aim to develop to be general enough to be applicable on the intelligence creating process for different outputs, we find this methodology insufficient. The fact that roadmapping has linear tendency<sup>58</sup> also make it an inappropriate methodological approach for a dynamic environment which is characterised by discontinuity.

We want the methodology we aim to develop to be general to that extent that it is useful for different outputs of the intelligence process, it should also be easy to follow and combine explorative characteristics with more normative characteristics such as planning and strategy building. Therefore we have chosen to combine the business intelligence process and the technology foresight process in order to achieve a framework that has all the characteristics we demand. The steps in the two processes are principally the same, but the focus and the analysis tools used differ.

---

<sup>58</sup> Kappel (2001), p.44

By choosing a combination of the processes for business intelligence and technological foresight we can achieve intelligence creating framework that is anticipatory. Since monitoring can be considered to be the first two steps of the business intelligence process, monitoring is included in the framework. Technology roadmapping is, as mentioned before, the main part of the work done at TBS and since the practical purpose is to develop a framework to support the existing process we want the existing roadmapping activities to be integrated in our TBS-framework. We think adapting the framework based on the business intelligence and technological foresight processes can do this. Technological forecast has developed towards technological foresight during the recent years placing more emphasis on investigating future possibilities rather than prediction of one possible future and focusing on the process rather than on the product. This is thus considered in the framework since the technological foresight process is included. However, we do not want to include the traditional scope of the technological forecast, which is prognosis and prediction of one possible future performed by an isolated team of experts. Figure 6.1 illustrates the reasoning above.

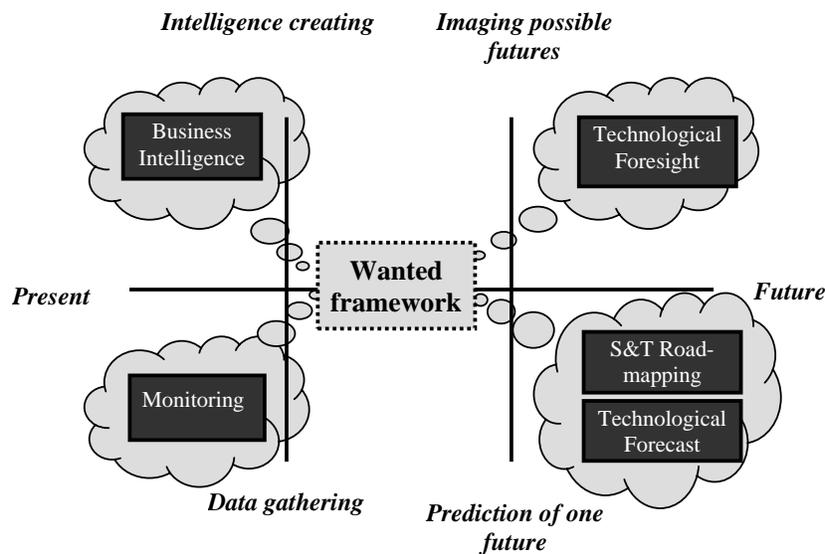


Figure 6-1: An overview of methodological approaches

The reason for choosing the BI process is due to the fact that we think that it is the best suited process for supporting and structure the already existing process. It is, by no means, the purpose that the business perspective (the B in TBS) should get more influence or that the technical perspective (the T in TBS) should get less attention by this introduction of the concept business intelligence. Nor is the purpose that this section should perform an activity that merely includes scanning of the environment and acquisition of data, which is the dominant view of BI. We want to emphasise once again that the purpose is merely to strengthen and support the already existing

process and we think that this could be achieved by applying the process of BI on the working process to identify phases and activities in each phase.

#### 6.4 The BI-process and the Technological Foresight process

Many different authors have described the intelligence process in various ways, but the core is the same. Here we will present a synthesised process that has been derived from a number of various cycles developed by different authors<sup>59</sup>. An overview is presented as a comparison between the methods that lie as a basis for the generic process.

Author	Focus	Collect	Assess	Process	Analyse	Communicate
<b>The main steps in the Business Intelligence (BI) process</b>						
<i>Sandström (1988)</i>	X	X		X	X	X
<i>Gilad &amp; Gilad (1988)</i>	X	X		X	X	X
<i>Herring (1996)</i>	X	X	X	X	X	X
<i>Kahaner (1996)</i>	X	X			X	X
<b>The main steps in the Technological Foresight process</b>						
<i>Reger (2001)</i>	X	X	X	X	X	X

Figure 6-2: A comparison of different intelligence and foresight processes.

By combining the different approaches presented in figure 6.2 we have developed a synthesised process in four steps. These four steps capture the essence of the processes and are chosen with the needs of TBS, and the requirements of a dynamic environment, in mind. The process is pictured as a cycle, see figure 6.3, since the methods presented above are of continuous character. Below a description of each step will follow.

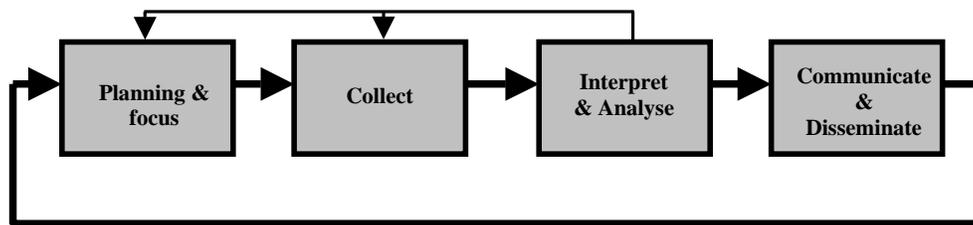


Figure 6-3. The synthesised intelligence creating process

<sup>59</sup> Sandström (1988), Gilad & Gilad (1988), Herring (1996), Kahaner (1996), Reger (2001)

**Step 1: Planning & Focus:** The first step in the process is planning and focus. This step is, in various, forms included in all the authors' processes even if it is not necessarily defined as an explicit step or named planning. Sandström has been active in the army for many years and this has inspired him in developing his process. This becomes apparent in his claim for a written plan. No other author specifically claims for this type of document, but all agree on that some form of planning is needed to successfully perform the process. The purpose of this step is to identify what information is needed and how to search for it. All authors stress that the informational requirements has to be identified. This need, which is also called critical intelligence need,<sup>60</sup> is dependent of the user. All executives have his or her own unique information need and it is therefore important not only to understand the use of the information, but also who is going to use it. It is also important to consider the time aspect and define when the information is to be used. The time frame determines what resources are needed and how the information should be collected. Another aspect that is important, and that is explicitly discussed in Kahaner's cycle, is to keep in contact with the user in order to ensure that his or her needs have not changed or that new needs have emerged. The first step in the Foresight process includes; determine information needs, determine objectives and core questions as well as selecting the search area before starting the search process, thereby this step could be considered a phase of planning and determination of focus.

**Step 2: Collect:** After having identified the need for information in step one, the second step in the process is to collect data. In this phase raw data is collected that later in the process should be transformed into useful information and intelligence.

Sandström<sup>61</sup> distinguish between internal and external sources. The internal sources are sources available within the own organisation. This source is often underestimated in spite of the fact that it is easily accessible. It is important that everyone in the organisation understands the importance of disseminating information obtained in the daily work to others.

Kahaner<sup>62</sup> and Herring<sup>63</sup> further divide the external sources in primary and secondary sources. A primary source is uncorrupted facts direct from the source, which makes the reliability very high. Examples of primary sources are: speeches, annual reports and other material that has not been changed by values, opinions or selection. Secondary sources are of more frequent appearance than the primary, examples of secondary sources are: newspapers, television, and analytic reports etc. These sources are not less valuable than the primary, but they have to be assessed to determine the reliability.

---

<sup>60</sup> Gilad & Gilad (1998)

<sup>61</sup> Kahaner (1996)

<sup>62</sup> Herring (1996)

<sup>63</sup> Herring (1996)

Sandström and Kahaner also distinguish two different types of collection processes. One of the processes aims to collect information for a special occasion that could be a particular decision or focal issue. This process is initiated by a request from the person or unit that need the information. The other process is of more continuous character and aim to monitor certain factors of the market. This is done continuous and the information is stored in a databasewhere information could be collected when needed.

The Foresight process focuses in this step on which data should be collected and what the appropriate organizational forms for the collection are.

**Step 3: Interpret & Analyse:** An interpretation and validation of the information collected is included in the cycles of all authors, either in this step or in the previous. This indicates the importance of this activity. The data is evaluated for reliability, usefulness, importance to the company, and urgency of action required among other factors. Evaluation is a part of the analysis but not the same as analysis, because it is the technical, not analytical processing of data.<sup>64</sup>

The next stage in this step is the most difficult and the most important step in the cycle. The main task of the analysis is to produce ennobled information, intelligence, of the data collected. To create intelligence, data and information from different sources and situations are combined and puzzled together. Gilad & Gilad describes the analysis with the following words “Analysis consist of collating data, condensing information, drawing conclusions, studying implications for competition, and recommending action.” There are a lot of tools and methods available for performing analyses, we will describe some methods more thoroughly in chapter 6.5, Analysis tools.

The Foresight process has two steps that in some way correspond to this step, they are filtering/analysing & interpret data and prepare decisions. This means that similar to the other processes the information is first validated and filtered before it is analysed and used e.g. for preparing decisions. The author emphasises that it is extremely important to give feedback to the person who collected the data as to what happened with their information.

**Step 4: Communicate & Disseminate:** In this last step of the cycle, the intelligence product is completed. The step is included in all cycles though some different aspects are emphasised. Most authors focus on the user of the product. The product has to be disseminated to the right user at the right time to be useful. No intelligence is valuable unless it is used.

Kahaner gives some guiding principles concerning the dissemination and communication of the BI product: the written report should be short and only contain the most important information, the analysis should be focused and not to general and

---

<sup>64</sup> Gilad & Gilad (1998)

it also should be updated and trustworthy. The result should be presented in a way that is adapted to the receiver, so that he or she easily can understand the message.

## 6.5 Analysis tools

One of the most critical steps in the intelligence creating process is the analysis, we will therefore continue with a chapter where some different tools for performing an analysis are presented and discussed.

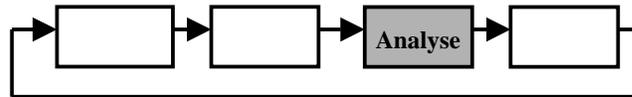


Figure 6-4: The analysis step of the intelligence creating process

To facilitate for the reader to follow the mode of thought by the authors we will emphasize the difference between the tools presented below and the methods: forecasting/foresight and monitoring presented earlier. The analysis tools presented below are tools to be used in the analysis step in the process, see figure 6.4 above, whereas the other methods could be seen as alternative methods or complement for the whole process.

### 6.5.1 Porter's five forces<sup>65</sup>

The five forces framework, developed by Michael Porter of Harvard Business School, is a tool for analysing the competitive environment in order to determine the industry attractiveness. By examining the principal structural features and their interactions for any particular industry, it is possible to predict the type of competitive behaviour likely to emerge and the resulting profitability<sup>66</sup>. The five forces model is a widely used framework for classifying and analysing four structural variables influencing competition and profitability. The five forces include three sources of horizontal competition: competition from substitutes, competition from entrants and competition from established rivals. It also includes two sources of vertical competition: the bargaining power of suppliers and buyers. For the interested reader, the sources of competition are further presented in appendix D.

### 6.5.2 PEST analysis<sup>67</sup>

This analysis involves identifying the political, economic, social and technological influences on an organisation. Political factors include regulations and laws, economic factors are for example business cycles, inflation, disposable income etc. Examples of social factors are lifestyle changes, level of education, social mobility and population demographics. Relevant technological factors are new developments, industry focus on technological effort and spending on research etc.

---

<sup>65</sup> Grant (1997), pp.54-65, Johnson & Scholes (1999), pp.115-116

<sup>66</sup> Profitability is defined as rate of return of capital relative to cost of capital.

<sup>67</sup> Johnson & Scholes (1999), p.104

### 6.5.3 Scenario planning - the intuitive logics approach

Scenario planning is about constructing scenarios of how the future may unfold. There are three main models of scenario planning: trend-impact analysis, cross-impact analysis and intuitive logics.<sup>68</sup> Trend trend-impact analysis and cross-impact analysis are closer to traditional forecasting and will not be considered in this thesis, since we find the intuitive logics approach the most useful for our purpose.

The *intuitive logics* approach to scenario planning is focusing on changing the mindsets in order to anticipate the future and prepare for it in a better way.<sup>69</sup> The challenge is to identify the important driving forces in the environment that will influence the organisation in the future, and with this in mind to create coherent and credible set of stories of the future.<sup>70</sup> Some of the factors that are analysed are quantitative, and even fairly predictable, for instance population, whereas others are qualitative and much harder to predict, for instance lifestyles or demand for a product. The point of making scenarios is not to make predictions about the future, but to understand the total environment in which the future develops and the several alternative futures that might unfold. The strength of the intuitive logic approach is, according to Ringland, its ability to develop flexible and internally consistent scenarios by an intuitive and logical approach.

### 6.5.4 SWOT analysis<sup>71</sup>

SWOT is a tool for analysing both the external and internal environment of an organisation. SWOT stands for strengths, weaknesses, opportunities and threats. The analysis summarizes the key issues from the business environment (opportunities and threats) and the strategic capabilities of an organisation (strengths and weaknesses). The purpose of the SWOT analysis is to identify the extent to which the current strategy of an organisation and its more specific strength and weaknesses are relevant to, and capable of, dealing with the changes taking place in the business environment. It can also be used to assess whether there are opportunities to exploit further the unique resources or core competences of the organisation.

### 6.5.5 Resource audit<sup>72</sup> and the VRIO<sup>73</sup> framework

A resource audit identifies and classifies the resources that an organisation owns or can access to support its strategies. The resources can be grouped into the following groups: physical resources, human resources, financial resources and intangibles. Once the resources are classified it is vital to analyse to what extent they can contribute to competitive advantage for the organisation. This can be done with the

---

<sup>68</sup> Huss & Honton (1987), pp.21-25, Ringland (1998), p.24

<sup>69</sup> Ringland (1998), p.183

<sup>70</sup> Ringland (1998), p.183

<sup>71</sup> Johnson & Scholes (1999), p.190

<sup>72</sup> Johnson & Scholes (1999), p.153, Grant (1997), p.112-117

<sup>73</sup> Barney (1995), pp.49-60

VRIO framework, which can be used to analyse if the resources are valuable, rare, imitable and organisational.

#### 6.5.6 Value chain analysis<sup>74</sup>

The difference in performance of different organisations will be determined by the way the resources are deployed to create competences and the processes of linking these activities together. An organisation's competences can be analysed and understood by using for example value chain analysis.

Value chain analysis – Resources are of no value unless deployed into activities and organised into routines and systems, which ensure that products or services are produced which are of value to the final customer. Porter argued that an understanding of strategic capability must start with an identification of these separate activities and the actors. Porter groups activities into primary and support activities. The primary activities, which consist of inbound logistics, operations, outbound logistics, marketing & sales and service, are directly concerned with the creation and delivery of a product or service. Each group of the primary activities are linked to the support activities. Support activities, which include procurement, technology development, human resource management and infrastructure, serve to improve effectiveness or efficiency of primary activities.

### 6.6 Discussion concerning analysis tools

We will now discuss the use of the tools described above and their appropriateness in a company acting in an environment that is highly competitive, complex, dynamic and uncertain.

We think that the five forces framework has some deficiencies and limitations that have to be considered when using it. First, it is *static* by its nature: it views industry structure as stable and externally determined. The forces are thought to be influencing the competition, which in turn influences the profitability in the industry. Though, in industries characterised by hypercompetition, competitors move quickly and erode the advantages of their rivals. This makes competition a dynamic process in which equilibrium is never reached and industry structure is continually changing. The dynamic nature implies that a static framework cannot be the only tool used for analysing the environment.

Another problem that we see with the five forces framework is that some aspects are not considered. The framework is based on the structure-conduct-performance<sup>75</sup> approach to industrial organisation economics, which does not always hold in practice. For instance, business relationships are not always arms-length. A business relationship is not always a transaction between a buyer and a seller. Companies interact in a more complex manner. Organisations can be both competitors and co-

---

<sup>74</sup> Porter (1985)

<sup>75</sup> Grant (1997), p.70

operators, which make the systems dependent. This would be the case if EMP sold platforms to e.g. Nokia. Furthermore, many relationships are influenced by human factors such as trust and personal contacts, which is neither considered in the framework.

The PEST-analysis can be said to be included in the scenario planning since scenario planning includes identification and analysis of forces in the environment, but scenario planning also includes forces on a lower level, that is in the competitive environment, which is often more relevant for the intelligence process.

Scenario planning is more future-oriented than the rest of the external analysis tools, meaning that it is aimed at making the organisation prepared for how the future will unfold and be able to respond and adapt quicker than competitors. Since scenario planning includes the identification and analysis of forces acting in the environment, the ability to identify trends and uncertainties in the environment could be improved by the use of scenario planning. This tool could contribute to an increased preparedness and proactivity of an organisation, which is crucial when operating in a dynamic environment.

The VRIO framework used in the resource audit also faces problems in a dynamic environment. In an environment characterised by hypercompetition, no sustainable competitive advantages can be created. Only by continually updating, recreate and renew competitive advantages and thereby create temporary advantages, can a company be successful in the long term. This is contradicted by the VRIO framework, which is based on the assumption that it is possible to create sustainable competitive advantages.

We have identified a limitation to the value chain analysis in analysing capabilities. This limitation lies in that the analysis only considers activities and linkages between them and does not concern learning aspects and the abilities to be flexible, adaptable and be able to deal with uncertainties. These capabilities are crucial in a hypercompetitive environment and a tool that intends to analyse capabilities should take this into account.

Regarding the SWOT analysis, we have found some deficiencies in that emphasis lies on classification rather than analysis. The problem is that the framework does not distinguish strengths from weaknesses and opportunities from threats. For example, the framework does not reveal whether a strong leader is strength or a weakness for the organisation. This implies that the tool is not objective since it is affected by the values of the analyst.

In order to facilitate for the reader, figure 6.5 below shows the relative positioning of the discussed analysis tools according to two dimensions: time perspective and scope, meaning internal or external focus.

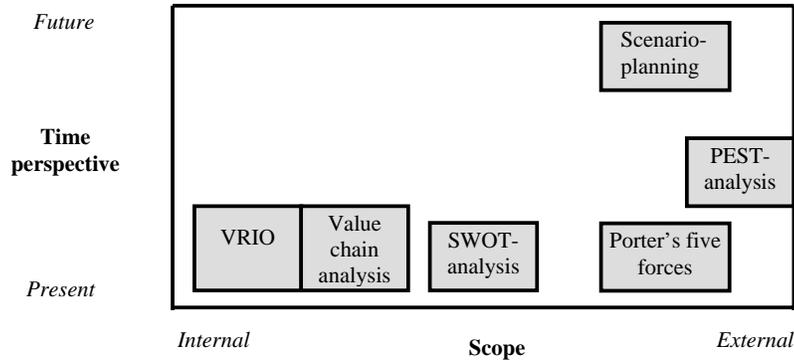


Figure 6-5: An overview of different analysis tools

To sum up, none of the tools above can be used in isolation as the only analysis tool. The five forces framework and the VRIO framework are, as concluded above, static by their nature. This means that they have to be complemented by tools that take the dynamic aspects into consideration. The value chain analysis should be complemented by an analysis of the capabilities concerning the abilities to be flexible and adapt to new situations as well as the learning abilities of the firm. For the SWOT analysis to be useful, the mere classification of factors is not satisfying. The classification has to be followed by a thorough analysis of the implications the factors have on the firm. Scenario planning can be used as a tool to analyse the external environment for the purpose of being able to better handle and deal with an uncertain future, though it has to be complemented by internal analyses that focus on the abilities inside the organisation.

Since scenario planning seems to be a relevant tool to use in an environment characterised by uncertainty and dynamics, we will present it further below.

### 6.7 Scenario planning presented further

Before any business decision can be made, the level of uncertainty must be assessed. The uncertainty arises when the pattern of events can be interpreted in different ways. These different interpretations become different futures.<sup>76</sup> Scenario planning can be helpful in order to better handle what might happen in the future and increase the perceptiveness to identify events as part of patterns.<sup>77</sup> This means that a better judgement of what this would mean to the company can be developed. This is done by working through the consequences of the different ways the business environment may change. This does naturally not remove the uncertainties in the environment, but

<sup>76</sup> van der Heijden (1996), p.84

<sup>77</sup> van der Heijden (1996), p.19

it helps in deciding whether a strategy or decision is robust across a range of possible futures.<sup>78</sup>

Scenario planning is different from traditional forecasting in that traditional forecasting assumes that the world to some extent is predictable. It is based on the rationalistic view that there is one right answer and the purpose of strategy is to get as close to it as possible.<sup>79</sup> This means that if you have the right tool, it is possible to predict the future and develop a strategy that guarantees success. The traditional approach tries to eliminate uncertainty by the use of experts who have “privileged knowledge” about the most likely future.<sup>80</sup> Scenario planning takes a completely different view and is based on that the future cannot be accurately predicted whatever tool is used. This view takes the uncertainty into account and recognises the fact that the future is inherently uncertain and ambiguous. This school of thought is hence more suitable in the dynamic and turbulent environment which is subject of this thesis.

Scenario is a many-sided tool<sup>81</sup>, which can be used for many different purposes in an organisation. Besides from being a tool for describing how alternative futures might unfold it can be used for example to understand risks. Decisions about future can affect the company for a long time. By analysing the consequences of a decision across all the scenarios a good understanding about the risks and possibilities that will face the company will develop. In a similar way, the robustness of a company’s strategies can be assessed by testing the strategies in alternative futures i.e. across the scenarios, to see whether they are successful or not. The strategies should hold for the different scenarios to be robust. Scenarios can also be used as a basis for discussions with customers, which are interested in the supplier’s view of the future in order to create a dialog for future collaboration. Scenarios can also be helpful in creating a consistent view of the future in an organisation by promoting discussions that lead to an integrated and consistent view of the company’s future.

### 6.7.1 Different scenario methods

In this section, methods for developing scenarios will be discussed with the GBN method<sup>82</sup>, SRI method<sup>83</sup> and Schoemaker’s method<sup>84</sup>, as a basis. The different methods are all presented thoroughly in appendix A. Both the GBN and the SRI method start with an “inside-out” perspective by identifying the focal issue or decision in order to ensure that the resulting scenarios will be strategically relevant to the decision-making process. Schoemaker’s method emphasizes the importance of seeing the future in broad terms, but also recognises the fact that the scope of the

---

<sup>78</sup> van der Heijden (1996), p.84

<sup>79</sup> van der Heijden (1996), pp.102-103

<sup>80</sup> van der Heijden (1996), p.8

<sup>81</sup> Pagels-Fick (1999), pp.83-88.

<sup>82</sup> Schwartz (1996), p.241

<sup>83</sup> Ringland (1998), p.247

<sup>84</sup> Schoemaker (1995), p.28

analysis must be determined. He also emphasizes the importance of determining the appropriate time frame of the analysis.

Schoemaker then proceeds to identify and discuss which stakeholders, e.g. customers, competitors and suppliers that will have an interest in the issue, those that are affected by it and also those that could influence it. This is not explicitly included in the GBN method, although the next step in the method aims to list the forces in the local environment, i.e. information about customers, suppliers, competitors etc., which influence the decision. The focus is on information that the decision makers would want know when making decisions. This is also included in the SRI method when the key decision factors, i.e. factors that influence the decision, should be determined as the second step.

Identification and analysis of the forces in the environment affecting the issue is considered in all methods. As opposed to Schoemaker, the GBN and SRI methods separate the macro level forces from the micro level forces. Macro level forces are e.g. social, political, economic and technological aspects while micro level forces are related to the industrial environment of the company. All methods identify and analyse all forces that influence the issue under consideration, but the GBN method emphasizes that in analysing the forces on the macro level (driving forces), only those that influence the forces in the local environment (key factors) should be considered.

Analysing the identified forces, Shoemaker separates basic trends, which are certain, from those events that are uncertain, which he calls key uncertainties. The GBN method ranks the key factors and the driving forces, identified earlier, by importance and uncertainty. The SRI method concludes the analysis of the micro and macro environmental forces with a detailed assessment of each force's level of uncertainty.

Next comes the construction of the scenarios, which is the heart of the process. All three methods proceed to decide the scenario logic, i.e. determining the uncertainties and environmental drivers that are considered to be the most important, and then placing them on the axes along which the scenarios will differ. Also the number of scenarios created should be determined. Two are seen as too few and more than four is considered to be too many.

Next, the scenarios are described as detailed stories in a context, which is both plausible and internally consistent. The name of each scenario should also be decided. This last part of the scenario-making process differs slightly between the methods. Schoemaker emphasizes the importance of developing learning scenarios, which are, at this stage, rather than used for decision-making, used as tools for research and study. This means that Schoemaker considers the process to be iterative and more information should be collected in order to really understand the uncertainties and trends. He also, which the others do not, emphasizes the possibility of using quantitative models at this stage before the final scenarios are developed which are used for testing strategies and so forth.

The Multi-Perspective Intelligence framework

Both the GBN method and the SRI method address the importance of analysing the implications of each scenario on the focal issue. The GBN method is even more explicit since it includes a step exclusively for this purpose. The scenarios could be used for testing the decision across a range of possible futures and to find out if it is robust in all or only part of them. The GBN method also emphasizes the importance of identifying indicators that can be monitored in order to determine which of the scenarios that is closest to become realised and use this to be able to act faster than the company otherwise could have done.

The GBN method	The SRI method	Schoemaker's method	Generic steps
1. Identify focal issue or decision	1. Identification of decision	1. Decide time frame and scope of analysis	Identification of issue
2. Forces in the local environment	2. Identification of key decision factors	2. Identify major stakeholders	Analysis of environmental factors -Micro level forces -Macro level forces -Trends -Uncertainties
3. Driving forces	3. Analysis of environmental factors	3. Analyse certain and visible trends 4. Identify key uncertainties	
4. Rank by importance and uncertainty	4. Development of scenario logics	5. Construct initial scenarios	Scenario logics
5. Selecting the scenario logics		6. Ensure internal consistency and plausibility	
6. Fleshing out the scenarios	5. Description of scenarios	7. Develop scenarios	Story telling
		8. Need for further research	
		9. Internal consistency re-examined	
		10. Develop final scenarios	
7. Implications			Implications
8. Selection of leading indicators and signposts			Indicators

Figure 6-6: A summary of the GBN method, the SRI method and Shoemaker's method.

In order to get an overview and to be able to easier compare the three different methods, a table containing the methods is provided above. In addition to this, generic steps, which represent the overall areas of concern in the three methods, are included.

### **6.7.2 Risks of the scenario method**

We have earlier only discussed the advantages of the scenario planning method, but there are also risks associated with scenario planning. In order to reduce these risks we want to make the reader observant of them.

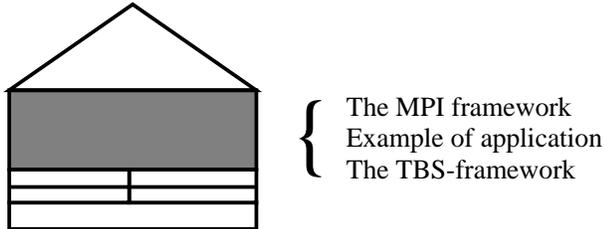
One risk that can occur for example when using scenarios when developing a decision support is if one scenario is chosen as the one most likely to occur. As mentioned earlier, this is not the purpose with constructing scenarios. If used in this way it is the same as trying to predict one future, which will destroy the underlying idea with scenarios. Instead, the scenarios should be used for testing the decision's robustness across a range of scenarios.

Another risk is that it is possible that persons working with scenarios concentrate on the resulting scenarios rather than on the process of making them. This would also destroy part of the purpose of scenario planning.

If other possible futures, which are not included in the scenarios, are neglected once the scenarios are constructed, this could be a third risk with scenario planning. This would cause the scenarios to have the opposite effect than what is the purpose. If the last step in the generic scenario approach presented above is followed, this risk can be reduced since it includes the identification of factors that indicate how the future develops.



## Part III. Practical & theoretical contribution

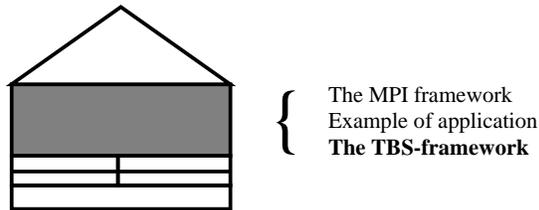


*Part III consists of three chapters, The TBS-framework, Example of application and The MPI-framework. In the first chapter we will present the practical result of our thesis in the form of “**TBS-framework**” and the steps in the process that are adapted to TBS will be thoroughly discussed. In the second chapter of this part the framework is used to show how it could be applied when developing a decision support, in connection with this scenarios are developed. The chapter ends with guidelines that give recommendations of how to use the framework. Finally, the third chapter contains the “Multi-Perspective Intelligence framework, which is a generalised form of the TBS-framework and constitutes our main theoretical contribution.*

---



## 7 The TBS-framework



*In this chapter “The TBS-framework” that aims to structure and support TBS’ existing working process will be presented. The framework consists of four main steps and is specialised to the work of TBS by differentiating the continuous work and the one-off activities. Each step will be thoroughly discussed and adapted to TBS.*

---

### 7.1 Introduction

In chapter three and four, we came to the conclusions that EMP operates in a competitive landscape characterised by fierce competition, turbulence and high complexity. This environment makes the future highly uncertain and difficult to predict. In chapter five we also identified a need for a formalised and structured working process in order to handle the external environment and ensure the quality of the output of the process performed by TBS. In order to practise proactive management in this changeable environment the ability to handle information and process it into actionable intelligence becomes critical.

With our purpose in mind, to formalise the working process of TBS, we came to the conclusion that the business intelligence process can be used as a basis to structure the process at TBS.

In this chapter we will formalise the work of TBS by describing the working process structured in the steps of the generic intelligence creating process. As discussed previously, the generic process consists of four different steps and aims to transform data and information into intelligence, as described in chapter six. The generic process is specialised and adapted in this chapter in order to satisfy the needs of TBS as well as meet the requirements of the external environment, the resulting framework is shown in figure 7.1 below.

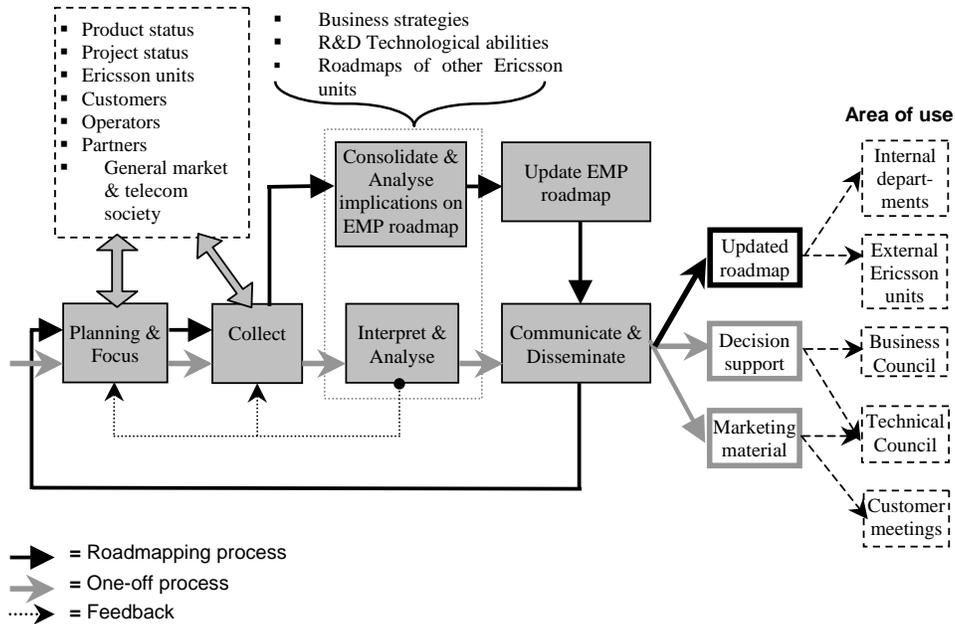


Figure 7-1: The specialised process for TBS

As can be seen in the figure 7.1 above, there are two kinds of processes at TBS. The first process contains the EMP roadmapping exercise. This process is, as mentioned before, continuous and conducted four times a year. The other process, represented by the grey arrows in the figure above, is of unique nature and initiated when needed, for instance when a decision support or marketing material is required. The two processes are similar, the two first steps, *planning & focus* and *collect*, are the same what differs is the focus and the scope. In the roadmapping process, the *interpret & analyse* step is replaced by two steps where in the first, information is consolidated and analysed to identify implications on the EMP roadmap and in the second the EMP roadmap is updated. Both processes conclude with the last step *communicate & disseminate*. Even though some of the steps are in common, there might be a difference between the two processes in that the steps focus on different aspects.

Next, each step in the process will be discussed more thoroughly.

## 7.2 Step one: Planning and focus

In the process of gathering information it is important to, as soon as possible, create a direction for the search and make a plan for which information is relevant to the particular investigation. This must be done to ensure that no important areas of information have been left out. The main areas of focus are presented in figure 7.1 as the inputs into the working process of TBS: *product status* (information about a product when it has left the project development phase), *project status* (information

about the products during their development phase), *customers, operators, partners, other Ericsson units, general market & telecom society, competitors and technology studies*. The areas of focus should be used as a checklist when gathering information. For the checklist to be useful, it is important to thoroughly define the scope and content of the areas. For example the area general market & telecom society is very broad, it is therefore important to define a number of factors that should be included in this particular area.

The list below, in figure 7.2, can be helpful in the process of gathering information in order to check that no important aspects have been forgotten or left out. The list is the output from a workshop conducted with employees at TBS as well as other parts of the organisation. The input areas were defined previously; the issue for the workshop was to specify these input areas further in order to make them concrete. We want to point out that this list is by no means universal, in some cases other aspects have to be considered and in some cases some aspects of the relatively detailed list is redundant. This calls for an adaptation to every particular situation by the individual analyst, though it is useful as assistance in the information gathering process. In the roadmap process, where the area of concern, i.e. the scope, generally is broad, all aspects have to be included, while it in the process which is initiated in an ad-hoc manner can be narrower.

The Multi-Perspective Intelligence framework

<b>Product status</b>	<b>Responsible: Product manager</b>
<b>Cost</b>	Bill of Material-analysis
<b>Market aspects</b>	Business Case
	Positioning, how to map the product in relation to the business
<b>Other aspects</b>	Yield
	Customer Product Description (CPD)
<b>Project status</b>	<b>Responsible: Product manager</b>
<b>Status ⇔ plan</b>	Actual status in relation to project plan
	Time, delays
	Milestones
	Risk analysis
<b>Requirements specifications</b>	Updated SRS (System Requirements Specification) – updated in real time
	PRS (Product Requirements Specification) including changes
	TRS (Technical Requirements Specification)
<b>Customers</b>	<b>Responsible: Sales Department</b>
<b>General information</b>	List; current, prospects, suspects
<b>Strategy</b>	What is important for them?
	Business drivers
	Strategy
	Functionality priority
	Decision process priorities
	Product roadmap
<b>Other relationships</b>	Suppliers
	Customers' customer
	Owner structure
<b>Market aspects</b>	Financial and market input
	Market segments
	Volume scenarios
<b>Other aspects</b>	Problem areas
	Outcome from customer contacts – reactions, signals
<b>Operators</b>	<b>Responsible: Operator relations</b>
<b>General information</b>	List of selected key operators
<b>Strategy</b>	Strategy – high-end, low-end etc
	Service roadmap
	Functionality priority
<b>Statistics</b>	No of subscribers
	No of users using GPRS/GSM
	No of business users, no of pre-paid etc.
	Subscriber growth rate
<b>Requirements</b>	RS of key operators

The Multi-Perspective Intelligence framework

	Focal point analysis
<b>Partners</b>	<b>Responsible: Technology Strategies</b>
<b>General information</b>	List with categorisation – backwards, forward and horizontal
	List of potential partners
	Prioritisation
	Other relationships – partners, customers, suppliers
<b>Strategy</b>	Business drivers
	Strategies
	Roadmaps – product, technologies
	Place in value chain
<b>Offer</b>	Business model – power balance
	How can they strengthen EMP's offer?
<b>General Market &amp; Telecom Society</b>	<b>Responsible: Business Analyst</b>
<b>Market development</b>	Market development – type of devices, standards, total market etc.
	Market data, volume scenarios
	Statistics
	Consumer lab
	New initiatives
<b>Players</b>	Analysis of potential customers
	Analysis of potential competitors
	Analysis of potential service providers
	Analysis of new operators
<b>Standardization</b>	Standardization forum
	Regulatory aspects
<b>Competitors</b>	<b>Responsible: Business Analyst</b>
<b>General information</b>	List of current competitors
	SWOT
<b>Market aspects</b>	Customer status
	Product status – what markets are they on?
	Market activities
<b>Strategy</b>	Strategies
	Roadmaps
	Positioning – direction
<b>Ericsson Units</b>	<b>Responsible: Technology Business Strategies</b>
<b>Coordination</b>	Coordination of strategic choices with LME
	Coordination of different Business Units – Roadmaps, Initiatives, Operator meetings/workshops

Figure 7-2: Different inputs and their areas of focus

### 7.3 Step two: Collect

TBS are themselves responsible for collecting information concerning other Ericsson units. Other sections are responsible for providing TBS with information concerning the remaining areas as shown in figure 7.2 above. For all kinds of information and especially information gathered by other sections, it is very important that a specification of requirements is made. This specification should include purpose and objectives of the information as well as delimitations to ensure that unnecessary information is strained off.

When other sections gather information it is critical to specify the format in which the information should be delivered. In the unique process, e.g. when developing decision support, the format is preferably determined by the person performing the analysis. In the continuous process, i.e. the roadmapping process, all relevant information should be collected and delivered in the format specified below in the bulleted list.

We define the format to consist of three aspects. First, it includes the way the information is presented. The analyst (the user of information in this case) must in consultation with the responsible unit decide how the information is to be received. Possible ways to deliver information could be the weekly meetings, monthly reports, different kinds of documents, on the company intranet etc. Second, the extent to which the data should be analysed before it is delivered must also be decided in consultation with the responsible unit. Some data could be delivered totally unprocessed while other data preferably should be structured and partly analysed by the unit responsible for the gathering. Third, another aspect that has to be decided upon is whether the information should be presented in a standardized document or in any of the presentation forms discussed above.

Another aspect that has to be clarified is whether the information should be delivered when the analyst demands it or if it should be continuously delivered. If the parts agree on the latter the intervals of delivery must be determined.

As a complement to the list presented above in figure 7.2, we will more thoroughly discuss the input areas and how and when they should be presented and also the important issue about who is responsible for the information.

- **Product status.** This input includes information about a product when it has left the project development phase. Each product manager should continuously update and disseminate the information to all relevant stakeholders, for example the section TBS. This could most easily be accomplished by a web-based document on the intranet that is updated when changes occur that affect the roadmaps of the platforms.
- **Project status.** This input includes information about the products during their development phase. The dynamic characteristic of the development

phase results in that the information rapidly becomes obsolete, hence the actual project status in relation to the project plan should always be available to concerned parts. This calls for a web-based document updated in real time for which the individual product manager is responsible.

- **Customers.** The sales department is responsible for gathering and disseminating information concerning EMP's customers. This should include a comprehensive list and a general view of current/prospect/suspect customers as well as a more specific description of the current customers. All details about the customers should be stored in the CRM system but to facilitate the working process of TBS a particular document including the relevant aspects defined, see figure 7.2 above, should exist and be updated quarterly before every workshop. This is important because changed customer requirements or priorities can seriously affect the roadmap and therefore have to be considered in the review. Except for the quarterly updates, information that is the outcome of customer meetings and negotiations should be documented and made available. Each key account manager should do this in connection to the meeting.
- **Operators.** The operator relations section should be responsible for gathering and delivering information concerning operators of interest to EMP. Similar to the information about the customers, this should include a comprehensive list of selected key operators as well a specific description of each operator including the aspects mentioned in the figure above. This information could preferably be presented in a web-based document that is updated at least four times a year, in advance of the workshop where the roadmap is updated and reviewed. This quarterly update should also be complemented by a "meeting-log" where meetings are coordinated and where reports from contact with operators are presented.
- **Partners.** This input should include a list which categorise partners according to their position in the value chain in relation to EMP. Partners could be either vertical, backwards/forward integration, or horizontal. The list should include current and potential partners in the three categories. The information could be presented in a web-based document on the intranet and should be updated as soon as something of relevance occur or at least every quarter of the year. In order for this to function, it is important with a clear allocation of the responsibility for each partner.
- **General market & telecom society.** This input should include aspects concerning the market in general, for example market development and market data, as well as more specific analysis of players in the industry. This type of information should preferably be analysed to some extent before it is delivered. The reason for this is that only raw data is not useful and the work of transforming the data into more useful information is an extensive and time-consuming task. General information should be available on the intranet and updated continuously by the responsible unit, which is the business

analysis section. Our recommendation is to complement the general presentation with e.g. a monthly newsletter that is distributed to relevant stakeholders within the organisation, reporting about the latest changes that have occurred.

- **Competitors.** The business analysis section within EMP is responsible for gathering and disseminating information concerning competitors to EMP. The information should include a comprehensive list of current competitors and also a specific description and analysis including strategy, roadmap, positioning etc. of each competitor. Similar to the general market information, this information could preferably be available in a presentation on the intranet. In addition to this, news and upcoming events can be reported in the newsletter mentioned above.
- **Ericsson Units.** When developing roadmaps, it is important that they are coordinated with the roadmaps of other business units within the Ericsson group. TBS is responsible for gathering the information from other Ericsson units that is required in order to make the coordination possible. Coordination is also necessary when making strategic choices, when arranging operator workshops etc. This information is based on personal contacts rather than a written document, it is also very specific and differs from one situation to another, and hence a format cannot be specified.

#### 7.4 Step three: Interpret and Analyse

Before the data and information become useful, actionable output it has to be interpreted and analysed. This step is the step that differs most considerably between the one-off processes and the continuous roadmapping process. In the one-off process the analysis is performed by the individual analyst or in co-operation with other analysts at TBS. The output from this process is decision support and marketing material.

In the roadmapping process, the Interpret & Analysis step is replaced by two other steps, *Consolidate & Analyse implications on EMP roadmap* and *Update EMP roadmap*, as seen in figure 7.1. The reason for this is that the roadmapping requires a different kind of analysis. As discussed previously, the scope of the analysis often is broader and it is important that the information is consolidated in a proper way, which we want to emphasize by adding the step Consolidate & Analyse implications. This step also includes an analysis of what implications the information, which reflects the new situation, have on the EMP roadmap. These two steps should be done in a workshop with participants from TBS as well as other employees from the sales and marketing department. It is important to involve the appropriate people and to emphasise the collective process since this promote coordination and communication. When the information has been consolidated and its implications on the existing EMP roadmap are determined, the roadmap is updated to reflect the new situation.

Both in the one-off and the continuous process some important internal aspects have to be considered in the analysis step. These aspects include *business strategies*, *technological abilities* and *roadmaps of other Ericsson units*. The business strategies influence both the continuous and the one-off process. The roadmaps are strategic documents showing the choices of functions and technologies to include in the platform in the years to come. Hence are the business strategies important to consider when constructing the roadmap in order to make it reflect the strategies of EMP. The one-off process is also influenced by the business strategies since e.g. a decision support includes recommendations, which should support the strategies. Naturally, the technological abilities within EMP must be taken into account when producing roadmaps as well as decision supports in order to create plausible and reasonable roadmaps and decision supports. The roadmaps of other Ericsson units are mainly used in the roadmapping process in order to coordinate between the different Ericsson units. This is done in order to optimise the result for the Ericsson group in total by ensuring that the roadmaps of EMP do not oppose the roadmaps of other Ericsson units.

As described in chapter six, there are many different analysis methods available. We will focus on scenario planning as an analysis tool since it is suitable for the type of environment that EMP operates in. The rationale for choosing to focus on scenario planning is also thoroughly discussed in chapter six. It is important to emphasize that this is only one possible tool to analyse the external environment. This analysis must be complemented by an analysis of the internal abilities. There might also be a need for other analyses of the external environment. Internal analysis and other external analyses will not, however, be considered in this thesis.

As the base for the external analysis method, the generic method that is presented in chapter six is chosen. The generic method for constructing scenarios is a synthesized method based on the GBN<sup>85</sup> method, the SRI<sup>86</sup> method and Schoemaker's<sup>87</sup> method of constructing scenarios. One reason for this is that the method is applicable both on one distinct decision and when a more general view is concerned, which we find useful for our purpose. Furthermore, the processes are relatively simple and completely transparent. It is easy for the participants to follow and to put them into practise, which are two important criteria. The processes are also highly flexible and can easily be adapted to individual situations, which we consider to be crucial. Identification and clarification of key issues and uncertainties are important to construct plausible scenarios of the future. In addition, it has the strength of capturing the power of both logic and imagination to generate images of the future.<sup>88</sup>

The method we recommend for analysing the external environment of EMP is a process in seven steps:

---

<sup>85</sup> Schwartz (1996), p.241

<sup>86</sup> Ringland (1998), p.247

<sup>87</sup> Schoemaker (1995), p.28

<sup>88</sup> Ringland (1998), pp.247-248

**Step 1. Identification of issue or decision:** The first step is to identify the issue to be investigated in the analysis. Most of the times in the work performed by TBS, there is a particular issue under consideration that needs to be investigated and analysed, which implies that this first step should be relatively simple. Example of issue at TBS could be: Should video telephony be supported by the platforms in the year of 2005? If scenario analysis is used in the roadmapping process, a broader scope should be used for the scenario planning activity. An isolated decision cannot be identified so that the scope of the roadmapping exercise is covered. Instead the starting point when constructing scenarios in the roadmapping process should be the environment rather than the company, as in an outside-in perspective, where only the scope and the time frame are determined.

**Step 2. Identification of key decision factors:** The purpose of the second step is to determine the key decision factors, which are the key factors that affect the issue or decision i.e. what you would like to know about the future in order to make a better decision. In a situation where the issue under consideration for instance is whether or not to include a particular function in a platform, a key decision factor could be if the consumers are willing to pay for the feature or not.

**Step 3. Analysis of environmental factors:** The third step involves the study of the external environment of the company in order to identify important factors that will influence the key decision factors. The factors that will influence the issue are both in the local environment, micro level forces, and driving forces, macro level forces. The micro level forces concerns the way different stakeholders like competitors, suppliers, customers etc. are acting and could act in the future, which will influence the issue under consideration. In EMP's case this could include factors such as competitor behaviour, other players' behaviour and operators' attitude towards a particular service. The macro level forces concern the forces and trends on a global level that will influence the micro level forces identified earlier for instance demographic, social, economic, political, technological forces. An assessment must be made concerning the relevance of some macro level forces. The time perspective that EMP is concerned about is one to five years. In this relatively short time perspective, the macro forces do not change to the extent that they have impact on the issue under consideration. This step is the most research intensive and it is of vital importance that effort is put into this step in order for the scenarios to become valuable to the company.

**Step 4. Scenario logics:** It is important to distinguish between trends and uncertainties to determine which are predetermined events and which are true uncertainties. It is a good idea to rank the identified factors according to how important and relevant they are to the company. In this way, usually a few factors that largely affect the company and uncertainties are identified. The few highly important and uncertain factors, which are relevant to the issue under consideration, become the dimensions along which the scenarios will differ. They are chosen to generate a set of initial alternative scenarios. These basic scenarios must be both plausible and internally consistent.

**Step 5. Story telling:** The next step aims to develop a set of plausible and internally consistent scenarios. It means that the scenarios should be narrated as stories and incorporate the macro and micro level forces and events that is needed in order to make the end point of the scenario connected to the starting point, i.e. the current date. The stories of each scenario should be between a half and one page long and they should vividly describe the scenario and illustrate the acting forces. They should also be complemented by an overview figure that shows the scenarios in relation to the dimensions along which they differ in order for the receiver to quickly be able to grasp the concept and basic ideas underlying the scenarios.

**Step 6. Implications:** Once the scenarios have been developed it is useful to consider the implications on the issue or the decision to be taken to determine the risks, rewards and vulnerabilities associated with it. Is the decision robust across the range of developed scenarios? What recommendations can be given concerning the issue or decision with the different scenarios in mind?

**Step 7. Indicators:** If the decisions look good for all scenarios or is very robust, then the work may be terminated after the previous step. If the decision, which is almost always the case, is dependent on what develops in reality this final step is necessary. In this step some indicators are chosen that reflect which of the scenarios that is about to be realized. These indicators should be monitored continuously in order to get an idea of what the future might hold. This step is also necessary for material that is of more continuous character e.g. EMP roadmaps that have to be reviewed and updated as the conditions on which the roadmap is based change over time.

The scenarios can be used in many ways at TBS. Firstly, they are a tool for visualizing the future in order not to become too single-minded and only focus on one possible future, instead TBS will be prepared and for multiple outcomes which will make them able to act less reactively and more proactively. Secondly, they can be used as a way to think about risk and reward for a specific decision by determining the robustness of the decision across the range of scenarios, which could be used when giving recommendations in Business or Technical council. Thirdly, the scenarios can be incorporated into the roadmapping activity in two possible ways; either by developing one roadmap for each scenario to identify possible future roads to take, or they can be used to test whether or not the roadmap is robust across the range of scenarios. If the conditions which the roadmap is based on changes, the roadmap has to be reconstructed. Finally, the scenarios can be used in discussions with customers as marketing material in order to show that EMP is a serious company that think about the long term.

Another aspect of the analysis step is feedback. It is very important that the persons planning and gathering the information get feedback from the persons performing the analysis step about the relevance and quality of the information used in the analysis in order to be able to improve their work. If this feedback is successful, the quality of

the information delivered to the persons performing the analysis will improve and less time will be spent on sorting out the information that is not relevant.

### **7.5 Step four: Communicate and disseminate**

The output of the analysis has to be disseminated and communicated in a way that the needs that initiated the process are satisfied. Different output requires different types of communication.

In the continuous process, i.e. the roadmapping process, communication is really important already in the analysis stages. The communication step should be performed in close connection to the analysis stages since communication is needed to succeed with the necessary coordination that makes the roadmaps useful for the organisation. The communication step contains the interaction between the participants in the previously discussed workshop as well as the communication of the produced roadmap that will contribute to the integration of business and technological perspectives. The updated roadmap should be communicated to internal departments of EMP in a way that the roadmaps become most useful. This means that the roadmaps have to be adapted to the technical department to show more detailed technical parameters. If the roadmaps are used for discussion with customers, they have to be simple to understand and not in great detail. The roadmaps should also be used as a communication tool in contact with the external Ericsson units. The level of detail should be adapted to what kind of user that is the other party in the discussion. The adaptation is important in order for the roadmaps to become useful and fulfil their purpose of coordination.

In the one-off process, the communication step mainly concerns the user of the output of the process. When presenting for instance a decision support, the analyst has to think about the receiver. Most decision makers are not interested and do not have the time to read extensive documents. They want the result of the analysis, the conclusions as well as implications and recommendations in a compressed form. An advice is to start the presentation with the conclusions and then present the underlying analysis. It is important to catch the essence and the relevant aspects in order not to make the decision makers loose interest. If the output of the process is a marketing material that should be used in meetings with customers, (potential) partners or operators it has to be communicated in a way that the receiver can understand and assimilate. The material should be simple and the message should be clear. A good example is to use pictures and/or figures. The scenario logic that is often done in a figure with four fields could be simplified by using different pictures in the fields representing each scenario.

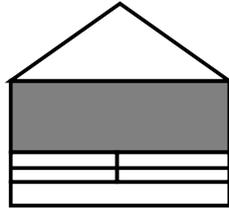
### **7.6 The cyclic nature of the process**

The arrow in figure 7.1 connecting the communicate step and the planning & focus step represents the fact that the process is continuous, i.e. the roadmapping process is, as mentioned before, continuous. Once the roadmap is updated and communicated,

which are the last steps in the process before starting at planning and focus again, it is important that the roadmap is stored. The roadmap could for instance be stored on the company intranet where it is reachable for all persons that use it in their work. Another reason for storing the roadmap is that it is needed as the starting-point for the following update and review of the roadmap. The analysis aims to identify implications on the existing roadmap based on changed condition, either internally or externally and therefore the most recent roadmap has to be available.



## 8 Example of application



The MPI framework  
**Example of application**  
The TBS-framework

*This chapter aims to show how the framework developed and described in chapter seven could be used. Initially a discussion will follow regarding the possible improvements that could be achieved by using the framework. After that we use the scenario method by showing how it could be applied when producing a decision support material. Finally guidelines for using the framework are given.*

---

### 8.1 Introduction

We will now give an example of a situation where the framework could be used. The example concerns a decision support material that is one of the outputs presented earlier along with technology roadmaps, core statement and marketing material. The decision in question was to be taken in year 2001 and regards whether the platforms should support real time video telephony or not.

Our example will focus on step three in the framework, which is the analysis, but the considered aspects in the decision support made (see appendix C) will also be compared to input aspects presented in the checklist of the framework. Since the material was constructed last year, and by another person it is not possible to evaluate it, neither is this our purpose with this example. The purpose is merely to show the applicability of the framework and also give examples of how it can make the working process of TBS more efficient and improve the quality of the output e.g. by ensuring that all relevant information has been considered.

### 8.2 Improvements in the decision support

The material contains technical requirements, market status, network status, operator requirement status as well as conclusions and recommendations. A comparison with the checklist we have developed together with employees from EMP, (see below) shows that several aspects are missing. We cannot for sure say that these aspects have not been considered, they might have been implicit assumptions or left out of the material prepared for the presentation.

- ❑ Product status
- ❑ Project status
- ❑ Customers
- ❑ Operators
- ❑ Partners
- ❑ Ericsson units
- ❑ General market & telecom society
- ❑ Competitors

We think that the quality of the material could be improved and that the process could become more effective by using the checklist above, to ensure that *no important aspects are missing*. Important aspects that are missing in the material are customers and consumers. We think that the material should include some information about the customer, such as which functions the customers prioritises, if multimedia is embraced in their strategy etc. The material should also include some information about the final consumers and their expected preferences. Another aspect that we think should be considered in this type of decision support material is competitors. The main competitors attitude towards the issue and their current product status should be paid attention to as well as market aspects such as customer status and other market activities. Another aspect that could be relevant is existing and potential partners whose roadmaps and objectives to collaborate with EMP should be considered.

Another area where we think that the framework could contribute to improve the decision support by making the process more efficient is the format of the input. By knowing who is responsible, where to search for the information and how the information should be presented, we think that less time could be spent on these types of administrative non-value adding activities.

In the decision support under consideration, the conclusion of the analysis is placed last in the Power Point presentation, after the underlying factors have been presented. The decision support could be improved by changing the order of the presentation so that the conclusion and recommendation are presented first followed by the underlying factors as recommended in the framework.

By the material given to us, it is not possible to evaluate the analysis made, which is the step where we think that the framework will contribute the most to improve the process and the output. Next, we will give an example of how the scenario method presented in the analysis step of the framework can be used.

### **8.3 Application of the scenario method**

#### ***Step one: Identify decision***

Should the platforms support real time video telephony or not?

***Step two: Key decision factors***

The key decision factors are the most influencing factors on the outcome of the issue under consideration. In this particular situation, we have identified the following key decision factors.

- ❑ ***Subscribers.*** Are the subscribers willing to pay for this service? Are the subscribers willing to change their behaviour when having a telephone conversation? Which are the potential users?
- ❑ ***Usefulness.*** Will video telephony be simple, comfortable and problem free to use? Are there multiple areas of use or is it only limited to transmitting pictures of yourself while talking in your mobile handset?
- ❑ ***Status.*** What status will video telephony get in 3G, will it be seen as essential in order for the consumers to even consider buying the handset i.e. a qualifier or will it become a feature that makes the consumers buy the handset only because of it, i.e. an orderwinner? A third alternative would be that the consumers do not care about the feature.
- ❑ ***Operators.*** What kind of services will be offered by the operators and when is the launch date? Will there be appropriate payment models to support video telephony i.e. how will the consumer be charged for the service, e.g. fixed or variable rate? What are the operator requirements?
- ❑ ***Competitors.*** Will the main competitors in area of platform providers support video telephony?
- ❑ ***Voice + SMS vs. multimedia.*** What are the future user areas for mobile handsets, will it be like today, mainly voice and SMS, or will the focus shift towards multimedia?
- ❑ ***Number of users.*** Since the service is dependent on that both parties in a conversation can use the service, we think that the critical mass is a factor that could affect the decision.

***Step three: Analysis of environmental factors***

Factors in the local environment that might affect the key decision factors are to be considered in this step. We assume that the forces like demographics, life-style changes etc., are relatively stable during the timeframe of this particular decision (five years) and hence they are not considered.

Factors that we think might have an impact on the key decision factors mentioned above are for example:

- ❑ ***Technology.*** The industry is characterised by technology-push and this might have the effect that video telephony is introduced although the consumers do not demand it. Is it technically possible to develop a user-friendly video-telephony service within the given time frame?
- ❑ ***Economics.*** Aspects like disposable income affects the consumers' willingness to pay for a service like this. The level of disposable income can change during a five-year period and should therefore be considered.

- ❑ **Market.** One factor that should be considered is changes in consumer preferences about what is considered important in the handsets, for instance physical design and services.
- ❑ **Health issues.** Today many people are workaholics and suffer from burnout. This might affect the willingness to be constantly reachable which in turn has negative influence on how mobility is valued.

**Step four: Scenario logics**

We think four scenarios are appropriate for this decision. Two are too few, by choosing three we risk constructing one worst case, one best case and one intermediate scenario that does not force a standpoint. Therefore four alternative scenarios are chosen.

The scenarios are developed along two dimensions, which we have identified from the discussion above. The dimensions have been put together in order to get four different scenarios. The dimensions are “*usefulness*” and “*consumers’ preferences*”. The choice of these two dimensions is based on our general knowledge of the mobile telecom industry. We think that the dimensions reflect many of the uncertainties that we see in the industry that might have impact on the future situation of video telephony.

By *usefulness* we mean simplicity of use, i.e. the user should not be required to understand the technology to use the service. Another aspect of this dimension is that the video in the handset should be possible to use in other situations than only during conversation, e.g. for taking pictures and sending them anytime. A third aspect included in this dimension is that the design of the payment form has to be simple and safe for the user, e.g. the consumer is charged in association with the ordinary telephone bill. Another example is that the consumers are able to choose between fixed and variable rate depending on the frequency and extent of use.

When discussing the other dimension, *consumers’ preferences*, we include factors as the willingness of the consumers to pay for the service and also how the consumers mainly will use their telephones in the future. Will the area of use mainly consist of speaking and sending text messages or will there be a development towards an extended use for example downloading music, films and using the telephone as a camera? Another aspect of this dimension is status, i.e. to what extent video telephony will be decisive for whether the handset will be considered in a buying situation.

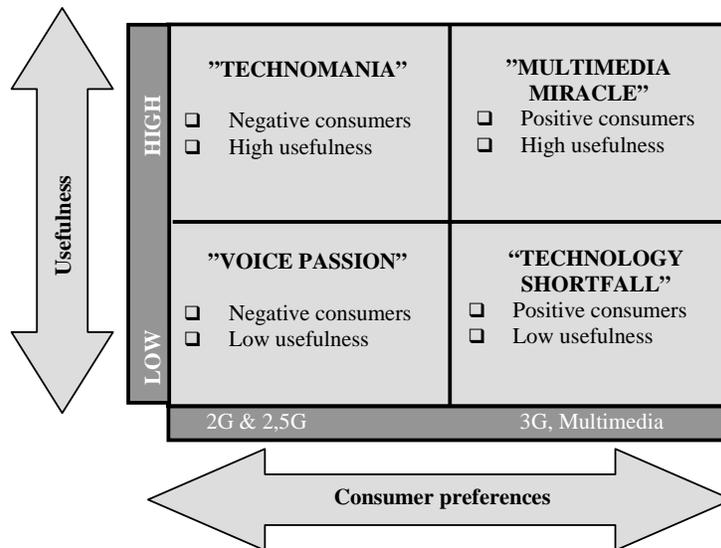


Figure 8-1: The scenario logic

**Step five: Storytelling**

1. **"Multimedia miracle" - high usefulness and positive consumers.**

*Imaging yourself in a situation where you are sitting waiting for your flight taking you to New York where you are supposed to meet your most important customer. While waiting you check your e-mails using your mobile handset. You are surprised to see that the customer has changed the calendar and left a message that says that her secretary will meet you at the arrival. She also left a number for the person meeting you and asked you to call for deciding where to meet. You dial the number and turn on your video telephony service in order to be able to recognise the person meeting you, which will help you when arriving. You are happy to see that respondent is really good-looking and since your phone call is very pleasant you seize the opportunity to be an attentive admirer by buying flowers before you full of expectation board the plane...*

Today the third generation of mobile communication is a fact and video telephony is a "buzz word" for this generation. The service is a necessity in all handsets and the consumers neglect the handset providers that cannot offer this service. Most consumers use video telephony more than ordinary mobile telephony because it is simple to use and appreciated by people in all ages. The service is promoted by a well functioning payment system that charges the consumer on the ordinary telephone bill.

2. **"Technomania" - high usefulness and negative consumers**

*Imaging yourself in a situation where you are sitting waiting for your flight taking you to New York where you are supposed to meet your most important*

*customer. While waiting you receive a SMS saying that the customer has changed the calendar and that her secretary will meet you at the arrival. She also left a number for the person meeting you and asked you to call for deciding where to meet. Instead of using the video telephony service in your phone, that you think is expensive and redundant, you call the secretary and decide a place to meet at the airport. When arriving you recognise the fact that Kennedy airport is extremely large and full of people and there are several Mc Donald's restaurants, which were the place where you had decided to meet. To your great horror you also recognise that there are many blond women wearing dark suits. After two hours searching for the secretary you have already missed your important meeting so you decide to rebook your return flight and go home.*

The telecom industry has pushed the market into the third generation of mobile communication. The consumers, though, are still using the services of the second generation and are unwilling to adapt their behaviour to the new system and are thus not willing to pay for the services provided. The service is available in most handsets, the usefulness is high and appropriate payment models have been developed, but despite these facts the consumers do not consider video telephony to be interesting. Most consumers use ordinary mobile telephony instead of video telephony because they do not consider the picture of the respondent to add any value to the phone call.

**3. “Technology shortfall” - Low usefulness and positive consumers**

*Imaging yourself in a situation where you are sitting waiting for your flight taking you to New York where you are supposed to meet your most important customer. While waiting you check your e-mails using your mobile handset. You are surprised to see that the customer has changed the calendar and left a message that says that her secretary will meet you at the arrival. She also left a number for the person meeting you and asked you to call for deciding where to meet. You dial the number and try to turn on your video telephony service because it would facilitate your arrival if you were able to recognise the person meeting you. Unfortunately this does not succeed since you have no clue how to use it, it is really too advanced for any person who is not a technical genius. Since the service is very expensive your pre-paid account does not cover any more attempts, you finally board the plane in disappointment and also uncertainty about the arrival.*

The consumers are interested in and demand the services available in the third generation of mobile communication. A problem is that the technology for the services has become very complex which results in products that are not user-friendly. Another deficiency is that no appropriate payment models have been developed which makes the payment complicated and hard for the consumer. Furthermore, there are few areas of use besides transmitting pictures to the remote party while speaking. Despite the positive general attitude, the consumers are not willing to pay for the quality received.

**4. “Voice passion” - Low usefulness and negative consumers**

*Imaging yourself in a situation where you are sitting waiting for your flight taking you to New York where you are supposed to meet your most important customer. You get the information that the plane is delayed and you reach for your mobile handset to call the customer and inform about the delay. At your horror you recognise that the phone is missing and probably has been stolen. Since you have an insurance that covers the loss, you go to the consumer electronic store to buy a new. The salesman tries to convince you to buy the new expensive type of phone that includes the video telephony service, but you hesitate because you do not see any use for it, furthermore you think it is too complex and difficult to use and also that the cost to use the service is too high. In addition, the number of users is too few. After some discussion you seem to have convinced the salesman about its deficiencies and you leave the store with your new GPRS handset.*

The services of the third generation of mobile communication are available but they are difficult to use due to their technical complexity, the cost for using them is high and the quality of them is bad. The consumers are not interested in the services and they mainly use the mobile handsets for ordinary conversation and for sending text messages. The consumers are unwilling to adapt their behaviour to the new system and are thus not willing to pay for the services provided. The negative attitude towards the services are strengthened by the fact that the payment models are under-developed which means that the consumer receives multiple bills or have to pay in an unsafe mode on the Internet.

**Step six: Implications**

At this step recommendations are given concerning the decision within the different scenarios. We also give a concluding recommendation to get the most robust decision that is successful in most scenarios.

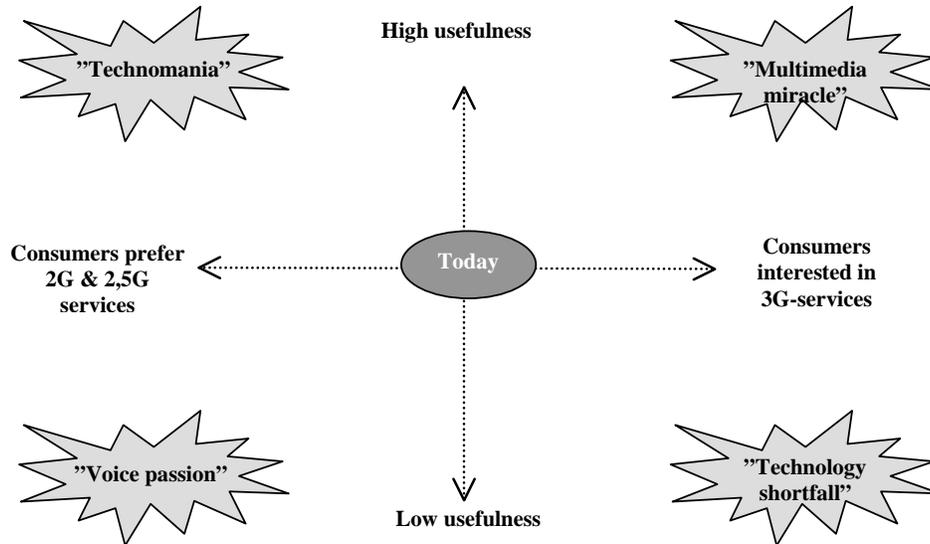


Figure 8-2: Four possible scenarios concerning video telephony

In the first, second and third scenario we give the recommendation that the platforms should support video telephony.

- ❑ In the first scenario, “Multimedia miracle”, the consumers are interested combined with a high usefulness. This results in that the products of the platform providers that do not support video telephony will not be considered when the handset providers chose platforms for their products. To be successful in this scenario a positive decision is crucial.
- ❑ In the second scenario, “Technomania”, the usefulness is high but the consumers are unwilling to use the services of the third generation. But this hesitation to changes lies in the nature of human minds and it might therefore only be a matter of time before the consumers change their preferences. To be successful in this scenario we therefore recommend a positive decision to support video telephony.
- ❑ In the third scenario, “Technology shortfall”, the consumers are positive but the usefulness is low. Like with almost all new technologies it suffers from child deceases in the beginning of its lifecycle. We think that this will improve over time. Since the consumers demands the service there is really no choice but to support it. The recommendation is therefore a positive decision.

- In the fourth scenario, “Voice passion” the consumers have a negative attitude towards the services of the third generation and the usefulness is low. It is possible that these conditions will change over time for the reasons mentioned above. The recommendation for this scenario is therefore to wait and see, but to be observant for changes.

Our concluding recommendation in this decision is that EMP should support video telephony in its platforms, since this is the most robust decision, i.e. the decision that leads to success in most possible scenarios.

#### *Step seven: Signposts and leading indicators*

If the decisions look good for all scenarios or is very robust, then the work may be terminated after step six. If the decision is dependent on what develops in reality this final step is necessary. It is also necessary for materials that are of more continuous character e.g. EMP roadmaps that have to be reviewed and updated as the conditions change over time.

If our recommendation had been to wait in this particular decision, a possible indicator could have been the migration of subscribers from 2,5G to 3G, which indicate that the main area of use develops from voice and SMS to include also multimedia.

### **8.4 Guidelines for using the framework**

We will now give some comments of how we think the intelligence framework should be used to best fill its purpose.

Imagine a situation where you are supposed to bake a cake or cook a delicious dinner. In relation to the work of TBS this is a relatively simple process, though most of us would not do this without structuring our work or without using some form of facilities e.g. a recipe. Without it, the risk to forget some critical ingredient is high and that could destroy the result totally. The recipe is used as help in the process of baking your cake by describing the *different steps* in the process and by *specifying* what *ingredients* should be included and in what *amount*, but though it could be helpful, the recipe is by no means automatic. A baker is needed that works according to the recipe, and the ingredients, in right amount and in the right order are also critical.

This is also true for the framework we have developed and presented earlier in this thesis. This is not a tool that automatically transforms input into a useful output, maybe this would be ideal but it is hardly realistic. However, the purpose is that the framework should serve to support the process of developing and updating roadmaps and of producing materials for decision support and for marketing, just like the recipe supports and facilitates the process of baking a cake.

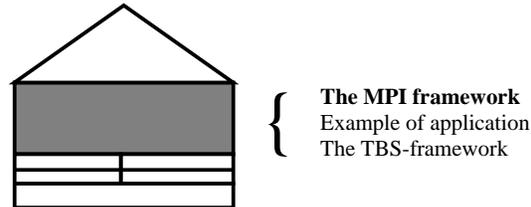
## The Multi-Perspective Intelligence framework

---

We want to recommend the users to utilize the framework in their working process but we also stress the need for complementing it by their own capacity of thinking and analysing and with a common sense. The framework should not be followed mechanically as a template, but function as a guide of how the work could be performed. There is always a risk that people stop thinking and rely completely upon a framework or a tool, this is absolutely not the purpose with the framework. Though the input is defined in the framework and though a specific analysis method is presented this is not the only input that has to be considered in every specific situation, the framework must be adapted to fit the specific situation.

If these recommendations are followed we think that the framework really could contribute to strengthen and support the working process of TBS, and thereby also satisfy the identified needs.

## 9 The MPI framework



*In this chapter “The Multi-Perspective Intelligence framework” that aims to structure and support an intelligence creating process, i.e. the process of collecting, consolidating and analyse information in a high technology, dynamic environment will be presented.*

---

### 9.1 Introduction

The theoretical purpose of this thesis is *to develop a generic framework for an intelligence creating process that fits an organisation operating in a dynamic, high technology industry*. By using the mobile telecom industry and TBS as a basis, we have created a generalized methodological framework, which is presented in this chapter. Before developing the framework a discussion will follow concerning the extent to which the requirements of telecom industry could be seen as general for a high technology, dynamic industry, and also to what extent the needs of TBS are general and holds also for other organisations.

### 9.2 The development of the framework

The mobile telecom industry was discussed in chapter four and we came to the conclusion that the industry is dynamic and uncertain. We also mentioned that an ability to handle information in a way to detect trends and evaluate their impact on the organisation becomes critical. Also the capability to handle uncertainties and to deal with irreducible uncertainty becomes critical in this type of environment. We think that the mobile telecom industry is representative of an industry that is based on high technology and characterised by dynamics and uncertainty. The abilities discussed above are thus important in any organisation that faces this type of environment.

In chapter five, we discussed the needs of the working process of TBS. We identified a number of needs, most of them being quite general in nature that we think all organisations recognise. Some of the identified needs are due to the dynamic environment, e.g. the need for becoming more anticipatory and proactive, and others are so general that we think they are important for all organisations both in a dynamic and in a more stable environment. For instance, specifying the relevant input information is a need that is general, most organisations are flooded with information and need to strain off the information that is not relevant. Also the needs concerning the process itself are quite general depending on the level of development and

maturity of the organisation. It is for example important to focus on the process and not only on the outcome of the process in order to achieve coordination and communication. Furthermore, the need of separating the continuous activities from the activities of a more unique character is also a need that we see as general since we believe that most organisations engage in both types of activities. The needs concerning the output, we also see as general, there is for instance always a need for assuring the quality of the outcome of the process.

To sum up, the requirements that a dynamic industry put on the framework is mainly that information must be handled in a way that trends and uncertainties are dealt with and their implications are evaluated. We think that this is important for any organisation operating in a dynamic industry. Also, the needs identified at TBS are general to that extent that it is able to construct a framework with them as a basis that aims to structure and support an intelligence creating process in any organisation operating in dynamic environment. Since we developed the TBS-framework with these requirements and needs as a basis, and since we have drawn the conclusion that these are general, we in turn draw the conclusion that also the TBS-framework could be generalised to work in any organisation operating in a dynamic environment.

### 9.3 The Multi-Perspective Intelligence framework

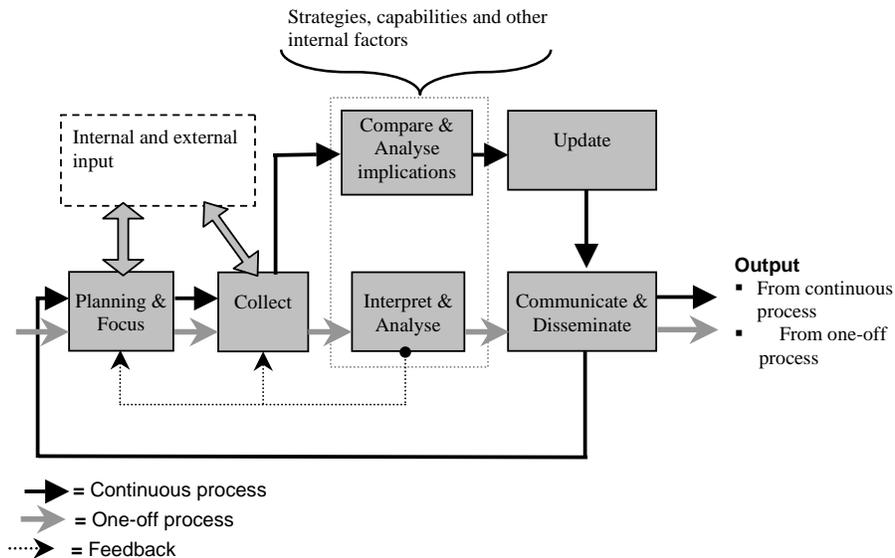


Figure 9-1: The Multi-Perspective Intelligence framework

We think that the needs of TBS, which we consider to be general in nature, can be summarized into three overall perspectives namely a *technological and a business* perspective, *current and future* perspective and a perspective that *separates the continuous activities from the unique*, also called “one-off” activities. The framework

that we intend to develop must take these perspectives into account in order to meet the requirements of a dynamic and high technology environment as well as the internal needs of a company, this is why we call it the Multi-Perspective Intelligence framework. The framework developed in chapter seven with the needs of TBS as a basis takes the perspectives discussed above into account. By generalizing this framework we obtain the Multi-Perspective Intelligence framework, see figure 9.1 above.

The synthesized intelligence framework, presented in chapter six, still serves as a basis in the MPI framework, which means that the business and technological perspectives are considered depending on how the information collection is focused. The future perspective is also considered since information about trends and uncertainties is gathered and evaluated for instance by the use of scenario planning. The framework also clearly separates the continuous activities from the one-off activities as seen in figure 9.1 above.

The continuous process, which is one part of the intelligence creating process, is constituted by the activities that are not connected to a specific decision and are constantly ongoing in the organisation. The one-off process, on the other hand, is a process that is more specific in nature and is primarily decision oriented. The continuous process partly serves as a basis for the one-off process since information that is gathered and analysed in the continuous process can be useful in specific situations. Therefore a greater emphasis should be put on the storage of the information and intelligence in the continuous process since this information and intelligence should be easily reached.

The continuous process differs from the one-off process in more ways than mentioned above. When analysing information in the continuous process the emphasis lies primarily on to compare the latest information with the information currently in storage. If necessary, the information is updated and its implications on the organisation are evaluated. On the contrary, the one-off process is more concerned with finding the information concerning a specific issue and analyse it in order to create actionable intelligence, for instance a decision support.

#### **9.4 What organisation could use the MPI framework?**

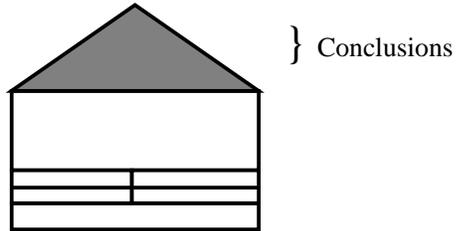
The unique nature of the framework is that it combines many different perspectives that have to be taken into account when creating intelligence. The framework is mainly constructed to work in an organisation operating in an industry based on high technology characterised by dynamics. Though, since the requirements are higher in a dynamic environment, we think that a framework that qualifies for this environment could also be used by organisations in industries that are more stable. But the analysis should in this case be adapted by using other tools that fit this type of environment better. One could also imagine that the continuous process runs over a longer period of time since the speed of change is lower which demands a more infrequent update. We think that this framework is general to that extent that it could be used in any

### The Multi-Perspective Intelligence framework

---

company in any industry by adapting it to the specific situation, but since the framework is developed to handle a complex situation, where many perspectives must be considered, we think that it might be to overdo the intelligence creating process by using this multi-perspective framework in a situation that are not as complex as the one described at TBS.

## Part IV. Conclusions

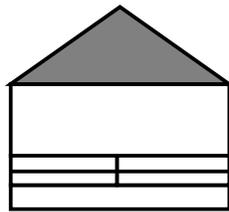


*In this part we summarise our findings. Initially the fulfilment of the purpose will be discussed, and after that we will answer the research questions presented in chapter one. We will also discuss to what extent this thesis has contributed to new findings in the field of Business intelligence and/or scenario planning by putting the thesis in relation to other published sources. Presenting areas of interest for further research will conclude the part.*

---



## 10 Conclusions



{  
Further research  
Positioning  
Research questions  
Purpose fulfillment

*This chapter begins with a discussion concerning the fulfilment of the purpose of the thesis. In the next section of the chapter we will answer our research questions and thereby present our conclusions. In the following section we will position our thesis in relation to other published material in the field of scenarios and intelligence. Finally we will present and discuss our suggestions regarding future research.*

---

### 10.1 To what extent has the purpose been fulfilled?

In the introduction chapter the purpose of this thesis was formulated. We will now remind the reader of the purpose to facilitate the assessment of whether the purpose has been fulfilled or not.

#### 10.1.1 The practical purpose

The practical purpose was formulated like this: *“The practical purpose of the thesis is to develop a framework for structuring the process of transforming information into road maps, core statements, decision support and marketing material at TBS. The framework should be adapted to TBS in that it satisfies the internal needs of the section as well as the requirements of the industry.”*

To fulfil the practical purpose we had to map the industry to identify the requirements of the external environment, and also the internal working process of TBS to identify the internal needs.

This part of the purpose is fulfilled in chapter 3 and 4, which aim to depict the industry and set the conditions for the rest of the thesis by identifying what requirements the environment put on the framework, and also in chapter 5 where the needs of TBS are identified and discussed. These types of analyses could be even deeper but we hold the opinion that the presentations are perfectly satisfactory to fill the purpose. A more detailed analysis would have shifted the focus from the main purpose.

To be able to develop a framework we also chose to make an inventory and analysis of different methodological approaches to find a methodology appropriate for the TBS process. With the need, requirements and the analysis as a basis we finally developed the TBS-framework that structures and supports the working process of TBS.

This part of the purpose is fulfilled in chapter six, which aim to give an overview of different methodological approaches available, and also in chapter seven and eight in which the framework is developed and used in an example.

### 10.1.2 Theoretical purpose

The theoretical purpose was formulated like this: “with the TBS framework as a basis, the purpose is to develop a generic framework for an intelligence creating process that fits an organisation operating in a dynamic, high technology industry.”

This part of the purpose is mainly fulfilled in chapter nine where the “Multi-perspective intelligence framework” is developed. This framework is a generic version of the TBS adapted framework developed and presented in previous chapters.

To sum up this discussion we think that both the practical purpose and the theoretical purpose of this thesis have been fulfilled properly.

## 10.2 The research questions

We will now answer the research questions presented in connection with the problem discussion in chapter one.

### 10.2.1 How can the existing working process of TBS be improved and become more efficient by the introduction of a structured method of working?

We have identified a need for a structured method of working at TBS. The structured approach could contribute to satisfy the needs identified in chapter five, and help to improve the efficiency in the ways that are discussed below. Since the needs lie as a basis for this discussion we initially present the table that concluded the needs in chapter five.

Identified Needs of TBS	
<b>Input</b>	Define the input in the process
	Specify the format, when, where and how
<b>Process</b>	Define responsibility
	Mapping the existing process
	Separating the continuous process from the unique
	Increase preparedness
	Better handle uncertainties
	Become more anticipatory
	Become more proactive
<b>Output</b>	Increase focus on the process
	Some form of quality assurance
	Identification of users
	Adaptation of material to end user

Figure 10-1: The identified needs of TBS

*10.2.1.1 Satisfaction of the needs concerning the input*

The structured approach that could be achieved by using the framework could contribute to increase the quality of the output since the input to the process is identified and defined. By doing this, it can better be ensured that relevant input aspects have been considered in the analysis. The structured approach also promotes a systematic way of obtaining the gathered information, which makes the process more efficient. The definition of what the information should include also makes the process more efficient since less time is spent on looking for material that is not relevant, this is very important in the information society of today since the main problem is that people are flooded by information. By defining the format the process is facilitated both for the person who is responsible for collecting and deliver the wanted information, and for the employees at TBS that are responsible for the analysis. If the wanted format is delivered from the beginning no work has to be made twice, the right format also facilitates and makes the analysis more efficient. Definition of who is responsible for the input also promotes efficiency because the employees will know where to find the information needed and who is responsible for updating it, thereby less time is spent on looking for the information needed. Since less time is spent on non-value adding activities, more time can be spent on acting proactively and to increase the preparedness for what the future might bring.

*10.2.1.2 Satisfaction of the needs concerning the process*

We think that the study done in this thesis broadly satisfies the need of mapping the process. We also think that a structured approach itself would satisfy the need of mapping the process in order to able to improve it. The work of TBS today has no formal structure and when structuring it, the deficiencies of the existing process are spotted and can thus easier be dealt with.

By structuring the process in the provided framework the continuous work is separated from the work of unique character. The advantage of this is that the difference between them is emphasized. We think this is needed since the two processes require different approaches concerning analysis and communication. The scope of the analysis in the continuous process is generally broader which means that other approaches when analysing must be used. Another thing that differs between the two processes is that the focus should lie on the process rather than the product in the roadmapping process. The analysis must be performed in collaboration with persons at TBS as well as people from other parts of the organisation, both from the technical department and Sales & Marketing in order to be the most effective, which is preferably done in a workshop. The persons participating in the process are very important for the outcome since the roadmapping activity is supposed to integrate business and technology and this can only be done if representatives with these different perspectives participate. It is also important to communicate during the analysis step in order do create consensus in the organisation about the roadmap. Since the roadmaps are used as a planning tool, the continuous process also contains elements of planning and management, which the other process, to the same extent, does not. The process that handles the one-off issues is not as communicative and generally does not require the same degree of involvement and the scope of the analysis is generally narrower. Another aspect that separates the two processes is

traced back to the cyclic nature of the roadmapping process. Since it is cyclical the process have to include storing of information, which is not necessary in the unique process.

The need of handling the uncertain environment to be able to work more proactively would be better satisfied by using a structured, systematic approach. In addition to this, the process becomes more efficient and more time can be spent on acting proactively. The structured approach includes analysis tools that can help to deal with uncertainty. The changeable environment could otherwise cause disorder and paralysis among the employees. A sense of structure might help them in order to handle the uncertainties in the best possible way. We also think that the need for becoming more anticipatory could be satisfied by using a structured approach that includes tried approaches such as developing scenarios and imagine and envision possible futures rather than just plan for one possible future.

Another advantage of a structured approach is that more focus would be placed on the process itself rather than focusing only on the outcome of the process. By achieving a better balance between the product and process, meaning for example that the right people should be involved in the process and that the interaction with the rest of the organisation could be improved, especially in the roadmapping exercise, to ensure that all relevant aspect are included.

#### *10.2.1.3 Satisfaction of the needs concerning the output*

As mentioned above the framework in some way contributes to assure the quality of the output since the input to the process is identified. The framework also separates the process in one continuous and one discontinuous, which in turn facilitate the identification of the user of the output produced by the section. The identification of the users are important since the outcome of the process should be further adapted to the end user of the material than done today. This is important since quality is a relative term, what is seen as qualitative material to one user is not by guarantee considered to be useful and qualitative to another.

#### *10.2.1.4 Risks*

In addition to this discussion about the advantages and improvements of a structured way of working, we also would like to give notice to some risks with a structured approach. One risk that we see is if the framework is put into practice all too stiff and mechanically. This could result in that the structured methodology creates blinders, which means that areas that are not included as inputs in the framework are neglected. We want to emphasise that the structure we advocate is only an approach to facilitate work, it is adapted to the general process of TBS but the user also has to adapt it to their own specific issue. Another risk we see is if the employees follow the framework to an extent that hamper creativity, though we do not consider this risk to be impending and we think that the positive affects of a structured working process by far makes up for the negative.

### 10.2.2 How can existing methodological approaches be adapted and used to support and structure the existing working process of TBS?

A section like TBS has to consider many different perspectives in their work. As indicated by the name, both a *business* perspective and a *technological* perspective are included. Along with this it is also important that the work focus both on the *present situation* and look forward into the *future*. Another aspect of the work is that some activities are *continuous* and some are “*one off*”, i.e. of more unique character with a start and an ending. Since the work includes all these perspectives, a framework for structuring the working process must be designed in a way that guarantee that all perspectives are considered. In our inventory of possible methodological approaches, we found that no methodology alone included all perspectives but that a complete framework could be achieved by combination and adaptation. The result of this is what we call “The TBS-framework”, that is presented in the figure below.

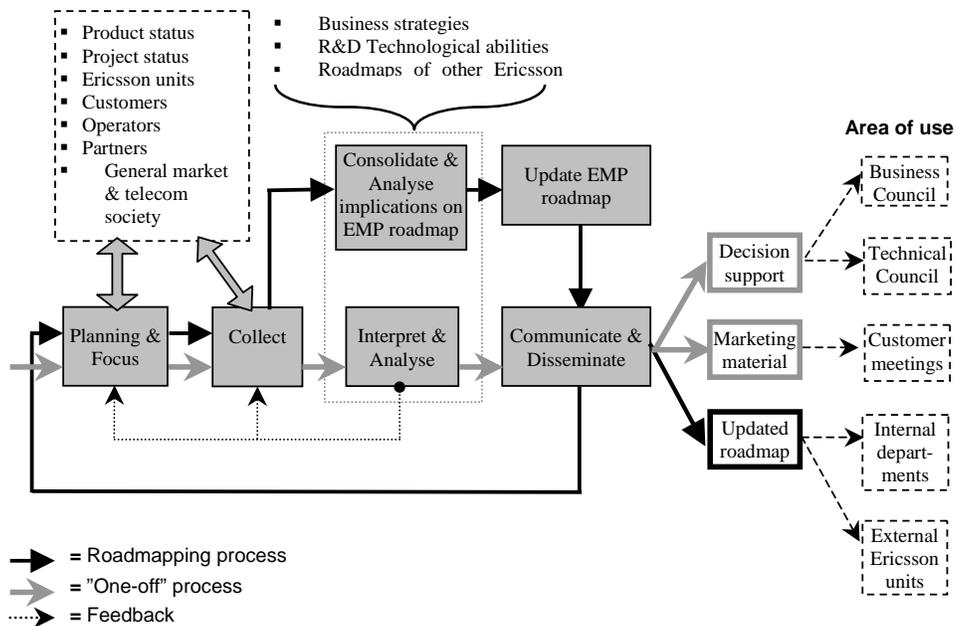


Figure 10-2: The TBS-framework

The generic intelligence process that correspond to the four basic steps in the process described above, serve as a basis for the framework. However we saw a problem in that the process might only take the present situation into consideration and leave the future perspective out of account. We also saw a risk that the employees would associate the name with the type of activity that includes merely the two first steps in the process since this is the dominating view of business intelligence in organisations.

Since the future perspective is very important in a dynamic, high technology industry like the industry for mobile telecom, and since the emphasise of the technical aspects is important in this type of industry, we asked ourselves how the intelligence process could be adapted in order to become more anticipatory, future oriented and include a technical aspect. We solved the problem by combining the BI-process with technological foresight. BI is the main-process and technology foresight serve to support the process by complementing the analysis step with a future perspective and also by emphasising the analysis of the process. We have adopted the scenario approach, which is a methodology used in technology foresight. By using a scenario approach when analysing data, the possible future development is considered and thereby the future perspective is taken into account.

The technology and business perspectives and the aspect of continuous and unique activities are included in the framework by adaptation. First we developed a generic process derived from the BI-process and then the process was specialised and adapted to the specific needs of TBS. Specifying what aspects that should be input in the process includes the technology and business perspectives. By defining two different processes for the work of continuous character and the work that is unique also this perspective is included. The result is the TBS-framework presented above.

### **10.2.3 Can the methodological approach developed for TBS be generalised in order to be applicable in other contexts?**

The third and last question we have asked ourselves is of more general nature and concerns the applicability of the TBS-framework we have developed. Is it applicable on other processes, in other companies and in other industries?

We concluded in chapter nine that the requirements that the environment puts on the framework are general in the sense that any industry characterised by dynamics and high technology experiences them. Furthermore, we concluded that the needs of TBS could be generalised to hold for organisations operating in dynamic and high technology industries. Therefore, the TBS-framework was modified to the Multi-Perspective Intelligence framework, see figure 10.3 below, where the specifics of TBS have been removed.

We are of the opinion that the MPI-framework can be used to structure and support an intelligence creating process, where information is gathered, analysed and communicated, in any organisation that operates in an industry characterised by dynamics and high technology. It must, though, be adapted to the specific company in terms of for example input specifications and definition of the output and the users of the output as well as other aspects of the framework that are not of a general nature.

Merely introducing a framework consisting of a series of steps does not add much value to a process, but if the activities of every step is defined and adapted to the specific situation, the framework could help to facilitate the work and to make it more efficient.

## The Multi-Perspective Intelligence framework

The answer to the question is therefore: Yes, the Multi-perspective framework is applicable in other contexts, *but* it has to be further adapted to be useful.

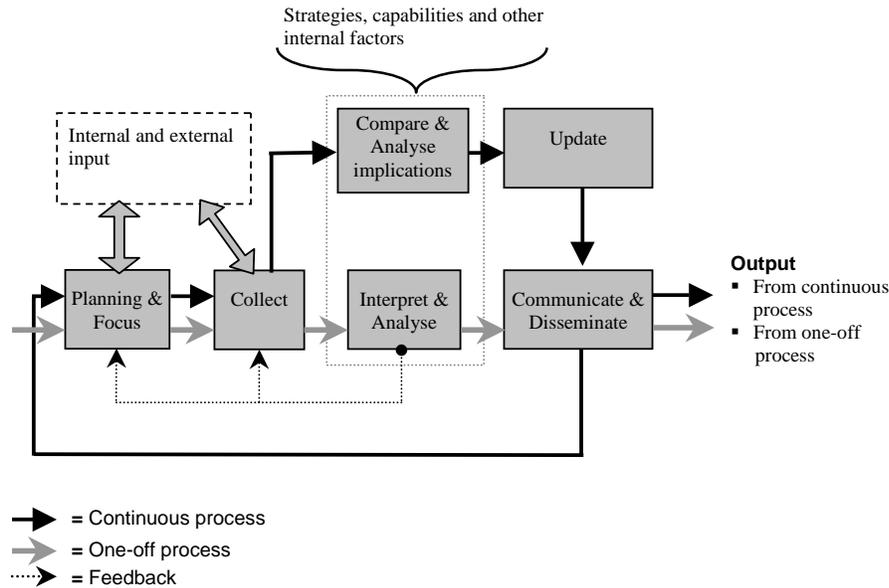


Figure 10-3: The Multi-Perspective Intelligence framework

### 10.3 Contribution to research

As discussed in the research approach in chapter two we have chosen an abductive approach while carrying out this thesis, which means that we use existing theories to describe and analyse the environment that surrounds the organisation and as a basis when constructing the methodological framework. The purpose is though to develop a framework that satisfies the needs of TBS and also cope with the environment the company operates in. This has resulted in that we to some extent also have created theory and broken fresh ground by combining and adapting existing theories and methodologies. One example of this is the development of our “Multi-Perspective Intelligence framework” that combines the business intelligence process with technical foresight by adopting scenario planning in the analysis step. The framework also differs the continuous process of creating intelligence from the one-off activities of more unique character. This combination and adaptation results in that the framework considers a *technical and a business perspective, the current and the future situation as well as the continuous and the unique process*. We have not found any existing methodological framework available that considers all these three perspectives. BI is an approach that to some extent includes both a technical aspect and a business aspect, but it mainly concentrates on the current perspective and the process is not divided and specialised depending on whether the process is continuous or unique. Technical foresight is an approach that, as the name indicates, focuses

merely on the technical and the future perspective. Since the needed of TBS requires a framework that considered all these perspectives we saw no other means but creating a new framework.

Another example of how we have tread new paths in this thesis is our new way of using scenarios on another level and in another time perspective than is described by the authors in the field. The traditional uses of scenarios in companies is on a corporate level, as a technique for planning business and develop and test overall strategies, and also to come to conclusion in strategic decision making, by developing different possible futures. These types of scenarios are made in a timeframe of at least ten to twenty years. In this thesis we show how the scenario approach could be used on another level of the company as well, and in another timeframe (one to five years), to support the working process of a section, by adapting the driving forces and other parameters that affects the scope of the scenario. One example of adaptation is that the macro level factors such as life styles and demographics are assumed to be stable during this period of time and therefore these factors are not considered in “the lower level-short time” scenarios.

#### **10.4 Suggestions for further research**

During the last years the literature concerning normative methodology in the field of Business intelligence, Technology foresight, roadmapping and other related areas has increased. This type of literature deals with the question how this type of activities should be performed, but there is still very little research done, and thereby also published material, about practical use of the methodologies. We think that we have touched upon this area in this thesis, but that there still are many questions that could be interesting to investigate further, for example: What does the actual use look like in companies? What difficulties and obstacles are there in practical use? What are the positive and negative effects of the use in practice?

While working with this thesis we have focused merely on developing a framework for the process of transforming information. This have been an extensive work since we first had to map the internal processes *and* the external environment, we therefore had to make some delimitations. One area of interest that has not been considered in this thesis is the question of implementation. This issue raises a lot of questions that seek an answer. How should this type of framework be implemented in an organisation? How should it be organised? Who should be responsible for the introduction and who should be defined as process owner? What should be done to guarantee that the employees follow the methodological approach and not continue their work in the same way they did before? What changes have to be made in the existing working process? We think that these questions could be an interesting subject for further investigation.

An area that is not directly related to our work, but that we think is of interest in the field of methodological approaches is the development from prediction and prognoses to an inventory of possibilities during the last twenty years. How does the general

## The Multi-Perspective Intelligence framework

---

pattern of development look like? What factors have driven this development? What implications does this development get on strategy building in companies?

## List of references

### Published Material

Ackoff, R. L. (1989) "From Data to wisdom presidential address to ISGSR", june 1988, *Journal of applied systems analysis*, Vol. 16.

Alvesson, M. & Sköldeberg, K. (2000) *Reflexive methodology: new vistas for qualitative research*, Thousand Oaks, Calif, London.

Ashton, B. A. & Klavans, R. A. (1997) *Keeping abreast of science and technology*, Battelle Press, Columbus, Ohio.

Augustsson, T. (2002) "Ericssons hjärna ute på marknaden", *Näringsliv*, 2002-01-04

Baldock, R. (1998) *Destination Z – The history of the future*, John Wiley & Sons Ltd, Chichester.

Barney, J.B. (1995) "Looking inside for competitive advantage", *Academy of management executive*, Vol. 9, No. 4.

Bray, O. & Garcia, M. (1999) "The fundamentals of technology roadmapping", <http://www.sandia.gov/Roadmap/home.htm> as of 2002-05-14.

Carlbon, T. (2002) "Framtidens mobiltelefoner: Den omöjliga mirakelapparaten", *Veckans affärer*, 2002-02-04.

D'Aveni, R.A. (1995) "Coping with hypercompetition – Utilising the 7S's framework", *Academy of Management Executive*, Vol. 9, No. 3, pp. 46-60.

Eisenhardt, K.M. & Martin, J.A. (2000) "Dynamic Capabilities – What are they?", *Strategic Management Journal*, Vol. 21. pp. 1105-1121.

Fahey, L. & Randall, R. M. (1998) *Learning from the future*, John Wiley & Sons Inc, New York.

Frankelius, P. (2001) *Omvärldsanalys*, Liber, Malmö.

Gerybadze, A. (1994) "Technology forecasting as a process of organisational intelligence", *R&D Management*, Vol. 24, No. 2, pp131-140.

Gilad, B. & Gilad, T. (1998) *The business intelligence system*, Amacom, New York.

Gilad, B. & Herring, J. P. The art and science of business intelligence analysis.

Grant, R. M. (1997) *Contemporary strategy analysis*, Massachusetts, USA.

- Grandy, C. (1997) "Power + performance for marketing databases", *Dynamic information system corporation*.
- Green, R. M. (1966) *Business Intelligence and espionage*, Homewood, Dow-Jones Irwin.
- Halvorsen, K. (1992) *Samhällsvetenskaplig metod*, Studentlitteratur, Lund.
- Hamel, G. & Prahalad, C.K. (1996) *Competing for the future*, Harvard Business School Press, USA.
- Hedin, H. (1992) "Svenska företag världs bäst på Business Intelligence?", *Skydd & säkerhet*, 8/9.
- Huss, W.R. & Honton, E.J. (1987) "Scenario Planning – What style should you use?", *Long Range Planning*, Vol. 20, No. 4, pp.21-29.
- Johnson, G. & Scholes, K. (1999) *Exploring Corporate Strategy*, Prentice Hall, London.
- Kahaner, L. (1996) *Competitive Intelligence-how to gather analyze and use information to move your business to the top*, Simon & Schuster, New York.
- Kappel, T.A. (2001) "Perspectives on roadmaps: how organisations talk about the future", *The Journal of Product Innovation Management*, Vol. 18, pp.39-50.
- Lenz, R.C. "Forecasts of Exploding Technologies by Trend Extrapolation". In: Bright J.R. (1968) (ed.): *Technological Forecasting for Industry and Government*, Prentice Hall: Englewood Cliffs.
- Lundahl, U. & Skärvad, P-H. (1999) *Utredningsmetodik för samhällsvetare och ekonomer*, Studentlitteratur, Lund.
- Mintberg, H. (1994) "The fall and rise of strategic planning", *Harvard Business Review*, jan-feb 1994, pp107-115.
- Mårtensson, D. & Risell, M. (2000) "Att hantera omvärldsinformation", [www.bidigital.com/papers/bi/index.htm](http://www.bidigital.com/papers/bi/index.htm) as of 2002-05-30.
- Pagels-Fick, G. (1999) *Business Intelligence*, Industrilitteratur, Stockholm.
- Pollard, A. (1999) *Competitor Intelligence*, Financial times, Pitman Publishing, London.
- Porter, M.E. (1985) *Competitive Advantage*, Free Press, New York.

Porter, A. L., Roper, A., Mason, T., Rossini, Tomas, W., Frederick, A., Banks, J. (1991) *Forecasting and Management of technology*, Wiley & Sons, New York.

Reger, G. (2001) "Technology Foresight in Companies: From an Indicator to a network and process Perspective", *Technology Analysis & Strategic management*, Vol.13, No. 4, pp.533-553.

Ringland, G. (1998) *Scenario planning – managing for the future*, John Wiley & Sons Ltd, Chichester.

Sandström, B. (1988) *Business Intelligence*, Liber, Malmö.

Saxby, S. (1990), *The age of information*, The MacMillian Press Ltd., London.

Schwartz, P. (1996) *The art of the long view*, Currency Doubleday, New York.

Senge, P.M. (1990) *The fifth discipline*, Random House, London.

Slywotsky, A. J. (1996) *Value Migration –how to think several moves ahead of competition*, Harward Business school press, Boston.

Van der Heijden, K. (1996) *Scenarios –the art of strategic conversation*, John Wiley & Sons Ltd, Chichester.

### **Web resources**

<http://ecs-lund.ericsson.se/lund>

[http://emp.ericsson.se/emp\\_top/](http://emp.ericsson.se/emp_top/)

<http://www.bidigital.com>

<http://www.docere.se>

<http://www.ericsson.com/mobileplatforms/>

<http://www.gartner.com>

<http://www.kairos.se>

<http://www.profundor.se>

### **Oral sources**

Berggren, Stefan, Strategic product manager, Ericsson Mobile Platforms, conversation, 2002-01-16, 2002-02-20, Workshop, 2002-04-24.

Carnehult, Thomas, Strategic product manager, Ericsson Mobile Platforms, conversation, 2002-01-22.

Eklundh, Bert, Technical Dr., Consultant at Profundor AB, conversation 2002-01-30, 2002-02-06.

Gerward, Magnus, Assistant strategic product manager, Ericsson Mobile Platforms, conversation, 2002-02-20.

Granberg, Anders, Ph.D. Research Policy Institute, Lund University, conversation, 2002-02-14, 2002-03-04, 2002-04-09, 2002-04-26, 2002-05-08.

Jönsson, Martin, Strategic product manager, Ericsson Mobile Platforms, continuous conversations 2002-01-14-2002-05-22.

Karlsson, Johan M, University lektor, department of communication systems, Lund Institute of Technology, Lund University, 2002-01-24, 2002-01-31.

Kleppestö, Stein, Ph.D. Department of business administration, School of economics and management, Lund University, conversation, 2002-01-21.

Kornby, Michael, Vice president technology strategies, Ericsson Mobile Platforms, Interview, 2002-04-23.

Melander, Mats, Technical Manager, Ericsson Mobile Platforms Interview, 2002-04-19.

Nilsson, Carl-Henrik, Ph.D. University lektor, Department of business administration, School of economics and management, Lund University, continuous conversation.

Nilsson Pernilla, Global sales co-ordinator, Ericsson Mobile Platforms, Workshop 2002-04-24.

Nordman, Peter, process owner, Ericsson Mobile Platforms, workshop 2002-04-24.

Rietz, Peter, Senior Analyst, Ericsson Mobile Platforms, conversation, 2002-01-17, workshop 2002-04-24.

Stankiewicz, Rikard, Professor at Research Policy Institute, Lund University, conversation, 2002-02-08.

Svensson, Claes, Ph.D., Professor at department of business administration, School of economics and management, Lund University, conversation 2002-02-07.

## Table of figures

Figure 1-1: Disposition of the report.....	9
Figure 2-1: Methodology model .....	13
Figure 4-1: The transformation of the computer industry.....	27
Figure 5-1: EMP's basic organisational structure and TBS's organisational position	32
Figure 5-2: Input-output transformation done by TBS .....	33
Figure 5-3: An overview of the identified needs of TBS.....	38
Figure 6-1: An overview of methodological approaches.....	43
Figure 6-2: A comparison of different intelligence and foresight processes. ....	44
Figure 6-3: The synthesised intelligence creating process.....	44
Figure 6-4: The analysis step of the intelligence creating process.....	47
Figure 6-5: An overview of different analysis tools .....	51
Figure 6-6: A summary of the GBN method, the SRI method and Shoemaker's method. ....	54
Figure 7-1: The specialised process for TBS .....	60
Figure 7-2: Different inputs and their areas of focus .....	63
Figure 8-1: The scenario logic .....	77
Figure 8-2: Four possible scenarios concerning video telephony .....	80
Figure 9-1: The Multi-Perspective Intelligence framework.....	84
Figure 10-1: The identified needs of TBS.....	90
Figure 10-2: The TBS-framework .....	93
Figure 10-3: The Multi-Perspective Intelligence framework.....	95

## Appendix

### Appendix A. Different scenario methods

*Scenario planning first emerged after World War II as a tool used by the military to consider alternative action plans. Subsequently, it moved to the corporate world by the RAND corporation and later further developed by Herman Kahn and the Hudson Institute.<sup>89</sup> Kahn specialised in stories about the future aiming at helping companies to think the unthinkable.<sup>90</sup> The scenario planning reached a new dimension in the early 1970's when Royal Dutch/Shell with Pierre Wack as the leading figure started using scenario planning.<sup>91</sup> Wack realised that for scenarios to be truly effective, they had to change the managers' view of the future.<sup>92</sup> In these new types of scenarios he did not talk simply about possible futures. He concentrated on making people feel the different scenarios by vividly describing the acting forces in the world and how they would affect the business in the future.<sup>93</sup> Wack and his colleagues developed a set of scenarios concerning the oil industry. One of those included that the oil suppliers would restrict oil supply and thus led to higher crude oil prices. When the oil price chock in October 1973 took place, Shell was the only major oil company that was emotionally prepared for the change and could therefore respond quicker than its competitors.<sup>94</sup>*

### The GBN method<sup>95</sup>

Peter Schwartz left Shell in 1987, he had decided that it was time to set up a new organisation to do the sort of imaginative thinking for other companies that he did at Shell. He would do this by using the work of Pierre Wack, his predecessor at Shell, as a model. Together with a few friends he started Global Business Network, which major part of activity is scenario generation<sup>96</sup>. In "*The Art of the long View*", Peter Schwartz presents a checklist to use as the basis for developing scenarios. This forms the basis of the GBN approach. It will here be described shortly as a process in eight steps.

#### ***Step One: Identify focal issue or decision***<sup>97</sup>

When creating scenarios you have to decide where to begin. Schwartz means it's a good idea to begin "from the inside out" rather than "from the outside in". That is, you should begin with a specific decision or issue and then build out towards the environment. Consider what decisions that will have to be made in the near future and

---

<sup>89</sup> van der Heijden (1996), p.15

<sup>90</sup> Ringland (1998), p.12.

<sup>91</sup> Schwartz (1996), p.7.

<sup>92</sup> Schwartz (1996), p.8.

<sup>93</sup> Schwartz (1996), p.8.

<sup>94</sup> Schwartz (1996), p.8.

<sup>95</sup> Ringland (1998), p.227

<sup>96</sup> Ringland (1998), p.228

<sup>97</sup> Schwartz (1996), p.241

that will be of great importance to your company. Scenarios that are created the opposite way, "from the outside in", on the basis of differences in the macro-economy may not highlight differences that make a difference to a particular company and especially not to a particular decision.

***Step Two: Forces in the local environment***<sup>98</sup>

Listing the factors influencing the success or failure of the decision or issue identified in step one is the second step in the process. Try to bring out facts about customers, suppliers, competitors etc that influence decisions. Consider what the decision-maker want to know when making decisions. Also consier what will be seen as success or failure in the specific decision and what the considerations are that will shape those outcomes.

***Step Three: Driving forces***<sup>99</sup>

This step follows the identification of the key forces. The vital issue is now to list the driving forces in the macro-environment that influence the key forces identified earlier. Forces within the social, economic, political, environmental and technological area is identified along with other macro-environmental aspects relevant for the specific decision.

***Step Four: Rank by importance and uncertainty***<sup>100</sup>

Next comes ranking of the key factors and driving forces on the basis of two criteria; first, the degree of importance for the success of the focal issue or decision identified in step one; second, by degree of uncertainty surrounding those factors and trends. The purpose is to identify two or three factors or trends that are most important *and* most uncertain.

***Step Five: Selecting the scenario logics***<sup>101</sup>

The result of the ranking exercise in step four are the axes along which the eventual scenarios will differ. Determining these axes is among the most important steps in the entire process. The goal is to end up with a few scenarios whose differences make a difference to decisionmakers. Once the axes have been identified it is useful to present them e.g in a matrix, where the logic of the scenario will be characterised by its location in the matrix.

***Step Six: Fleshing out the scenarios***<sup>102</sup>

The process is almost done, but first the scenarios have to be put in a story that gives the reader a realistic and descriptive view of the scenario. It is supposed to point out the most important factors in a context that they can relate to.

---

<sup>98</sup> Schwartz (1996), p.242

<sup>99</sup> Schwartz (1996), p.242

<sup>100</sup> Schwartz (1996), p.243

<sup>101</sup> Schwartz (1996), p.243

<sup>102</sup> Schwartz (1996), p.245

***Step Seven: Implications***<sup>103</sup>

Once the scenarios have been developed it is time to return to the focal issue or decision identified in step one. How does the decision look in each scenario? What vulnerabilities have been revealed? Is the decision robust across all scenarios or does it look good only in one or two? If that's the case it qualifies as high-risk gamble. It might be good to consider how the strategy could be adapted to make it more robust if the desired scenario shows signs of not happening.

***Step Eight: Selection of leading indicators and signposts***<sup>104</sup>

It is important to identify some indicators to monitor in an ongoing way to see which of the several scenarios is about to be realized. If those indicators are selected carefully the company can get an idea of what the future holds for a particular industry and how the future is likely to affect strategies and decisions in the industry.

---

<sup>103</sup> Schwartz (1996), p.246

<sup>104</sup> Schwartz (1996), p.246

### The SRI method<sup>105</sup>

Stanford Research Institute (SRI) began developing scenario-based planning techniques for studying the future in the mid-1960s. In the late 1970s, SRI revised its methodology to meet the needs for strategic analyses of future trends and uncertainties that had direct implications for strategic plans and other decisions about the future being made in the present. This methodology was developed in parallel with Royal Dutch/Shell Group's scenario process, here referred to as "the GBN method", and they have a number of features in common. This methodology, that will be presented below, is considered the paramount example of "intuitive-logic" approaches to scenario development and application. The methodology is a process in six steps preferably performed by a multi-disciplinary team in a series of analyses and workshops.

#### ***Step One and Two: Identification of decision and key decision factors***<sup>106</sup>

This process is decision-focused and starts with clarification of the strategic decision the scenarios aim to address and of key decision factors –that is, what decisionmakers would like to know about the future to make a better decision. This starts from "inside-out" aim to ensure that the resulting scenarios focus on the trends, events and uncertainties that are strategically relevant to the decision-making process.

#### ***Step Three: Analysis of environmental factors***<sup>107</sup>

The issue is now to carefully map the full range of environmental forces that will shape the future business environment confronting the decision-makers. The analysis is focused on forces on two different levels – those at the industry and market level (micro) that directly affect the key decision factors and those at the broad social, economic, political and technological (macro) level that set the overall context for the business environment. The analysis concludes with sorting out what is relatively predictable from what is truly uncertain by a detailed assessment of each force's degree of impact on the decision factors and the level of uncertainty.

#### ***Step Four: Development of scenario logics***<sup>108</sup>

This is the heart of the process in which the basic structure for the scenarios is established. It includes identification of a limited number of scenario logics which encompass the critical environmental drivers and major uncertainties each logic presents.

#### ***Step Five: Description of scenarios***

In this step the scenarios are described in detail to identify decision implications and to help develop and assess strategy options. The descriptions normally include an extended storyline, some form of tabular description of the differences and a selective quantification of key factors.

---

<sup>105</sup> Ringland (1998), p.247

<sup>106</sup> Ringland (1998), p.248

<sup>107</sup> Ringland (1998), p.249

<sup>108</sup> Ringland (1998), p.250

## Shoemakers method<sup>109</sup>

The objective of this model is to see the future broadly in terms of trends and uncertainties. Schoemaker considers scenario planning to be an attempt to “capture the richness and range of possibilities, stimulating decision-makers to consider changes they would otherwise ignore”. The method consists of ten steps, which are presented below.

### ***Step One: Decide time frame and scope of analysis***

The first step is to decide the time frame and the scope of the analysis in terms of markets, geographic areas and technologies. Often, it is useful to look at historical data since it can help to give insights to what might happen in the future. The management should participate in this step.

### ***Step Two: Identify major stakeholders***

During the second step, the major stakeholders, such as competitors, suppliers, employees, shareholders and governments, are identified. Their roles, interests, power positions and how they have developed historically are examined.

### ***Step Three: Analyse certain and visible trends***

During the third step identification and analysis of visible and certain trends is done to try to figure out how and way they influence the organisation. The trend should thereafter be place in a diagram to show the impact the trend has on the organisation’s present strategy.

### ***Step Four: Identify key uncertainties***

The fourth step identifies the key uncertainties and the relationships between them. The trends, which were categorized as uncertain in the former step, are analysed in this one.

### ***Step Five: Construct initial scenarios***

In the fifth step, the initial scenarios are constructed.

### ***Step Six: Ensure internal consistency and plausibility***

The sixth step focuses on ensuring that the scenarios are internally consistent and plausible. The internal consistency can be assessed by testing them in three ways:

- Are the trends compatible within the chosen time frame?
- Do the scenarios combine outcomes of uncertainties that indeed go together?
- Are the major stakeholders placed in positions they do not like and can change?

### ***Step Seven: Develop scenarios***

Scenarios, based on the initial scenarios constructed in the fifth step, are developed during the seventh step.

### ***Step Eight: Need for further research***

---

<sup>109</sup> Schoemaker (1995), pp.28-30

The eighth step identifies the need for further research to enhance the understanding of trends and uncertainties.

***Step Nine: Internal consistency re-examined***

During the ninth step the internal consistency of the scenarios is re-examined. It is also assessed whether certain interactions should be formalised with a quantitative model.

***Step Ten: Develop final scenarios***

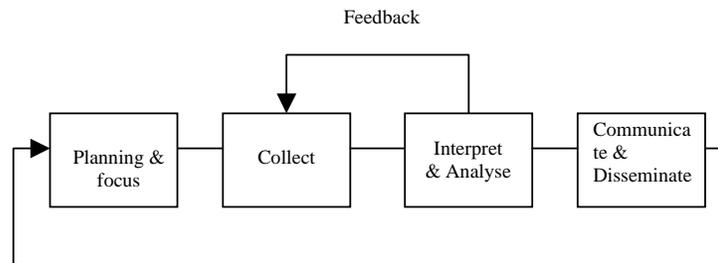
The tenth step develops the final scenarios by an iterative process. If the results are not satisfying, the process has to be repeated.

## Appendix B. Workshop Material

### Workshop 22/4 concerning input to the process "review and update EMP roadmap"

**Background:** We are currently working with our master thesis at the section TBS. The task consists of structuring and formalizing the working process of the section by developing a method that could be used by the collaborators of the section.

So far we have constructed a method that consist of the four steps: planning & focus, collect, interpret & analyse and communicate & disseminate, that has been combined with the process "Review and update EMP roadmap". And now we need your help to make the method concrete and useful.



**Purpose:** The first purpose of this workshop is to specify the content of the input in the process, by listing a few important parameters/aspects of each input, which is represented by a blue box on the process chart that is attached to this document.

The second purpose is to define the format of the information to be delivered. The format includes aspects such as: presentation form, degree of analysis (totally raw data or partly or completely analysed), frequency of delivery etc.

**Demarcations:** The inputs we intend to discuss are: *Project –and Product status, Customers, Operators, Partners, General market & Telecom society, and Competitors.*

The process considered on this workshop is the one for developing and updating the EMP roadmap, thereby we do not include the tasks of more ad-hoc character also performed by the section.

**Expected outcome:** The expected outcome is a checklist for each of the inputs mentioned above as well as a specification of the format for each input in the process.

**Agenda/disposition:** We prefer if each participant prepare by reflecting over each input before attending the workshop, to make it more efficient and ensure a fruitful discussion. We will send templates to each participant a few days before the workshop.

## Appendix C. Decision support material

### Real Time Video Telephony- Decision support

#### Background

- Technical requirements
  - To handle real time video telephony with full duplex
  - 64 kbit/s CS in both UL and DL
  - The protocol for handling real time video telephony, H.324, is implemented in 3G1 platform.
  - Good quality performance - 15 frames per second both for encoding and decoding video.

#### Business Analysis

- Market Status
  - The feature, real time video telephony, is a buzzword for the launch of the 3<sup>rd</sup> generation. Though the operator wants the feature at launch date a significant market demand will not be until earliest 2004.
  - Real time video telephony represents the manifestation of an innovation that is truly leading edge technology
- Network Status
  - The network will support the H.324 protocol during H2 2001, i.e. the ERA R1 release
- Operator Requirement Status
  - Operator X 3G intends that the delivery of high quality real time and packet video will be the main service to differentiate 3<sup>rd</sup> generation networks from the 2.5 generation networks.
  - Operator X 3G is the only operator, yet to date, that has had a mandatory requirement on real time video telephony. Other operators have only asked if Ericsson will support real time video telephony or not.

#### Summary

- Wait until the 3G2 platform
  - 3G2 will have support for real time video telephony. TTM is expected to be 2005.
- Conclusions
  - To meet existing and future market requirements 3G1 platform needs to support high quality video telephony during the whole of its lifecycle.
  - To keep up the perception of Ericsson as a truly leading-edge technology company quality of real time video telephony cannot be compromised.
- Recommendation
  - To be able to meet the market requirements during the whole lifecycle of 3G1 platform shall have support for video telephony

### Appendix C. Decision support material, cont.

Operator requirements were also included in the decision material, but for confidentiality reasons, it cannot be presented in this thesis.

## Appendix D. Analysis Tool

### Porter's five forces<sup>110</sup>

The five forces model is a widely used framework for classifying and analysing four structural variables influencing competition and profitability. The five forces include three sources of horizontal competition: competition from substitutes, competition from entrants and competition from established rivals. It also includes two sources of vertical competition: the bargaining power of suppliers and buyers.

- ❑ **Competition from substitutes:** The absence of close substitutes for a product means that consumers are relatively insensitive to price, i.e. demand is inelastic. Another aspect is the complexity of the need being fulfilled by a particular product. The more complex need the lower the extent of substitution on the basis of price.
  
- ❑ **Threat of entry:** The threat of new entrants in an industry is dependent on the level of barriers to entry. These barriers determine the extent to which an industry can enjoy profit above the competitive level in the long run. Examples of barriers to entry include:
  - Economies of scale* – Industries that are capital, research or advertising intensive require large volumes to share cost in order to be profitable. It often takes some time to increase volumes and this is a problem for new entrants.
  - Product differentiation* – In industries where products are differentiated established firms possess the advantages of brand recognition and customer loyalty.
  - Governmental and legal barriers* – In knowledge intensive industries patents, copyrights and trade secrets are major barriers to entry. This is a disadvantage to new entrants.
  
- ❑ **Rivalry between established competitors:** A major determinant of the level of competition for most industries is competition among the already established firms. The following factors play an important role in determining this competition: concentration, the diversity of competitors, product differentiation, excess capacity, exit barriers and cost conditions.
  
- ❑ **Bargaining power of buyers and suppliers:** The firms in an industry operate in two types of markets, in the market for input and the market for output. The relative profitability of the two parties in a transaction depends on relative economic power. When dealing with sales to customers two sets of factors are important in determining the buying power: buyers' price sensitivity and relative bargaining power. Buyers' price sensitivity depends upon factors such as: differentiation, competition among buyers and the importance of an item as proportion of total cost. Relative bargaining power is influenced by factors such as: size and concentration of buyers relative to

---

<sup>110</sup> Grant (1997), p.54-65, Johnson & Scholes (1999), p.115-116

### The Multi-Perspective Intelligence framework

---

suppliers, buyers' information and ability to integrate vertically. When dealing with suppliers the analysis is analogous to the analysis of relationship between producers and their buyers.