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Markku Salo

Woven Strategies

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ABSTRACT

Due to rapid changes in the current business environment, there has been a lot of discussion about the role of and the need for strategies, strategic planning and strategy processes in companies. This thesis focuses on how information technology can support strategic planning in a more efficient way, whether strategic planning can be partly automated and whether questionnaires can be used in this process. Furthermore, we explore how strategic work in companies can be improved with the proposed bottom-middle-up methodology and a new supporting software tool enabling to avoid some fallacies of strategic planning

Several research strategies were reviewed, after which a solid research construct was created. With several case studies the construct was then verified and validated. This particular method was selected due to the nature of the managerial problems encountered. The main goals were to improve the case organizations' strategy process and to analyze the role of middle management in the successful implementation of the strategy. New technologies were also studied and applied. Furthermore, the relationship between intuition and analytical tools has also been investigated.

A computer application that comprises of several components made it possible to capture the intuition and experience of individuals in the case-study organizations. The results have shown to support the view that companies which follow strategic planning cycles obtain good financial results, due to the commitment of the organization to a particular vision or target, as well as due to the improved implementation of the strategy. It has also been shown that certain fallacies of strategic planning can be avoided with the developed approach and application. The results also support the fact that strategic planning should not only be a top-down process, but also a bottom-middle-up process in which the versatile expertise of the organization is captured. This work has created a methodology and computer application to bridge the existing gaps between organizational levels and systems. The time spent on strategic planning has been reduced, whilst the strategies have been made more up-to-date.

Keywords: Decision Support Systems (DSS), Executive Support Systems (ESS), Intuition, Knowledge, Strategic management, Strategic Planning, the Strategy Process, Woven Strategies

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Espoo, November 4, 2005

Markku Salo

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ABBREVIATIONS

AI	Artificial Intelligence
BA	Business Area
BL	Business Line
BSC	Balanced Score Card
CI	Computational Intelligence
DSS	Decision Support System
EDA	Exploratory Data Analysis
EIS	Executive Information System
ERP	Enterprise Resource Planning
ES	Expert System
ESS	Executive Support System
GDS	Group Decision System
GDSS	Group Decision Support System
HR	Human Resources
HRM	Human Resource Management
HQ	Headquarters
ICT	Information and Communication Technology
IS	Information Systems
IT	Information Technology
MIS	Management Information System
MLP	Multi-Layer Perceptron
NPV	Net Present Value
OLAP	Online Analytical Processing
PDA	Personal Digital Assistant
R&D	Research and Development
SBA	Strategic Business Area
SBO	Strategic Business Objectives
SBU	Strategic Business Unit
SOM	Self Organizing Map
STP	Short-Term Plan
SWOT	Strengths Weaknesses Opportunities Threats
URL	Uniform Resource Locator

DEFINITIONS

Comprehensiveness	In this context, comprehensiveness means the extent to which an organization attempts to be exhaustive or inclusive in making and integrating strategic decisions.
Corporate Strategy	Corporate strategy refers to the highest level of strategy making in which the portfolio of a company is defined.
Decision Support Systems (DSSs)	Decision Support Systems couple the intellectual resources of individuals with the capabilities of a computer to improve the quality of decisions. DSSs are computer-based support systems for management decision-makers who deal with semi structured problems Keen and Scott Morton (1978).
Deductive	Conclusions that are formulated about particulars from general or universal premises.
ERP	Any software system designed to support and automate the business processes of medium and large businesses. This may include manufacturing, distribution, personnel, project management, payroll, and finance. ERP systems are accounting-oriented information systems for identifying and planning the enterprise-wide resources needed to take, make, distribute, and account for customer orders.
Fuzzy Logic	Reasoning with abstract things.
Hermeneutic	The study of the methodological principles of interpretation (Webster, 2005).
Inductive	Proceeding from particular facts to a general conclusion.
Nomothetic	Relating to, involving, or dealing with abstract, general, or universal statements or laws (Webster, 2005).
Normative	Determining norms or standards (Webster, 2005).

Positivistic	The theory that theology and metaphysics are former, imperfect modes of knowledge and that positive knowledge is based on natural phenomena and their properties and relations as verified (Webster, 2005).
SAP	A very common ERP (enterprise resource planning system).
Self-Organizing Maps (SOM)	A data-mining method that visualizes the characteristics of a dataset.
Soft Computing	General terms for methods that are not crisp. The principal constituents of soft computing are fuzzy logic, neural network theory and probabilistic reasoning, with the latter subsuming belief networks, evolutionary computing including DNA computing, chaos theory and parts of learning theory (Zadeh, 2005).
Strategy Mode	Strategy mode refers to the ways in which strategy is or is not planned.
The Woven Strategy Process	This is the strategy process in which top management sets targets for a company. Data and knowledge for strategy making is collected from the whole organization with questionnaires. The questionnaires include pre-defined strategic questions. A management team then analyzes the answers and creates a strategic concept map. Finally, from the selected strategic topics a new strategy is merged – the Woven Strategy.
The Woven Strategy Tool	A software application that consists of a questionnaire tool, analysis tool, dialogue tool, and merging tool. This application makes the Woven Strategy process faster than without using an application.
Woven Strategies	A collection of strategies created with the Woven Strategy process.
Woven Strategy	The strategy created by the Woven Strategy process.

1. INTRODUCTION

1.1. Background

This research started from the idea of using questionnaires in strategic planning. During the research, the idea has grown to a large decision support system for strategy development. The initial ideas behind this work originated from Professor Hannu Vanharanta following the development of the Continuous Strategy framework (1995). After obtaining financial support for the "Brainpoweri" project, the idea started to grow with the help of research assistants as well as from people from various industrial corporations. The author has been involved from the first discussions to the completion of the "Brainpoweri" project. Co-workers from Tampere University of Technology, Pori, especially Janne Mörönen and Kimmo Liinamaa, and from the University of Joensuu, especially Jussi Nuutinen and Teemu Laine, made this research and the applications inside the strategy making process possible.

This research is presented in the following chapters as closely as it has been possible. The author was responsible for the architecture of the applications, as well as their testing in each of the corporations in the case studies. The specialists above did the software coding.

1.2 Context

The business world has become continuously more and more turbulent. The aim for short-term share price performance and the maximization of profits have driven (strategic) thinking.

The current strategy processes in use are mainly practiced by a small, top management group of a company or a corporation. The expertise, know-how and intuition that exist in all of a company's organizational levels and functions are not captured, and there often seems to be a risk that the strategy does not reflect the needs and demands of markets and customers. In other words, the strategy does not fit the current environment. Furthermore, organizations often lack commitment to their given strategy, because the people in these

organizations do not understand the meaning and context of the strategy and how they are supposed to act based upon it. Strategic statements are frequently too broad and generic, and their wording is either too ambiguous or vague. It is impossible for an organization to implement a strategy that is not understood. Strategy processes are often still time consuming and are tied to budget-based annual cycles instead of being continuous processes, though this may have been viable in the past when the business world was more stable than today. Twenty or thirty years ago, information technology did not offer any possibilities to support the strategy process. This was not even seen as necessary, because small management teams did not find utilizing tools in the strategy process useful. The only supporting tools available were office applications. Over time, technology has developed and provided new possibilities for developing the strategy process. When comparing today's business needs in strategic management and available methodologies and technologies, there is a big gap. This means that it is crucial for companies to apply these technologies. However, this old way of thinking has also been supported by Mintzberg (1994a), who published his fallacies in response to the use of computers in strategic planning. This kind of thinking has been valid in strategy making and thinking up until now, even though easy to use computer tools are becoming increasingly available.

This research focuses on creating a new strategic approach that will enable companies and corporations to respond faster to the changes in our turbulent business world, therefore making sure that all the relevant information is available to management when they create new strategies. The research further aims to show that Mintzberg's fallacies in strategic planning can be overcome by the intended approach. This new approach is called **Woven Strategies**. The idea for this name came from Professor Erkki Sutinen's development of his Woven Stories tool. After modification, this tool was also thought to be useful for strategic planning. Its basic philosophy is to utilize the potential, expertise and experience of the people within the organization to support strategic planning. One important aspect of this has also been to analyze the roles of analytical methods and intuition in the strategy process and strategic decision-making. Woven Strategies is implemented in an IT system by using strategic questionnaires, with which the knowledge of all organizational levels can be

gathered automatically through the Web for further analysis. Contrary to most of the present strategy concepts, the Woven Strategy Process is a bottom-middle-up approach. The Woven Strategy Process is also possible through the use of manually written questionnaires, and manually analyzed data. However, this is not practical and would make the strategy process more time consuming and complicated.

The Woven Strategy Process consists of two parts. Firstly, a questionnaire is created which asks the respondents on their views of the strategy process. Secondly, the answers are analyzed on-line using analysis tools. Using a planning tool a new strategy concept is created. Finally, the Woven Strategy is automatically merged from the selected strategic topics. The Woven Strategy uses the latest knowledge available from the organization globally and locally. This knowledge enhances the support material for the final strategy decision-makers. Although a lot of intuition might be used when creating a strategy, intuition is based on facts. Therefore, analytical thinking and intuition are combined, and hence Mintzberg's fallacies in strategic planning can also be overcome.

The Woven Strategy methodology and software tool have been tested with eight case studies in three different multinational companies. There have been several hundred participants in these case studies. They have represented people from all organizational levels, i.e. workers, middle management and top management. The method has been the same in all the cases. Due to the development of the tools, in the first case study only paper format questionnaires were used, but by the last case study all the developed tools were utilized. However, regardless of technology, in order to create a successful woven strategy support from the top management is required. This can be seen in all the case studies.

Although the development of information technology is ongoing, and new technologies emerge all the time bringing us ever closer to the vision of automated decision-making processes, ultimately it is always the case where a human decision-maker makes the final decision and bears the responsibility for doing so.

1.3 Research Objectives

In order to improve the competitiveness of companies by means of strategic planning, there has been a need to study the problem areas of strategic management that are presented in the previous section. This research project aims at addressing the following questions:

- How can strategy processes be improved to address new challenges such as the human, strategic and technological, in order to create better strategies and enable their accurate implementation?
- What is the role of the organization, and especially that of middle management, in the strategy process and in strategy implementation, and how can intuition be captured to create new knowledge for the new strategy? Is it possible to facilitate this process using questionnaires?
- How can new technologies be utilized in the strategy process and decision-making?
- Is it possible to create a new strategy development model and enable its use with a new type of computer application?

When we compare the rate of development of strategy theories and information technology, it is quite clear that the pace of development has been much more rapid in the latter case. Many top executives responsible for strategy development still rely on Mintzberg's (1994a) fallacies of strategic planning. Mintzberg argued that analytical tools are not beneficial in the strategy process, and that strategic planning has become too formal and too far removed from the real business context. Thus the main theses in this work are:

- questionnaires can be utilized in strategy processes and they give valuable input to business strategy and the strategy process
- information technology makes strategic planning in organizations more efficient and effective than strategies developed without information technology
- Mintzberg's fallacies of strategic planning can be avoided

- capturing and leveraging human intuition, especially that of middle management, makes the strategy process and its implementation more efficient

These theses were developed during the initial stages of the research. The goal was to test and analyze them in the case studies. The case studies started with strategic questions and continued with the analysis of strategies and the current positions of the organizations. The organizations' understanding of and commitment to strategy was also analyzed. The development of the case organizations has been followed up by more questionnaires and by using both public and internal data of the organizations.

The objectives of the study are: a) to develop a new approach for strategy making, b) to develop new tools for strategic planning, c) to improve the strategy processes and especially the implementation of the strategy of the participating companies, d) to examine the relevance of Mintzberg's fallacies in strategic planning in the current business environment, and e) to test the objectivity of the Woven Strategies Process.

1.4. Research Approach and Strategy

1.4.1 Research Philosophy

This research belongs to the field of industrial economics and engineering. The previous section presented the research problems and objectives which require quite a versatile research approach. A starting point in selecting a research strategy is to look at the Research Process Onion as presented in Figure 1. This diagram covers all the possible philosophies, strategies, approaches and methods needed in this research.

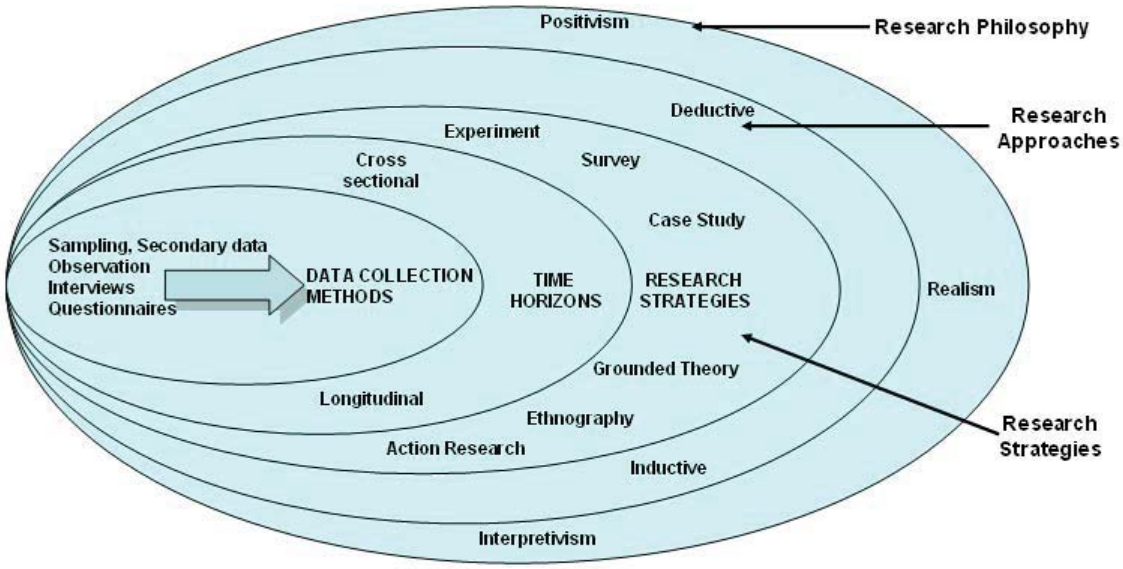

Figure 1 The Research Process Onion (Saunders et al. 2003)

In opposition, for example, to mathematics, strategic management or decision support systems do not have any explicit theories prevailing as such, but they draw their bases from books, articles and systems developed by researchers and experts as well as practitioners. According to Knox (2004), researchers are often confused by methodological and philosophical pluralism and the above onion structure is not that well understood or applied. The researcher has come to the same conclusion when trying to find out the research strategies and approaches applicable for this specific research.

When first selecting the research philosophy, positivism is linked closely with quantitative research (Olkkonen, 1994; Knox, 2004; Ticehurst and Veal, 2000) and qualitative research is closely linked with critical-interpretative research philosophy, as shown in Figure 2.

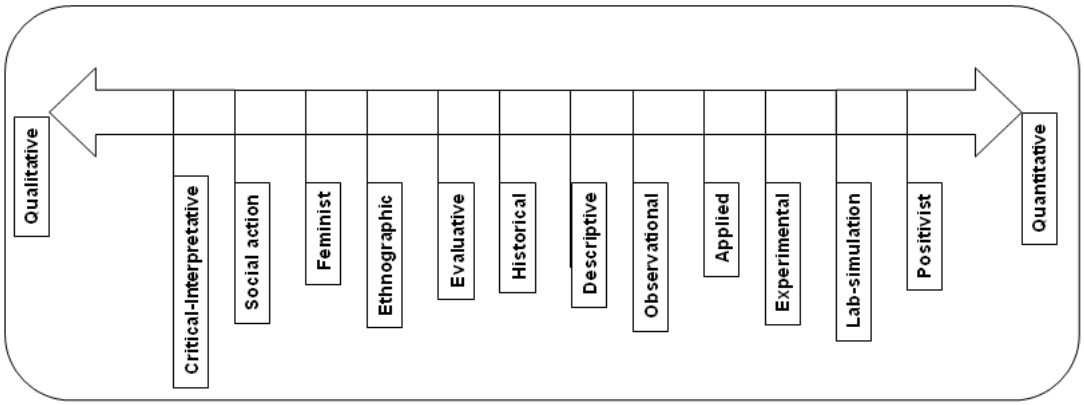

Figure 2 Approaches and methodologies (Ticehurst and Veal, 2000)

In this research, quantitative methodologies and positivism have been used in mapping the present status of the case organizations. The main study is analyzed with qualitative methodologies. This has taken place by testing the validity of the presented theses in the case study organizations. However, positivism and interpretivism overlap in this research, as shown in Figure 2. Table 1, in turn, presents the differences between positivism and interpretivism.

Table 1 Metatheoretical Assumptions about Positivism and Interpretivism (Weber, 2004)

Metatheoretical Assumptions about:	**Positivism**	**Interpretivism**
Ontology	Person (researcher) and reality are separate.	Person (researcher) and reality are inseparable (life-world).
Epistemology	Objective reality exists beyond the human mind.	Knowledge of the world is intentionally constituted through a person's lived experience.
Research Object	Research object has inherent qualities that exist independently of the researcher.	Research object is interpreted in light of meaning structure of person's (researcher's) lived experience.
Method	Statistics, content analysis.	Hermeneutics, phenomenology, etc.
Theory of Truth	Correspondence theory of truth: one-to-one mapping between research statements and reality.	Truth as intentional fulfillment: interpretations of research object match lived experience of object.
Validity	Certainty: data truly measures reality.	Defensible knowledge claims.
Reliability	Replicability: research results can be reproduced.	Interpretive awareness: researchers recognize and address implications of their subjectivity.

This research mainly uses an interpretive approach in its research philosophy, but it also uses a positivist approach to position the current state of a company. In this analysis no interpretation is made, whilst in creating a new strategy the analyzed facts are interpreted, see Table 1. The researcher and reality are inseparable. The research would not have been possible if the researcher had been a complete outsider, as he would not have had any understanding of the organizations' problems and their interpretations. This field of research is not specific in statistical terms either, and it is easy to express opinions about the research results. Only by knowing the reality is it possible to be objective enough when analyzing the research results. Olkkonen (1994) regards hermeneutics as part of idealism, opposite to realism, which is part of positivism. As we can see from this, the terminology is not very clear or easy to understand. However, Olkkonen (1994) regards hermeneutics as including interpretation, understanding and meaning. In this research, these terms are very important. We discuss meanings and interpretations that are opposite to statistical facts.

Research approaches can be divided into the inductive and deductive. Table 2 explains the differences between these two approaches.

Table 2 Kolb's (1984) Experiential Learning Cycle Stages

Kolb's Experiential Learning Cycle Stages	Induction or Deduction
Concrete experience Feeling – learning takes place by being immersed in the problem, and relies more on intuition than logic	Induction
Reflective observation Watching – consideration of previous experience, reflect so as to formulate expectations	Induction/deduction
Abstract conceptualization Thinking - analysis of the problem, reflection so as to develop theories for the future	Induction/deduction
Active experimentation Doing – the application of thoughts and ideas, learning through trial and error	Deduction

The overall research strategy contains both induction and deduction. The use of the application is inductive and the creation of a new strategy is both inductive and deductive, as is the development of the strategy process. Deduction has been used when the new application was developed.

The following section more closely studies the approaches inside the research strategy used in this thesis.

1.4.2 Generic Research Approaches

This section presents the typical research approaches used in economic studies. For instance, the research onion presented in Figure 1 outlines following the research strategies:

- experimentation
- surveying
- case studies
- grounded theory
- action research
- ethnography

However, in Scandinavia, and especially in Finland, economic research approaches have been categorized in four sections, as presented in Figure 3. Yet here there is a difference in terminology: instead of 'strategy' a word approach has been used to describe the content of the strategies.

In the conceptual analytical research approach (see Figure 3), the goal is to develop conceptual systems that can be used to describe and identify a specified phenomenon. A research material is used in addition to other conceptual solutions and theories related to the phenomenon. This approach mainly consists of analysis, comparison and synthesis.

	Theoretical	Empirical
Descriptive	Conceptual analytical approach	Nomothetic approach Action-analytical approach
Normative	Decision-making methodological approach	Constructive approach

Figure 3 Research strategies in economics (Kasanen et al., 1991)

The nomothetic approach (see Figure 3) aims at explaining causal relationships on the basis of empirical findings. Results from this approach are often presented in graphics, mathematical formulas, tables, etc. The data is gathered from large samples and is analyzed by statistical methods. When this approach is used in industrial economics (Olkkonen, 1994), the statistical result presents the features and correlations of a basic population. In this research context, these features and correlations refer to many companies whose competitive positions are analyzed by using several variables.

The action analytical approach is used with the qualitative approach to understand and diagnose phenomena in their specific real-life context (Neilimo and Näsi, 1980). In industrial economics (Olkkonen, 1994) this approach tries to understand the internal problems of a company. Therefore, in addition to hard facts like numbers, people and their goals have to be taken into account. This approach is used in studies of management, decision-making processes, development processes and change processes. As a result, various hypotheses, theories, concepts, explanations for change and meaningful development processes can be formulated. This is then very close to *normative research* where the target is not only to gather facts, but also to point out in which respect the object of study can be improved or where new objects of study can be created.

From the decision-making methodological approach, first models for decision-making are constructed, after which principles of mathematics and logic follow. The results are often mathematical or provide system models with which it is possible to give recommendations. The scientific contribution is estimated with the usefulness of the problem's solution (Olkkonen, 1994).

Kasanen et al. (1991) and Lukka and Tuomela (1998) think that the constructive approach has features of the decision-making methodological approach and also of the action analytical approach. Neilimo and Näsi (1980), on the other hand, think that the constructive approach is quite close to the decision-making methodological approach. Both of these approaches include theoretical analysis and thinking. As a result of their use of the approaches a new object is created. However, according to Neilimo and Näsi (1980), there is one considerable difference between these methods: the decision-making methodology is analytical deductive and the constructive approach is creative, innovative and heuristic. Lukka and Tuomela (1998) have stated that constructive research is as follows:

> *"Constructive research can be viewed as one form of conducting field research parallel to ethnographic, grounded theory, theory illustration, theory testing and action research; to these five options constructive research adds an alternative which applies a strong problem-solving type of intervention and an intensive attempt to draw theoretical conclusions based on the empirical work."*

The main features of the constructive approach, according to Lukka and Tuomela (1998), are that it:

- focuses on real world problems that need to be solved in practice
- produces an innovative construction meant to solve the initial managerial problem
- includes an attempt to implement the developed construction and is thereby a test of its practical applicability
- implies a very close involvement and co-operation between the researcher and practitioners in a team-like manner
- is explicitly linked to prior theoretical knowledge
- pays particular attention to reflecting the empirical findings back to theory

This current research focuses on real world problems and brings an innovative woven strategy approach to a managerial problem. New applications have been constructed and the results of case studies have been produced and analyzed with it. Throughout the research there has been very close co-operation

between the researcher and the practitioners. However, this research is also linked to prior theoretical knowledge of strategic management, and it tries to create new theories that are based on existing ones. The validity of the construction is then tested with a market test (Kasanen et al., 1991):

- **The weak market test:** Has any manager responsible for the financial results of his or her business unit been willing to apply the construction in question in actual decision-making?
- **The semi-strong market test:** Has the construction become widely adopted by companies?
- **The strong market test:** Have the business units applying the construction systematically produced better financial results than those that are not using it?

1.4.3 Specific Research Approaches

In addition to research approaches presented in the previous section, more specific approaches can be used as well (cf. Checkland, 1981; Carlsson, 1991; Vanharanta, 1995; Brännback, 1996). In management science, the descriptive approach can be defined as a case-oriented approach in which, through the study of different cases of a similar type, a general theory is constructed around a specific item of focus. According to Carlsson and Walden (1990), there exists the possibility to use these cases to describe a context or to build up a framework for deciding on effective actions, but these cases are not useful for describing strategic management on a practical level. With the descriptive approach it is possible, for instance, to assess the need for information, its use and the satisfaction level with current products and desired improvements.

With the prescriptive approach (Carlsson, 1991), the target is to find optimal solutions to management problems. The problems are solved using hard data and mathematical methods. It is possible to use this approach for structured problems, but it is not well suited for unstructured ones.

The basic idea of the prescriptive approach is to support strategy development and formation processes and for this reason, it should fall at least partly within the scope of prescriptive hard data, optimization, as well as simulation possibilities to answer what/if questions. The prescriptive approach is effective in these cases and should be available as an option in active decision support applications. The overall problem area targeted in strategic planning is, however, to also assist in solving unstructured problems, and hence an approach broader than the prescriptive approach is required. The prescriptive approach is used here to find out the current position of a company with numerical hard data. The prescriptive approach is quite close to the normative approach, because both normative and prescriptive research efforts serve action. They help individuals and organizations to better detect and correct errors, create lasting solutions, and develop valid information. They become critical as participants go from describing their insights to formulating and carrying out an innovation - and evaluating their work together (Action Science, 2005). However, prescriptive methodology can be seen as close to the nomothetic approach, too.

The rescriptive approach has been developed by Carrier and Wallace (1987). It transforms the knowledge of experts into a form that can be used in decision support systems for dealing with management problems. This is an appreciation-oriented method, better suited for handling unstructured problems. The rescriptive approach needs tools for acquiring the knowledge possessed by experts. Carlsson (1991) suggests that this knowledge should be acquired using the tools of expert systems to arrive at appreciation-oriented theories for management and scientific purposes. In our case, we are building a co-evolutionary system to deal with strategy development and the formulation process, therefore the rescriptive methodology is suitable for our purposes. One weakness of the rescriptive approach is that it is not widely known or used in scientific literature.

Kloptchenko (2003) has analyzed data mining and text mining methods mainly on a theoretical basis. She has predominantly used the exploratory and constructive research methods in analyzing the applicability of prototype matching in financial and scientific text collection. In exploratory research, the

emphasis is on discovering and classifying the general nature of the problem and the variables or hypotheses related to it (Tull and Hawkins, 1987). Although some of the applications and methods used in her thesis have been very similar to, if not the same as, those used in this thesis, the goal and context of her research is completely different.

In using the methodological framework described here (i.e. descriptive, prescriptive and rescriptive), the author's overall objective is to close the gap between management theory and management practice. These previous research questions can now be condensed as follows:

Is it possible, with the aid of executive support systems technology, to help executives in their strategy development and formulation processes?

This question can be answered only through empirical tests in which real users develop and formulate strategy by using test applications.

1.4.4 The Overall Research Context

As we can see from Sections 1.4.1, 1.4.2 and 1.4.3, the theoretical research approach used here does not consist of only one approach, but is a combination of several approaches. This is typical of research in industrial economics, and especially in the field of strategic management, which takes into consideration all the functions of a company and looks both backwards and forwards in a company's history and future.

The basic philosophical approach is also used here, i.e. the questioning technique and fundamental thinking developed by Socrates and Plato, and from which all other Western philosophies and research strategies and methods have been developed. This method is especially used in empirical case studies.

This research focuses on a construct called Woven Strategies, which we have built for strategic management purposes. The research context can be seen in Figure 5, which presents an overall picture of the research described earlier. The main theoretical studies have been done in the area of strategy concepts

and strategic decision-making. In this specific strategic management area there have been a few researchers like Mintzberg, Porter, Day and Vanharanta who have tried to create new theoretical approaches. Our goal has been to start creating a new construct by applying theories from the strategic management process. Furthermore, this research tries to show through case studies that some of the old statements of these 'old gurus' are not valid anymore, especially when the latest information technology is being used. The application we have created is completely new and is one of a kind. In this respect the researcher has utilized the constructive research approach. However, this work also contains features of the conceptual approach where the goal is to create a concept system that helps in describing various phenomena and creates instructions for present and future actions. The nomothetic approach has been used in analyzing the position of a company with the positioning tool. In the case studies, the current performance position of the company is gained through various company data and with this data the future position of the company has also been forecasted.

Descriptive methodology is used in several ways in the present work. It is used to interpret management theories (old and new) and management practices. Furthermore, the management issues addressed by the computer applications require strong qualitative support in terms of definitions, rules, learning, etc. all of which are descriptive. In the case studies, what is looked for is the need for different types of information, and an analysis of present systems, their use and the level of executives' satisfaction with them, as well as their desired improvements.

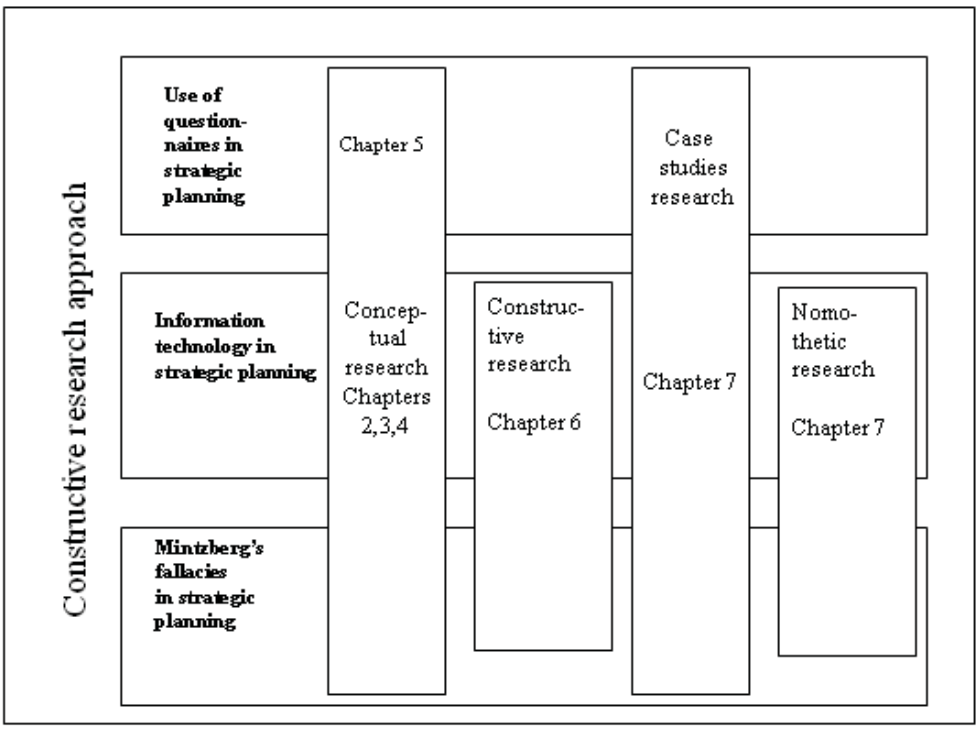

Figure 4 The interrelationship between chapters and research methods

Figure 4 presents a summary of the interrelationship between the chapters of this thesis and the used methods: This thesis is a case study made by using the constructive research approach. The conceptual approach has been used in Chapters 2, 3 and 4. The constructive research approach has also been applied in creating a new application in Chapter 6 and in defining the requirements for it. In Chapter 7 the nomothetic approach has been used in connection with the positioning tool.

Figure 5 presents the overall scope of the thesis. It is possible to see the relationships between the main theories and the supporting theories, as well as the construct.

The main methods in the research process have been:

- collecting strategic questions for the database
- collecting concept maps for the database
- creating a questionnaire for the research of each case study
- collecting the answers either manually or through the Internet for the strategic question database
- analyzing the results
- creating the Woven Strategies

Case studies have been used in collecting data for the construct. In analyzing the data in the case studies, both quantitative and qualitative methods have been used. With the woven strategy tool both methods could be used, although when using qualitative methods the linguistic meaning of the answers had to be relied upon more.

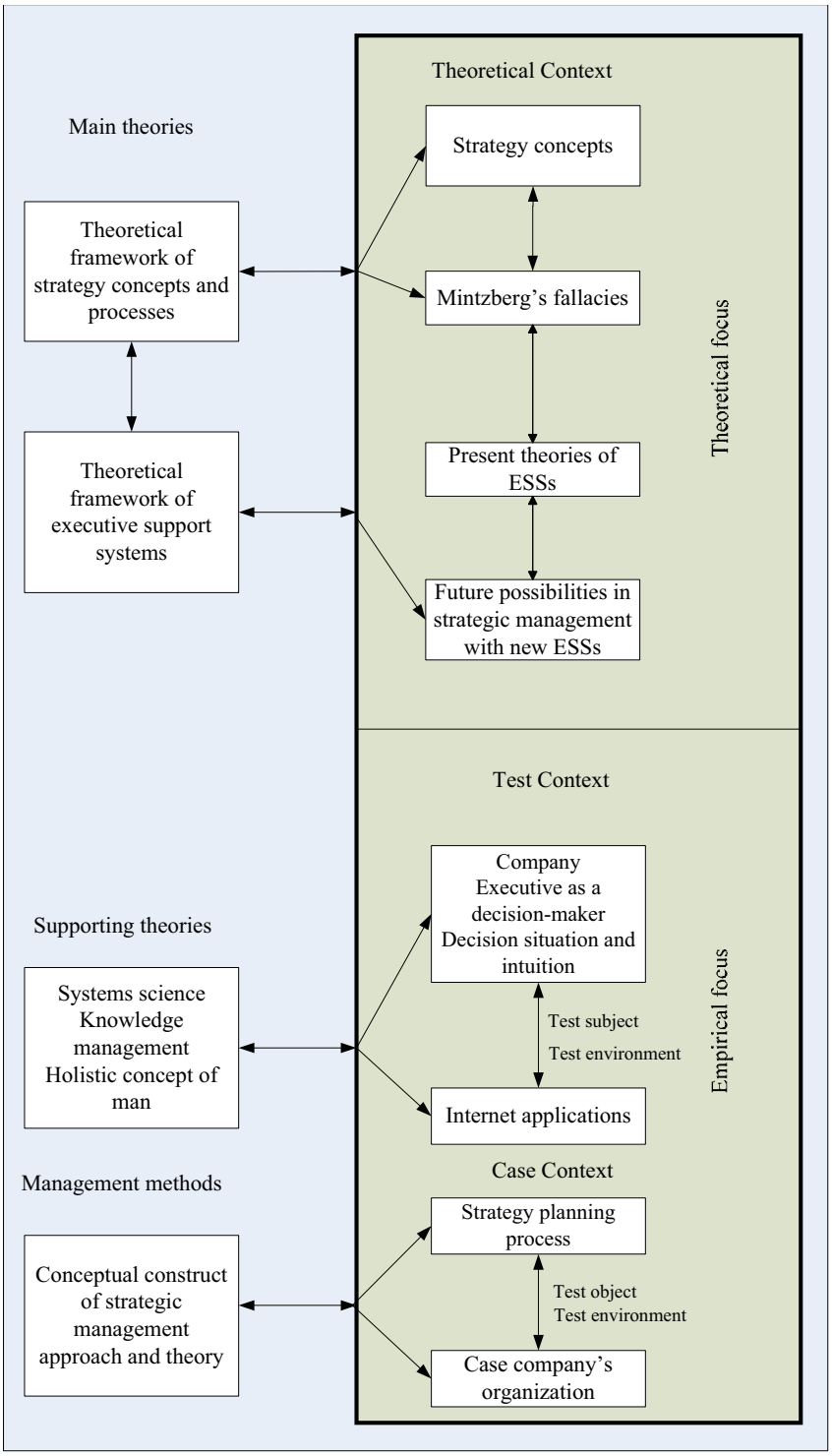

Figure 5 The overall research context

1.5. Contributions of the Thesis

This thesis makes two main contributions to the field of strategic management.

The first contribution is the development of a new Woven Strategies method and Woven Strategies software application for strategic planning. The method is based on a bottom-middle-up approach in strategic planning. The whole organization is captured in the strategy development process by using questionnaires. Hence, a number of often critical and valuable information is obtained for strategy development, whereas in traditional methods only a small number of people participate in strategic planning. This means that rapid changes in the business world often passed unnoticed. The intuition of decision-makers is supported by giving them more relevant strategic information. The Woven Strategy method is further supported by the developed woven strategy IT tool. This application is web-based. Using this tool, a questionnaire can be published on the Internet or intranet. The questionnaire contains a number of questions related to strategy formulation that have been found in the literature for different functions in a company. With the help of the software, it is easy to continuously make new questionnaires by using the old questions in the database. The answers can easily be analyzed and finally a new, woven strategy can be drawn with the developed tool. It was shown in the case studies that the time and effort spent on strategic planning could be shortened when compared with current practices. The second contribution is therefore that we can support strategic planning both with capturing intuition and by the analytical tools created.

Many strategy experts and primarily Mintzberg have argued that it is not possible to use information systems in strategic planning. Through the use of extensive case studies, this thesis shows that all Mintzberg's (1994a) fallacies in strategic planning can be overcome. We will also show that both intuition and analytical tools support strategic planning. With Woven Strategies applications it is also possible to provide templates for strategic planning a priori.

The Woven Strategies tool that was developed during this thesis gives future direction for strategic planning and management, and it has a lot of potential for further development.

New tools and new ways of thinking should be welcomed and accepted in strategic management.

1.6. Literature Research

The theoretical research is based on the study of existing literature and articles on strategic management and executive information systems. The researcher has searched and analyzed many databases and thousands of articles from scientific databases to find the relevant information, yet still not much good quality information was available for these kinds of strategic management research purposes.

In strategic management, the prominent writers are Henry Mintzberg, Michael Porter, George Day, Gary Hamel, Peter Drucker, Robert Kaplan and David Norton, and Igor Ansoff. They have written numerous books and articles over the past decades. On the other hand, several other researchers have written articles about strategic management as well. These researchers' goals have often been to study the meaning of strategic planning in practice. The starting point of this thesis has been those well known names and a review of the latest available articles. One major contributor has been Grant (2005a, 2005b) who also published a book this year. One should also note Vanharanta (1995) who has developed the Continuous Strategy Concept.

In the area of executive support systems (ESSs), the main writers have been Turban and Aronson (1998) and Watson and Frolick (1993). Furthermore, there have been many others who have written a number of articles on the subject, and one should especially note Barbro Back (Eklund et al. 2003, Magnusson et al., 2005). Also in this area, the main research focused on finding the latest developments from written articles.

One interesting area of new technology that is developing is in neural networks and especially self organizing maps (SOM) that were developed by Kohonen (1997). Kolehmainen (2004) has written his doctoral thesis in this area, showing that SOM can be also applied in many areas of science.

The above writers are referred to more in the following chapters.

1.7. Structure of the Thesis

This thesis has been divided into nine chapters. The content of Chapters 2-9 are as follows:

Chapter 2 presents the general concepts of strategy, strategy processes and the latest development in strategy theories.

Chapter 3 explains the role of intuition in strategic decision-making. This is one of the key aspects of this research, i.e. how to define intuition and how to apply it in strategic decision-making processes.

Chapter 4 looks at the development of Executive Support Systems (ESS) and how they are used in practice today. This chapter also defines the requirements for ESSs. Also, the ways to analyze data with the help of ESSs is discussed. The latest trends in executive support systems are presented showing us the new possibilities to utilize and develop them.

Chapter 5 presents the idea of how to use questions in strategy making.

Chapter 6 presents the new Woven Strategy application and its components. The use of the application and how to construct the strategy process and new strategies with the help of it is also explained.

Chapter 7 shows the validation of the Woven Strategy Process with the case studies. Eight different case studies within three different companies are presented.

In **Chapter 8** the results of the studies are reviewed, as well as the scientific contribution of this study.

Chapter 9 concludes the thesis.

2. THE CONCEPTS OF STRATEGY

During the last few years there has been a lot of discussion about the role and need of strategies, strategic planning and strategy processes in companies and corporations. Many people think that the world is changing so rapidly that it is impossible to forecast anything and, therefore, no planning is needed. Others consider all kinds of planning as extra costs only which do not make any positive contributions and which can therefore be ignored. Yet some companies have put a lot of effort into the development of strategic planning. In this thesis, several organizations have been studied to see how strategic planning contributes to their success. However, their strategy process is not the only thing examined here. A much more in-depth perspective on strategy has been taken which analyzes and attempts to understand strategy, the strategy process, strategic planning and how an organization and its members should be involved with this, as well as what kind of support tools could be utilized.

First of all, what is strategy?

Mintzberg et al. (1988) define strategy as a pattern or plan that integrates an organization's major goals, policies, and action sequences into a cohesive whole. A well formulated strategy helps to marshal and allocate an organization's resources into a unique and viable posture based on its relative internal competences and shortcomings, anticipated changes in environment, and contingent moves by opponents.

Day (1999) sees strategy as a directional statement that describes the array of choices that a firm makes to deliver a particular value proposition to a target group of customers. In his approach, everyone in the company contributes to strategy.

Tregoe and Zimmerman (1980) define strategy as:

> *"a framework that guides those choices that determine the nature and direction of an organization."*

This definition conveys that strategy is a guiding framework in which choices are made.

Ansoff (1987), Drucker (1985), and Prahalad and Hamel (1994) each have their own definitions of strategy, but common to all of them is that strategy is some kind of broader concept or framework and not just a strict pattern or rule.

The following sections of this chapter present different forms and approaches of strategy, and present the most common strategy theories. In the sections thereafter, strategic planning, decision-making and the key success factors in today's turbulent business world are discussed. Understanding all of these is of the utmost importance when building our application construct. We must understand how strategy is planned and how it should be planned in order to get successful strategies, and most important of all, to implement them successfully.

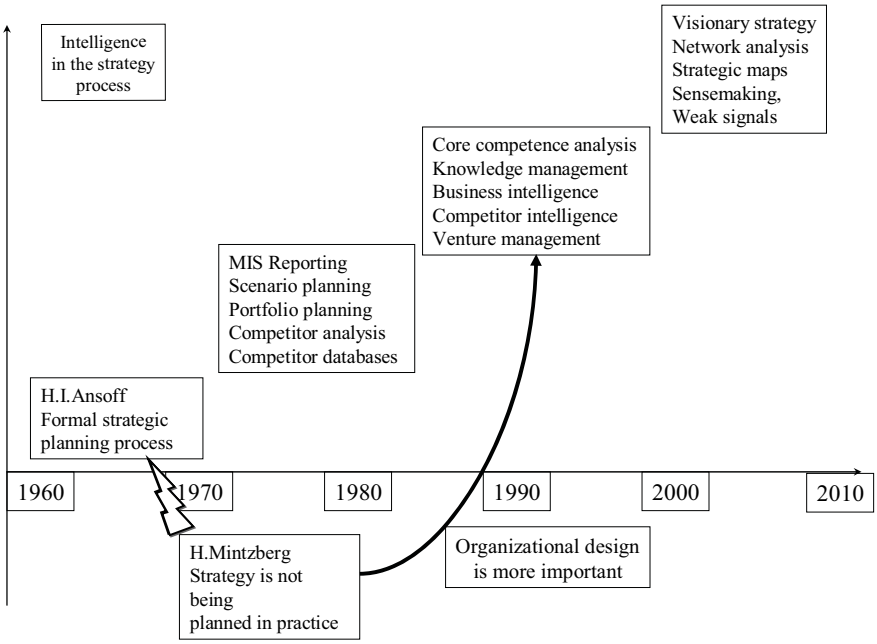

Figure 6 The development of strategy approaches

Figure 6 presents the development of strategy approaches during the last few decades. The main approaches have been those of Mintzberg and Ansoff. However, it is also possible to see that computer applications and technologies

are going to have a bigger role in strategic planning in the coming years. Those technologies will be discussed in Chapters 4 and 5.

2.1 Forms and Approaches of Strategy

As we have seen, there are different approaches to the strategy process and strategic planning. The way an organization formulates its strategy certainly affects its results and, as a consequence, the results of the company.

This section describes different strategy approaches and terminologies of the most prominent strategists. The terminologies were first defined by Ansoff and then modified by others. In this way, various design schools were established. During those times no sophisticated tools or technologies existed to support strategists in their work. However, today more advanced tools are available and so the thinking in strategy making must also change so that these modern technologies can be utilized, as happens in all other areas of business.

2.1.1 Day's Approach

Day (1999) sees strategy as a directional statement. In his view, the direction is set by four choices (Figure 7):

***Arena*:** the markets to serve and the customer segments to target.

***Advantage*:** the positioning theme that differentiates the business from its competition.

***Access*:** the communication and distribution channels used to reach the market.

***Activities*:** the appropriate scale and scope of activities to be performed.

The choices presented above are very interdependent; if we change one, all the others have to be changed as well. Hence we get a dynamic model in which all components have to be evaluated in every situation and each component affects all the others.

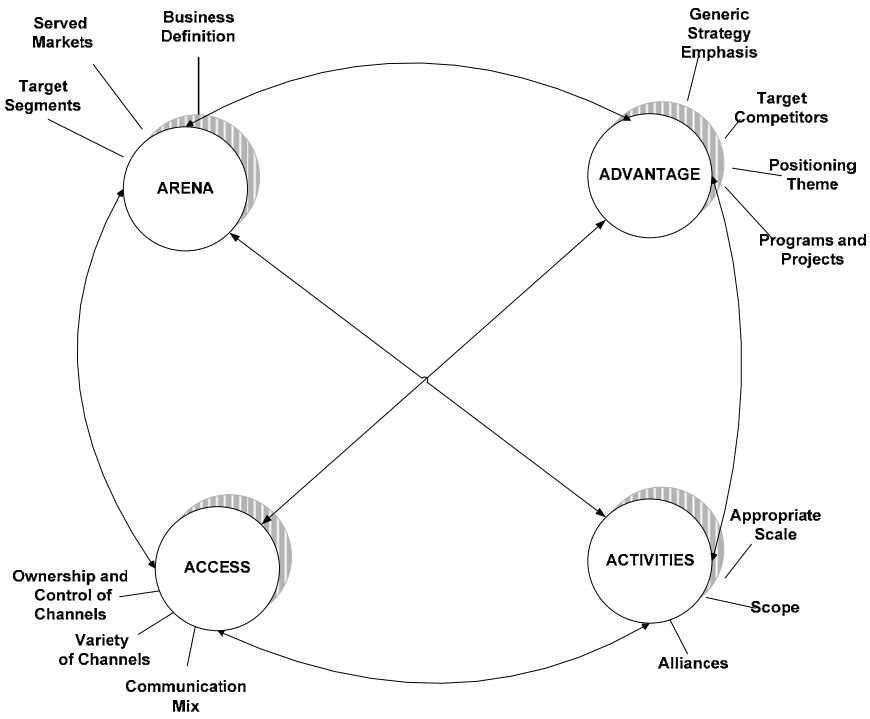

Figure 7 Strategy as an integrated pattern of choices (Day, 1999)

After selecting the arena, we have to define the access to the selected market. In today's world especially, there are several ways of distributing products. E-commerce has started to play a more and more important role in this respect. In his book, Siegel (1999) has also done much analysis on the customer-led model in defining different e-business models.

In the arena we have to determine the following issues:

- Business definition: in which business are we? Day (1999) sees business definition as the foundation of strategy, because it reveals the true function or purpose of the business. On the other hand, business definition also sets the boundaries of effort and the horizons for growth. Before creating any strategy, a company has to have a business definition as a starting point.
- Defining the market: Day's (1999, pp. 90-91) definition for 'market' is as follows:

  "A market is an arena where customers with similar needs or problems meet with sellers of reasonably substitutable products or services who are competing to satisfy these needs."

When thinking of markets in strategic terms, there must be a broader definition for them. Day (1999, p. 92) takes into account the following aspects: presently unserved market opportunities, changes in technology, price levels, and supply conditions and potential competitive entrants.

- Segments: When thinking of markets, as such, a company and its management has to consider whether they serve all possible customers or if they can select only some lucrative segments that are more profitable for the company. By segmenting the markets the company understands them better, but on the other hand, if the segments are not selected correctly, the consequences could be very harsh for the company.

After choosing the market and the key success factors for competing, there is much less choice for the management than before. According to Day (1999), each market has a distinctive profile of key success factors shaped by the market's attributes. In material industrial markets, for instance, the defining attributes are technology – whether it is a small or large batch process or continuous process – and transaction complexity, which reflects the frequency of purchase, risk of failure, and size of the decision-making unit.

In the advantages for the management, one of the key tasks is to look at the competitive position of the company. According to this way of thinking, the main theme is to analyze how a company performs compared to its rivals. According to Day (1999, p. 9), the most successful themes are built around various combinations of three thrusts: better (through superior quality or service), faster (by being able to sense and satisfy shifting customer requirements faster than competitors), and closer (with the creation of durable relationships). The task for management is to simultaneously find a compelling theme and ensure continuing superiority in the skills, resources and controls that will be the source of this advantage over target competitors. The following themes are essential when looking at a company's advantages:

- Generic strategy includes choosing the differentiation that offers superior customer value, cost leadership and playing the spread. The company's management has to find a balance between these themes, while the first two ones often contradict each other. In many cases it has been impossible for

the same organization to sell low-end and high-end products. By 'playing the spread' it is meant that a company can at the same time lower its costs and gain price premiums with superior customer value.

- The positioning theme means how the business favorably distinguishes itself from competitors. The purpose of the positioning theme is to translate the generalities presented in the generic strategy into meaningful distinctions for customers.
- Programs and projects are those strategic programs that assist in supporting a positioning theme. These programs require the full commitment of the organization. Therefore it is difficult for competitors to imitate these, but at the same time very challenging for a company to implement them as well.
- Target competitors are crucial to define in order to understand which other players are competing with the company and what their special features are. In a normal situation the competition is well known, but today's world situation can rapidly change and new substitutes may also arise.

By 'access' it is understood the selection of channels to reach the arena. According to Day (1999, p. 10):

> *"Until recently, channels were not seen as a matter of strategic choice – they were a fact of life that came with the market. A propensity for inertia was reinforced by a perceived absence of good alternatives, and the justified fear of the conflicts that would be unleashed by any changes*."

Access comprises of the following items:

- Ownership and control of channels. The utmost way to control the access to markets is to own the channels. This way a company has tight control of the channels, yet it also loses flexibility. Another way to control channels is to have different linkages, such as market linkage or leadership linkage. Even more control is gained through contractual linkages.
- Channel variety. Nowadays new channels are constantly becoming available and so most companies establish hybrid arrangements, for instance, they use a combination of direct sales, distributor programs and direct mail operations. The advantages of using hybrid channels, according to Day (1999, p. 223), are that each new channel adds incremental volume by reaching new customers and that reliance on only one channel increases

vulnerability to new competition from lower-cost routes. However, when the number of channels multiplies, so does the number of problems.

- 'Communication mix' refers to how the arena is informed about the goods. Today we have many new ways to communicate about a company and its products thanks to the development of information technology. However, in some businesses personal contacts can not be substituted with any other media.

The next step after finding out the right access is to define the strategically central and distinct activities to be performed to convert inputs and outputs that customers will value. These activities consist of purchasing, manufacturing, design, sales, etc. The enterprises have, in practice, many different strategies to get competitive advantages. The development of information technology has helped a lot in developing control functions. On the other hand, by utilizing alliances the companies can have several strategies at the same time. Globalization has brought along many new perspectives on manufacturing costs, like many companies who have started to manufacture their products in China and other low cost countries.

Activities consist of the following topics:

- Appropriate scale, Day (1999):

  "Until recently the choice of appropriate scale was guided by two rules of thumb: bigger is better, and keep as many activities as possible under one roof to maintain control. Adherence to these beliefs led to big companies characterized by sprawling plants, extensive vertical integration, a continuous striving for economies of scale, hierarchical and functional organizations, and mass marketing with a strong volume orientation."

Today, however, the big organizations have proved to be inflexible and old organizational structures have become obsolete. Instead, large corporations have in many cases adopted forms of entrepreneurial organizations.

- Scope is also changing: the supply chain is being modified and many companies outsource non-core activities like managing computer systems. In these cases, all companies have to be careful in analyzing the real cost and efficiency benefits, because it seems that nowadays not all actions have been fully analyzed.

- Alliances have been established, for instance, to support the co-development of technology or entering new markets. In many cases this is much more cost-efficient than trying to do everything independently. Of course, there might also be a risk that technology is spreading to competitors faster than wished.

Finally, there is the need for adaptation and renewal: markets are changing, customers and consumers change their habits and there will be new substitute products for the existing ones. As a good example we can look at cameras where traditional film has been substituted by digital cameras. New products and markets should always be under development, as should observations about the changes in the markets. When looking at Day's strategy framework, it gives a good theoretical framework for developing the construct in this thesis. We can set questions around Day's choices of arena, advantage, access and activities. Also, when further developing a strategy concept, Day's approach of strategy as a directional statement serves our purposes. With this approach it is possible to collect intuition from the organizations. One dilemma is that this model is dynamic and each area depends on each others, making strategy planning more difficult than if there was no dependency between areas.

Abell (1993) is in his approach very much alike to Day, but he defines his dual strategy by simultaneously looking at the time perspectives of today and of the long-term.

2.1.2 Mintzberg's Approach

Mintzberg is probably the most famous strategist analyzing different forms and concepts of strategies. Mintzberg (1994a, pp. 23-24) has presented the following forms of strategy (Figure 8): intended strategy, deliberate strategy, realized strategy, unrealized strategy and emergent strategy. *Intended strategy* means how the company's strategy was intended to be when it was created. Strategic intentions that get fully realized are *deliberate strategies*. Strategic intentions that are not realized at all are called *unrealized strategies*. Some planned strategies are never implemented and become unrealized due to a

mismatch of resources available or a changed competitive environment (Seidel, 2000). *Emergent strategy* means a realized pattern that was not intended in the first place but was realized anyway. Emergent strategies emerge through the work process—through a new technical discovery, for instance, or from surprising market results—and they then become integrated into a final, realized strategy (Seidel, 2000). Realized strategy is the strategy that has actually come true. Usually, it is a combination of deliberate and emergent strategies.

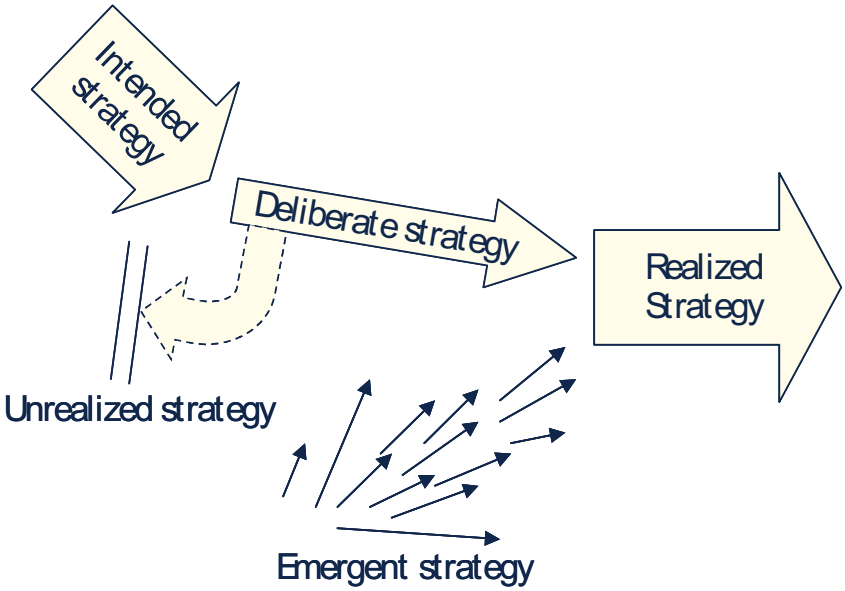

Figure 8 Forms of strategy (Mintzberg, 1994a)

When looking at different strategy forms, there is a lack of intuition in all of them. Through intended strategy intuition may be behind the strategy formation, Mintzberg does not emphasize this in any way. If we look at intended strategy, intuition may be part of it, but there is no model or template on how to progress with the implementation of the strategy or how to learn from the realized strategy, or if the intended strategy has ever been successful. Also, in all these forms the participation of the whole organization is missing. In today's organizations the most challenging part of the strategy process is in communicating it to the whole organization and getting people to commit to it. Another important aspect is also the learning function that plays a key role in knowledge management.

Furthermore, Mintzberg (1994a, pp. 23-39) divides strategies from rather deliberate to mostly emergent, as follows:

- Planned strategy
- Entrepreneurial strategy
- Ideological strategy
- Umbrella strategy
- Process strategy
- Disconnected strategy
- Consensus strategy
- Imposed strategy

When analyzing the articles and studies made on strategy processes in practice, one of the main questions has been: Is there any benefit from strategic planning, what kind of planning process should there be and who should be involved? One main issue has also been the evaluation of the success of forecasting future business scenarios. This can also be analyzed in many respects. In the pulp and paper industry, the Jaakko Pöyry Company has for decades published several analyses in their reports and publications of the development of pulp and paper consumption in the world. However, in the review of Jaakko Pöyry's analyses (Rennel, 1984, p. 11) it has already been stated that many forecasts were wrong, and when the forecast for the future development in technology was made, the Internet, for instance, was not mentioned. Today, the Internet is a very important piece of technology that affects the life of practically everyone who has a computer.

Mintzberg (1994a, p. 23-35) has created a 5P concept for the strategy concept. These P's are Plan, Pattern, Position, Perspective and Ploy. Mintzberg thinks that while there are various relationships among these definitions, still no one relationship or any single definition takes priority over the others. In fact, in his opinion, these definitions compete with another.

2.1.3 Porter's Approach

Porter's strategy model is probably one of the best known and widely used in companies. Porter (1980, pp. xvi-xvii) has examined competitive strategy.

Figure 9 The wheel of competitive strategy (Porter, 1980)

Figure 9 shows that competitive strategy is a combination of ends (goals) and means (policies) by which the company is aiming to get to its goals. The hub of the wheel shows the broad objectives, the spokes are the key operating policies.

Figure 10 illustrates the competitive strategy on a broader level.

One of the starting points of this approach is the SWOT analysis (strengths, weaknesses, opportunities and threats), where both the internal and external factors of the company are analyzed.

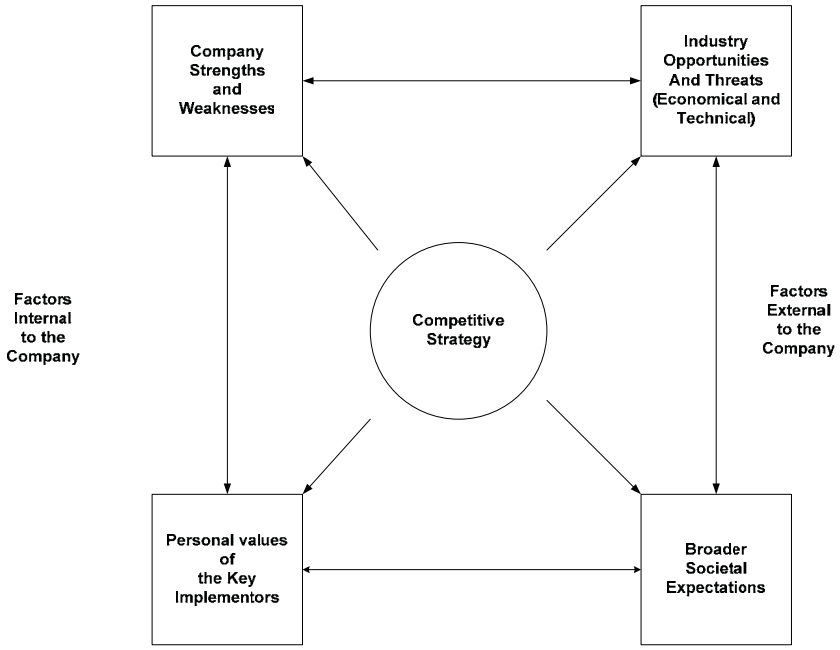

Figure 10 The context in which competitive strategy is formulated (Porter, 1980)

Porter (1980, p. 6), in his competitive strategy, says that there are five forces (bargaining power of suppliers, bargaining power of buyers, threat of new entrants, threat of substituting products and competitive rivalry) that drive industrial competition. These five competitive forces are used to describe a company's position within its field of industry, as well as its ability to practice three generic strategies: overall cost leadership, differentiation and focus. According to Porter (1980), understanding the drivers behind the five competitive forces will help company management to develop a proper generic strategy and to create and sustain a superior performance. Porter (1996a, 1996b) has developed his strategy concept further, but his basic idea has always remained the same.

When looking at these and other concepts, Day, Mintzberg and Porter more or less share the same ideas; like the company's internal and external position and critical success factors. What is missing in all these theories is how this data is evaluated and, after all, how it is captured from an organization in practical terms? Day's and Porter's concepts look for competitive advantages for the firms, whilst Mintzberg focuses on how many different strategies are really needed before the whole picture emerges.

2.1.4 Vanharanta's Approach

Vanharanta (1995, pp. 27-30) has defined the Continuous Strategy framework that is based on the concept of gradually improving the critical success factors of a company, so that it continuously grows stronger and more profitable. He defines the Continuous Strategy Concept as a conceptual framework for strategic planning processes. His framework is derived from metaphorical insights into a "Company", an organism seen as part of a living system, see Figure 11. Furthermore, Continuous Strategy is supported by a chain of construction metaphors: the Company World, the Product World, the Buyer World, the Business World and the External World. Vanharanta (1995, pp. 29-30) states that the continuous development of living companies requires company assets (capital), company structure (work) and company knowledge (people). He continues that a comprehensive understanding of business dynamics requires an understanding of the product world and the buyer world, i.e. of supply and demand. Vanharanta (1995, p. 30) furthermore states that when a company has taken the Continuous Strategy conceptual framework into use, it is anticipated that company personnel would ideally find themselves encouraged, aided and in a better position to acquire a comprehensive understanding of issues, concepts and characteristics that exist both inside and outside the company. They would thus become better motivated to continuously develop, strengthen and improve company characteristics (commitment and responsibility). The statements made by Vanharanta (1995) are also supported lately by Kaplan and Norton (2004) and can be seen in practical business life as well.

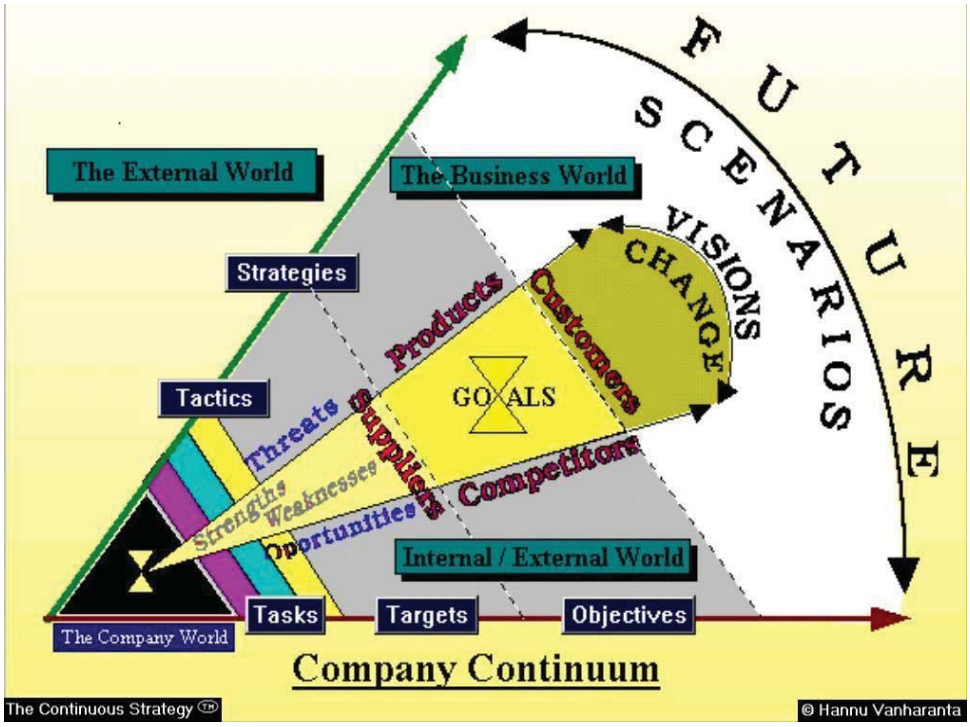

Figure 11 The Continuous Strategy Concept (Vanharanta, 1995)

2.1.5 Other Strategy Approaches

Ansoff (1987) sees strategy as a set, or several sets, of decision-making rules for the guidance of organizational behaviour. He gives the following examples as decision-making rules:

1) yardsticks by which the present and future performance of the firm is measured
2) rules for developing the firm's relationship with the outside world
3) rules for establishing the internal relations and processes within the organization
4) rules by which the firm conducts its day-to-day business

Tregoe and Zimmerman (1980) define strategy as "a framework that guides those choices that determine the nature and direction of an organization". This definition conveys that strategy is a guiding framework in which choices are made.

It is essential for all these definitions and descriptions presented above that strategy is a descriptive and prescriptive process that deals with decision-making, and that it can be developed and formed through different frameworks. In nature, the strategy process is continuous and deals with future and change. Decision-making, in turn, results in activity and change.

We can clearly see from the text above that strategic support systems should support this kind of overall framework and they should also support important activities inside the framework, such as enthusiasm, motivation, focus, thinking, learning and understanding.

2.2 Strategic Planning in a Corporation

The size and the industrial environment, at least to some extent, affect the strategy process of a corporation. Some companies only operate in domestic markets, while some export goods to other countries and some are fully international or global enterprises. If the size of a company is one variable, then the organization's structure is most probably another variable. We have conducted several case studies in different types of industries, and it is helps to understand the role of strategic planning in different parts of an organization. When looking at research in the area of corporation-wide strategic planning, not much new data has been found during the last few years; the main interest being the need for strategic planning and how strategy should be implemented.

Table 3 presents research carried out by Andersen (2000). It shows the various studies carried out during the last decades which concern strategic planning. In those articles, the main focus has been on evaluating the contribution of strategic planning to the performance of companies and to the role that corporate level and strategic business units (SBUs) play in them. In most of these studies, the analyses show that strategic planning has positive results for the corporations. One interesting feature of the latest research is that it emphasizes the strategy process as a learning process.

Table 3 Studies of Strategic Planning (Andersen, 2000)

Author	Focus	Method	Conclusions
Chandler (1962)	Corporate strategy	Case study	Strategy formulation leads to corporate structure
Bower (1970)	Investment decisions	Case study	Managers' resource-committing capital budgeting decisions influence strategy
Mintzberg (1973)	Strategy modes	Literature study	Planning applies to stable environments and emergent strategy to dynamic industries
Wood and LaForge (1976)	Strategic planning	Questionnaire	Strategic planning has a positive performance effect
Sapp and Seiler (1981)	Strategic planning	Questionnaire	Strategic planning has a positive performance effect
Fredrickson (1984)	Comprehensiveness	Scenario analysis	Comprehensiveness has a positive performance relationship in stable industries
Fredrickson and Mitchell (1984)	Comprehensiveness	Scenario analysis	Comprehensiveness has a negative performance relationship in dynamic industries
Whitehead and Gupp (1985)	Strategic planning	Questionnaire	Strategic planning has no performance effect
Rhyne (1986)	Planning openness	Questionnaire	Planning openness has a positive association with performance
Fredrickson and Acquinto (1989)	Comprehensiveness	Scenario analysis	Comprehensiveness has a positive performance relationship in stable industries and negative in dynamic industries
Eisenhardt (1989)	Fast strategic decisions	Case studies	High performers in the dynamic computer industry make extensive decision analyses
Jelinek and Schoonhoven (1990)	Corporate innovation	Case studies	Development commitments influence strategy in the dynamic computer industry
Kukalis (1991)	Planning flexibility	Questionnaire	Planning flexibility has a positive performance association
Powell (1992)	Comprehensiveness	Questionnaire	Comprehensiveness has a positive performance relationship in stable industries and negative in dynamic industries
Miller and Cardinal (1994)	Strategic planning	Meta-study	Strategic planning has a positive relationship to performance, particularly in dynamic industries
Hopkins and Hopkins (1998)	Planning intensity	Questionnaire	Planning intensity has a positive relationship to performance in the banking industry

Porter (1985) defines two types of strategy: business unit strategy and corporate strategy. According to Porter, business strategy charts the course for a firm's activities in individual industries while corporate strategy addresses the composition of a firm's portfolio of business units. Hence, corporate

planning has become more of a portfolio management and real strategic planning has been done in SBUs.

Drucker (1985, pp. 638-645) has studied a lot about the size of a company and its related strategy. He sees that size by itself has a major impact on strategy, and strategy, in turn, has a major impact on size. He states that both large and small companies can do things that the other cannot. He continues that it is crucial for management to consider what strategies benefit different sized companies.

In Figure 12, Beard and Dess (1981) have identified three different strategic levels.

	Organizational units		*Environmental units*	
Three concepts of strategy	1.Management decision makers	2. The organization as a whole	3. The directly linked environment	4. The indirectly linked environment
1. Corporate level strategy				
2. Business level strategy				
3. Functional level strategy				

Figure 12 Three concepts of strategy and four units of analysis (Beard and Dess, 1981)

They see strategy as taking place at three levels:

- corporate
- business
- functional

These levels are quite practical and are used in many companies, even though in many cases the functional level is often forgotten. However, in the researcher's experience, the more the functional level has been involved in the strategy process, the more committed middle management has been to the implementation of strategy and the more successful the company has been. Unfortunately, in many cases where the functional level has been left outside the strategy process, the different functions have been very unbalanced in the final strategy and some functions may not have had a strategy at all. Of course, in this case too there may be situations in which corporate level portfolio strategy formation cannot be communicated to a large group of people.

The units of analysis have been organized from smallest to largest, the smallest being the management's decision-makers. The organization as such, without taking into account the people inside it, does not make it successful or unsuccessful. Even in their study, Beard and Dess (1981) concentrated on the structural side of the strategy, leaving the organization's individuals and environment out. This lack has been repeated in many cases up until the days of knowledge management, and even then the meaning of individuals and their capabilities has often been forgotten in the strategy process context.

Table 4 presents Katz's (1970) propositions for corporate and business level strategies. Katz (1970) looks mainly for propositions on business and corporate strategy and company size as the basis of the strategy making, rather than trying to give separate advice for small and large companies. His propositions are quite obvious and rational.

Table 4 Katz's (1970) Propositions on Business and Corporate Strategy

Universal propositions:

1. Always lead from strength.
2. Concentrate resources where the company has (or could develop readily) a meaningful competitive advantage.
3. The narrowest possible product/market scope should be selected for each unit consistent with unit resources and market requirements.
4. A unit whose future earning power (discounted at the company's current cost of capital) is less than its liquidation value should be sold as quickly as possible.

Propositions for large companies:

1. Planning is critical.
2. Give up the crumbs.
3. Preserve company strength and stability.

Propositions for small companies:

1. Attack when the enemy retreats.
2. Do take full advantage of opportunities.
3. Be as inconspicuous as possible.
4. Respond quickly.
5. Retreat when the enemy attacks.

In Table 5, we see Glueck's (1972) hypotheses on business and corporate strategies. According to Hofer (1975), those propositions were at that time the most explicit and complete on business and corporate strategies. Glueck (1972)

also sees the size of the company as a very important factor in the success of strategy and its implementation. This gives a good basis for strategic planning for companies of different sizes.

Table 5 Glueck's Hypotheses on Business and Corporate Strategy (Glueck, 1972)

H18:	The most important factors in developing a strategy are relative dependence on the environment, complexity of product/service line, relative size of the firm, and volatility of the relevant marketplace. Less important factors are current technology and relative proportions of employees in education/training categories.
H21B:	The more dependent the firm is on its competitors, the less offensive it is likely to be in its strategy.
H23A:	The more volatile the market sector the firm chooses to operate in; the more flexible the strategic response needs to be in effective organization.
H28:	Firms which operate with an offensive strategy will be more effective than those with a reactive or defensive strategy.
H29:	Small firms which create a strategy that stakes out specific market segments will be more effective than those who define themselves more broadly.
H30:	For dominant firms in an industry, the best strategies (in order) are innovation, intense marketing (fortification); the least are persecution and confrontation.
H30A:	For the small firm, the best strategies are innovation and segmentation; the least are improved promotion and distribution improvements.
H36:	Firms which are in mature industries with low volatility can be minimally effective by adopting a stability [incremental adjustments to the present] strategy.
H48:	Firms with long linked technologies will be more effective if they grow through vertical integration.
H49:	Firms with mediating technologies will be more effective if they grow by increasing the geographic area served.
H50:	Firms with intensive technologies will be more effective if they grow by incorporating the object worked on.
H53:	Companies with a large share of market will be more effective if they choose conglomerate growth strategy.
H54:	Companies with a small share of market will be more effective if they choose an intensive growth strategy.
H55:	If a company is in a high growth of market, it will be more effective if it chooses intensive growth/integrative growth strategies.
H56:	If a company is in a mature product life cycle market, it will be more effective if it chooses intensive growth/conglomerate growth strategies.
H57A:	The most effective entry strategy is joint development.
H57B:	Acquisition strategy is best when the company has little knowledge of the product, when speed is vital, or when other companies own key patents on control key resources.

Both Katz (1970) and Glueck (1972) thus view the size of the company as the most important factor in strategic planning. It is natural that strategic planning is much more demanding in a large corporation than in a small company. In both of these articles the organization's levels are ignored, contrary to the work of Beard and Dess. However, if we read the strategic literature of today, it has emerged that more important than size is the entrepreneurship and innovativeness within the organization. Also, the management and leadership styles in different cultures may vary greatly and, especially in smaller

countries, the size of the company may not be that important. Skills are most probably respected more today than ever before. One can state that the propositions that would be made today may differ greatly from those made 20-25 years ago.

Also, when thinking of the enterprises in this study, we should examine the different needs of the corporate and SBU levels. Some of the case companies are such that there is not much synergy between the SBUs, and the top management's role is clearly to analyze the company portfolio. We should also examine the significance of functional levels. One of the best examples of an extremely large corporation that has been very successful at all levels of strategic planning and implementation is General Electric (Kaplan and Norton, 2004).

Grant (2005a, 2005b) states that since the technology boom in the late 1990s, there has been a completely new way of thinking of business strategy due to the rapidly dropping costs of communication and information processing. Hence, for instance, complexity science and option theory could be used in strategy making. These are also some of the factors which have contributed to the initiation of this thesis.

Waterman (1982) has developed the 7-S Framework for strategy making. He has mainly studied organizational changes, and states that effective organization changes require a relationship between structures, strategy, system style, skills, staff and something he calls 'super ordinate goals'. The researcher finds that these elements are also essential in normal strategy planning situations as, without these, proper strategies cannot be established. Mintzberg (1988) has also widely studied these subjects.

Critically analyzing these theories, the researcher's opinion is that the biggest development need is for strategies developed for the SBU level, and for putting these together as a corporate strategy in which the top management has also included their portfolio strategy. There also needs to be a link between the corporate and SBU level strategies. This work has created a tool and concept to bridge the existing gap.

2.3 Strategy Formulation

In contrast to Chapter 2.2, there has been continuous and vivid discussion and research around strategic formulation and strategic decision-making. The main writers on this topic have been Mintzberg and Schwenk. Quinn (1980) has also had doubts about strategic planning and its ability to produce good strategies. Others have their own opinions about the ideas of these writers.

Mintzberg has mostly written about different schools of strategy formulation. In one article, Mintzberg (1990a) writes that he has identified ten of these:

> *"Three are prescriptive in orientation, treating strategy formation as a process of conceptual design, of formal planning and of analytical positioning (the latter including much research on the content of competitive strategies). Six other schools deal with specific aspects of the process in a descriptive way, and are labeled the entrepreneurial school (concerned with strategy formation as a visionary process), the cognitive school (a mental process), and the environmental school (a passive process). A final school, also descriptive, but integrative and labeled configurationally, by seeking to delineate the stages and sequences of the process, helps to place the findings of these other schools in context."*

Mintzberg has mainly concentrated on writing about the design school, which is described in Figure 13. He has severely criticized the design school model and has written his fallacies of strategic planning against this particular school. In these four fallacies of strategic planning, Mintzberg (1994a, pp. 221-321) argues the following:

1) *The fallacy of predetermination*; Mintzberg argues that forecasting is impossible, especially in turbulent business environments. Strategy formation cannot therefore happen in advance, and it can better be characterized as a dynamic changing process. Strategies as such should be considered as intangible abstract concepts in the minds of people, supporting the product of a worldview.

2) *The fallacy of detachment*; Mintzberg argues that the designers of strategy are too far removed from operational business practices and the business environment. Strategy designers normally belong to a high hierarchical level where active strategic planning is impossible.

3) *The fallacy of formalization*; Mintzberg argues that formal planning models cannot create strategies. Creativity in strategy making does not exist within formal planning models.

4) *The grand fallacy*; Mintzberg states that strategic planning through analytical methods alone cannot lead to the synthesis needed in strategy making.

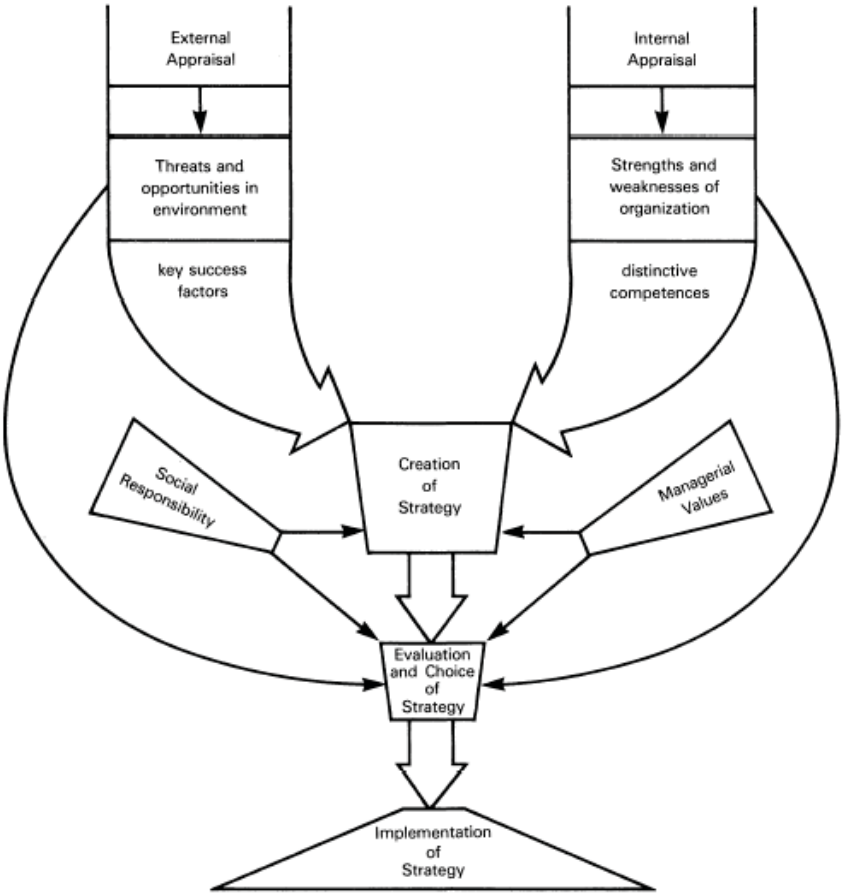

Figure 13 The basic design school model (Mintzberg 1990a)

Figure 13 presents the basic principle of the design school in strategy formulation. In this model, which follows many of the principles of Porter's analytical methods, internal strengths and weaknesses as well as external opportunities and threats are analyzed first with the SWOT analysis. After that, the key success factors for external parameters are established, as well as an evaluation of distinctive internal competences being made. Following these analyses, a strategy is created. In this process, the company's and

management's managerial values and social responsibility also play a role and affect the creation of strategy as well as its following step, i.e. the evaluation and choice of strategy, as well as its final implementation. Mintzberg (1994a, p. 43) summarizes:

1. *Strategy formation should be controlled and conscious as well as a formalized and elaborated process, decomposed into distinct steps, each delineated by checklists and supported by techniques.*
2. *Responsibility for the overall process rests with the chief executive in principle; responsibility for its execution rests with the staff planners in practice.*
3. *Strategies come out of this process fully developed, typically as generic positions, to be explicated so that they can then be implemented through detailed attention to objectives, budgets, programs, and operating plans of various kinds.*

When we think of strategy making and strategy processes, it has been widely proved in the literature and also referenced in this thesis that the companies which have made efforts in strategic planning are more successful than those who have not. For instance, before making any decision, a manager must analyze the present situation and position of his company. At the same time, when looking at external factors and having the vision and mission of the company, the manager must decide which the needed competences are. In all this work, the question method is useful, and the strategy work can be made less formal through the use of the Internet and other technologies of today. Even when the key success factors are being analyzed and established, information technology and systems can help. All organizations contain a lot of information, but it must be captured for the benefit of decision-making and for the company as a whole. Also, though in all companies the CEO is responsible for activities, line and other managers can participate in the strategy work with the help of systems without as much use of external planners. The strategy process must be a continuous one and strategies must be updated all the time. With a good system this can be easily done without too much work.

In the literature, opinions for and against Mintzberg's fallacies of strategic planning can be found. Brews and Hunt (1999) state:

> *"If anything, the dissatisfaction with formal strategic planning has surfaced the practices to be avoided in planning, rather than providing support for the proposition that the remedy for bad planning is no*

planning. For example, the first of Mintzberg's planning 'fallacies' (detachment) is avoided by placing planning responsibility in the hands of engaged line managers. The second fallacy (predetermination) is avoided by acknowledging, as this paper points out, that good planning is about both synoptic formalism and incrementalism. The third fallacy of 'formalization' (Mintzberg, 1994a) may not be fallacious after all: as this study illustrates, there is room for formal, specific planning in the work of managers, and no support for firms which rely on incremental processes alone."

Mintzberg (1978, 1990a, 1990b, 1991, 1994a, 1994b, 1994c) has defended his views with several articles on this topic. Yet Ansoff (1991, 1994) has further written several articles challenging Mintzberg's fallacies of strategic planning.

However, as in many successful companies, the top management has to have a vision of the path down which to lead the company. The strategy formation cannot be a compilation of everyone's opinions, but must be guided by the mission and vision of the company, its shareholders and top management. Vanharanta (1995) states that the formulation of corporate strategy is, to a large extent, group work and teamwork. First, the determinants of strategy (i.e. external threats and opportunities, corporate objectives, present capabilities and future resources) must be balanced against each other (cf. Ansoff, 1987). Second, the strategic work itself requires group interaction, so that all necessary background information will be continuously available for strategy formulation, evaluation, implementation and control work. All the actions taken in strategic development work require a continuous information flow. It is important to constantly be aware of the position of the company; where and how to do future business. In addition, this total cycle of actions should always occur at a low cost, and should take into account diverse internal and external interests.

Lowendahl and Revang (1998) propose that instead of developing models they prefer developing concepts. With the help of these concepts it is possible to focus on action and attention. Similar thoughts are found in concepts like 'stick to your knitting' (Peters and Waterman, 1982), 'core competence' (Prahalad and Hamel, 1990), 'invisible assets' (Itami, 1987), 'dynamic networks' (Miles and Snow, 1986), 'relationship management' (Eccles and Crane, 1988), 'strategic intent' (Hamel and Prahalad, 1989), 'corporate culture' (Deal and

Kennedy, 1982), and 'business process re-engineering' (Hammer and Champy, 1993). Thinking about all of this, it is obvious that something new has to be developed in the arena of strategic planning, its systems and thinking. Grant (2005a, 2005b) sees the strategy process as a planned emergence. In this approach, strategic management is achieved in the turbulent business environment through a combination of rational top-down planning, and decentralized emergence is supported by the findings of complexity theory. Grant (2005a, 2005b) emphasizes the analytical approach instead of skill, intuition, emotion and creativity. However, he also thinks those are essential ingredients for successful strategies. He emphasizes the role of analysis because that way one learns from past failures and successes. Grant's focus is on developing the strategy process and its tools. The researcher shares this view, but finds that above all the knowledge and skills of the organization should be taken into full consideration.

Unfortunately, little attention has been paid to those articles and studies on people within the organization, their intuition and capabilities, and the visions of the top management. Though Hamel (2000) has written about visions and foresights and what they mean to the success of many companies like Microsoft, none of the traditional research has considered the meaning of vision and managerial intuition to the success of a firm. It is often the people within the organization that have a practical feel of their customer needs, customer satisfactions and development needs of their company's products and services. With the traditional strategy formation models and theories, this knowledge will never be captured for the benefit of a company. That is one of the main reasons for developing the application presented in this thesis. This way, with the help of teamwork, the whole organization can participate in the strategy formation process and strategy making.

2.4 Strategic Decision-Making

Strategic decision-making is a challenge that all companies face during the strategy process. In addition to strategy formulation, strategic decision-making has been under constant discussion amongst strategy researchers and practitioners. Again, one of the main pacesetters in this area has been

Mintzberg (1994a), who has given the most famous definition of the strategic decision:

> *"The strategic decision is one which is important, in terms of actions taken, the resources committed, or the precedents set. That is, we focus on those infrequent decisions made by top leaders of an organization that critically affect organizational health and survival. There are three major choice paradigms, i.e. rationality and bounded rationality, politics and power, and garbage can."*

Schwenk (1984) has created a cognitive simplification process for strategic decision-making as presented in Table 6. Other research in the area of strategic decision-making has been done, for instance, by Burgelman (1983) and Thurbin (2001).

Schwenk (1984) has divided the strategic decision-making process into three stages that are:

- goal formulation
- strategic alternatives generation
- evaluation and selection

Schwenk writes that researchers have identified a simplification process that may lead decision-makers to ignore or misinterpret information. Levine (1971), Pruitt (1961) and Wason (1960) have showed that individuals who formed erroneous beliefs in hypotheses about the relationship between variables tended to make decisions on the basis of these beliefs despite abundant evidence over numerous trials that they were wrong. This is very much true. Also, in the researcher's experience, practice has shown that in environments where people have worked in the same positions for a long time, employees tend to make decisions based on past facts rather than re-evaluating things properly. In the ever-changing world of commerce, this can sometimes lead to a disastrous business situation.

Table 6 Schwenk's (1984) Simplification Process for Strategic Decision-making

Stage I		Stage II		Stage III	
Goal formulation / problem identification		Strategic alternatives generation		Evaluation and selection	
Process	Effect	Process	Effect	Process	Effect
(1) Prior hypo-thesis bias	(1) Evidence ignored gaps not perceived	(1) Single outcome calculation	(1) Restricts alternatives to a single one	(1)Representati-veness a) insensitivity to predictability b) insensitivity to sample size c) illusion of validity	(1) Inaccurate prediction of consequen-ces of alter-natives
(2)Adjustment and anchoring	(2) Evidence under used, gaps not perceived	(2) Inferences of impossibility	(2) Premature rejection of alternatives	(2) Illusion of control	(2) Inaccurate assessment of risks of alternatives
(3) Escalating commit-ment	(3) Significance of gap minimized, strategy not revised	(3) Denying value trade-offs	(3) Biased use of evaluation criteria	(3) Devaluation of partially described alternatives	(3) Rejection of strong but poorly presented alternatives
(4) Reasoning by analogy	(4) Problem mis-defined (oversimpli-fied), in-appropriate strategy revision	(4) Problem sets	(4) Alternatives restricted		

Table 7 presents other theoretical models for strategic decision-making. From the table, it can easily be stated that all decision-making models have many similarities and similar elements, i.e. there is first identification and analysis, then the development of different alternatives, evaluation and selection and finally implementation. We should not see the world in only black and white; companies have different needs at different times and develop their decision-making processes. There is no right or wrong solution.

Furthermore, based on previous studies, Dean and Sharfman (1996) have studied the strategic decision-making process. They state that none of the above models has looked at the link between strategic decision-making processes and their effectiveness. They have therefore created a model for strategic decision-making effectiveness (Figure 14).

Table 7 Strategic Decision-Making Models (Schwenk, 1984)

Hofer and Schendel (1978)	**Minzberg et al. (1976)**	**Glueck (1976)**	**Mazzolini (1981)**	**Derived model**
(1) Strategy identifi-cation	*Identification phase* (1) Decision recognition (2) Diagnosis		(1) Decision-need identification	Goal formulation, problem identification
(2)Environmen-tal analysis		Appraisal (determine environmental threats and opportunities: company's comparative advantage		
(3) Resource analysis				
(4) Gap analysis				
(5) Strategic alternatives	*Development phase* (3) Search (4) Design	Choice: Phase I (consider strategic alternatives)	(2) Search for alternatives for action	Strategic alternatives generation
(6) Strategy evaluation	*Selection phase* (5) Screen (6) Evaluation (7) Authorization	Choice: Phase II (choose the strategy)	(3) Investigation of courses of action (4) Review and approval	
(7) Strategy choice				Evaluation and selection
		Implementation	(5) Implementation	Implemen-tation
		Evaluation		

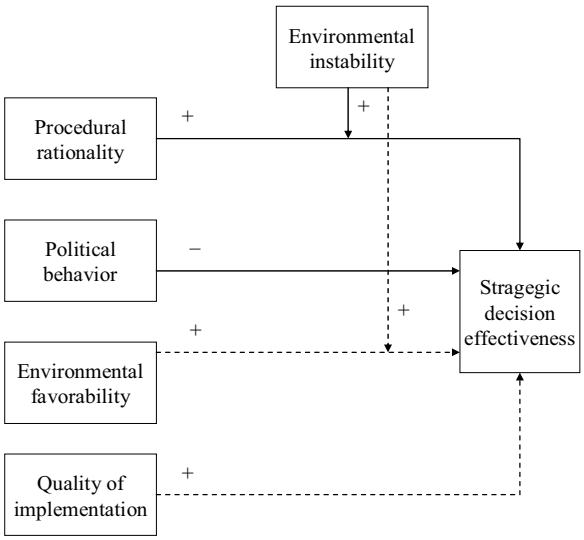

Figure 14 The strategic decision-making effectiveness model (Dean and Sharfman, 1996)

Dean and Sharfman (1996) have made three hypotheses on the effectiveness of strategic decision-making:

1. Procedural rationality will be positively related to strategic decision-making effectiveness.
2. Political behavior will be negatively related to strategic decision-making effectiveness.
3. Environmental instability will moderate the relationship between procedural rationality and decision-making effectiveness.

The following results were found in the study:

- Decision processes influence strategic decision-making effectiveness. Even when both environmental favorability and quality of implementation were included in the regression model, procedural rationality and political behavior were significantly related to effectiveness. Managers who collected information and used analytical techniques made decisions that were more effective than those who did not. Those who engaged in the use of power or published hidden agendas were less effective than those who did not.
- Furthermore, the study reconfirms that environmental instability and quality of decision implementation play important roles in influencing a decision's effectiveness.

Dean and Sharfman's (1996) findings somewhat confront Mintzberg's fallacies of strategic planning, yet also confirm the researcher's approach of using analytical tools in strategy formulation processes and strategic decision-making. On the other hand, there is no discussion about the learning process and intuition in the decision-making process.

Strategic decisions and their success are of key importance to any company or enterprise. Therefore, it is quite odd that the consequences of the decisions have not been studied and analyzed more. One individual strategic decision may have and often does have long-term implications for the company. Also, in a pragmatic world, new CEOs in companies often try to achieve something visible quickly. However, if they do not have any experience of the specific industry at hand, it is very difficult to utilize any intuition other than that available for decision-making on a general level only, which is perhaps without any deeper understanding of the technical issues affecting the decision.

Simon (1965, 1977) defines the decision-making process as consisting of intelligence, design, choice and review phases. Mintzberg et al. (1976) very much share this view. According to Zeleny (1982), there are two basic approaches on how to model human decision-making: 1) the outcome-oriented approach and 2) the process-oriented approach. In outcome-oriented decision-making, the decision-maker can predict the outcome because he understands the process of decision-making and, by understanding it, can reach a decision.

One aspect that has not been discussed in the aforementioned articles is that decision-making processes, even if strategic, are different at corporate or SBU levels. On a corporate level decisions often deal with portfolio-management, as discussed earlier in this thesis. In such a case, it is often only top management who evaluate possible synergy and other benefits.

2.5 Strategy Processes

Sections 2.1-2.4 have studied different definitions of strategy given by various strategy gurus as well as formulations of strategy and its decision-making process. This section discusses different types of strategy processes and forms of strategy. The main focus is on the time cycle of strategic planning.

Grant (2003) has studied strategic planning in all the major oil companies in the world, and has identified the strategic planning cycle to be as in Figure 15. This is a very traditional approach to the process that many companies currently use. The main disadvantage is that it derives from the annual approach, having one year as a planning cycle. No specific has been mentioned about personnel involvement in the strategy process, and so it can be assumed that strategy is planned by corporate and divisional top management, making this very much a top-down approach which, in turn, may have the problems faced by Dean and Sharfman (1996). Figure 16 also stems from a very traditional approach to the strategy process. The elements presented in Figure 16 are simply timed on a calendar and nothing new is brought into the development of strategy processes.

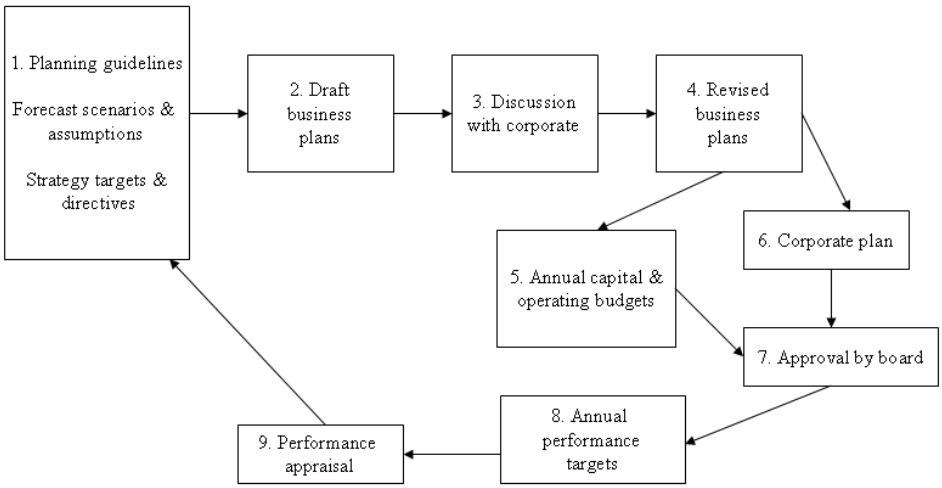

Figure 15 The generic strategic planning cycle among the oil majors (Grant 2003)

As we can see from Figure 16, the strategy process is quite straightforward. Over the previous decade, Grant (2003) found the following changes to the content of strategic planning:

1. Shortening time horizons: most of the companies had planning periods of 5 years or less and the focus had become more and more on medium or short-term planning
2. A shift from detailed planning to strategic direction: Increased environmental stability results not only in less formality and rigidity of the planning process, but in less precision and greater flexibility in the content of strategic plans. There was less concern with detailed programs of action, commitments to particular projects and resource deployment, and greater emphasis placed upon more broadly defined goals.
3. Increased emphasis on performance planning: According to Grant's notifications in the 1990s, the companies shifted the focus of their strategic plans from forecasts and strategic decisions that specified timetables and resource deployments, towards targets relating to financial and operational performance targets.

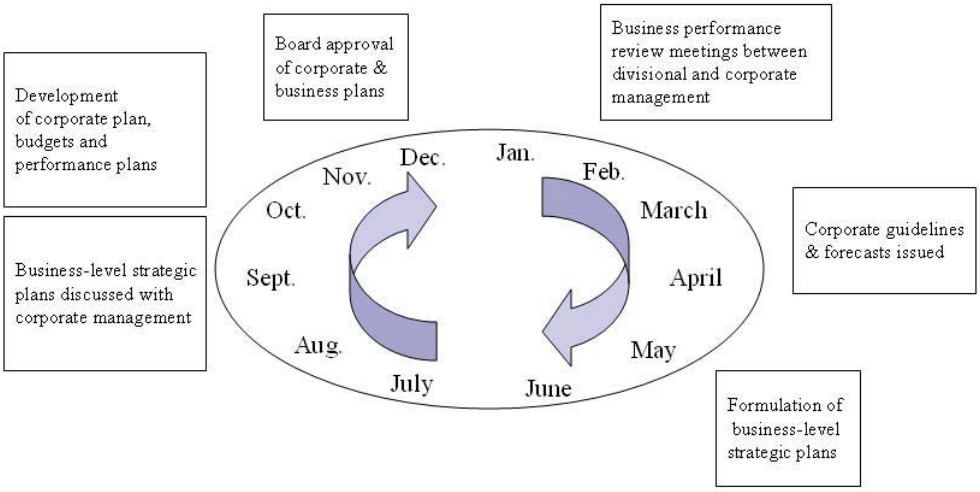

Figure 16 The timing of the planning cycle (Grant, 2003)

Kaplan and Beinhocker (2003) state that strategic planning processes are often arranged around a set of meetings, which typically include the chief executive officer and senior corporate team. Furthermore, Davison (1995) has stated that after firms become more international, there are more people with different cultural backgrounds in strategy planning teams. These international teams are crucial for the success of the strategy process. Mintzberg (1987) argues:

> *"The popular view sees the strategist as a planner or as a visionary; someone sitting on a pedestal dictating brilliant strategies for everyone else to implement. While recognizing the importance of thinking ahead and especially of the need for creative vision in this pedantic world, I wish to propose an additional view of the strategist as a pattern recogniser; a learner if you will, who manages a process in which strategies (and visions) can emerge as well as be deliberately conceived."*

The strategy process looks so traditional and formal that here we can again assume that intuition is hardly captured in the process (if at all). On the other hand, researchers who have studied strategic information systems have stated that there is a need to first model the strategy process before any system can be built.

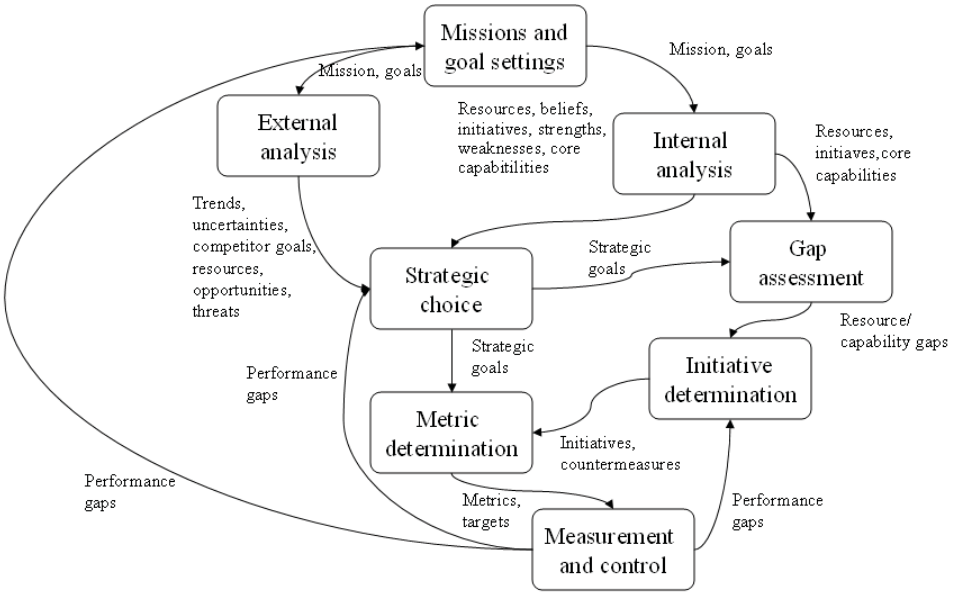

Figure 17 High level data flow for enterprise strategy management (Wagner, 2004)

Wagner's model (Figure 17) has some key pitfalls in its approach: first of all, this approach is also very much top-down, i.e. the expertise and knowledge of the organization is not utilized effectively, which leads to the general non-commitment of the organization to the top management's targets and strategies. Once again, we can state that intuition is very likely ignored in the strategy process.

If we look at Figures 15, 16 and 17, it is more than obvious that even the latest literature in strategic writing has taken a very traditional approach to the strategy process and consequently there has not been much change in companies' strategic planning practices.

2.6 Occupational Roles in Strategy Making

For the successful implementation of strategy the commitment of the whole organization is crucial. This topic has been covered in many articles about strategic management and strategic planning as many of these have commented on Mintzberg's fallacies of strategic planning. For instance, Grant (2003) writes in his article:

> *"Although hierarchical in structure with decision-making power ultimately vested in the top-management team and critical inputs*

provided by corporate planning staff, the major oil companies' strategic planning systems of the late 1990s had little in common with the highly bureaucratized, top-down processes caricatured by Henry Mintzberg. In particular, strategic planning was primarily a bottom-up process in which corporate management provided direction, but primary inputs came from the business units and operating divisions."

Barringer and Bluedorn (1999) have also studied employee involvement in a firm's strategic planning activities. They call the depth of employee involvement in this planning the process locus of planning. A deep locus of planning denotes a high level of employee involvement, typical for instance in Japanese companies. They state that a deep locus of planning facilitates a high level of corporate entrepreneurship intensity. First, a high level of employee involvement in the planning brings the people closest to the customer into the planning process. This characteristic of employee participation in planning may facilitate opportunity recognition, which is central to the entrepreneurial process (Schumpeter, 1936). Moreover, a deep locus on planning legitimizes the active participation of middle and lower-level managers in the planning process. This way the potentially good ideas coming from these levels are not overlooked (Burgelman, 1988).

The Corporate Strategy Board (1999) has concluded that developing the strategic thinking skills of middle managers provides companies with the greatest opportunity for improvement. Figure 18 illustrates the potential of senior managers, middle managers and front-line employees to give valuable input into the strategy process. The top managers are already heavily engaged in strategy processes and not much further potential is available in their area. The frontline is, for its part, so far away from seeing the "big picture" that it can add little valuable input to the strategy process.

Figure 18 clearly shows the area most need of development. This information can be utilized in planning practical case studies. It is clear that middle management's brain capacity is well under-utilized.

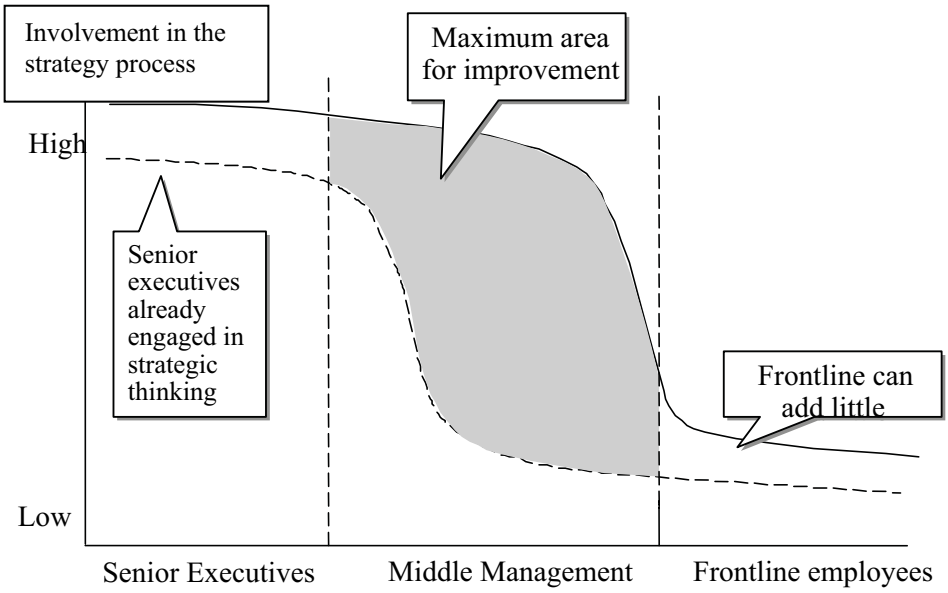

Figure 18 Developing the strategic thinking skills of middle managers provides companies with the greatest opportunity for improvement (Corporate Strategy Board, 1999)

Mankins and Steele (2005) also discuss the gap between strategy planning, its implementation and actual performance. They think that it is essential to increase the standards both for planning and execution at the same time. They list the following to be the important actions in closing the gap between planning and execution:

- Keep it simple, make it concrete
- Use a rigorous framework, speak a common language
- Discuss resource deployments early
- Continuously monitor performance
- Reward and develop execution capabilities

2.7 Strategy in the Turbulent Business Environment

Today's business world is more unpredictable and volatile than ever. External and unexpected cases like 9/11, the Iraq crisis, and acts of terrorism all over the world have affected global business and the global economy far more than anyone forecasted. Also new technologies and habits have changed the world. We have seen the rapid breakthrough of ICT, mobile phones, digital cameras, etc. What will there be next? Hence, many executives have stated that there is no need for strategic management or planning, because anything can happen. Especially nowadays, the trend is in cost cutting, streamlining, etc. and strategy-related issues are often regarded as excessive costs.

Fradette and Michaud (1998) state that

> *"until now, virtually every work of management theory has been on a single premise: The future is predictable. Until now, we have forecast market trends, scheduled production, designed services, and trained employees on the assumption that we could count on a stable future except for the occasional unexpected earthquake."*

As mentioned earlier, the Jaakko Pöyry Company (Rennel, 1984, p. 11) has stated that predicting the future of paper consumption and technological development in the pulp and paper industry is becoming more and more difficult. IBM's former CEO, Gerstner (2002), states that the hardest part in the changing world has not been coming to grips with technology or economic transformations, but with the changing of culture – the mindsets and instincts of hundreds of thousands of people who had grown up in a successful company. The most difficult task for him was to make people live, compete and win in the real world.

One of the most interesting studies in this area has been that of Grant (2003) who, as mentioned previously, has studied the very volatile oil business by analyzing all major oil companies in the world and how strategic planning has been viewed and developed by them. He states that the challenge of making strategy when the future is unknowable has encouraged a reconsideration of both the processes of strategy formulation and the nature of organizational strategy. According to Grant (2003), attempts to reconcile systematic strategic planning with turbulent, unpredictable business environments include the following:

- Scenario planning
- Strategic intent and the role of the vision
- Strategic innovation
- Complexity and self-organization

Scenario planning:

Multiple scenario planning seeks not to predict the future but to envisage alternative views of the future in the form of distinct configurations of key environmental variables (Schoemaker, 1993). Schoemaker (1992, 1995) has

presented his own technique for scenario planning. With scenario analysis, strategic planning is a process where decision-makers share and synthesize their different knowledge sets and surface their implicit assumptions and mental models. Eden and Ackerman (1998) have included the concept of visualization in scenario planning. This has also been taken into account when developing the application in this thesis.

Strategic intent and role of vision:

In the cases of uncertainty of any details, strategy is then mainly concerned with establishing broad parameters for the development of the enterprise with regard to “domain selection" and “domain navigation” (Bourgeois, 1980). Also, as in the case of uncertainty, long-term strategic goals are established, articulated through statements of ‘vision’ and ‘mission’ (Van der Hejden, 1993) and committed to through ‘strategic intent’ (Hamel and Prahalad, 1989; Prahalad and Hamel, 1994).

Strategic innovation:

The role of strategic innovation is widely discussed in the literature. It is a necessary part of the strategy process to be able to convert new and fresh ideas into strategic plans. Schoemaker (1995, p. 31) states that good scenarios challenge tunnel vision by instilling a deeper appreciation for the myriad factors that shape the future. Hamel (2000) writes that strategic inertia may have more to do with planners than the planning per se. If top management teams are characterized by the lack of genetic diversity and heavy investments of emotional equity in the past, breaking the conservative bias of strategic planning may require involving younger organizational members who are further from the corporate HQ.

Complexity and self-organization:

Models that have been used to analyze biological evolution have been also applied to the evolution of organizations. When we have a constantly changing

landscape, we also need constant and parallel exploration efforts by different organization members and the combination of incremental steps.

According to Grant (2003), a key feature of the strategic process is the presence of semi-structures that create plans, standards and responsibilities for certain activities while allowing freedom elsewhere.

Grant (2003) concludes that the findings of his study, together with other recent evidence, show that strategic planning continues to play a central role in the management systems of large companies. At the same time, strategic planning practices have changed substantially over the past two decades in response to challenges of strategy formulation in turbulent and unpredictable environments. Strategic planning processes have become more decentralized, less staff driven and more informal, while strategic plans themselves have become more short-term, more goal focused and less specific with regard to actions and resource allocations. The role of strategic planning systems within companies' overall management has also changed. Strategic planning has become less about strategic decision-making and more a mechanism for coordination and performance managing.

Hoque (2004) has studied the association between strategy, environmental uncertainty and performance from a contingency model. He has made two hypotheses. His first hypothesis H1 was:

> *"A positive and significant association between business strategy and performance exists through management's choice and use a performance measurement system."*

His second hypothesis H2 was:

> *"A positive and significant association between organizational environmental uncertainty and performance exists through management's choice and use of a performance measurement system."*

The practical study was conducted with 100 New Zealand manufacturers. In the study H1 was directly supported, but H2 received no direct support. However, he concludes that business unit strategy is positively and significantly associated with the management's greater emphasis on non-financial performance measures for performance evaluation, and that the data

also indicate the direct and positive relationship between the management's emphasis on non-financial performance measures and increased organizational performance.

Similar results have also been received in similar studies (cf. Hart and Banbury, 1994). This very clearly shows that strategic planning is beneficial for the company, but also that the right, innovative people must be involved.

2.8 Strategy and Entrepreneurship

In many cases internal efficiency tends to decrease in large companies and, in some cases, there is so much focus on quartile results that more long-term strategic thinking seems to be forgotten. This means that new businesses or business models are not continuously and actively thought of, and changes that have taken place in the business environment have not been identified early enough. This can occur in practically any area of business. Even a company's product development may suffer from excessive "good feeling". One factor that may negatively contribute to the success of strategic planning is that year after year always the same people are found thinking in the same way. This has been seen, in practice, in some of the case companies. In fact, it is clearly evident that these people have lost touch with the real business. This supports Mintzberg's second and especially third fallacy where he states that formal planning models cannot create strategies, and that creativity in strategy making does not exist within formal planning models.

There are many articles written about strategic management and entrepreneurship. Barringer and Bluedorn (1999) state that many authors have singled out corporate entrepreneurship as an organizational process that contributes to a firm's survival and performance. Authors like Covin and Slevin (1991), Drucker (1985), Lumpkin and Dess (1996), Miller (1983), and Zahra (1993) have argued that entrepreneurial attitudes and behavior are necessary for firms of all sizes to prosper and flourish in competitive environments. However, often in the literature the focus has been on looking at how organizational characteristics facilitate entrepreneurial behavior. These studies have looked at a broad array of variables and have not provided the

extensive impact of a firm's strategic management practices. Barringer and Bluedorn (1999) have concentrated on studying the relationship between the strategic management practices and corporate entrepreneurship intensity of a sample of 169 U.S manufacturing companies. They studied five dimensions of the strategic management process, which include scanning intensity, planning flexibility, and planning horizon, locus of planning and control attributes. As a result Barringer and Bluedorn (1999) conclude that a firm's entrepreneurial intensity is influenced by the nature of its strategic management practices. They do not regard that as a surprise, because a firm's strategic management practices are intended to shape and mold its behavior. They also state that employee participation at all levels is an essential key to the entrepreneurial process.

Hitt et al. (2001) have also studied strategy and entrepreneurship in their article 'Strategic Entrepreneurship: Entrepreneurial Strategies for Wealth Creation'. They define strategic entrepreneurship to be an entrepreneurial action with a strategic perspective. In the words of Venkataraman and Sarasvathy (2001), entrepreneurial action is the "Romeo and the balcony". One could also think of entrepreneurial action as strategic action with a strategic mindset. In short, strategic entrepreneurship is the integration of entrepreneurial and strategic perspectives in developing and taking actions designed to create wealth. Many researchers believe that innovation is the most important component of a firm's strategy. This is, for instance, Hamel's (2000) opinion. Others such as Germany and Muralidharan (2001) believe that successful innovation allows a firm to provide directions for the evolution of industry. Hitt et al. (2001) and McGrath and MacMillan (2000) have integrated thinking from both fields in developing their entrepreneurial mindset concept. They argue that those with an entrepreneurial mindset passionately seek new opportunities. They continue that the integration of entrepreneurial thinking is important for strategic management as well. Shane and Venkataraman (2000) state that a firm's focus must be on identifying and exploiting opportunities. Hamel (2000) argues that managers can enhance the profitability that new wealth-creating strategies will create inside the firms by dreaming, exploring, creating, pioneering, and inventing. If the firms do not engage in these activities, other firms will do so and will take their markets, customers, best employees, and finally their assets.

As we have seen in the above theory and also in practice, entrepreneurship plays an increasingly key role in the success of a firm. It must be part of strategic management at all levels and the whole organization must be involved. There should also be a lot of genuine will for entrepreneurial efforts. Entrepreneurship is somehow a driving force and focus of many articles. It seems that entrepreneurship and strategic management belong together. Entrepreneurship is practically a must for the success of a company, even for a large one.

2.9 Strategy Maps

Kaplan and Norton (2004) have studied over 300 organizations and the strategy planning and implementation processes within them. They found that each organization thought of strategy in a different way. They concluded that without a comprehensive description of strategy, executives cannot easily communicate it among themselves or to their employees; and without a shared understanding of the strategy, executives cannot create alignment around it; and without alignment, executives cannot implement their new strategies to deal with the changing environment of global competition, deregulation, customer sovereignty, advanced technology, and competitive advantage derived from intangible assets, principally human and information capital. Kaplan and Norton (2004, p. 6) continue:

> *"In the strategy-focused organization, we noted a study of failed strategies, which concluded, in the majority of cases – we estimate 70 percent – the real problem isn't bad strategy . . . its bad execution. Clearly, most companies don't succeed in implementing their strategies."*

In contrast to this bleak record, organizations that made the balanced scorecard the cornerstone of their management systems, as we described in the strategy-focused organization, beat these odds. They implemented new strategies effectively and rapidly. They used a balanced scorecard to describe their strategies and then linked their management systems to the balanced scorecard and, hence, to their strategies. They demonstrated a fundamental principle underlying the balanced scorecard: "If you can measure it, you can manage it."

In order to build a measurement system for describing the strategy, a strategy model is needed. Therefore Kaplan and Norton (2004) have created a strategy map model that describes how an organization creates value (Figure 19).

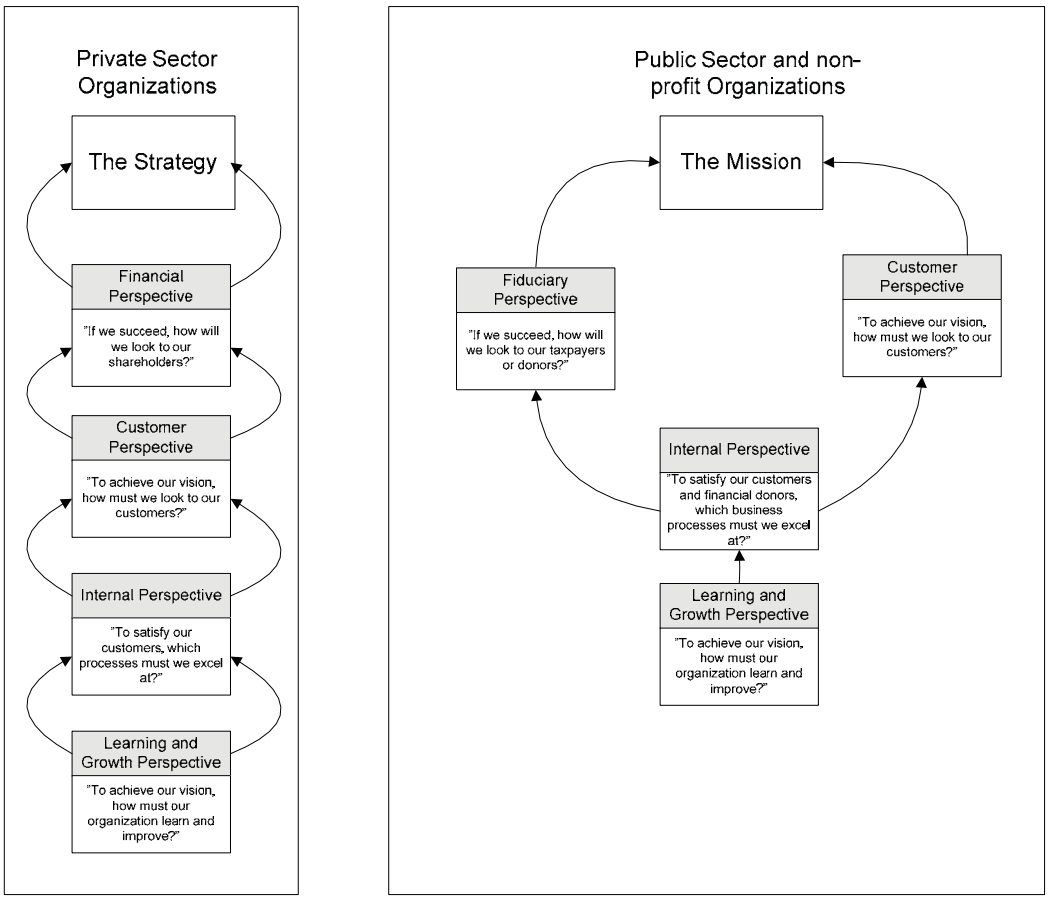

Figure 19 The concept of strategy maps (Kaplan and Norton, 2004)

Compared to the traditional strategy models and strategy processes presented in previous chapters, the strategy maps strongly highlight the learning and growth perspective. In order to achieve the company's vision, organizations must learn and improve. This is a continuous process. Basically, at a theoretical level, Kaplan and Norton's thinking contains many of the same ideas present in Vanharanta's Continuous Strategy framework.

Strategy maps create a framework for strategic planning. Many other strategists see strategy as a framework. Similarly Kaplan and Norton (2004) talk about strategy as one step in a continuum.

In Figure 20 we can see that strategy maps have been divided into different processes, each of them creating value and success for their process owners. Each process is consequently split into sub processes and smaller sub tasks.

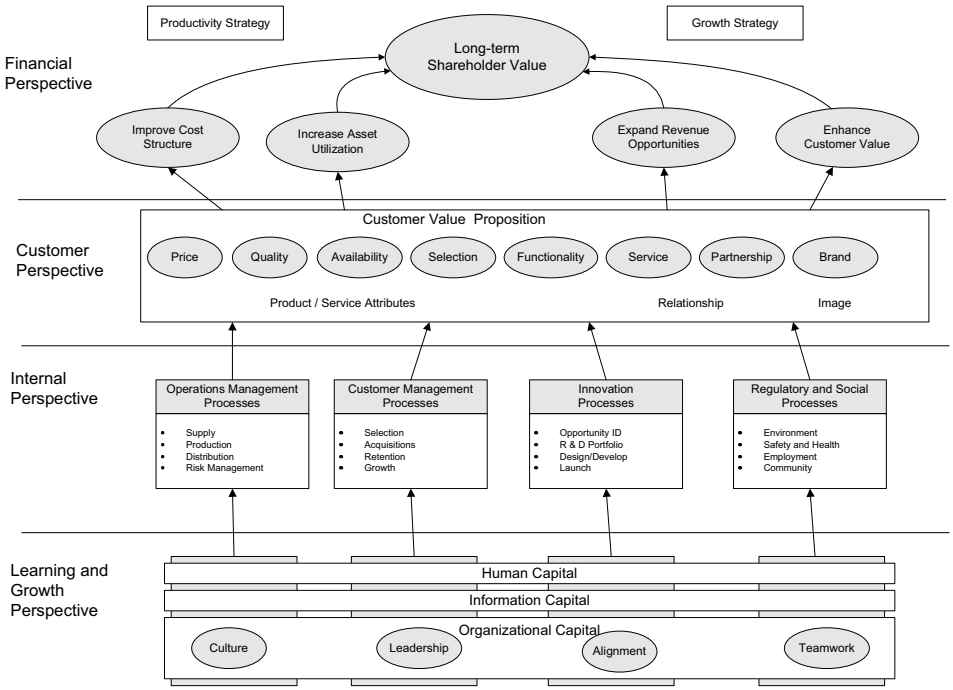

Figure 20 The components of strategy maps (Kaplan and Norton, 2004)

Figures 19 and 20 present the principles and elements of strategy maps in different types of organizations.

The strategy map is based on several principles as stated by Kaplan and Norton (2004, p. 10):

> "*Strategy balances contradictory forces. Investing in intangible assets for long-term revenue growth usually conflicts with cutting costs for short-term financial performance. The dominant objective for private-sector organizations is the creation of sustained growth in shareholder value. This implies a commitment to the long-term. Strategy requires a clear articulation of targeted customer segments and the value proposition required to please them. Clarity of this value proposition is the single most important dimension of strategy.*"

In practice, there are four major value propositions and customer strategies that organizations use:

- low total cost
- product leadership

- complete customer solutions
- system lock-in

Value creation takes place though internal business processes, financial and customer perspectives in strategy maps describe the outcomes, i.e. what the organization wishes to achieve: increases in shareholder value through revenue growth and productivity improvements; increases in the company's share of customer spending through customer acquisition, satisfaction, retention, loyalty and growth.

Internal processes are classified as follows:

- operations management: producing and delivering products and services to customers
- customer management: establishing and leveraging relationship with customers
- innovation: developing new products, services, processes and relationships
- regulatory and social processes

When all of these areas are being developed, they will simultaneously and complementarily bring results. According to Kaplan and Norton (2004, p. 12), as operational processes are developed, the results can be seen in the short-term in the form of cost savings and quality improvements. Improved customer management processes bring results within six to twelve months. Naturally, getting results from innovation and regulatory and social processes takes a much longer time.

Learning and growth describes the organization's intangible assets and their role in developing strategy. They can be classified as follows:

- human capital: employees' skills, talents and knowledge
- information capital: databases, information systems, and technology infrastructure
- organizational capital: culture, leadership, employee alignment, teamwork and knowledge management

These intangible assets assist organizations in implementing their strategies and they cannot be measured separately or independently.

2.10 Concluding Remarks

In this chapter we have looked at different strategy theories and processes. In practice, the most used strategy theory is most probably that of Porter.

Mintzberg has been quite skeptical about the possibilities which exist to use any IT systems in strategic planning, but as modeling the process is nowadays much easier than before due to modern methods and technologies, there are always more efficient ways to improve the strategy process and its implementation.

However, as Kaplan and Norton (2004) state and as many companies have seen in practice, planning strategy is not the most difficult task – the difficulty lies in how to implement and convey the strategy in an understandable format to the whole organization. Thus, in many respects Vanharanta (1995) and Kaplan and Norton (2004) have similar ways of thinking and use similar terminologies.

Lately many articles have studied the success factors and strategies of various companies, for instance Hitt (2005) and Kirby (2005). Common to all these articles remains the fact that no clear answer or methodology is presented or verified.

3. INTUITION IN STRATEGIC DECISION-MAKING

Chapter 2 looked at the main development of strategic thinking during the last few decades, but it could be said that those approaches did not have much intuition in them. The purpose of this chapter is to look at intuition more closely, and to answer the question: what is intuition and how it could be utilized in strategic decision-making? Although intuition plays a very important role in top-level decision-making, not many articles or books have been written on this topic. Yet intuition has been widely discussed in context with knowledge management. Sayegh et al. (2004) have studied intuition and emotion in the decision-making process in connection with crisis management. They state that:

> *"However, in critical decision situations like the 9/11 tragedy, a manager experiences a myriad of both cognitive processes and intuitive and emotional reactions that interact instantaneously during the decision process.*"

A very interesting article about decision-making and intuition has been written by Kasparov and Coutu (2005), who evaluate the analogies of intuition and analysis in the chess game and in business. Other writers on this topic have been Kleinmuntz (1990), Miller and Toulouse (1986) and Mintzberg (1976). The roles of tacit knowledge and intuition are appearing with more prominence in management literature in an attempt to address intuitive decision-making processes (Agor, 1990; Blattberg and Hoch, 1990; Brockman and Anthony, 1998; Langley et al., 1995; Polanyi, 1996).

Kuo (1998) defines intuition as a

> *"psychological function that allows knowing to occur by means of transmitting perceptions in an unconscious way. It enables individuals to grasp the meaning, significance, or structure of a problem without explicit reliance on analytical apparatus hence it can synthesise disparate ideas, achieving serendipity as it senses combinations which did not appear to be related in the past. Intuition and analytical thinking are not mutually exclusive, but rather work in tandem in problem solving. Intuition permits executives to instantly form a judgement when confronted with a problematic situation, while analytical thinking can help executives probe the structure and rules that may underlie the observed phenomenon."*

Gladwell (2005) has conducted a comprehensive study on people's behaviour in different situations and how they act instantly. He has learned that people with the right intuition can come to the right conclusion from as little as even two seconds or fifteen minutes, while those who have only studied the topic may take up to one year to come to the same conclusion. Hisrich (1987) and Bastick (1982) see decision-making as involving a feeling (gut-reaction) or intuition (the felt awareness of a situation as a whole).

It takes several years of experience and training for managers to apply intuition effectively. The research on intuition has decreased during the past few years because there has not been a proper method to study it with.

Mintzberg (1994a) states that a manager's job is greatly influenced by values and experience. Through experience the manager has certain skills or competences. These give the manager a basic knowledge that is converted into a set of mental models. In Mintzberg's model, managing takes place on three levels, i.e. an action level, people level and information level. On the information level there are two key elements: communicating and controlling.

According to Kuo (1998), perception has a considerable role in intuitive decision-making. It is possible to make an immediate situation analysis with intuition. Perception must be followed by actions, as a result of being in a situation.

> *"Hence, intuitive decision-making can be seen as a seamless combination of perceptions and actions, among which interpersonal perceptions and actions are probably the most critical. Managers in work are not subject to information input; they are actively asking questions to the environment based on their perception of the context. As a result, managers act thinkingly. Thinking is inseparably woven into and occurs simultaneously with action. When managers tour, read, talk, supervise, and meet, those actions contain managerial thought, they do their thinking for managers, they are substitutes for thinking, and they reduce the necessity for separate reflective episodes. Connected ideas, which are the essence of thought, can be found outside the mind, with relatively little assistance from the mind."*

Both intuitive and analytical thinking is used in the decision-making process. Many factors can affect decision-making that is based on intuition. These include personal values, intentions, goals, stress, fatigue and emotional factors.

If one relies too much on intuition, the decisions may fail systematically without anyone noticing it. People's minds also tend to work on an old pattern on which decisions are usually based. An individual must recognise his/her constraints and deficiencies in order to make neutral and correct decisions. Grant (2005a, 2005b) relies more on analytical tools than on intuition and skills. The researcher sees the organization's skills and knowledge at least as important as analytical tools. The reason for this is that analytical tools only look at the past and in today's changing business world, if a person is intuitive and capable, the chances for improved decision-making are far better than just utilizing analytical tools. Agor (1989) has most probably studied strategic decision-making and the role of intuition in it more than anyone else. He discusses intuitive talent. According to Agor (1989), extensive research on brain skills indicates that those who score as highly intuitive on such test instruments as the Myers-Briggs Type Indicator tend to be the most innovative in strategic planning and decision-making. These people are more insightful and better at finding new ways of doing things. In business, they are the people who can sense whether a new product idea will fly in the marketplace. Those people also generate ingenious new solutions to old problems that may have festered for years. Unfortunately, organizations often thwart, block, or drive out this talent – the very talent they require for their future survival! At the very least, most organizations lack well-established human-capital programs designed to search for and consciously use their employees' intuitive talent in the strategic planning process. As a result, this talent is either left unused, is suppressed, or lost altogether. Finally, the intuitive executive begins to emotionally withdraw, slowly but surely reducing his or her input and often leaving the organization altogether. This also seems to be very true in the case studies later in this thesis. The frustration of intuitive people can easily be seen.

According to Kuo (1998), the way we perceive the world from one moment to another depends on our sensing capability; one part of what we see is with our eyes, while the rest comes from inside our brain. One could assume that our visual processes only work in one direction, bringing information from the world into the mind: World > Sensation > Perception > Recognition > Cognition. But this does not explain the phenomenon that what we see is influenced by what we expect to see. Human vision somehow combines the

information that comes from the outside with structures in our memory. By using our framework, we can look at the situation like this: a feeling of sensation in our memory system > interpretation of the description with our interpretation system > comparison of our motives to our expectations with our motivation system. Cognitive science is approached in this way.

Despite it being a very demanding task to define intuition and make a model of it, Sayegh et al. (2004) have constructed the following conceptual model of decision-making under crisis (Figure 21).

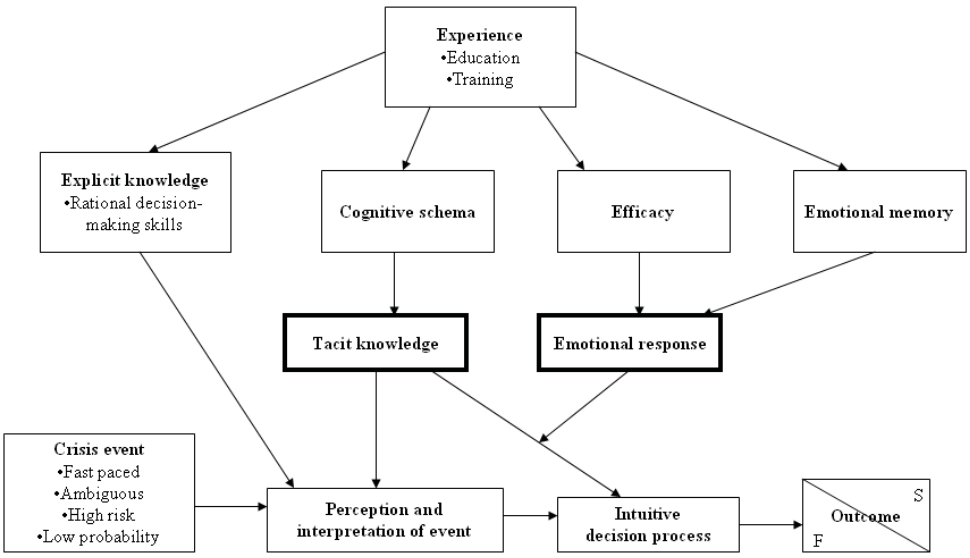

Figure 21 Managerial decision-making under crisis (Sayegh et al., 2004)

This model places great emphasis on the importance of emotions and tacit knowledge in the decision-making process. Emotion is seen as not only being a contributing factor to good managerial decision-making, but it may also be an essential element in the intuitive decision-making processes used in crises. Sayegh et al. (2004) recognise that a manager's explicit knowledge may influence his/her cognitive schemata and tacit knowledge. Emotional memory may influence the manager's sense of efficacy (i.e. sense of self-confidence) based on past successes and failures and their remembered attendant emotions.

Furthermore, Sayegh et al. (2004) conclude that findings in the empirical literature support the value of intuition in organizational decision-making. Khatri and Ng (2000) describe intuition as the "smooth automatic performance

of learned behaviour sequences and often can short-circuit a step-wise decision-making, thus allowing an individual to know almost instantly what the best course of action is." Their study found intuitive synthesis (defined as a combination of experience, judgement and "gut-feeling") to be an important part of senior managers' strategic decision-making. Moreover, the study showed a significant use of "gut-feeling" in strategic decision-making in the computer industry, a benchmark for future-oriented business, organization, and industry for the foreseeable future.

As we can see, decision-making is greatly affected by a change in the environment, the values of a manager, changes in managers, how the manager perceives the business environment, etc. In the current business climate, this could well lead to the question of whether it is possible to make any "mathematical model" of the world or the company or the manager so that any kind of intelligent ESS could be utilized reliably. The question of personal properties is also very valid in decision-making. Additionally, these factors are affected by the situation; if the manager is exhausted, over-energetic, etc. his process of decision-making can change on a daily basis. These factors affect intuition, too. Different executives make different decisions based on their intuition. Hence there is a need for more analytical tools that assist decision-makers in difficult situations. The researcher's own view is that some decision-makers always make the "right" decision whilst some decision-makers always seem to make less favorable decisions for their companies. This would be an interesting research topic to research further.

Intuition plays a key role in many critical situations. The researcher's opinion is that companies should avoid using only intuition and some time should be spent on using analytical tools and methods before any critical decision is made. Agor (1989) quite rightly states that in order to get more productive strategic planning and decision-making processes, an organizational climate is needed in which intuitive brain skills and styles can flourish and be integrated with more traditional management techniques.

The questionnaire technique captures the intuition of the organization for the purposes of the strategy process. At the same time, the organization learns

strategic management and complicated problem management with the aid of the implemented application.

4. EXECUTIVE SUPPORT SYSTEMS IN THE STRATEGY PROCESS

As seen in chapter 2, not much consideration has been given to information systems in strategic planning. Mintzberg (1994a) has especially been very critical in using these systems to support strategy making. A fundamental question during the last fifteen years has been which IT systems should support strategic decision-making and business strategy. One question has also been which IT investments are necessary to support business strategy. A consequent question is what opportunities to do business differently does IT bring. The objective of this chapter is to find out the possibilities to support strategic planning with the means of IT systems. Another issue to be examined is whether intuition, which was discussed in Chapter 3, can be captured with the help of IT systems.

Earlier decision support systems (DSSs) were mainly used by professionals or middle-level managers. These systems were not good enough for the needs of executives. Therefore executive information systems (EISs) and executive support systems (ESSs) were developed. According to a study made by MIT, about half of those using EISs are CEOs, CFOs, and COOs (cf. Turban and Aronson, 1998).

Today, most systems regarded as ESSs or similar systems are very much related to balance scorecard systems. Yet, the same dilemma still exists as before; those systems are really number crunching systems. One of the most well known of these systems is SAP, which has an ESS-module as part of its ERP-software. Naturally, financial performance is one of the key issues for companies, but one should always ask: how should we achieve the set targets? The researcher's opinion is that a company has to have a clear mission, vision and strategy. Furthermore, all the key personnel must be committed to these. This commitment does not come without their involvement. This chapter examines how ESS and similar systems should be defined, and what characteristics they need in order would fulfill these requirements.

Figure 22 shows the relationship between MIS, DSS, EIS and ESS. As we can see, the DSS is the most "advanced" having the most features, while the EIS is mainly a reporting tool.

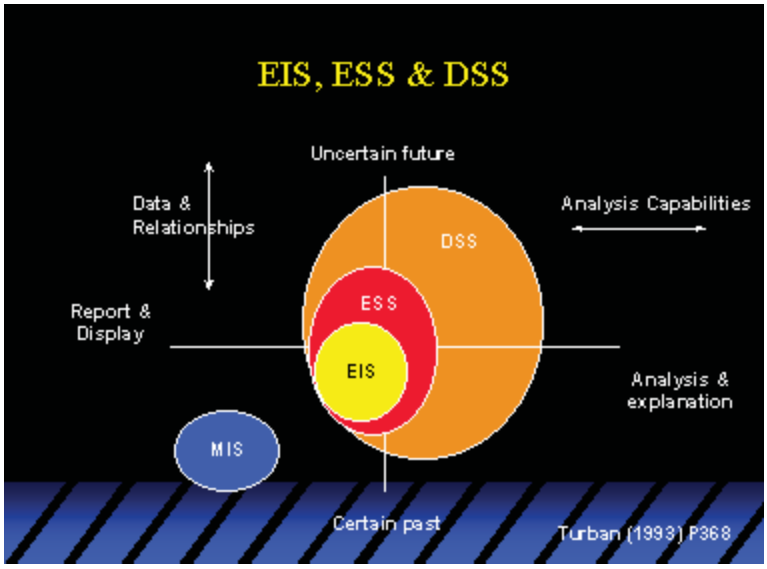

Figure 22 The relationship between EIS, ESS, DSS and MIS (Modified from Turban, 1993)

The latest development in ESS has been in applying new technologies like neural networks and fuzzy logic (King and O'Leary, 1996; Chang et al., 1994; Newkirk et al., 2003; Walters et al., 2003; Magnusson et al., 2005), but no such new executive support systems have emerged. The applications that have been developed are applicable only for a defined problem solving area. This is somewhat surprising because though the technologies are there, no applications have been developed in addition to large ERPs, which are not real ESSs or DSSs and are not at all for strategic management purposes.

4.1 Requirements for Enterprise Strategy Management Software

The use of EISs and ESSs is growing rapidly. Executive support systems (ESS) go beyond EIS, because they include communication, office automation, analysis support and intelligence. According to Turban and Aronson (1998), the decisional role of an executive can be divided into two phases. The first phase includes the identification of problems and opportunities; the second

phase contains the decision of what to do with them. One interesting phenomenon is that there are relatively few articles and books written about ESSs. The researcher's view is that one likely reason for this is that Mintzberg did not find ESSs useful. Only recently, when more and more writers have started to criticize Mintzberg, and also when there has been a rapid adoption of information technology, more discussion on ESSs has followed. Another factor which may account for the lack of literature published on ESSs may be due to the implementation of ERPs like SAP, thus many companies have not seen it necessary to invest in any other software.

Executives use both external and internal information in their decision-making. Internal information is received from functional units like finance, accounting, and personnel. External information can be received, for instance, from the Internet, commercial databases, newspapers and magazines. Turban and Aronson (1998) call this kind of information "soft". However, in order to be able to make the right decisions, executives need combined data and combined information and knowledge. It is also of the utmost importance to scan and filter this information in order to find the most important issues. Mintzberg argues (1994a) that strategy formulation is a dynamic changing process and that the designers are far too removed from operational business practices. However, we believe that by using modern technology, it is possible to build a system within the given framework that can help a creative executive to form new strategies. The information can be transparent and therefore it is possible to see all relevant data needed with hyperknowledge-type systems (cf. Vanharanta, 1995). Mintzberg also states that there is no room for creativity if a formal planning model is used, but in the researcher's opinion the application can be constructed in a way in which there is still place for some creativity within the given strategy framework. In all the answers given by the respondents, as well as in the final strategy of the top management, intuition is captured. This is important because new aspects of the strategy are elaborated. This opinion is supported by Fahy (2002) who states that strategic planning has to change from a sequence of planning events to a business process whose outputs are captured in organizational information systems, from which planning can be followed up by implementation, results measurement, and organizational learning.

Vanharanta (1995, p. 3) has commented on Mintzberg's fallacies of strategic planning in the light of strategic information systems:

> *"Faced with the aforementioned problems, strategy makers continually express the need for comprehensive, reliable, comprehensible and commonly assimilable information that they can use to monitor, diagnose and analyze the current performance of their organization and to estimate its future potential."*

According to Turban and Aronson (1998, pp. 391-394) there are four formal approaches to finding the executive's information needs. Many other authors such as Feinberg (2005) refer to Wetherbe's (1991) and Watson and Frolick's (1993) methods, which seem to be the most significant ones.

1) Wetherbe's approach is a two-phase process. The first phase consists of structured interviews which can be conducted with three different methods, i.e. IBM's Business System Planning, critical success factors, and ends/means analysis. In the second phase, prototyping is used. After the information requirements have been found, a prototype of the ESS is quickly made and is then presented to the executives who make the necessary improvement proposals. The testing and modification continues until the detailed requirements have been determined.

Executives are part of the planning process in this method. However, this method is time consuming and expensive and may require many iterations before executives are satisfied.

2) Watson and Frolick's approach is based upon the following basic strategies for defining the information requirements:

- Asking (the interview approach as described above)
- Deriving the needs from an existing information system
- Synthesizing from characteristics of the system
- Discovering from experimentation with evolving systems that are used (prototyping)

3) Another way to find the executive's information needs is through Volonino and Watson's Strategic Business Objectives (SBO) Approach (Volonino and Watson, 1991)

This method tries to solve some of the deficiencies found in other methods, for example, ignoring executives' needs for soft information and identifying the timeliness requirements of information, and the possible independence of information and specific executives. Soft information refers to information that is fuzzy, unofficial, intuitive, subjective, nebulous, implied and vague. This is quite close to intuition as presented in Chapter 3. Yet this method shares a problem similar to the two other previous methods, i.e. only the executives and ESS-specialists participate in the system design. Of course many consultants are most probably involved, but when seen from the company's organization as a whole, only a few levels are actually involved. In practice this means that only a limited number of related topics are most likely to be discussed, although in the SBO method other non-measurable targets may also be set. However, this method does try to capture soft information. Thus Watson and Frolick (1993) regard this method as better than critical success factors, because it requires a completely new way of looking at an organization, and after people have understood this, this generally leads to results.

The SBO approach consists of six steps:

- To determine the organization's SBOs
- To identify related business processes
- To prioritize the SBOs and their related business processes
- To determine the information critical to each business process
- To identify information linkages across the SBO in business processes
- To plan for the development, implementation, and evolution of the system

SBO is good for organizations that undertake business process re-engineering. With the use of this approach it is possible to build an enterprise-wide system, yet this requires a lot of co-ordination of communication between executive users and ESS developers.

4) Stein (1995) presents the information success factors approach. In this model, an organization's business goals are linked to business strategies and to leadership strategies. Ideally an executive guides the design of systems that meet his information needs and work requirements.

There are several important terms and topics related to ESS. One of the most important features is that by using it, drilling down is made possible. By 'drilling down' we mean the ability to achieve a detailed level of data by clicking a number or a chart. When a country's data is available, for example, it is then possible to drill down to a regional level.

Other characteristics of an EIS/ESS include:

- Critical success factors
- Status access
- Analysis
- Exception reporting
- Use of graphics
- Navigation of information
- Communication

The future EISs and ESSs most probably look very different from those systems of today. Technology evolves and the demands of executives will increase. One key topic in the development of the systems is their ability to support the creativity of human beings. However, an executive has to firstly be creative enough to utilize this feature. The following is a list of some features that will most probably be built into future EISs/ESSs (Turban and Aronson, 1998; Feinberg, 2005; Wagner, 2004; El Sawy, 1985; King and O'Leary, 1996):

- A toolbox for building customized systems
- Multimedia support
- Virtual reality and 3-D image displays
- Merging of analytical systems with desktop publishing
- Web-enabled EIS/ESS
- Automated support and intelligent assistance
- Integration of EIS and group decision support systems
- Global EIS/ESS
- Better access (via PDAs and cell phones)
- Merging of analytical systems (OLAP / multidimensional analysis) with desktop publishing
- Multi-tier architecture
- Integration and deployment with ERP products
- Data capture, recording, and reporting capability for all relevant data objects within the strategy
- Groupware for brainstorming, idea sharing, idea categorization, and idea prioritization. These components are not part of typical planning software, but are part of separate group support systems

- Workflow tools to structure the strategy formulation and implementation workflow. Workflows are nowadays a part of many typical planning software products
- Use of intelligent and autonomous agents

The hypertext applications presented by Conklin (1987) and Nielsen (1990) enable the easier use of DSSs. Hyperknowledge and its use in DSSs and ESSs has been studied by Chang et al. (1993, 1994), Walden and Carlsson (1995) and Vanharanta and Chang (1996). These researchers have started to analyze the link between the systems, human beings and the surrounding environment. Intuition plays a key role in strategic planning and cannot be substituted by computers, but the systems can "learn" more than individuals. With rescriptive methodology it is also possible to support strategic decision-making with fewer technical solutions. It is important to understand that the human memory system, motivation system, and interpretation systems often need very simple activation. How this kind of activity support can be embedded in computer applications is crucial in our theoretical approach. Although the systems can learn many things, they are not as creative as human beings – at least not yet.

Mockler (1993) states that in a rapidly changing business environment it is necessary to quickly collect, analyze, and use information. Shaw et al. (2002) discuss the use of strategic stories instead of plain bullets in the strategy process. This approach is closely related to the subject of this thesis and shows that the thinking behind the methodology as such has been thought of earlier, although no tool was available. The perception of the respondents is recorded in this way. Porter (2002) and Shapiro and Varian (1999) have studied the effect of the Internet in strategic planning, but mainly from a practical point of view of implementing strategy, but not in planning it.

Our planned and built tool has taken most of these requirements into consideration, but it excludes a workflow tool. Additionally, at least the following requirements should be added:

- Ease of use: this is a key element for a successful decision support tool. High level executives do not have the time and patience to learn and use systems which are too complicated.
- Easy analysis of data (data mining).
- Visualization of data and remote sensors.

- Implementation of strategy maps: Strategy maps, as developed by Kaplan and Norton (2004), are a very useful tool in the strategy process and should be part of the application.
- Good analytical tools: In the world today there are huge amounts of data available. This data exists both in text and numeric format. Numeric data can be easy to analyze, but textual data and combined data are very difficult to analyze with existing tools.

4.2 Commercial Applications for Strategic Planning

In 2001 CFO.com made a vast study of commercial software packages for strategic planning (cfo.com, 2001, Top providers of budgeting and planning systems, http://www.cfo.com/charts/1,5520,b|1|122|142|3,00.html). Also, many companies offering BSC (Balanced Score Card) software were available. However, most of these packages concentrate on planning and budgeting. Some of them focus on BSC implementation and business forecasting. According to CFO.com's study, only two of the studied software packages included strategic planning. More recently, however, a couple of new strategic planning applications have come on the market. The most promising application seems to be the one developed by the Finnish company Fountainpark. This application utilizes web-technology in collecting data from the organization.

Furthermore, even when reading very recent articles and literature, it is obvious that at the time of writing no real software for strategic planning exists, although the need for it had been identified years ago. Of course, one can also ask whether the need has really been so high after all because if the demand had been strong enough, surely someone would have built such software already. On the other hand, many authors state that because this kind of software must be simple enough for executives to use, this could account for the failure of any previous attempts to create such a program.

Table 8 lists some of the features supported in the present software packages.
Wagner (2004) states that in 2002 there were only two software packages available that targeted phases 3 and 4, i.e. Active Strategy's Active Strategy Enterprise, and NextStrat's NextSTRAT. These packages contain strategic planning templates, SWOT-analysis, competitive analysis and so on. Figure 20 presents some features of three different editions of Active Strategy's software

(Activestrategy, 2004). Figure 23 presents three versions of Active Strategy software. The main pitfall of this system is that it is mainly a balance scorecard application, i.e. although strategy maps are part of the system, most of it is there for the follow-up of financial targets. As a consequence, much of the intuition in the organization cannot be captured. Basically, with Active Strategy's software it is possible to implement both bottom-up and top-down strategies.

Table 8 Software Support for Strategy Management (Wagner, 2004)

Software support for strategy management		
Planning process supported	Vendor / application example	Functionality
Phase 1-2: financial planning, resource allocation, initiative planning	J.D. Edwards financial planning and budgeting	Multi-level budgeting, actual-to-budget, long-range financial planning (beyond one period), what-if analysis
	Comshare Management planning and control (MPC)	Planning, budgeting, consolidation, initiative planning and management reporting
Phase 2-3: strategic planning based on a defined set on strategic factors in four key areas	CorVu RapidScorecard	Balances scorecard (part of a suite of reporting, analysis, business intelligence and modelling tools)
Phase 3: strategy formulation	Active strategy Active Strategy Enterprise	Balanced scorecard for monitoring. Various templates for strategic planning, such as SWOT on core process analysis
Phase3-4: strategy planning, alignment, implementation and reporting	NextStrat NextSTRAT	Encompasses entire process of strategy formulation, alignment, implementation and tracking, using proprietary methodology

These phases are somewhat similar to those defined for strategic planning in Chapter 2. Interestingly, no other writers have made a similar literature study on this topic, as far as the researcher has found. This raises the question of whether new tools also enable a completely new approach in the phases of strategic planning. By combining some of these phases, we come closer to the concept of continuous strategy. It is obvious that the implemented tool makes this kind of approach possible.

Wagner (2004) has studied the use of enterprise management systems (ERPs) in practice and has concluded that there are three different cycles.

Cycle 1 is the planning cycle when a senior-planning team, possibly supported by consultants, convenes to define or re-define the strategy: the iterative 3-cycle model. At the end of this cycle, the strategy resides in the system in a well-structured form, from where it can be shared and re-used, distributed in the form of printed reports, or extracted via queries.

Cycle 2 is an integration cycle, consisting of both technical and organizational integration activities. At the organizational level, issues such as leadership roles and responsibilities for measures and targets are negotiated and agreed upon, while at the technical level, access points are set up for the proper data sources. For example, depending on the organization's definition of 'revenue' or 'ROI', the data items accessed and computed can differ significantly.

Cycle 3 is a monitoring, measurement, and 'control' cycle similar to strategy measurement via BSC systems. The main advantage of having an integrated system where Cycle 1 (and Cycle 2) are carried out, is that any implementation's under-performance can be linked back to the planning model. Hence, the impact of missed targets within the strategy can be better understood, and can be potentially used to trigger a new Cycle 1 (plan revision), as part of a closed-loop planning model.

These cycles are very much the same as the phases in Table 8, and can also be implemented with an ERP-system like SAP. At least some of the intuition and knowledge of different organizational levels is captured in this process, however not as much as the researcher believes is important and necessary.

Edition Component Table	Scorecard & Dashboard Edition	Deployment Edition	Enterprise Edition	
Rapid Scorecard Creation	●	●	●	
Core Scorecard Reporting	●	●	●	
Stategic Initiative Linkage	●	●	●	
Measure Trend Graphing	●	●	●	
Strategy Mapping	●	●	●	
Open User Access (Non-personalized)	●	●		
Multiple, Linked Scorecard Creation		●	●	
Measure Roll-up And Calculation		●	●	
Personalized User Views		●	●	
Ownership Security Profiles			●	
Full Initiative Management			●	
Variance Report Alerting			●	
Scorecard Exception Reporting			●	
Standard User-based Web Reports			●	
Email Alert User Notification			●	

Figure 23 Active Strategy's software components (Activestrategy, 2004)

Brignall and Ballantine (2004) have also studied new directions for management systems, but they think that this kind of system should be built around ERP, and at the same time there should be organizational change. The researcher strongly disagrees with both of these points. First of all, ERPs are too heavy and rigid as systems for strategic planning, and secondly, systems should be built so that they support all kinds of organizations. When a new system is being installed everyone has to be committed to it, but one cannot change the whole organization due to a new system. A good example of an ERP is SAP.

SAP has a balanced scorecard application for Strategic Enterprise Management in its software package, see Figure 24. ERP is a typically corporate-wide integrated information system that covers all company functions from finance and accounting to plant maintenance. However, this application is built around

ERP software and is more of a number crunching tool. Wagner (2004) regards some reports of SAP as just an extension towards ESS, but he does not see it as a real ESS. Furthermore, in real life many people regard SAP's solutions difficult to use and possibly too complicated for busy executives. This is based on the researcher's experience in several companies and from discussions with many SAP users. Based on this fact, it is hard to believe that in practice it is possible to capture the intuition or tacit knowledge of an organization with this system. However, SAP is developing all the time, so this may be possible one day.

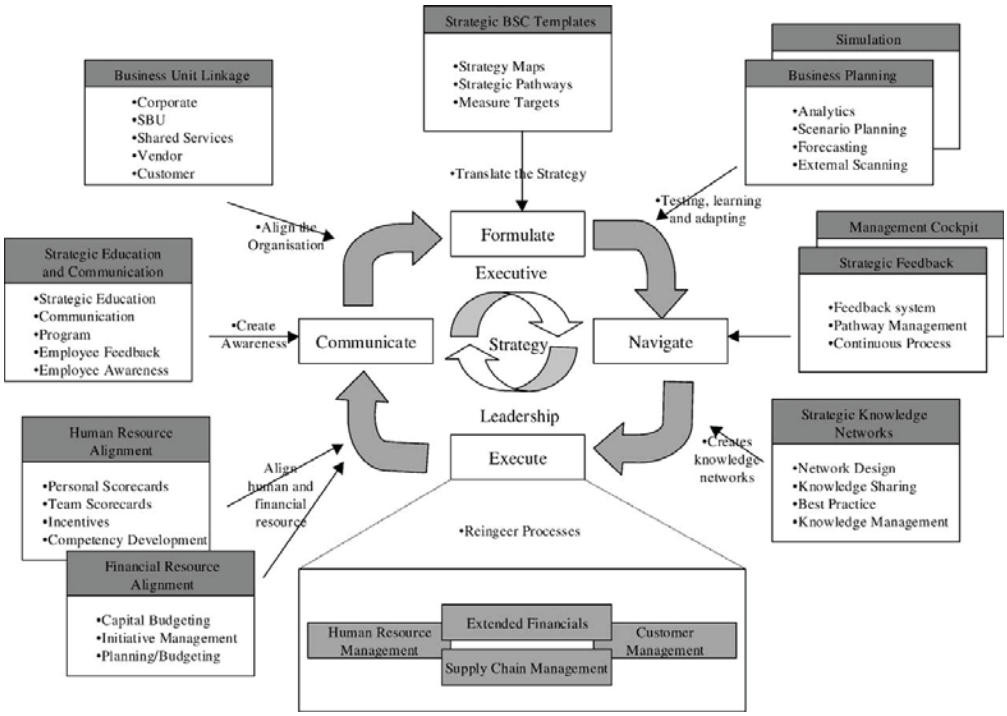

Figure 24 SAP's balanced scorecard solution for strategic enterprise management (Norton, 1999).

The cost of Active Strategy's projects is between 50.000-400.000 USD per implementation. In addition to this, all inputs from the company itself have to be counted. SAP's implementations are much more expensive.

4.3 Data Analysis Tools and Data Processing for Decision-Making Purposes

Information technology has brought along many new possibilities to analyze and process data in various formats. Previously, it was mainly only possible to analyze numerical data, but more and more applications for analyzing textual and written data have now also been developed. However, the software requirements are also becoming more and more demanding. Software developers have responded to these demands and have developed increasingly better tools that give many more possibilities in ways of analyzing data than previous systems.

In this section, some of the main methods for the strategic analysis data are described. The goal is to find the most suitable methods and study how they can be utilized in this research and in the case studies.

The main emphasis of this section is on using SOM and intelligent agents in analyzing strategic data. A new kind of text analysis tool has also been designed during this project at the University of Joensuu. This analysis tool immediately shows short answers, whilst SOM tools assist in analyzing long texts and large amounts of data.

Computational intelligence has been studied a lot (Feigenbaum, 2003; Tsakonas and Dounias, 2002; Bonissone et al. 1999). A lot of useful information about intelligent computation systems is available in Mikko T. Kolehmainen's doctoral thesis (2004). He divides computational intelligence into the following subcategories:

- hybrid computational intelligence
- data mining

An interesting phenomenon is that only this year (2005) has there been more and more articles about the use of these new technologies in data analyzing and decision-making. Common to all of these articles is an application that has been developed to support decision-making in a specific area such as

manufacturing investment decision, linguistic analyses, medicine, etc. (Tan et al. 2005, Nute et al. 2005, Bordogna et al. 2005).

'Computational intelligence' (Bedzek, 1994) refers to a system that deals with numerical (low-level) data only, has pattern recognition components, and does not use knowledge in the artificial intelligence sense.

Pal and Pal (2002) put the following requirements on CI (neural networks, fuzzy logic, etc.):

- Considerable potential in solving real world problems
- Ability to learn from experience
- Capability of self-organizing
- Ability to adapt in response to dynamically changing conditions and constraints

This thesis does not explore the theories of CI in-depth, but it does see it as a good piece of technology for future development. For the purpose of this research, it is important that the systems look forwards and learn, c.f. the prescriptive method, and that we can extract and use these systems for intelligence generation internally and externally. Therefore, later in this thesis neural networks are studied more closely.

Data mining has become a very popular term after many database suppliers have developed tools for building large data warehouses. These have become so huge that there has been a need to develop tools to group and analyze the data they hold.

For example, according to Hand et al. (2001), a data mining process consists of the following steps:

- Exploratory data analysis (EDA)
- Descriptive modeling
- Predictive modeling: classification and regression
- Discovering patterns and rules
- Retrieval by content

The first three steps are related to model building. This thesis utilizes existing tools developed for data analysis, so the main goal is to be able to process the

existing data into an understandable and easy to use format. Practical studies of experiences in this area have been conducted by Kloptchenko (2003), who has also found that data mining works well with long documents.

Another area of technology that will be useful in the future development of the application is the neural network. Its role will be significant in data analysis and forecasting especially (Haykin, 1999; Kohonen, 1997; Kolehmainen, 2004).

A subset of neural networks is the self organizing map (SOM) algorithm which plays an important role in planned applications when analyzing the position of a company. Kohonen initially developed these concepts and they are one of the best known unsupervised learning methods. In unsupervised learning, there is no teacher or critic to oversee the learning process.

4.4. New Trends and Ideas for Next Generation Executive Support Systems

An Executive Support System (ESS) also includes, in addition to the system itself, people, knowledge and data. As discussed earlier, the present systems are not intelligent enough to take into account the multiple needs of managers, and are not suited for supporting the multiple senses needed for managerial intuition.

Furthermore, the dynamics and the turbulent nature of the business environment have increased considerably during the last few years. Globalization has also brought people closer together and therefore the need for increased data, and especially its analysis and filtration, have become increasingly important. Managerial decisions have to be made faster than ever before and still the decisions have to be good enough to enable successful business.

However, whilst the technology develops, information technology may soon be a usable medium for human intuitive perception and action. Intuitive computers are not, however, as yet a reality. Despite this, the objective still remains to combine human-dependent factors like intuition, wisdom, judgment

and experience, with both company-dependent issues such as visions, goals and targets, and with a computer's capacity to analyze and use simulation and scanning. This goal is one of the greatest challenges for designers of ESSs. Kuo (1998) states that, on one hand, we can design sophisticated programmable systems where everything is possible but nothing is easy, while on the other hand, we can design such systems with which all things are easy but nothing is possible. This dilemma can be resolved by developing ESSs that fits the ecology of managerial work. By 'ecological ESS' we mean an ESS that interactively facilitates visualization, exploration, interpretation, reflection, understanding, and eventually sound decision-making, all of which takes place while the manager thinkingly acts. Also to be taken into account, are the motivational systems, automatic systems, memory systems and interpreting systems of the human being. They form an integral part of the manager's perceptual and action fields where managers can function with ease on their mental models of the environment in which the problem is situated. All these factors have to be placed into the context of the environment of the decision-making, also taking into consideration the situation and time in which the decision is being made. Therefore, a lot of attention has to be paid to the design of the interface between the ESS and the manager and that between the ESS and the overall business environment.

The new application would probably use the latest information technology and management, i.e. the Internet, intranets, neural networks, fuzzy logic, resource and value based management, knowledge management, etc. With this new technology many tasks can be automated. This means that it would be easy to use the right business issues and concepts with a mouse click, it would be possible to scan the latest business information, to use multimedia and so on. The application would possibly operate in a way in which the executive answers the questions presented by the system. It would also therefore support strategic learning and knowledge creation. Executives could make intuitive strategy proposals which are seen on screen. Thereafter, a common strategy could be drawn up after the necessary discussions with the team members have taken place. Hence, the first step in this work is to develop a theoretical framework, define enough strategic questions and make the first prototype. To

proceed to this stage is not difficult, but it may take years of work and development to get the final application ready.

Based on the above, we decided to establish the "BrainPoweri" project to define the scope and content of a new type of strategic decision support system for executives. The researcher had a vision for the new system in the late 1990s. This provided the guiding framework for the new application developed. Over the years, new and more concrete IT-related ideas emerged and were implemented.

This chapter has presented the necessary requirements for Executive Support Systems. In the literature available, there have been few writers who have studied this topic and even fewer applications available in the field of commercial software. However, information technology is rapidly developing and there are now new technologies available (SOM, data mining, etc.) that help in developing evermore sophisticated ESSs and DSSs. Regardless, no commercial software is as yet available and therefore partly for this reason, this thesis and its related development work have been initiated. Table 9 lists some of the new technologies and how they are implemented in existing products.

Table 9 New Technologies and Existing Strategy Applications

	Data Mining	Text Mining	SOM	Woven strategies	Strategy Map
Phase 1	Financial planning software packages				
Phase 2					
Phase 3	SAP				Active Strategy, SAP
Phase 4		Woven strategy tool	Positioning tool created for the project	Woven strategy tool	Woven strategy tool

Table 9 compares various strategy applications and the different technologies they use. Phases in Table 9 refer to those presented in Table 8. The Woven

Strategy tool refers to the new application developed here, which is presented in more detail in Chapter 6. As we can see, there is still a lot of development potential in the Woven Strategy tool. Table 7 shows, first of all, that there is no integrated tool which supports both a company's strategic planning and financial planning. Furthermore, SAP is nowadays more or less a standard in the financial planning of large corporations and as an enterprise planning system (ERP). Real tools for strategic planning as such do not exist. The developed Woven Strategies tool is the first step in this direction.

5. QUESTIONS

One of this research's theses was that questionnaires can be utilized in strategic planning. In order to be able to understand how questionnaires can be made to capture the intuition and organizational knowledge for the benefit of strategic planning, one has to analyze what kind of questions should be used in this context and what kind of IT system can be used for making the questionnaires.

For several years Nadler and Chandon (2004) have studied the problem of how to translate the gift and intuitive precepts of holistic thinkers' thinking into a repeatable process that others could learn and use in their daily lives. Based on their study, they have created a method that they call SQA (Smart Questions Approach). The core of their approach was the fundamental premise: Ask questions.

> *"This concept is rooted in what we learned from leading thinkers: that the best way to begin approaching any problem is to ask question to gain appropriate knowledge and wisdom."*

Marquardt (2005) has researched companies for years and has analyzed why some leaders are better than others. He has found that successful leaders use a lot questioning in their management.

Great philosophers like Socrates and Plato also asked many questions. Plato also wrote a lot, conveying Socrates' message in his dialogues. Socrates turned everything into a question and he refused to accept nothing less than an adequate account of the nature of things. Additionally, children learn a lot by asking their parents and friends things all the time. This is how people develop themselves.

In management science, executives can practice their jobs much more efficiently by asking their subordinates and organizations questions. This helps to build up knowledge of the status and feel of the organization much better than by just reading reports showing financial data.

Chapter 6 presents the requirements and modules of the new application (the Woven Strategies tool). In this chapter the focus is on the nature of the questions within the Woven Strategy tool.

The strategic questions that are used in the Woven Strategy tool have been grouped by the function of the company and will be analyzed as such.

Financial data is still excluded, because the application's purpose is to collect the intuitive side of the decision-making, to figure out how much intuition is included in the strategic decision-making and how much of it is based upon figures and financial analysis. However, financial data can be analyzed with the positioning tool and in the near future a new financial analysis module will be integrated into the application.

The questions are grouped as follows:

- Basic information about respondent
- Strategic management
- General management
- Marketing management
- Production management
- Logistics management
- Human resource management
- Research and development management
- Information technology and information systems management

For each of the above functions, a set of questions was collected from the literature. The goals of the questions were set as follows:

- To show each company's business strategy level
- To measure and describe the degree of implementation of a company's strategic objectives
- To measure and describe innovation and intuition behind answers
- To structure intuition
- To point out new business strategy
- To create new business

To some extent the questions also include those which are not of a strictly strategic nature, but are relevant to the strategic decision-making process.
An example of these questions is presented in Appendix 1.

6. THE EXECUTIVE SUPPORT SYSTEM APPLICATION

As made evident in Chapters 2, 3, 4 and 5, the strategy and strategy process concepts developed earlier neither utilize information technology nor capture the knowledge of the organization in order to improve the created strategy. Therefore, a challenge was undertaken to create a completely new type of strategy planning application tool that would contain predefined strategic questions to make the strategy process and strategy implementation more effective. The goal was to get the organization involved in the strategy process, thereby ensuring its commitment to the drawn strategy. This idea was tested afterwards with the Woven Strategy tool.

One of the biggest challenges in this is related to the development of the software. In the beginning commercial software for question-making was used, but it was subject to many restrictions and deficiencies. It used a relational database and had a web-browser based front-end. The database was located on a server and users could enter their answers to the questions with the browser from anywhere they wished. The questions could easily be entered and modified in the system, and each company could have its own set of questions. The Woven Strategy tool therefore makes the strategy process much more efficient than before.

6.1 Requirements for a New Application

With the Woven Strategy tool it should be possible to improve executives' strategic thinking. They should be able to learn the strategy process through answering the questions. Hence, we could utilize their intuition, experience and knowledge creation capabilities as described in Chapter 3. The new system should also help organizations to focus on the right things and to motivate continuous learning and strategy development, thus improving their skills and experience (cf. Kuwada, 1998). The executives could focus on the key areas of their business and motivate themselves and their organizations. During this process, they should be able to form strategic insight into the company and, by

collecting data and knowledge from their external business environment, furthermore focus their visions.

Chapter 2 showed that the existing strategy approaches and processes do not utilize the possibilities available today by using the latest information technology, as presented in Chapter 4. There is also a clear divide between the planning of the strategy and its implementation. Even Mintzberg argues that analytical tools and means are not very useful in the strategy process. The planned approach aims at reducing that gap by rethinking the strategy planning approach and also by using the possibilities given by the technology today. However, as discussed in Chapter 4, the present systems available for companies to use do not support strategy planning processes very much, nor do they support the possibilities to gather information from the organization. It is also obvious that by using modern ICT, it is possible to rationalize the strategy process. There is a need both for analytical thinking and intuition in strategic planning, and not only from those of the top management but from all organizational levels. This has been the main driver when setting requirements for the new application and strategic approach. Chapter 4 also showed that the present commercial applications do not really support the Woven Strategy methodology.

In our work, the main question has been whether predefined questions can be used in solving strategic problems. We should easily be able to find questions that are related to and helpful in daily decision-making. We propose to create a framework where it is possible to search for strategic questions, to create them and to offer strategic statements. Basically, while the strategic questions remain the same, the answers change depending on the environment. In building the system one should automate as many tasks as possible. As it has been shown, there is a big leap from DSS to ESS, although neither is yet good enough to suit our requirements. Weber and Konsynski (1988) have suggested dividing the decision-making process into five steps and they have proposed architecture to support the functional requirements of these steps. Table 10 presents their 'problem management' approach.

Table 10 Problem Management (Weber and Konsynski, 1988)

Problem management stage	Functional requirement	Architectural support
Problem finding	Perceptual filters, knowledge management	Flexible knowledge management, intelligent filters
Problem presentation	Model and pattern management, suspension of judgment	Flexible dialog and knowledge management reason maintenance system, pattern search strategies
Information surveillance	Knowledge and model management	Demons, intelligent lenses, scanners, evaluators, interpreters
Solution generation	Knowledge management, idea generation	Idea and solution model management, heuristic and analytic drivers
Solution evaluation	Meta-level dialog and knowledge management	Flexible knowledge management, analytic and symbolic processors

For the moment, there is no theory or practice that even directly supports our approach.

One problem we do face is that if we have constructed all the relevant questions, how they can be modified according to the situation?

Examples of the types of questions we can use are:

- What is our present situation?
- Where are we now?
- Why are we here?
- Where could we be?
- How can we get there?
- Do we have clear goals, objectives and an overall strategy?
- How do we define our objects, goals and our overall strategy?
- What are our competitors doing?

First, these questions should *cover all areas of strategic management and all functions (management, marketing, R&D, production, etc.) of the company*. The question framework would be a kind of multidimensional map. These questions can be collected from the literature, and experts, executives and other managers can modify them. This approach would most probably also improve the knowledge management and learning process of the company.

Secondly, our framework encourages participating executives *to take the opinions of other members of the executive team into account*, because in the final phase of decision-making they are forced to interact and communicate, and reach a common insight or a consensus on the issue under discussion. Therefore, what is in question is interaction and group decision-making. This, in turn, enhances learning through participatory strategy formation (Venugopal and Baets 1995). In this sense, the framework resembles that of group decision systems.

Thirdly, the executive always has to *think of the whole company, the whole decision-making process and the consequences of each decision* for all affected areas, products, personnel, etc. before the final decision-making and its implementation. One has to consider all the possible alternatives. With ESS it is possible to analyze these options.

Furthermore, the system should *support the prescriptive method and be able to calculate, for instance, the NPV of each choice and integrate the real-option method.* The timing of the implementation is often crucial and critical. This poses a real challenge for the system development work, because it should be able to take into consideration the internal and external business environment and how the business situation changes with time. Yet we cannot ignore other human-related facts which derive from decision-makers. These factors include wisdom, intuition and experience. The system created must be able to combine these with analytical, scanning and simulation tools, using the company environment as a starting point.

As the whole business environment changes, the value chains are being completely restructured in many businesses. The Internet replaces the

"middleman" in many cases. A company must be able to find these alternative supplier chains.

Another area of software that is developing is idea generation software. Turban and Aronson (1998) state that:

> *"A key feature in idea-generating software is the bombardment of the user with many ideas. This is critical because it helps the user move away from an analytical mode and into a creative mode. Psychological research indicates that people tend to anchor their thoughts early in their problem-solving endeavors, using their first ideas as springboards for others. The drawback is that subsequent ideas may not be significantly new, but simply minor variations of the original idea. Because brainstorming software is free from human subjectivity, it can help broaden the thinking platform to encourage truly unique ideas to emerge."*

A possible future problem is that when a system is capable of learning and adapting its decision-making rules to reflect the operating environment, it will lose its freedom from subjectivity, so that in behaving more like a human being the system would also be likely to inherit unwanted human properties such as learning rules that are close to the decision-maker's own opinion. This way we can compile a rescriptive system that supports continuous strategy in one application.

Before the application development starts, it is of the utmost importance to develop the descriptive part of the system from common discussions. One way to create questions is to analyze the way in which children learn to do things and ask questions. As already mentioned, we believe that within the given framework, it is possible to develop a system in which creativity can be taken into account, thus also taking into account Mintzberg's fallacy which states that analytical methods alone cannot lead to a synthesis in strategy making. This is tested in the case studies.

The Woven Strategy tool is such that the respondent, as well as the questionnaire makers, can reside anywhere where Inter-/intranet access is available.

However, one of the most important criteria when using this kind of system, especially when dealing a company's strategic issues, is data security.

As it became obvious that commercial software is not internally transparent and flexible enough, a decision was made to build our own software that would enable all the necessary links to other required systems. These systems could be a company's financial and business intelligence systems, competitors' web pages, any web page that contains interesting and relevant data for the company, etc. In the beginning, when starting to design the system we had the following prerequisites:

- the software must be usable for small and multinational multi-site corporations
- as organizations change, the system must be flexible enough that no reprogramming is required after changes in company structures and organizations
- the software must be open enough so that it can easily be linked with other applications, making extra data transfer unnecessary
- the system must be easy to use
- the system must be web-enabled
- the system must be open for easy linking with other systems
- the latest IT must be applied

There are six main stages when creating a new strategy with the application. Figure 25 shows the first stage, *the positioning tool,* which is a separate tool and will be discussed in detail in the next section. Including the positioning tool stage, there are six stages altogether in the strategy process. In the first stage the financial and competitive position of the company, as compared to its competitors, is analyzed. In many cases, although a company may make a SWOT-analysis, for example, the real competitive position of the company is often different from what the company's management thinks. The first stage in the Woven Strategy process consists of collecting external data, whilst all the following stages consist of internal data and analysis. In the second stage, the *questionnaire* is created using the strategic questions in the database. This questionnaire is sent by e-mail to the respondents. The answers can then be viewed either with the *questionnaire tool* or with the *analysis tool*. In the third stage, the answers are analyzed with the analysis tool. This tool shows all the textual answers as well as the quantitative answers, presented in bar diagrams. In the fourth stage, the *planning tool* is used to create a strategy concept map.

The most important issues for strategy making are selected in this stage, though usually at this point the number of persons that participate in the strategy process is limited. In the fifth stage, the strategy makers can create more detailed texts about the selected strategic topics by using the *dialogue tool*. Finally, in the sixth stage, the written texts can be combined into a new strategy by using the *Woven Strategy tool*. All the work done during this process remains stored in the database for further use.

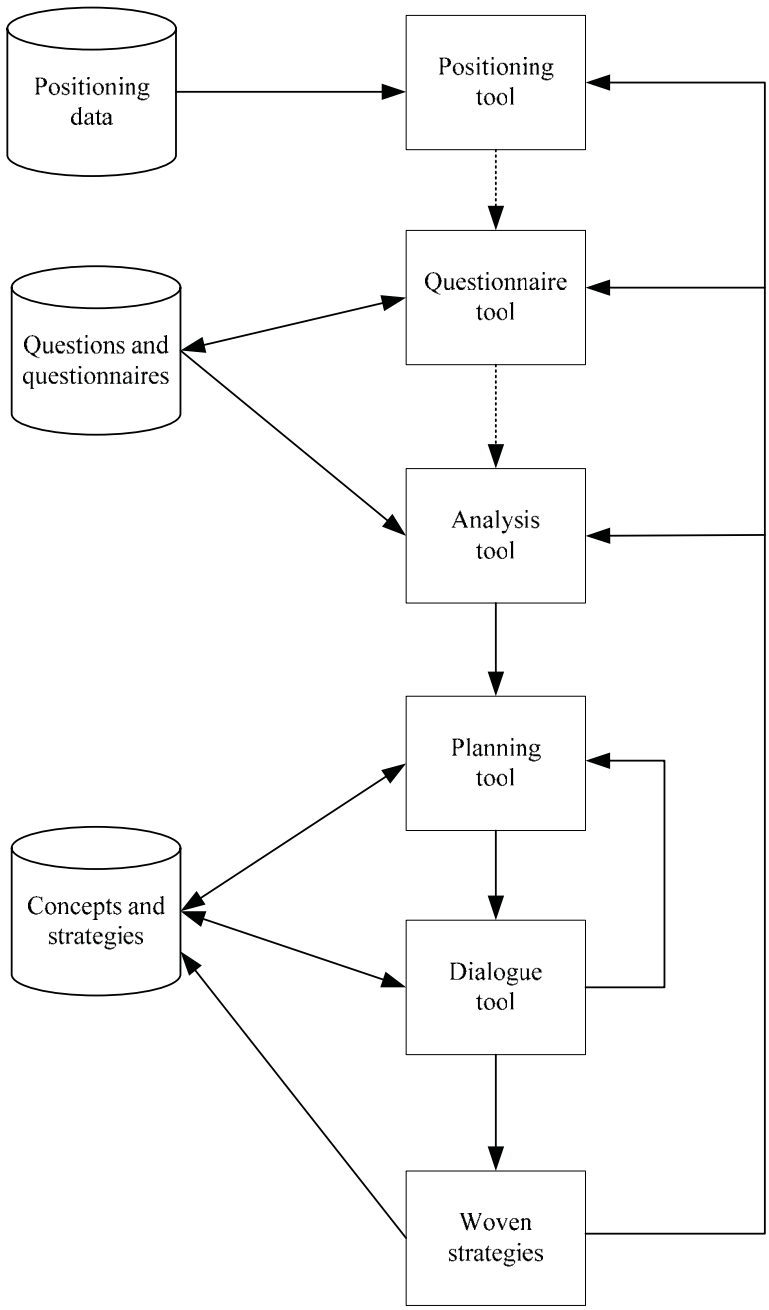

Figure 25 Stages of use of the Woven Strategy tools in the Woven Strategy process

The Woven Strategy tool is used to enable the Woven Strategy approach, i.e. strategy making by the bottom-middle-up approach. This approach would take a lot of effort in any organization, if no tool was available. As seen in Chapter 2, most of the prevailing approaches are top-down and thus lack any input from the organization. Therefore, the top decision-makers knowledge does not increase and there is no more data for intuition.

6.2 The Positioning Tool with External Analysis

The positioning tool gives a visual presentation of a company's financial position in regard to that of its competitors. With this tool, it is easy to see the strengths and weaknesses of the company and how the company has been performing over the years when compared to its competitors. This tool provides a useful starting point for strategic planning, making it easy to start thinking about and setting targets for different business lines in the company.

A SOM application was developed for this research, for one corporation operating in the metal industry. Using this application it was possible to:

- find out the present position of the company in relation to other companies in the same industry
- make a competitor analysis with financial key figures
- find out the changes in the company's competitive position
- simulate the future financial position of the company

The benefit of this kind of system is that it is very visual and provides an easy to read format that quickly gives an idea of the company's competitive position to the decision-makers. One of the disadvantages is that, for the moment, an executive cannot update the system alone, without an expert's help, but that will most probably be possible in the future when these types of applications develop.

In the examples presented in this chapter, a lot of data for certain industrial sectors has been collected; initially manually collected from annual reports, and then automatically collected from the Internet. The data collection and analyzing process is presented in Figure 26. This example uses data from various large telecommunication companies (Eklund, 2004).

Neural networks and self-organizing maps provide a viable solution to analyzing and visualizing the current financial position of a company.

The methodology has been developed by Eklund et al. (2003) who have written several papers on this topic (Figure 26).

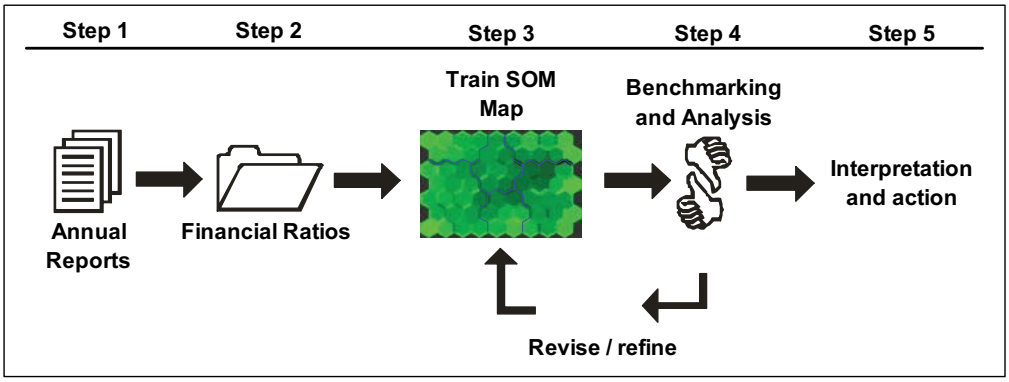

Figure 26 SOM-methodology for financial analysis (adapted from Eklund, 2004)

On the aggregate level, the methodology can be defined in this context as follows: the data that has been analyzed is financial data. The financial ratios that have been analyzed are:

- Return on Equity
- Operating Margin
- Debt to Assets
- Dividend Payout
- R&D to Net Sales
- Cash Flow to Net Sales

In short, these steps are:

Step 1 – Collection of the annual reports of the companies to be included in the benchmarking.

Step 2 - Calculation of financial ratios for the above-mentioned companies in order to measure their performance.

Step 3 - Training of SOMs based on the data. Before this, all data must be in a uniform format in order to ensure that comparison is made between correct figures.

Step 4 - Analysis of the resulting map.

Step 5 – The final SOM model that can be used for benchmarking and interpretation.

Figure 27 presents two-dimensional layer maps that have been created:

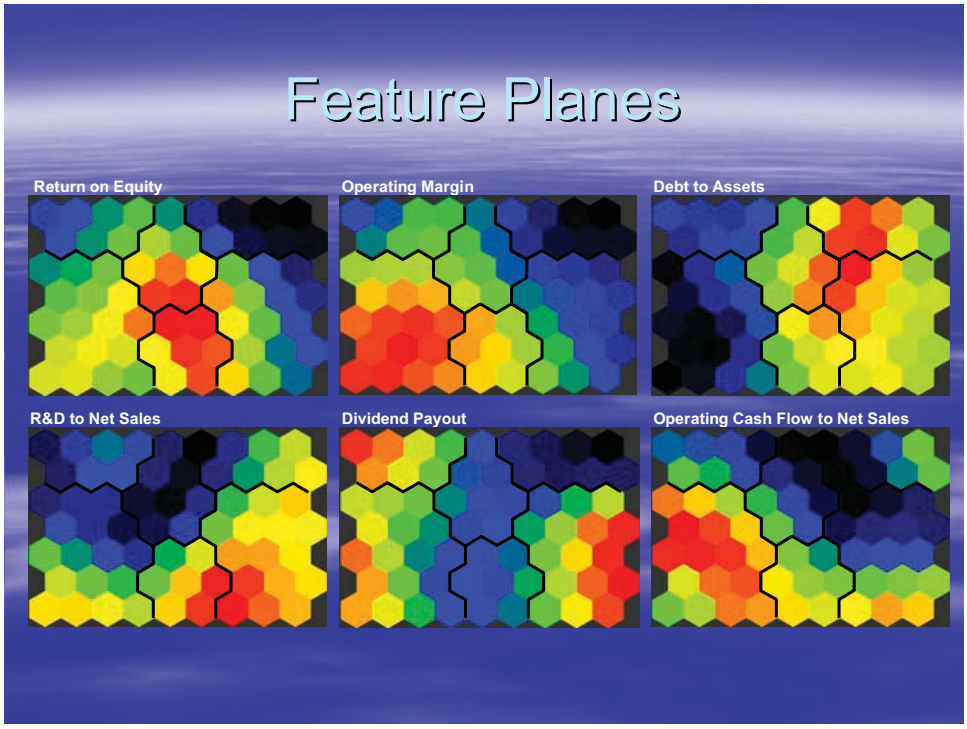

Figure 27 Feature planes for financial analysis (Eklund, 2004)

As Figure 27 shows, originally rather complex and theoretical tools can be used to analyze and simulate the financial performance of a company and even benchmark it by its competitors. This way it is possible to use both Porter's and Day's approaches to analyze the current competitive position of the company.

6.3 The Questionnaire Tool

By using a questionnaire technique we can directly approach people who have the best knowledge of their area. The aim is to strengthen the bottom-up strategic initiatives coming from those closest to the customers, competition and technology (for example see Bartlett and Ghoshal, 2002). This is the Woven Strategy approach. The questionnaire tool is part of the Woven Strategy tool and is the first step in the Woven Strategy process.

Liinamaa et al. (2004) state that

> *"A web-based questionnaire system can also facilitate the externalization, internalization, and combination of knowledge (SECI-model, see Nonaka and Takeuchi, 1995). Socialization means transferring person's tacit knowledge to another person's tacit knowledge, which is difficult without face to face interaction (Nonaka and Takeuchi, 1995)."*

By utilizing a questionnaire methodology, data and knowledge is captured from those who have it. People discuss matters face-to-face (tacit to tacit knowledge) and this data is transformed into an explicit form (tacit > explicit), after which it is easier to create new knowledge (explicit > explicit), and furthermore make practical knowledge (explicit > tacit).

An advantage of a web-based system is that people filling in the questionnaire can be located anywhere in the world, as long as they have access to the Internet (tacit > explicit).

In the beginning, the person responsible for making the questionnaire prepares the questions based on a problem at hand. The person can use questions already existing in the database or can formulate the questions in situ.

After finalizing the questionnaire, it is published for those selected respondents. They receive an e-mail providing a URL address with a hyperlink.

A paper questionnaire was used when our system was under construction, but this required much more effort in terms of collecting data and especially in analyzing the data. One advantage of a computer-based questionnaire is that

the questions can be stored for later use and used as templates for the next questionnaire. It is also easy to compare and analyze the changes that have taken place between two questionnaires. In Case 1, a Lotus Notes-based application was used, and in Cases 3 and 4 a commercial application from Atbusiness was used. However, it was noted that data analysis was difficult with these applications. Even the data transfer to other tools was difficult. These factors led to the decision to develop our own questionnaire tool. Figure 25 presents the process of creating a questionnaire.

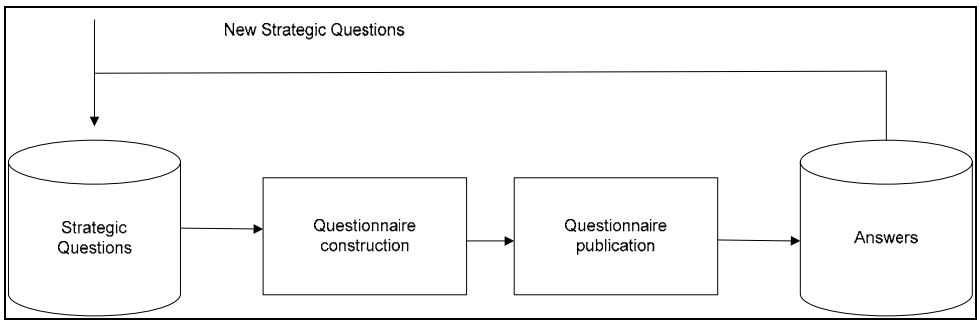

Figure 28 The process of creating and publishing a questionnaire

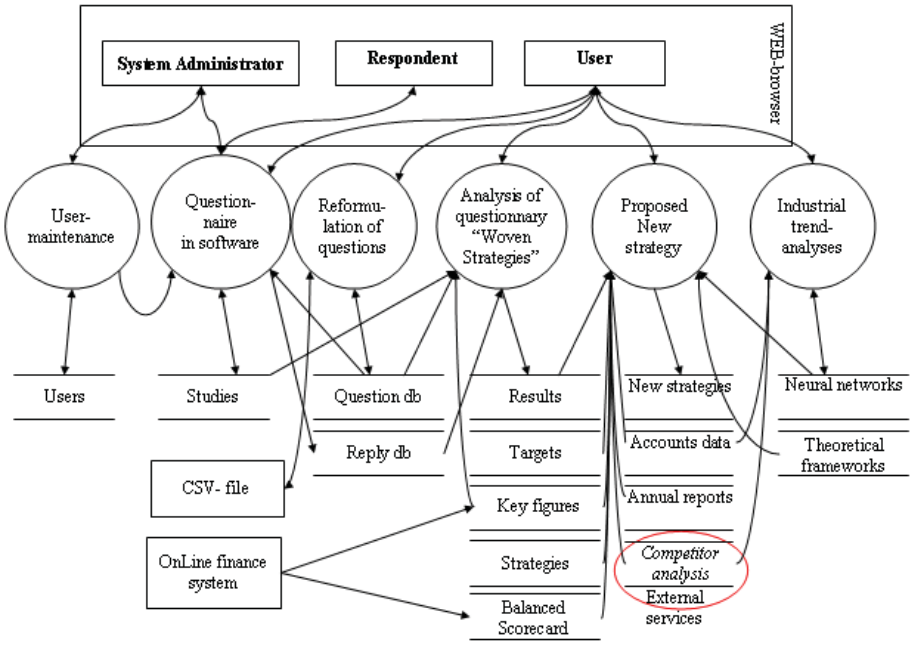

Figure 29 Architecture of the Woven Strategy tool

Strategy making normally takes one of two approaches: top-down or bottom-up. The first approach is naturally easier for top management, but one of its major disadvantages is the lack of commitment to it from lower organizations and even their general lack of knowledge of the strategy.

In the top-down approach, top management "dictates" the targets and strategy, and middle and lower management have to implement them. However, in this case the implementation of the strategy is often deficient due to lack of commitment of the people in the organization. In contrast, the Woven Strategy approach formulates more accurate strategies in addition to gaining the organization's commitment to them.

This thesis focuses on the fact that shareholders and top management set the targets for the company, and during the strategy planning the contribution of the whole organization must be used. This is supported by the Woven Strategy process. After the initial questionnaire, top and middle management use the tool to define the final strategy. This way the commitment of the whole organization to the targets and strategy is achieved. The knowledge that exists in the organization is captured for the use of management, and therefore management can use their intuition in their decision-making. Compared to traditional methods, much more information can now be utilized in the intuitive decision-making. In this way intuition and analytical tools have been combined.

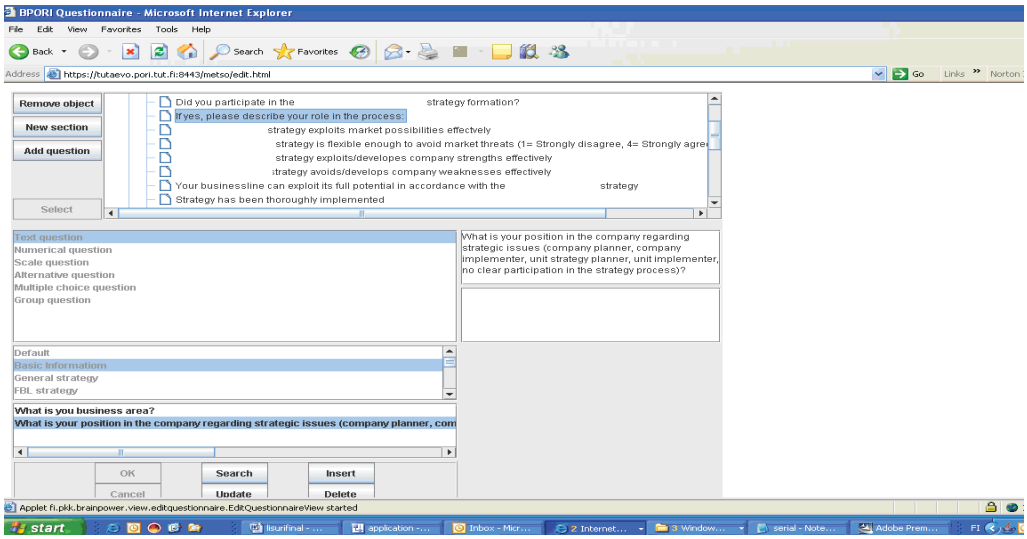

Figure 30 The questionnaire tool, a screen shot of questionnaire creation

Figure 29 presents the architecture of the Woven Strategy tool. We can see that a system administrator is needed to upkeep the system. The questions and questionnaires are usually prepared by a facilitator who organizes the strategy process, and is a person that has enough knowledge and understanding of the business and the company. The facilitator has to be a neutral person in the organization in order to get the people in the organization to give their honest opinions. Figure 30 shows a screen shot of creating the questionnaire. First the questionnaire is created, followed by its sections, and finally the questions are attached under each section. Of course, new questions can be created as well. They will be stored in the database where they are available for further use. The questionnaire contains all the questions that may be asked. The sections include the functions of the company in each area, for instance management, marketing and production. The questions in each section are strategic questions collected from the literature. It is possible to create several types of questions, such as open questions, multiple-choice questions and numeric questions. It is also possible to create new question types, although the most common types are already in use.

6.4 The Analysis Tool

The basis for the analysis tool is created with the questionnaire tool. The answers of all the respondents can be instantly seen on screen. The more traditional strategy process, as described for instance by Day (1999) and Porter (1980, 1985, 1996a, 1996b) and as presented in Chapter 2, can be started with the analysis tool. The analysis also provides the basis for creating new strategic scenarios, as well as enabling dialogue and discussion between the strategy makers.

Using the analysis tool, the answers stored using the questionnaires are analyzed. The replies are all of a strategic nature and all the functions of a company are under analysis. Top management can see from the replies how well their intended strategy has been understood, but at the same time they obtain valuable information for creating or updating a common vision and

strategy for their company. The answers also provide an instant picture of their company's development needs.

In order to understand the respondents' views on a problem, their answers must be examined. It is possible to create several different types of questions and, of course, the method of analysis depends on the type of question. For instance, analyzing numerical answers or answers with predefined sets of options is easier than using separate statistical applications.

The data analyzing process can be seen in Figure 31.

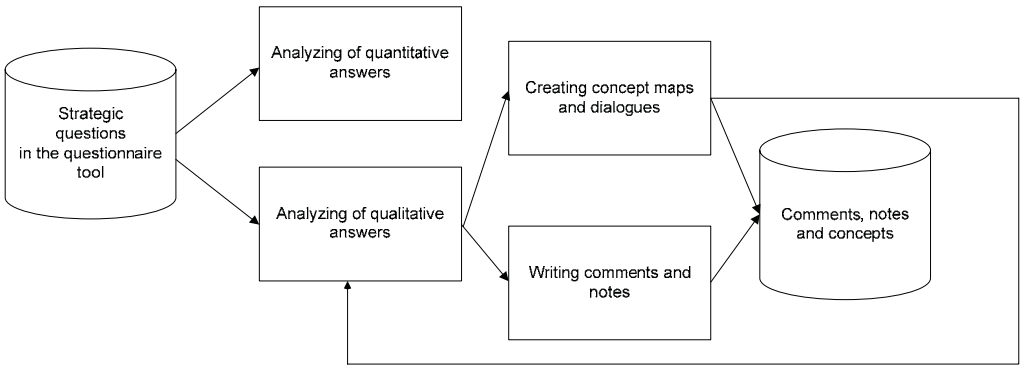

Figure 31 The data analyzing process

The analysis tool enables the immediate viewing of quantitative answers. For qualitative analysis the tools are versatile. It is possible to see the answers of all the respondents at the same time, and thus discussion or making notes based on those answers can start. The first task is to select the most important topics for further analysis and discussion.

Figure 32 shows how answers are presented by the analysis tool.

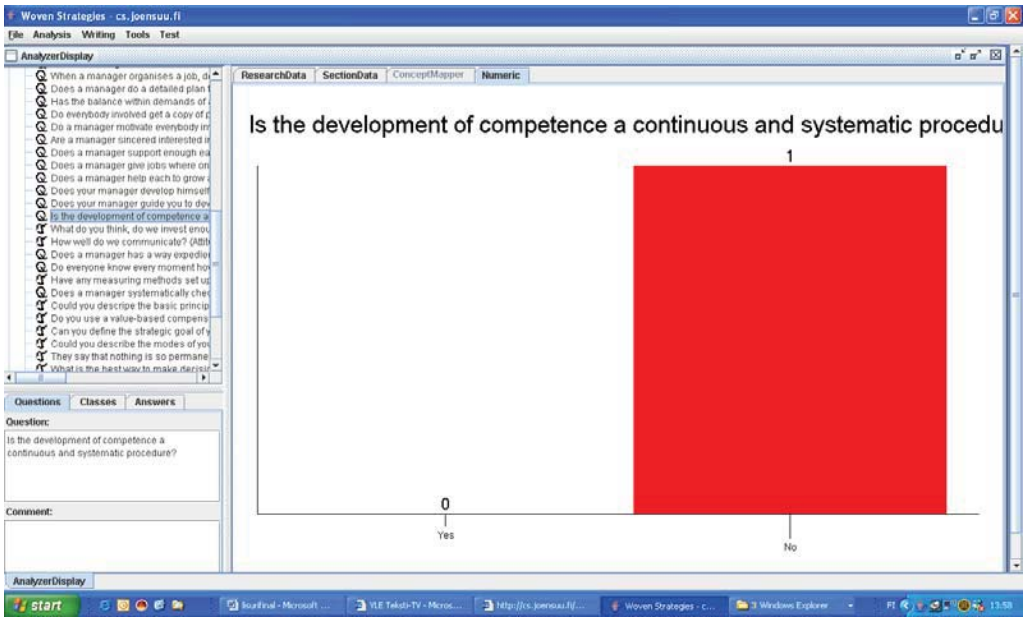

Figure 32 The main screen of the analysis tool

The analysis tool is linked to the questionnaire database. The analysis database and the questionnaire databases are completely different and are located on different servers. All the tools described in Chapter 6.1 utilize the analysis database. The analysis database also shows the answers and their analysis as in Figure 33.

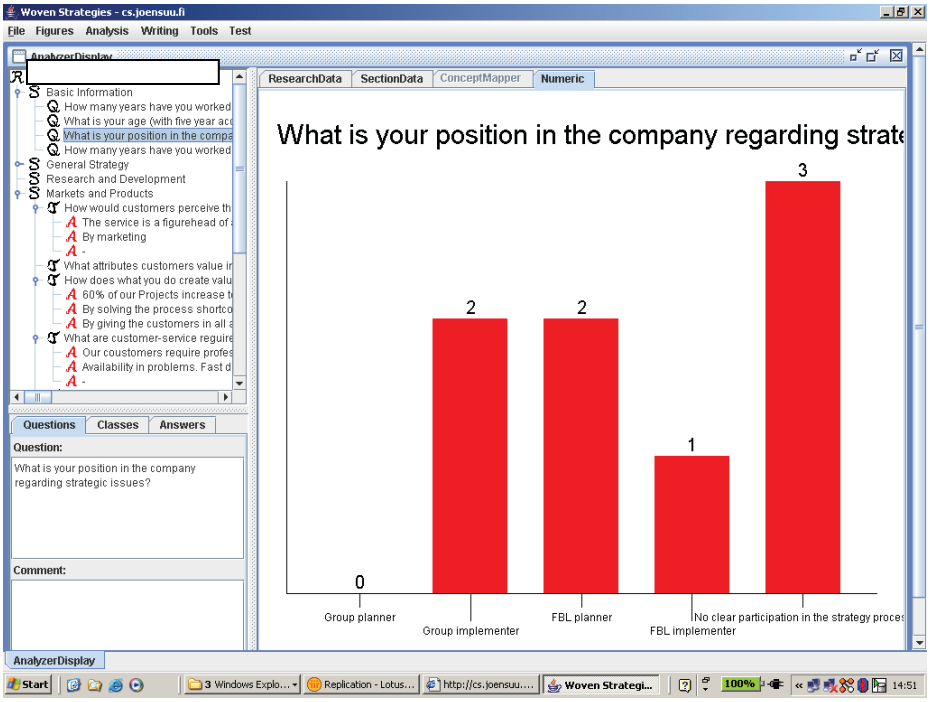

Figure 33 Questions and answers in the analysis tool

As Figure 33 shows, all the answers can be seen after the question, and numerical answers can be seen in a chart, as in Figure 32 and Figure 33. The questions are shown as a tree at the top left of the screen. Immediately after the question, the answer can be seen at the bottom left of the screen. The strategy concept map that is described in the following chapters will be created in the middle of the screen.

The main advantage of the analysis tool is that it is fully integrated with the questionnaire tool. Hence, there is no need for any additional data transfer.

6.5 The Planning Tool

Concept map

Topics related to business strategies are most often complex and ambiguous concepts. The related questions are also mainly unstructured. The analysis of the textual answers is very complicated and difficult, but concept maps can assist us in this. They can cluster the answers which share the same central idea. Figure 34 presents the basic idea of the planning tool.

When creating strategy, the strategy making group creates the strategy concept in which the core areas of the future strategy are being drawn. This group mostly consists of the company's senior management. While Figure 34 shows a theoretical approach to the strategy concept, Figure 35 presents its practical application.

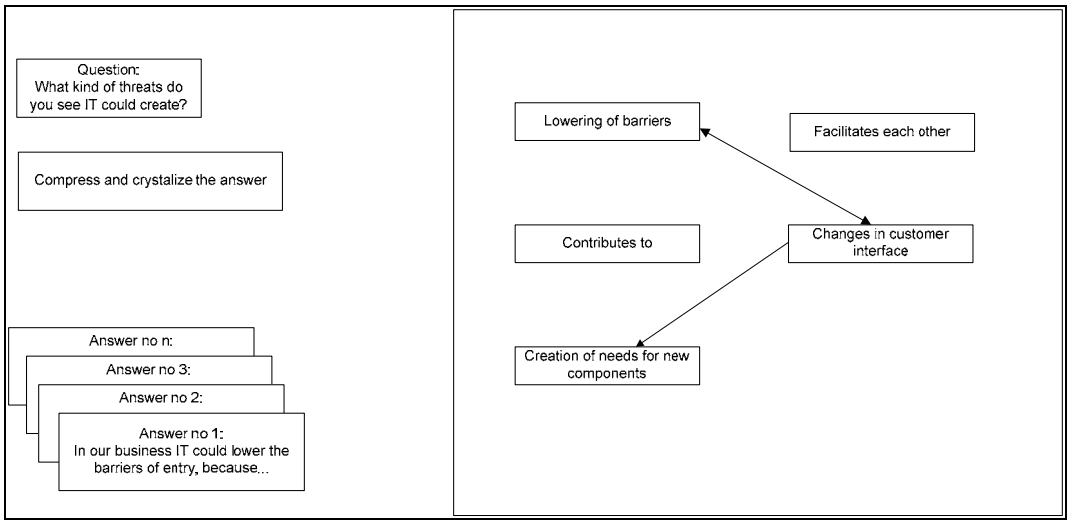

Figure 34 Architecture of concept maps

With the help of concept maps, it is possible to quickly focus on the main ideas and their relationships with each other. Several persons can simultaneously look at the map, giving them the possibility to discuss the key points at the same time. Without this kind of short summary, it would take a much longer time to discuss the proposed strategy, especially if the answers are long. In a concept map, a question is presented and all the strategists give their own answers. From these answers or from related topics an issue is selected. This topic is of key strategic importance and will be form part of the strategy under construction. In Figure 35, the selected key topic in which new issues will be linked is shown on the right-hand side of the screen. Also in this figure, the questions and answers are visible on the left-hand side, while on the right side the new concept map, which is being constructed by first creating two nodes which are linked with an arc. The purpose of the concept map is to represent meaningful relationships between concepts (Novak and Gowin, 1984, Liinamaa et al., 2004).

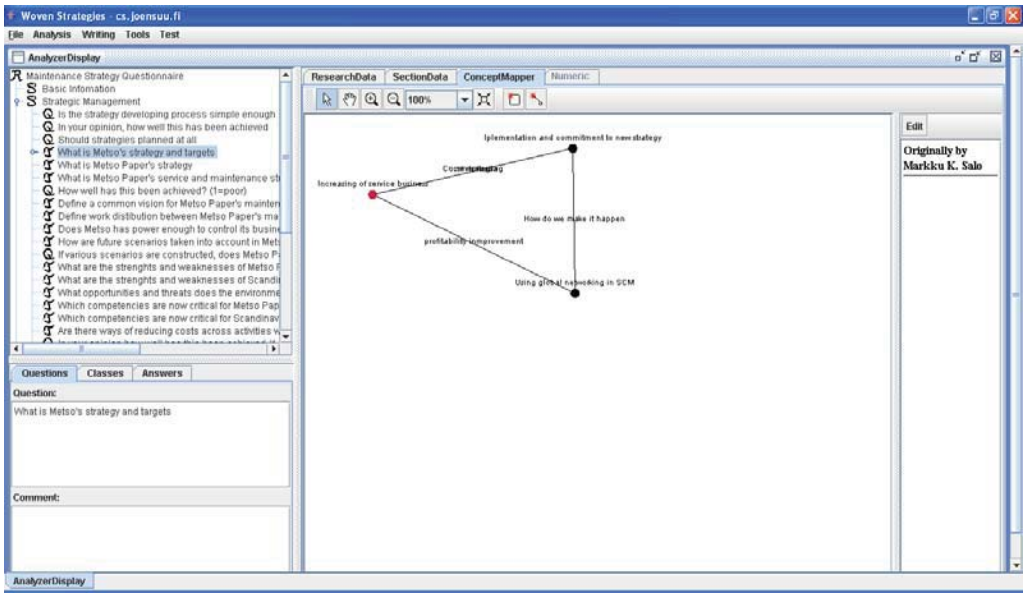

Figure 35 The strategy concept map, a practical application

By utilizing concept maps, new relationships and/or propositions can be discovered when the maps are being studied. This analysis can be also regarded as a creative process (Novak and Gowin, 1984). One source for making biased strategies depends on those persons doing the analysis. Therefore a heterogeneous enough group is required to participate in the analysis sessions. They also have to be open-minded to accept and evaluate new ideas. Unfortunately, the researcher has seen cases in many organizations where, year after year, the same people only adjust old strategies, for example correcting inflation in the target figures. With that kind of attitude, the rapidly changing business world and its economies will go unnoticed and the consequences of this may be catastrophic for the company.

The results of the analysis can be later utilized in the planning tool and Woven Strategy tool when creating the new strategy synthesis (cf. Mintzberg's fallacy). In his strategic fallacies, Mintzberg (1994a) has stated that strategic synthesis with software is not possible. However, in this work we have shown that it is possible. Everyone participating in strategic planning has access to the analysis tool, which makes the sharing of knowledge and bottom-up strategic planning possible. By using concept maps, the time spent on the strategy process can also be shortened, because not everyone has to read all of the lengthy answers.

The Planning tool

With the planning tool, the persons participating in strategic planning can engage in a real-time discussion on what the strategy should be (Figure 36). The responsible persons can discuss the strategy's implications on different issues. Also with this tool everyone can make their expertise available to everyone else. All this is done in real-time with several participants simultaneously discussing, and collaborating over the Internet. The planning tool also works as an "organizational memory" (Huber, 1991) where discussions and opinions are recorded for later reference. The application uses the same module as a planning tool and as a dialogue tool. In the planning stage the data is recorded on a higher level, whilst when using the dialogue tool data is recorded for each individual question.

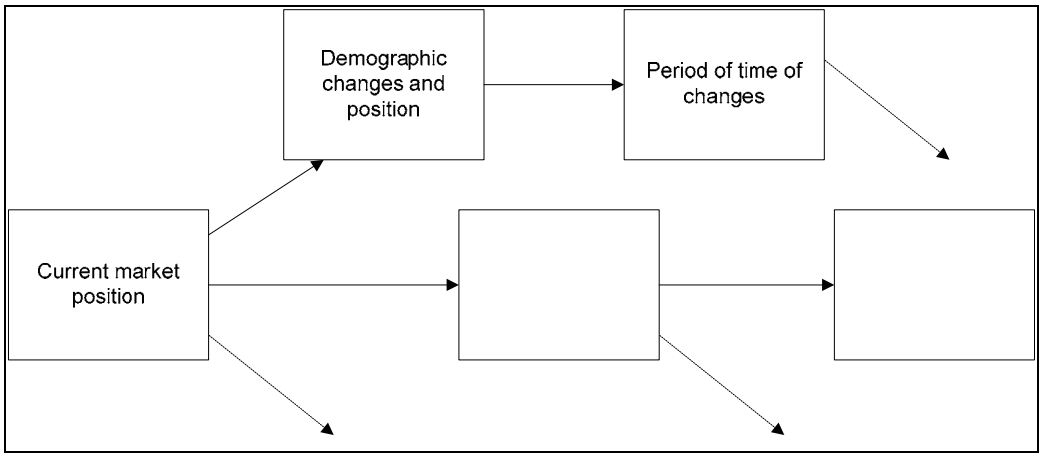

Figure 36 The planning process using the planning tool

By using the questionnaire tool and dialogue tool, the strategists and executives have a lot of information and concepts ready for the actual planning. The planning tool can also be utilized for scenario planning and visioning. Scenario planning refers to when the strategy team develops alternative views of the future and plans appropriate strategies for each situation (see e.g. Geus, 1997; O'Brien, 2004). Scenario planning is especially useful in situations in which the future is highly unpredictable.

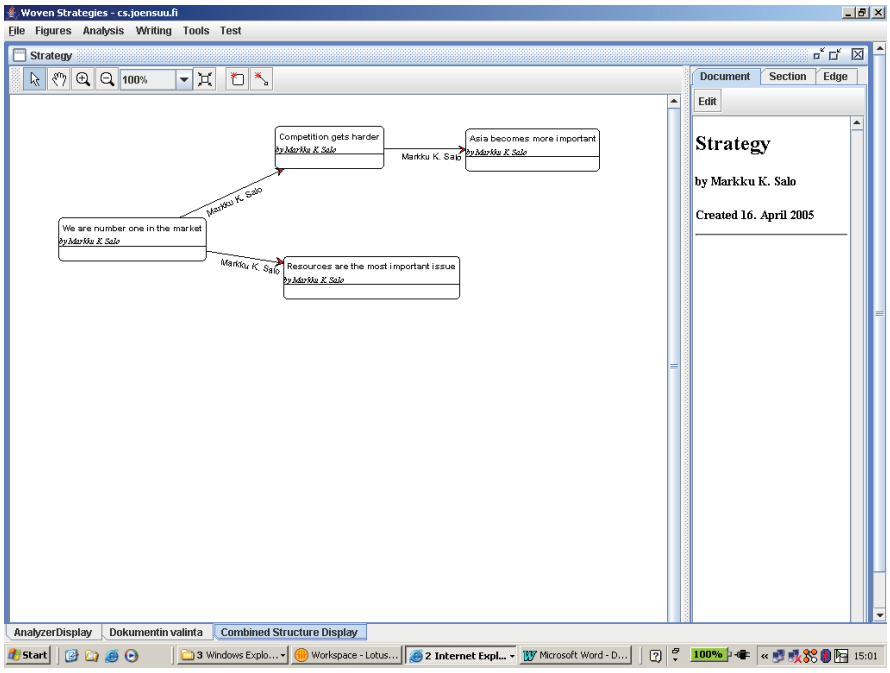

Figure 37 A screen shot of the planning tool

The planning tool and the concept map have many similarities, but the main difference is that by using the planning tool the discussion will be progressive, i.e. every node takes the conversation a little closer to the end goal, which in this case is the mutually agreed strategy. Of course there are nodes that could take conversation further from the goal, but they should come to an end early enough. However, brainstorming software is free form human subjectivity, so this may be a positive thing to use as well (Turban and Aronson, 1998). Figure 37 shows a screen shot of the planning tool. In this case, a new scenario planning for the company has already been started.

6.6 The Dialogue Tool

Common knowledge among individual experts is necessary for the effective integration of distinct knowledge (Grant, 1996). The dialogue tool presented here is aimed at creating such a knowledge base, as well as ensuring agreement on the basic assumptions concerning the business and explicitly defining the most common concepts used in the context of strategic planning and strategic conversation. The idea here is that people with different cultural and educational backgrounds can discuss strategic issues with clearly defined concepts. The dialogue tool is meant to complement the planning tool

presented in Section 6.5. The dialogue tool, as well as the planning tool, supports collaborative work between strategists.

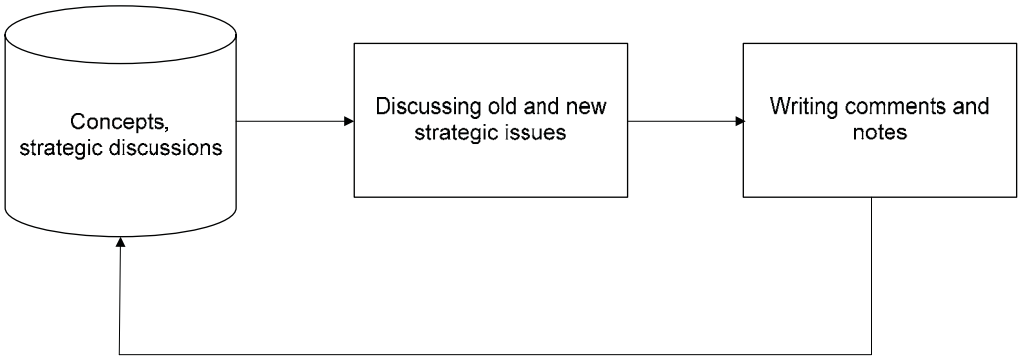

Figure 38 The process of using the dialogue tool

With the help of the dialogue tool, it is possible to have a truly open discussion which has no explicit goal (Figure 38). This kind of open dialogue does not happen if participants try to convince others that only their view on the matter is correct (see e.g. Bohm and Nichol, 1996; von Krogh and Roos, 1995).

Also, the dialogue tool is based on concept maps. Each node in a concept map holds three information fields: (1) the name of the node which is visible in the concept map, (2) the actual information describing this node in full detail, (3) the name of the author of the node, or at least some form of identification. It is important that the name of the node describes the contents accurately and in a compact form. Otherwise the map loses some of its characteristics, which are the reason for its use in the first place. The most important reason for using these maps is to focus on the most critical strategic issues of a company.

The relationship between two interconnected nodes has the same properties as the nodes have. Again, the name of the arc, which is visible on the map, should accurately describe its detailed description.

The dialogue tool can be seen in Figure 39.

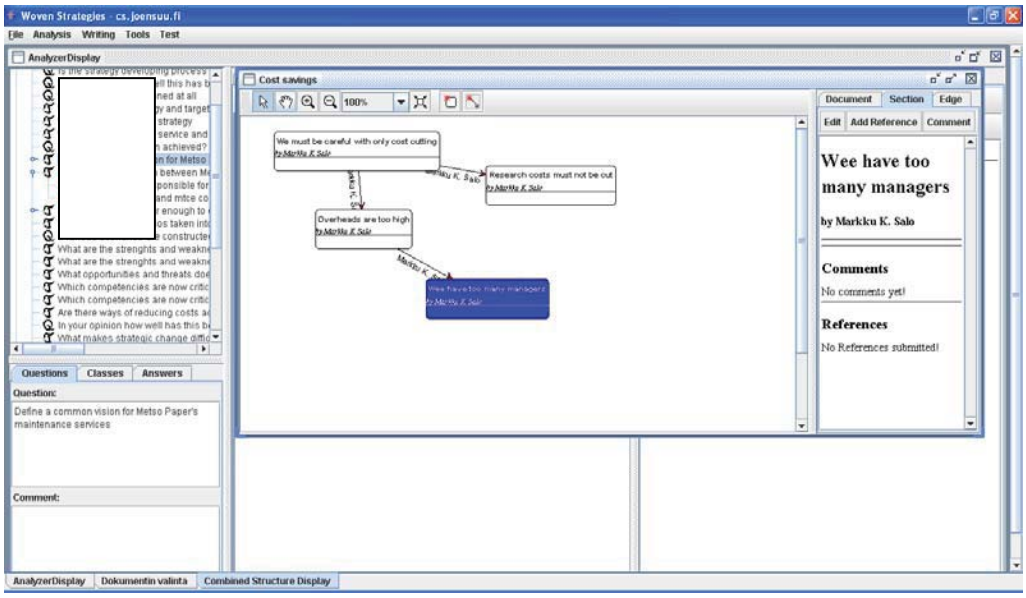

Figure 39 A screen shot of the dialogue tool

The participants write their comments in the dialogue tool, which also can be connected with arcs. The texts can be linked to different answers.

With the dialogue tool it is possible to effectively use a company's resources. Barney (2002) states that even if a company had valuable resources that are scarce and difficult to copy, if they are not organized efficiently the company will still destroy its own competitiveness.

6.7 The Synthesis Tool – Woven Strategies

With the synthesis tool (Figure 40, 41) it is possible to combine all the planning steps done with previous tools. By using the dialogue and planning tools, individual executives and planners should have been able to identify the key topics for the strategy and should have written their own portions for the strategy as agreed in the concept stage. From the written pieces of text, the Woven Strategies tool compiles one document, i.e. a Woven Strategy, that is the synthesis of all the work that originally started by asking various people the strategic questions.

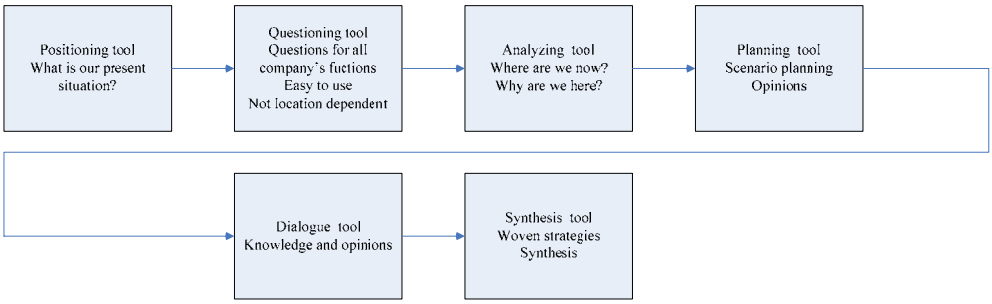

Figure 40 The creation of Woven Strategy

Figure 41 shows an example of a merged text.

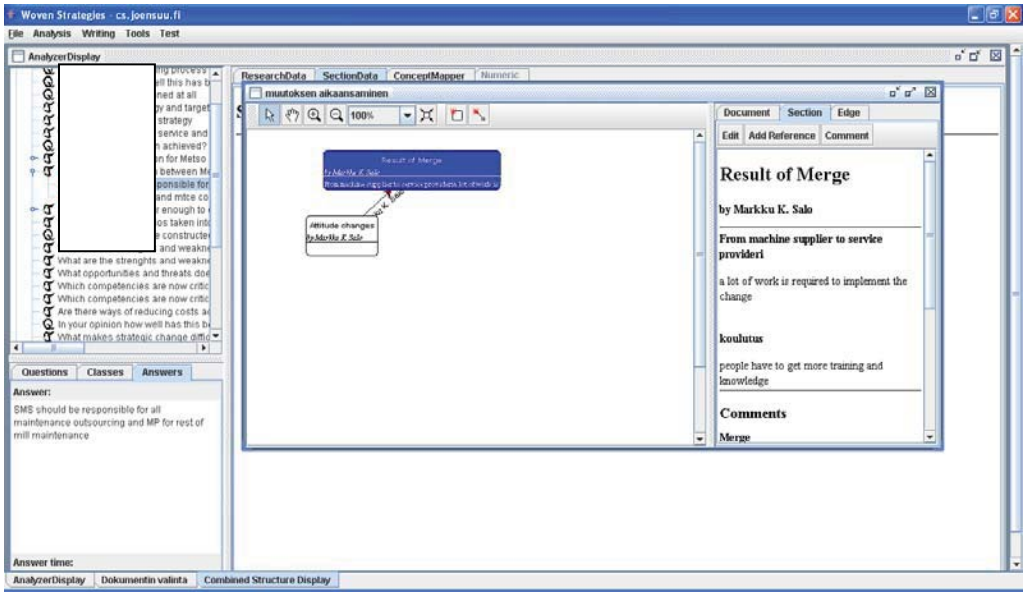

Figure 41 A screen shot of Woven Strategies

The merged text is created by selecting the detailed nodes to be merged into one node. This process happens automatically with the Woven Strategy tool. As a result, all the texts from the nodes are listed after each other, as seen in Figure 41. After a merge there is normally only one node left, because the other nodes have been merged into it. The merged text is selected from the texts created by the same participants who created the strategy concept. This contains all the essential information for the new strategy. The merging is done by the facilitator and the process itself is automatic. The intuition of the strategy makers has been captured, the questions have been analyzed and the new strategy concept has been created.

The use of this kind of tool makes strategy creation much faster and easier than traditional strategy sessions. Participants can be located anywhere they wish. In a traditional strategy process, people have to gather together from various places for several meetings. One of the additional advantages of this tool is also that the concepts (strategies) can be stored in the database for further use.

Figure 40 shows how different tool modules link together, as well as the planned progress of the strategy process when developed tools are used. The positioning module is still an independent module but should be integrated into the whole application.

Figure 40 presents the tool modules and the requirements set for them. Yet financial analysis of the data is still required. This module will be integrated into the application in the near future. We can thus state that the set requirements are adequately fulfilled by the Woven Strategy tool. There is naturally a lot of development work to be done in the future. One of the main tasks will be to improve the availability and usability, as well as the reliability, of the application.

If we compare the developed application with those on the market, it is evidently quite unique. This application is not based on number crunching, but captures the intuition and expertise of the company by using questionnaires. No other tool uses the method of asking questions nor gives the possibility to analyze qualitative answers. The major differences of this application to other commercial applications are presented in Table 11.

As we can see from the research point of view as laid out in this thesis, the Woven Strategy application has most of the desired features. Next in this ranking of necessary features is the SAP system and, with the least amount of desired features, is the Active Strategy's application.

Table 11 Comparison of the Main Strategic Planning Features of the Woven Strategy tool and Commercial Applications

Feature	Woven Strategy Tool	Active Strategy	SAP
Financial analyses	in the future	∠	∠
Balance Scorecard	no	∠	∠
Advanced positioning tool	∠	no	no
Strategy maps	∠	∠	∠
Questionnaire	∠	no	no
Knowledge management	∠	no	∠
Concept mapping	∠	no	no
Dialogue tool	∠	no	no
Synthesis tool	∠	no	no

7. EMPIRICAL RESEARCH WITH CASE STUDIES

7.1 Background and the Test Environment

When this thesis was initiated, the decision was made to practically test the idea with some pilot cases. The ideas were drafted by Professor Vanharanta and the researcher in Pori. A vision of a future application already existed at that point, but the decision was made to go forwards in small steps. After a couple of years the "BrainPoweri" project was started to develop the application. At that time Professor Vanharanta asked the researcher to write his thesis on this topic. The goal was also to create a new methodology for strategic planning as well as to make a commercial application based on the idea. This new tool was needed to capture local knowledge and put it to global use in a world where globalizing trends dominate.

The developed Woven Strategies method was first tested manually by producing questionnaires in paper format and analyzing the answers with Excel spreadsheets. In the beginning, no other IT tools were available. In all case studies the method to test the Woven Strategies has been the same, only the applied tools have differed. The reasons for using different tools were only technical ones. In the first case study, no questionnaire tools were available. In the second case study, a Lotus Notes-based questionnaire was utilized. After that a commercial questionnaire tool was acquired, but it had too many bugs and therefore analyzing the answers with it was not possible. Nor was it possible to link this tool with any analyzing software. It also became obvious that by carrying on in this way, the Woven Strategies approach would become impossible to follow in global enterprises, for it would be too time consuming and tedious to collect the answers and analyze them manually. Therefore, the decision was made to make our own application. This application was developed step by step, and for this reason not all modules were ready in time for all the case studies. Table 12 presents a summary of the case studies, showing which applications have been used in which particular study.

The application presented in Chapter 6 has been running on the servers of the University of Joensuu and Tampere University of Technology, Pori. The modules developed during the project have been tested in the test cases presented in this chapter.

The research questions and theses are presented in Chapter 1. The Woven Strategies method and Woven Strategies tool are tested in the case studies. The case studies analyze how effectively information technology can be used in strategic planning with the help of the Woven Strategy tool, and also how effective questionnaires can be in strategic planning. With the help of these studies it is also possible to evaluate whether Mintzberg's fallacies of strategic planning are valid today. Vanharanta's (1995) Continuous Strategy concept has been one of the bases for the strategy processes developed in the different contexts and cases of all these case studies. When looking at the case studies, one common feature to all of them has been the efforts to involve the whole organization and all relevant functions in the strategy process. Another common feature has also been that a shared vision was established with the help of the strategy process, and that has been the cornerstone for further strategy and target development.

The experimentation of the application and theses took place in three major corporations named here as Companies A, B and C. In all these companies a selected group of managers used the application. Two of the companies are international, whilst one is mainly based in Finland. In Company B two case studies were made, and in Company C three case studies in different organizations were made. Altogether several hundred persons participated in the studies. They represented top and middle management of the selected organizations. In Company B lower levels of the organizations were also included. Table 12 gives the summary of the case studies.

Table 12 Summary of Case Studies

	Case1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
Company	A	B	B	C	C	C	C	C
Organi-zation	Logistics organization	Equipment and services for process industry	Equipment and services for process industry	Expert services for pulp and paper industry	Equipment and services for pulp and paper industry	Expert services for pulp and paper industry	Equipment and services for pulp and paper industry	Equipment and services for pulp and paper industry
Time	2002	2001	2003	2002	2004	2004	2005	2005
Case topic	Role of middle management in strategic planning	Use of questionnaires in strategic planning, create new strategy process that utilizes intuition and modern IT-technology	Bottleneck in strategy process, success of strategy implementation, testing of developed application	Use of web-based questionnaires in strategic planning	Testing of the developed tools and approach, new strategy for organization	Testing of the developed tools and approach, new strategy for organization	Testing of the developed tools and approach, new strategy for organization	Testing of the developed tools and approach, new strategy for organization
Relation with research problem	1	1	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2
Tools	Lotus Notes questionnaire	Manual questionnaire	Developed questionnaire application	Commercial questionnaire software	Developed questionnaire software	Developed questionnaire software, 3	Developed questionnaire software, 3	Developed questionnaire software, 3
Results	Increase of strategic interaction between organizational levels, developed strategic approach works, questionnaires are useful in strategic planning	More effective communication of strategy, reorganization, developed strategic approach works, questionnaires are useful in strategic planning	More sophisticated strategy process, new construction (process and application) that makes strategy process more efficient	Structure for new application, verification and validation of use of questionnaires and web-based tools	Functioning of the tools were verified and validated. The top-down strategy model which was used in the organization was not as efficient as the developed approach	Functioning of the tools were verified and validated. The top-down strategy model which was used in the organization was not as efficient as the developed approach	Functioning of the tools were verified and validated. The top-down strategy model which was used in the organization was not as efficient as the developed approach	Functioning of the tools were verified and validated. The top-down strategy model which was used in the orgainization was not as efficient as the developed approach
No of parti-cipants	149	60	46	14	10	15	20	6
Type of parti-cipants	4	4	4	5	5	5	6	5

1) Use of questionnaires, developed strategic approach (Mintzberg's fallacies of strategic planning)
2) Use of information technology in strategic planning
3) Dialogue tool, analysis tool, Woven Strategy tool
4) Top management, middle management, foremen, workers, others
5) Top management, middle management
6) Top management

The Case Companies

Case Company A is a large, multinational, Finnish company with operations and personnel all over the world. The study was carried out in the logistics unit of the company. This unit is responsible for the supply chain of the company's products. The supply chain has a very important role in Company A's business in regard to its profitability.

Company A is a world leader in mobile communications, driving the growth and sustainability of the broader mobility industry. Company A provides equipment, solutions and services for network operators and corporations. It is a broadly held company with listings on four major exchanges.

Company A comprises of four business groups and three horizontal groups.

Case Company B offers technical infrastructure investment and maintenance services for the property and construction sector, several industries and telecommunications. In all sectors of operations, the Group's services cover the entire life cycle of their projects. The company's main market areas are the Nordic countries, the Baltic Countries and Russia.

In line with its business concept, Company B's core competence area comprises of good management of investment projects and the development of service chains encompassing their entire life cycles in all its business segments. The business segments share a strong synergy, but their differences also balance out cyclical fluctuations.

The main strategy for Company B is profitable growth.

Company B also has its focus on cash flow and cost-efficiency. In this company, strategic development at the group level focuses on procurements, marketing, public sector services, and impressions of the company as an employer, from investor relations, internal communications and intra-group co-operation. In order to ensure that the strategy is realized, particular attention is paid to risk management.

Case company C is a large Finnish-based international corporation with activities all over the world and with four different divisions that manufacture equipment, automation systems and services for a wide range of industries. During the past few years the company's main problem has been poor profitability.

The case companies are large corporations and case organizations within the case companies. They are 1-4 levels below the corporate level, but are large and relatively independent in their strategic business areas.

The managers who participated in the test were decision-makers and those responsible for planning and implementing strategies in their respective areas and fields.

The middle manager was defined as a person in a supervisory position or as a person who had the possibility to communicate interactively. This definition for a middle manager is valid in all the case studies.

In Company A, the participants came from different parts of the world, but all of them were in managerial positions. The experience inside the organization varied from half a year to up to 10 years.

In Company B, the questionnaires were given to several groups that represented different organizational levels in different regional areas in Finland. Those participating in the questionnaire were workers, foremen, members of management teams, etc. This means that all organizational levels were involved. The main objective was to test the use of questions as a method in the process of strategic decision-making.

In Company C, the questions were first presented in a commercial software program (Atbusiness's Surveyor) but the principle was exactly the same as in Company B. The persons involved represented middle management and the main purpose was to identify their role in the strategy process. When the new questionnaire tool was finalized, it was used.

7.1.1 Evaluation Methods

All the case studies were conducted in a similar manner. Even though the tools used were different in the early cases, and the questions posed were different in different case companies, within each company everything remained the same. The main focus was on questionnaires that included both qualitative and quantitative analysis. Quantitative analysis was used for questions with scale-type answers and choice-related answers. Qualitative analysis was used to analyze open questions. For the purpose of verifying the theses of this thesis, only quantitative methods can really be used. This is because it is very daring to claim that improved or impaired results were due to this method and this application. Much more future research is needed in many more organizations before that evaluation can be made. However, it is possible to use quantitative methods in evaluating the time spent on strategy sessions.

Questionnaires

There were basically five different kinds of questionnaires. Firstly, the questions in each company varied slightly, and secondly, in Company C there were two different kinds of questionnaires depending on whether the whole organization's strategy was in question or whether only a specific function of the strategy was studied. Thirdly, there was also a questionnaire which focused on the respondents' opinions of the research method used.

The questionnaires could be completed either directly on a web-based system or though a MS Word file. The questionnaires dealt with different areas of strategic management, however one questionnaire in Company C concentrated only on R&D strategy. The total number of respondents was slightly over 300.

The total number of questions and respondents can be seen in Table 13, which excludes the opinion questionnaire's data.

Table 13 Number of Respondents and Questions in Case Studies

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
Number of respondents	149	60	46	14	10	15	20	6
Number of questions	60	60	50	300	185	185	185	45
Number of replied	149	60	46	14	10	15	10	6

In all case studies, the goal was to test the theses that it is possible to use questionnaires in strategic planning.

Description of the Methodology in the Case Studies

The first step is to make the questionnaire. This is rather easy, because now many questions are already available in the questionnaire database. The questionnaire should be made by a person who has wide enough business experience and understanding. The questionnaire must be accepted by the case organization's management.

The next step is to send the questionnaire to the respondents. An e-mail link and a word file can be sent. There is most probably always someone who prefers to fill in a word document rather than enter data in a web questionnaire. An important issue is to control the process so that all questionnaires are received back in time. If necessary, reminders should be sent.

After receiving all the answers, they can be analyzed. Analysis with only the Woven Strategies tool is described. This work is done by a facilitator together with the case organization's management team. The researcher presents the results by using the analysis tool. Based on the analysis, the main themes are selected for further discussion. During this process a strategy concept map

using the planning tool is made. Furthermore, by using the dialogue tool nodes are written and connected with arcs. These nodes contain portions for the new strategy.

Finally, by using the synthesis tool, the Woven Strategy is written from the main themes.

Chapter 2 discussed different strategy forms and approaches. The case studies analyze each organization's strategy and strategy process, as well as the new strategies which are created as a consequence of the Woven Strategy process. Chapter 3 discusses intuition. One of the main tasks of the case studies is to capture the organization's intuition by using questionnaires, and to further elaborate the knowledge of the organization to support the top management in their decision-making. Chapter 4 analyzed the requirements for the Woven Strategy tool, as well as existing IT tools for strategy making. In Chapter 5, the Woven Strategy tool which was used in most of the case studies to create the Woven Strategy was presented.

Test situations and arrangements

The test situation was made as easy and as relaxed as possible for the respondents. They were allowed to answer the questions via the Internet anytime and anywhere within the given time frame. Only in Case Study 2 was the test situation formal and controlled, and partially arranged in a large meeting room.

The test cases have been conducted over a lengthy period of four years. During this time period the application has developed, but the basic methodology has been the same. Nevertheless, we can assume that the experiments are still valid because the research problem has remained the same all this time and no similar methods for examining the strategy process have emerged during this time.

The case studies in Companies B and C started in 2001. The research problem has broadly been the same in all the studies, but there are two main research

problems. Firstly, there is the issue of using questions in strategic planning and secondly, there is the question of using information technology in strategic planning with the Woven Strategy tools. In the two first case studies the goal was to test the questionnaire method in Company B and a questionnaire IT system in Company C. Furthermore, in Case Company B the goal was to improve strategic planning in the case organization. In 2002 the questionnaire method was tested in Company A. In this company, the role of middle management in strategic planning was analyzed with the questionnaire. In 2003 another case study was conducted in Company B, however, this took place in a different organization. The goal here was partly the same as in the previous study, but it also involved testing the Woven Strategy questionnaire application. During 2004, the goal was to create new strategies in Company C for two different organizations by using the Woven Strategy application. In all cases the suitability of questionnaires for the strategy process has been tested. In all cases except the first case study carried out in Company B, the suitability of information technology in strategic planning has also been tested by using both the commercial tools and our own, continuously developed, questionnaire tools.

Test subjects

The test subjects represented the various levels of the organizations. In these case studies the age sample of the respondents was between 20 and 60 years. The age did not seem to affect the experiments in any way when using the questionnaire tool.

Table 14 summarizes the number of respondents in the different case studies.

Table 14 Number of Respondents in the Case Studies

Case	Top Management	Middle management	Foremen, workers, others	Total
1	7	82	60	149
2	7	43	10	60
3	5	25	16	46
4	1	13		14
5	2	8		10
6	2	13		15
7	10			10
8	1	5		6
Total	35	189	86	310

Results of the case studies

The results of each case study are presented in conjunction with each case. More detailed analyses have been presented in various studies which are publicly available. Some of the results are so closely related to the case organization's structure that they cannot be presented in public.

About half a year after answering the questionnaire, various key people of the case organizations were interviewed with a few short questions concerning the success of the case study. Their opinion about the method was also asked.

Following the first cases it was obvious that the selected methods were successful and the case organizations achieved more and more of their intended results. Since the very beginning, most of our efforts have been in developing the tools and this work still continues.

The template used to present the case studies is the same for all cases. First the case organizations and the empirical tests are presented, and then the results are analyzed. Finally there is the verification and validation of the method and of the application developed.

7.2 Case Study 1 in Case Company A

The main goal in Case Study 1 in Case Company A was to test the questionnaire methodology.

The empirical tests were led by the author and constructed by research assistant Juha Risikko (2002) who at the same time wrote his master's thesis.

7.2.1 Case Organization 1

The strategy of the studied unit is derived from the corporate strategy and divisional strategy, i.e. in the company under study the strategy was approached at three levels.

The main features of the unit's strategy are:

- to provide customers with the market's best technological solutions with best time to market and profit
- to ensure supply and demand balance, and accurate and cost efficient order fulfillment
- to enable fast and cost efficient product integration

It is easy to see that this organization is very profit and cost-oriented. This also sets very high demands on the organization and its middle management, because they are situated between the strategy and its implementation and need tools for implementing the strategy properly.

The divisional strategy is communicated to the unit level and to plant and area managers through different management groups. Although there is no official way to communicate strategy throughout the organization, the knowledge reaches employees at each level.

The strategy is transformed into implementation plans of six month periods, which are called *short-term plans (STP)*, i.e. objectives, resources, and budgets are made for the next six months. This plan is very implementation-oriented and focuses on each unit's actions. Furthermore, these STPs are transformed

into individual plans in private discussions between superior and subordinate, i.e. development discussions. One goal of these discussions is to communicate the organization's business strategy and objectives.

7.2.2. Empirical Tests

Research focus and the test assignment

In Company A and Case Study 1 the research assistant was sent to study the strategy process of the organization. He formulated the research problem with the following questions:

"How can we increase the involvement of middle management in a strategy process?" The main research question is approached through several sub-questions. They are listed below:

- What kinds of roles do middle managers possess in different strategy processes?
- What are the major barriers of strategic involvement?
- How can the barriers of strategic involvement be overcome?

The goal of the study was to understand middle management's role in the strategy process and to increase their involvement and commitment to it in order to form more realistic strategies and get them implemented faster. This helped the researcher to analyze the developed method and the strategy approach, i.e. learning to know which way the strategy should be planned and implemented (top-down/bottom-up), by using the developed method i.e. questionnaires and information technology. At the same time Mintzberg's fallacies of strategic planning could be tested.

The middle management's role in the strategy making process in Company A was studied with a questionnaire, using the company's own software for this purpose.

The study supports the hypothesis of this thesis by answering the research question of whether using questionnaires in strategic planning is helpful and

also in analyzing whether top-down or bottom-up strategy processes are more efficient.

Table 15 Summary of Case Study 1

Time	**Specific research topic**	**Relation to hypothesis of the main research**	**Applications used**
2002	Role of middle management in strategic planning	Use of questionnaires and IT, Mintzberg's fallacies of strategic planning	Lotus notes questionnaire

Research methodology and test methods

A questionnaire using a web-based solution was used. Its analysis was mainly quantitative.

Questionnaire

The questionnaire used differed greatly from that in the other cases. Respondents had to answer about 60 questions, which were mainly of the format "Agree strongly…Disagree Strongly". For some questions open answers were requested.

Preparing the questionnaire

The research assistant was mainly responsible for preparing the questions and providing some information about the questionnaire before sending it to the respondents.

Applications used

In this case Lotus Notes was used to make the questionnaire and the analysis was made using a spreadsheet solution.

Test environment

The questionnaire was put on the case organization's intranet to which all respondents had access.

Test situation

The test situation was informal and respondents had the freedom to answer the questions when and where wanted within the given time frame.

Duration of the tests

This study took place in February-March 2002. Respondents were given two week's time to answer the questionnaire. Each respondent spent a few hours answering the questions.

Respondents

149 people in the organization completed the questionnaire and they came from units from 17 countries all over the world.

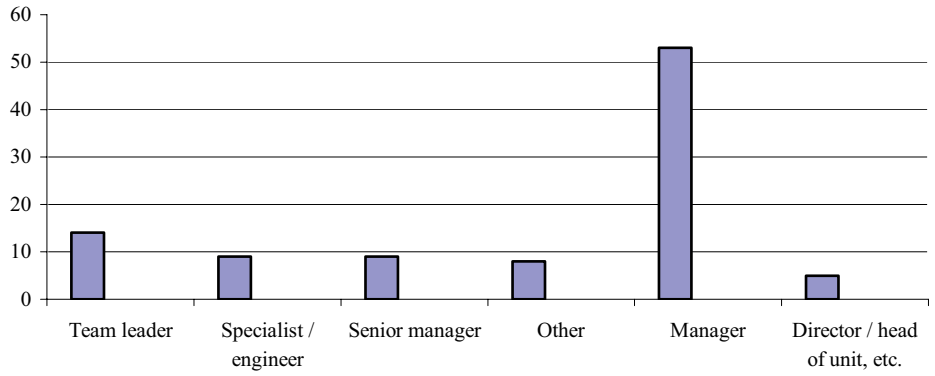

Figure 42 Respondents' titles and positions in Case Organization A

Figure 42 shows respondents' titles and positions in the case organization. About 90% of respondents had worked for the case company for more than three years.

Test Results

Analysis

The research assistant made a very thorough analysis of the middle managers' strategic roles in all the organizations.

The strategic role of middle managers was analyzed with one open question and four multiple-choice questions. The open question was: "What kind of role do you have in the strategy process?" Multiple-choice questions concentrated on analyzing how often different strategic roles occur.

Respondents had to analyze how well and how often the statements described their work. Most of them regarded themselves mainly as strategy implementers, and not as strategy planners or as major contributors in the strategy process. Some respondents felt that they had a minor role in the short-term planning process, but that they otherwise did not participate in it.

When analyzing the case from the research questions' point of view, this case study addressed practically all the questions and showed that questionnaires make strategy process more effective and fruitful. The early development of the IT tool also proved the viability of the methodology. The role of the organization and especially that of the middle management was shown to be critical in the implementation of the strategy. As a result, it was seen that middle management was not motivated enough for the strategy implementation and hence their role was strengthened. The Woven Strategy tool was not available yet, so its applicability could not be tested.

Verification

The target was to test the questionnaire method. The method proved to be successful and the application used functioned as planned.

Validation

The results obtained in this case support the theory that middle management still has a lot more capacity in strategic planning, and if they participate in the planning process a lot more strategy implementation can be anticipated. The number of respondents was large enough, so the credibility of the case study's results is good.

7.3 Case Study 2 in Case Company B

The main goal in this study was to test the questionnaire method in strategic planning.

The empirical tests were led by the author and constructed by research assistant Mauri Kivimäki (2001), who wrote his master's thesis during this case study.

Table 16 Summary of Case Study 2

Time	**Specific research topic**	**Relation to hypothesis of the main research**	**Applications used**
2001	Use of questionnaires, intuition	Use of questionnaires and IT, Mintzberg's fallacies of strategic planning	Questionnaire in paper format

7.3.1 Case Organization 2

This organization's turnover was about 100 M€ in 2000, and there were around 1000 persons who worked for it. Customers came from the pulp and paper, metal, oil and other process industries as well as from equipment suppliers. Their markets cover Finland, other Nordic Countries, Baltic countries, Central Europe and Russia.

The organization has made several acquisitions over the years. Due to this rapid growth, as well as the many geographically distant companies, the management of the company had become quite complicated. There was an overall lack of vision and a restricted number of management resources, which caused a lack of co-ordination thereby increasing internal competition.

In the strategy process, the organization's starting point was the basic values of the company:

- providing the best service
- continuous learning
- obtaining good results
- functioning co-operation

These results are converted with bottom-up and top-down principles to goals and key targets. This process goes down to an individual level.

One of the main areas for development was the communication of strategy to the whole organization.

7.3.2 Empirical Tests

Research focus and the test assignment

In Company B, Case Study 2, a research assistant was sent to study the strategy process of the organization. He formulated the research problem as follows:

- The company's top management wanted to know how well the strategy was understood and implemented in the case organization. Therefore, a task was given to the research assistant to analyze the situation and at the same time to study also if the questionnaires could be used in strategic planning.

The main goal of this research was to analyze the success of the strategy implementation in the case organization. A wide range of units took part in the study. By carefully selecting strategic questions from the literature and formulating some with the company itself, a compact strategy questionnaire was made. One of the main goals was also to study strategic thinking at different levels, starting from top management and ending up with workers at different sites. This goal was also related with the research questions examined in this thesis, i.e. the use of questionnaires was tested as well as Mintzberg's fallacies of strategic planning.

The questionnaire was compiled from the sets of questions collected from strategic and management literature. The students at Tampere University of Technology, Pori had collected these questions. They had gone through dozens of strategy and management books which covered all company functions, like management, financing, marketing, production. The questionnaire was made in co-operation with the researcher, case company and support personnel at Pori. The main goal was to have a reasonable number of easy to understand questions that would be comprehensible for the entire range of respondents.

Research methodology and test methods

This was the first case study and the developed web-based questionnaire system was not available at that time. The idea was, in practice, the same as that for the rest of the research, i.e. using strategy-related questions for each company function in order to collect ideas from a wide range of organizations and from different organizational levels.

The questionnaire was completed in closed sessions and the respondents were given a certain time frame (normally 1.5 hours).

Figure 43 shows the steps of the study.

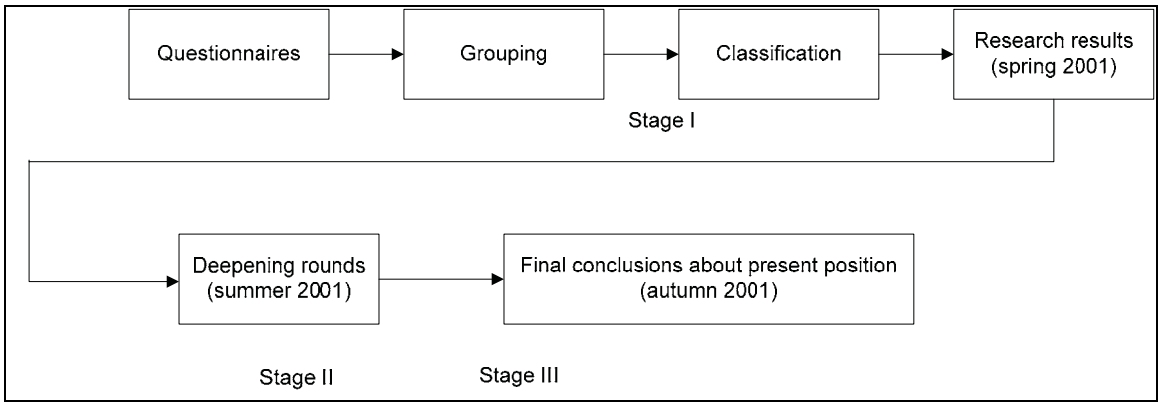

Figure 43 The steps of Case Study 2 in Case Company B

The method used supports the model developed in the theory. Questionnaires included all functions and were for all management levels. Present and future key success factors were also addressed.

Questionnaire

The questionnaire contained around 60 questions and was prepared in a paper format, because no computer system was available.

Preparing the questionnaire

The questionnaire was prepared well in advance. First of all, a lot of time was spent preparing the questions. Then the planning of meetings, whom to interview and which locations to be included, were also very carefully and systematically organized. The goal was to study how well corporate strategy was understood and implemented at all levels of the strategy process. Therefore, all organizational levels in all different geographical locations had to participate in the study.

The company understood the need for communication and therefore a lot of information about the questionnaire itself and its goals were given beforehand to participants.

Applications used

No applications were used except those necessary to write the questions and analyze them, such as Excel spreadsheets.

Test environment

As no software for interviewing was used, all the respondents answered the questionnaire on their own premises.

Test situation

The test situation in this case was very formal. Those on-site answered the questions in a formal session in meeting rooms. They answered the questions on a paper given to them. In some respects this was a good arrangement

because if the respondents had any questions, they could be answered immediately.

Higher level management was interviewed separately.

Duration of the Tests

The tests took place during the summer of 2001, during June and August.

Respondents

Respondents answered questions on all functions of the business and management, making it possible to also analyze the strong and weak functions of tested units and the business environment. The management team replied to questions related to all functions and management, i.e. strategic and operative management. The management team consisted of seven members: the managing director, the result responsible area directors and a controller. Area management replied to the questions related to marketing, operative management and implementation. On the project level, foremen and workers replied to questions related to the functioning of operative management and implementation. In the research, about 60 person's replies were analyzed.

Test results

Analysis

The questions on continuous strategy have been modified and phased as presented in Figure 44.

One of the goals of the research was to find out the functioning and compliance of different areas with each other. For seven functions the results were confusing. Marketing, implementation and logistics were estimated to function well, but support functions like human resource management, accounting and information technology were in such a state of stagnation that there were many respondents who could not even identify their existence or at least they did not feel that anyone was responsible for them.

The strategic planning and management were poor. The management team members were presented with 17 questions and the corresponding functionality had to be evaluated with a scale from one to seven.

When evaluating the answers to open questions, it became clear that the common direction was not known and the need for it was not identified either. Neither a vision nor key success factors were identified.

When evaluating the operative management and implementation of the projects, the same questions were presented to three different organizational levels. The results were above average when compared to all answers in this case study, although workers were more critical than managers and their replies showed below average performance.

The operations and their management could be regarded as very short-term and financially controlled. Long-term thinking was almost totally missing. The lower level field personnel thought that top management purposely organized the internal competition. Also, the idea that the company must grow all the time was ingrained deep into the organization. As an excuse to why communication was so poor, the explanation was used that the company is a stock listed company with many confidentiality obligations.

The case company's CEO stated at the end of the study that their reality and goals are exactly opposite to what he was presented in the replies to the questions.

The status of this organization was analyzed with Day's (1999) and Porter's (1980) theories concerning strategy. The following contains some results of the analysis:

Present position: According to Day (1999) *present position must be known all the time, i.e. where are we now and what are others doing.* It became very clear in the study that the present position was not known to the company. Although SWOT was done once a year, its real purpose was not understood.

The case organization had a strong top-down strategy making process but without understanding their present situation and proper scenario, it was impossible to create a decent strategy and communicate it well.

The Woven Strategy process, even without any tool, showed its viability in this case. The questionnaires brought forward the problems in the strategy process and its implementation. The knowledge level of the whole organization in respect to understanding the strategy increased and the top management could facilitate their intuition for improved strategy and vision. Even though no tool was used, the feeling was that the use of an IT tool would make the process much easier and quicker.

Verification

The main goal was to test the questionnaire methodology in analyzing how well the case organization understood and implemented their planned strategy. The chosen method and questions functioned very well in this case. Both the interviews and replies supported the questionnaire method, although the analysis was more difficult than if the answers had been readily available in a database.

Validation

The persons that participated in the study represented all organization levels within the company. In interviews conducted after the study, all participants stated that they regarded the method as suitable for the study's purpose.

7.4 Case Study 3 in Case Company B

The main goal in this study was to test the questionnaire method in the strategy planning process, as well as to test the Woven Strategy questionnaire tool.

The empirical tests were led by the author and constructed by research assistant Juha Takamaa (2003) who used this case to write his master's thesis.

Table 17 Summary of Case Study 3

Time	Specific research topic	Relation to hypothesis of the main research	Applications used
2003	Strategy process, strategy implementation	Use of questionnaires and IT, Mintzberg's fallacies of strategic planning	New questionnaire application

7.4.1 Case Organization 3

Case organization 3 was in the energy sector of Case Company B.

The strategy process of the company is described in Figure 44.

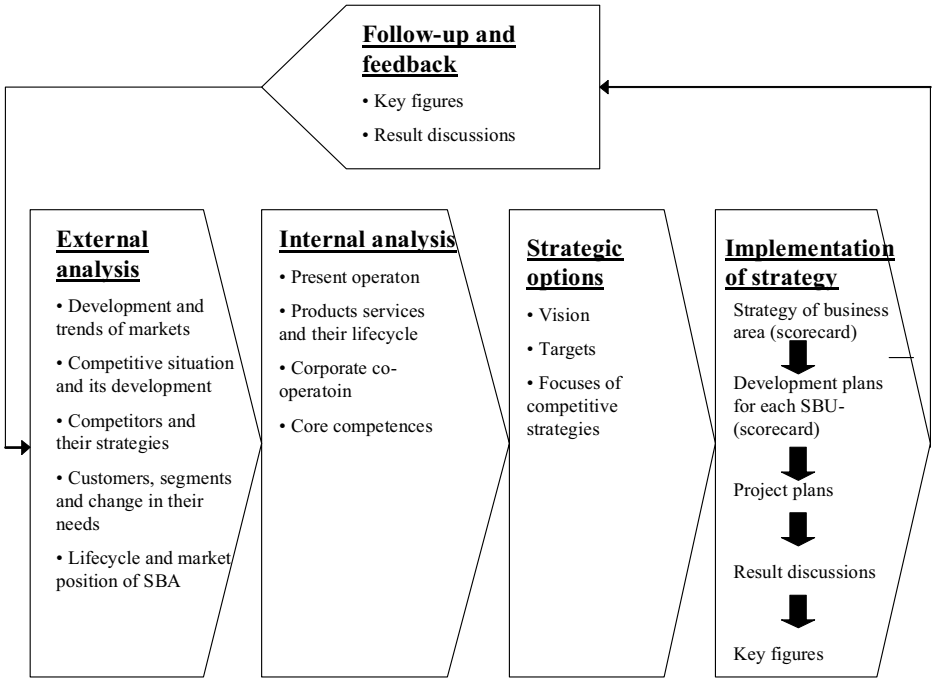

Figure 44 The strategy process of Case Organization 3

7.4.2. Empirical Tests

In Case Study 3 the goal was to create a new model for strategy planning. In this model the personnel of the company had to reply to strategic questions. As a result, the company gained a set of strategic questions with their relevant analysis. Furthermore, the strategic position of the company was found and the continuous strategy model was tested.

Research focus and the test assignment

In Case Study 3, the research focus and the test assignment were more or less the same as in Case Study 2, but a web-based system was utilized to collect the answers for the strategic questions.

The main assignment in this case was to find out how successful the strategy process was in the case organization and how well the Woven Strategy tools supported it.

Research methodology and test methods

The research was implemented by using interviews and web-based questionnaires. The web-based questionnaire was made using the tool developed in the "BrainPoweri" project.

Written answers were qualitatively analyzed with the developed application and quantitative answers were analyzed with a spreadsheet.

Questionnaire

The questionnaire used was more or less the same as in Case Study 1, and contained around 50 questions. The method was already well known and established in the company.

Preparing the questionnaire

Top management and middle management utilized the web-based system whilst supervisors and workers were interviewed with paper format questionnaires similar to those used in Case Study 2.

To those responding to the web questionnaire, a link and password were sent by e-mail.

Applications used

For the web-based questionnaire, the questionnaire tool presented in Chapter 6 and developed in the “BrainPoweri” project was used. In the same project, the developed analysis tool, as presented in the theoretical part of this thesis, was also used.

For web-based strategy discussion, the Woven Strategies application was used (Liinamaa, 2004; Nuutinen et al., 2004a; Nuutinen et al., 2004b). The analysis of the quantitative answers was done with a spreadsheet application.

Test environment

The questionnaire application could be found on the servers of Tampere University of Technology, Pori. Respondents were also sent links so that they could answer the questions wherever they felt convenient. This was possible with the paper format questionnaires, which were additionally sent by mail to respondents. The analysis tool servers were at the University of Joensuu.

Test situation

Compared to Case Study 2, the test situation was much more informal due to the freedom respondents had in selecting when, where and how to complete the questionnaire.

Duration of the Tests

The study was conducted during August-September 2003. The time spent on answering the questionnaire by individual respondents has not been analyzed.

Respondents

The questionnaire was sent to three different organizational levels, i.e. management, middle management and project personnel (supervisors and workers).

The respondents consisted of five top managers, 25 middle managers and 16 supervisors and workers. These worked in one workshop and in one large scale project site. All 16 persons answering on paper completed the questionnaire. Figure 45 shows the breakdown of the number of respondents who replied using the web-based application.

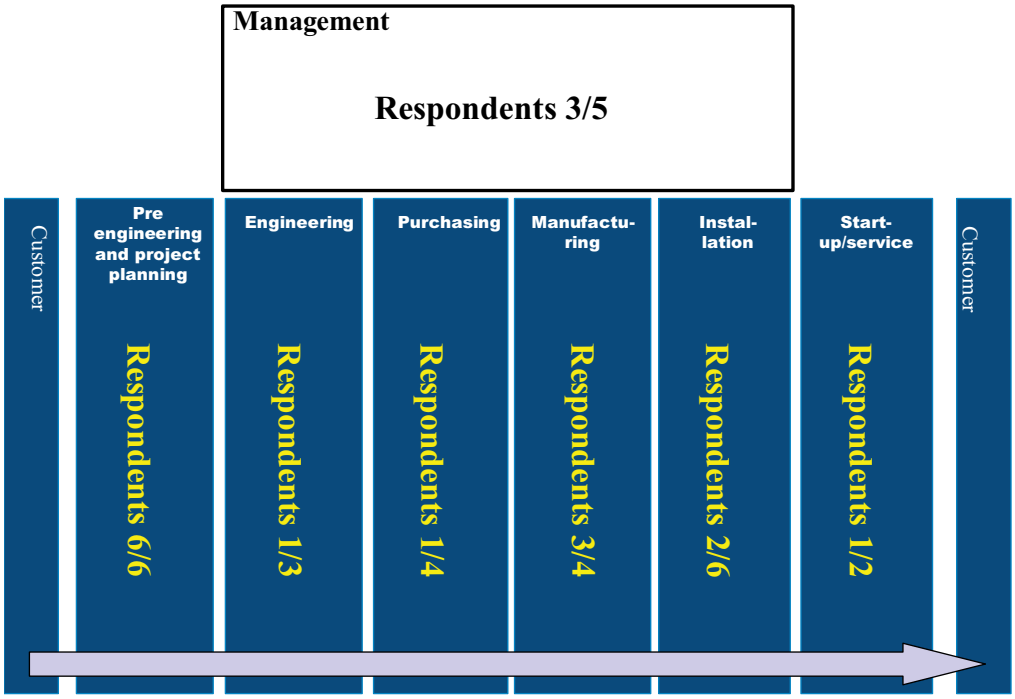

Figure 45 The division of respondents and number of those who replied with the web-based application

Test results

Analysis

The research showed that 42% of top and middle management knew the organization's vision and strategy. Some of the respondents had restricted the vision to a narrower geographical area or had ignored customers. The study also showed that all the respondents did not fully support the strategy defined by top management. Some of the replies gave proposals for alternative strategies. Figure 46 is a concept map showing how respondents defined the organization's strategy.

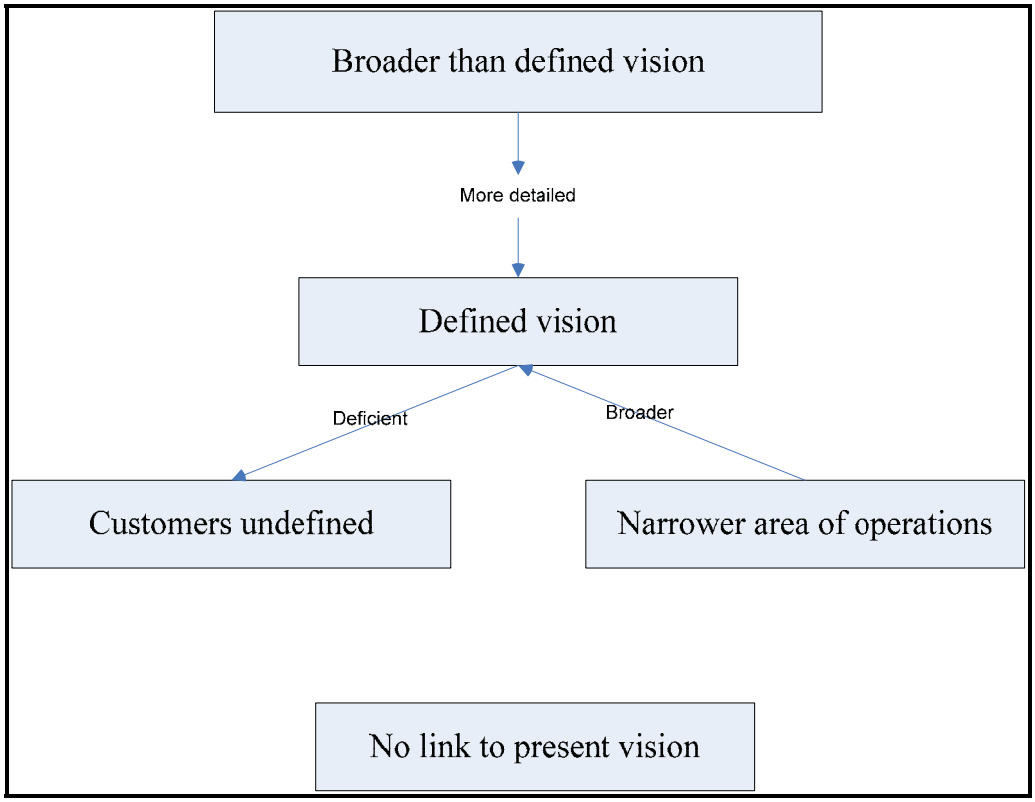

Figure 46 A concept map for understanding vision and strategy in the case organization

When analyzing the project level, it was clear that neither vision nor strategy was communicated well enough to supervisors and workers. Of those persons, only 30% knew the organization's strategy.

Another issue addressed by the questionnaires was how well the balance scorecard (BSC) had been understood and internalized. The study showed that 66% of management and only 6.3% of project personnel understood the scorecard (Figure 43).

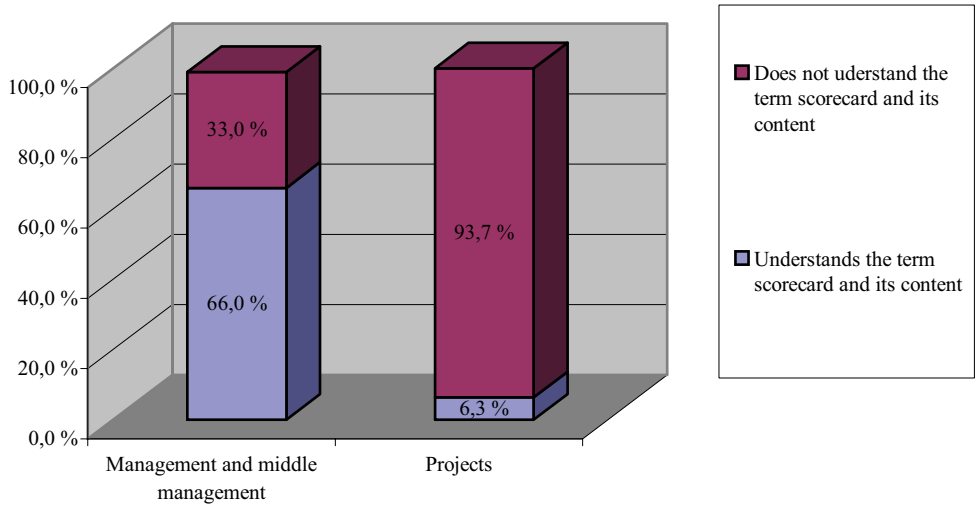

Figure 47 Information on the scorecard and its content

Figure 48 presents the new strategy concept where the developed tools presented in Chapter 6 can be seen (questionnaire and analysis tools, concept map, and Woven Strategies). They are part of the everyday strategy process and help in the implementation and communication of strategy. In this case practically all research theses were shown to be correct.

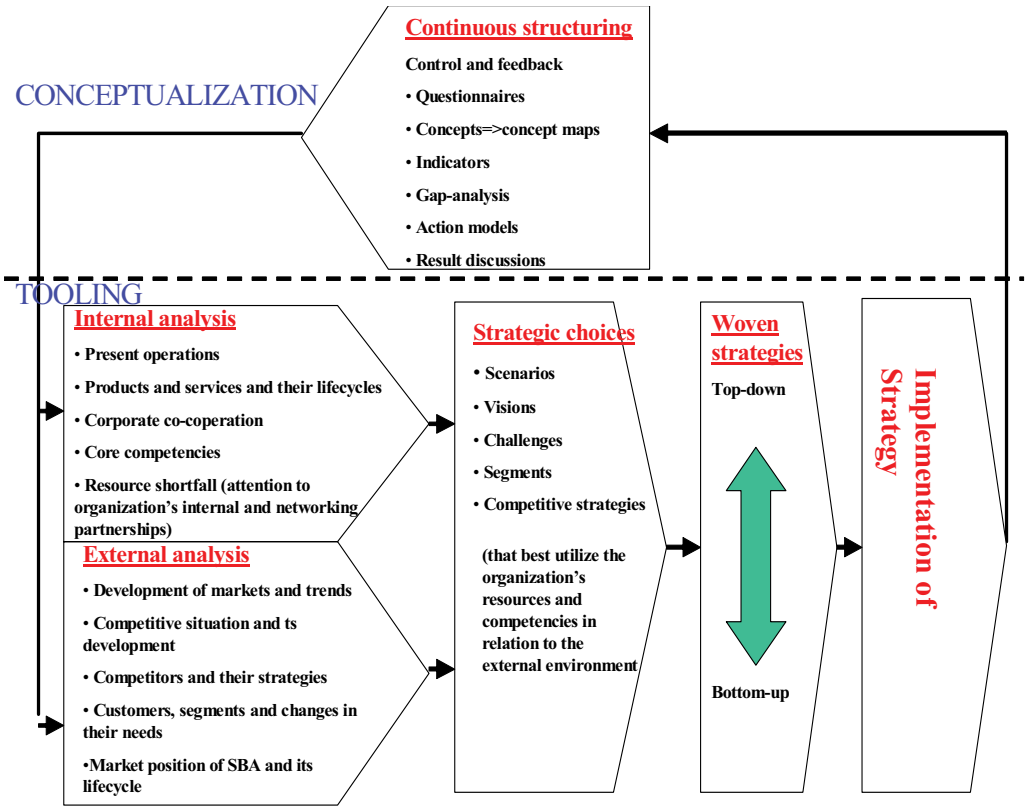

Figure 48 New strategy process (Takamaa, 2003)

Verification

In this case, as in the first, the developed questionnaire and analysis tool was used. The questionnaire tool utilized the questions included in previous questionnaires, so there was not much new in this respect. For Case Company B, this was new because in this company's first case study manual questionnaire methods were used. In Case Study 3, paper questionnaires were only given to project workers, i.e. to workers and their supervisors. This was mainly because the majority of them did not have available computers or web-access on-site. The questionnaire tool functioned exactly as expected. The analysis tool did make the analysis easier than in the first cases, but it was still difficult to use.

Validation

The realization of the planned strategy was much further studied in Case Organization 3, a different organization of the same Company B. In analyzing the situation the conclusions drawn were very much the same as in the previous case study.

One year after the completion of the study, the researcher discussed the system and the method with the sub-researcher. The case organization continued to use the same method, and its results as well as the organization's financial results were seen as very positive. Due to the fact that the analyzing tool was difficult to use, the tool was abandoned and the company developed its own tools for questionnaires.

7.5 Case Study 4 in Case Company C

The main goal in Case Study 4 was to test the questionnaire method and the questionnaire tool, as made by AtBusiness.

The empirical tests were conducted by the researcher, and assisted by Janne Mörönen (2002) who also wrote his master's thesis during the research.

Table 18 Summary of Case Study 4

Time	Specific research topic	Relation to hypothesis of the main research	Applications used
2002	Use of web-based questionnaires and tools in strategy process	Use of questionnaires and IT	Commercial questionnaire application

7.5.1 Case Organization 4

Case Organization 4 is one of the global leading companies in its business area with sales of about 2200 M€ and with around 9500 employees. The sales of service business represented about 25% of the company's overall sales. Case Organization 4 is an independent business unit within Case Company C.

The cornerstone of the case company's strategy was based on a new service focused business concept (Figure 49).

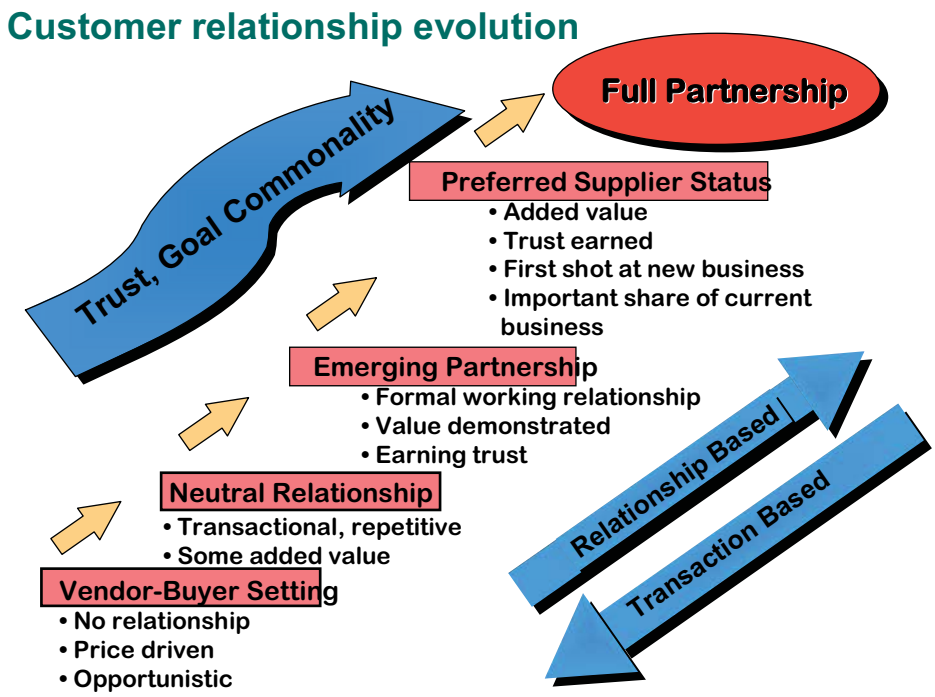

Figure 49 The new business concept of Case Company C

In practice, this concept meant a closer partnership between the case company and its customers, for instance, the company would take maintenance responsibility of its customers' mills.

The case company developed and still develops numerous technologies to support its new business concept. An example of this is their remote diagnostic system developed to enable the company to control its customers' equipment and processes remotely. This system is also able to give its customers advice and help without the need to travel to them.

This research was done for the case company's global services organization, which consisted of around 500 persons, sales being of about 75 M€. As for the whole service, the market area was global, although at that time most of the sales came from Finland, Scandinavia and North America. Asia Pacific was still in the very initial stages of business development and South America was only in future plans. As Case Organization 4 was very close to the organization's new business concept, this was selected as the pilot strategy project.

The organization's scenario had been made a couple of years earlier and it was strictly followed (Figure 50).

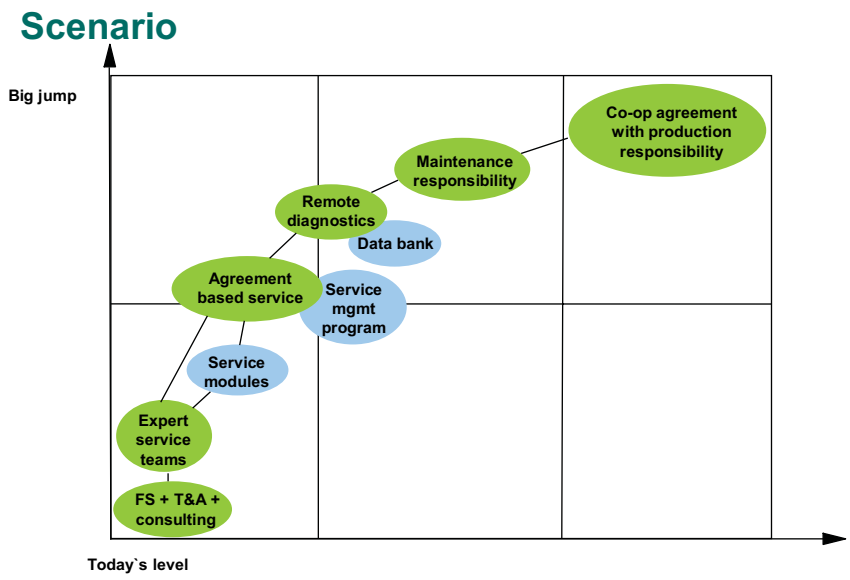

Figure 50 The scenario of Case Organization 4

Case Organization 4 had a very systematic approach to the strategy process, although this was not based on any particular theoretical framework. Figures 51, 52 and 53 describe the strategy processes of Case Company C.

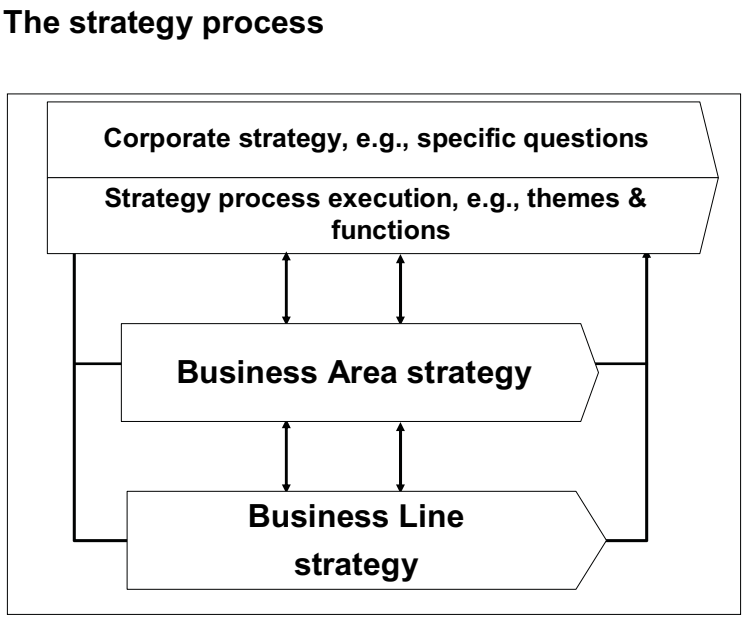

Figure 51 The strategy process of Case Company C

Figure 52 The business planning calendar of Case Company C

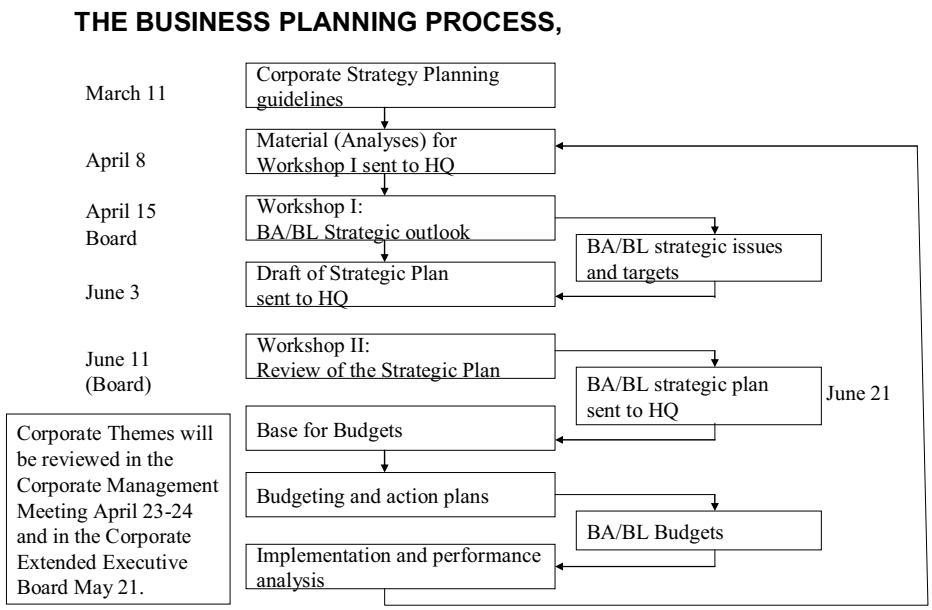

Figure 53 The business planning process of Case Company C

As we can see, the process is very traditional in its planning around the annual calendar. In principle there were three organizational levels involved in strategic planning, but in practice there were only two levels. Personnel's opinion was, however, listened to and taken into account.

The strategic planning process had been very similar year after year and mainly concentrated on budgeting, as based on previous years' strategies and budget figures. The tools used were also very traditional.

Again, one of the main pitfalls in the case organization's strategy process was that strategy was not properly communicated to the lower levels of the organization, even though the top management of various business units was committed to it.

7.5.2. Empirical Tests

Research focus and the test assignment

In Case Study 4 the Research focus and the test assignment were to test two main separate issues: 1) The suitability of the commercial application for the purpose of making strategic questionnaires, 2) The methodology itself, i.e. the

suitability of using questionnaires in the strategy planning process. Chronologically, Case Study 4 was the second case study carried out.

The questions were collected mainly by students at Tampere University of Technology, Pori. These were gathered from 18 books dealing with strategic management. Altogether there were about 600 questions.

In Case Study 4 about 300 questions were used. Of them half were open and the other half closed. Around 100 questions required the respondent to evaluate how successful the company had been in respect to a particular topic and also give proposals for improvement.

Research methodology and test methods

The methodology in Case Study 4 was basically the same as in Case Study 2, but there were some major differences as well. Also, the target of Case Study 4 differed from that of Case Study 2. The main target here was to test the web-based application's suitability for collecting answers to strategic questions from respondents residing all over the world. The goal was also to find out if this kind of informal and anonymous questionnaire could inspire more intuitive and innovative answers than with formal occasions.

Questionnaire

The whole questionnaire can be seen in Appendix 2. As in all cases, the questions covered all functions of the company starting from strategic management and ending up in production.

The questions were also more or less standard questions collected from the database. Some extra questions relating to the company and business area were added. In this case, however, the main emphasis was in testing the application and its suitability for the strategy planning process via the Internet.

One problem found was that many answers included a scale from one to seven, meaning that it was very easy to give a neutral four.

The questionnaire consisted of ten parts that can be also shown with a positive strategy process (see Figure 54). The first part was very general and the rest consisted of questions on business processes. Most of the questions (46%) were related to strategic management and general management (Figure 55).

All forms of questions were included, i.e. multiple-choice, alternatives, open questions and scale questions.

Figure 54 The process of the positive strategy spiral (Kivimäki 2001)

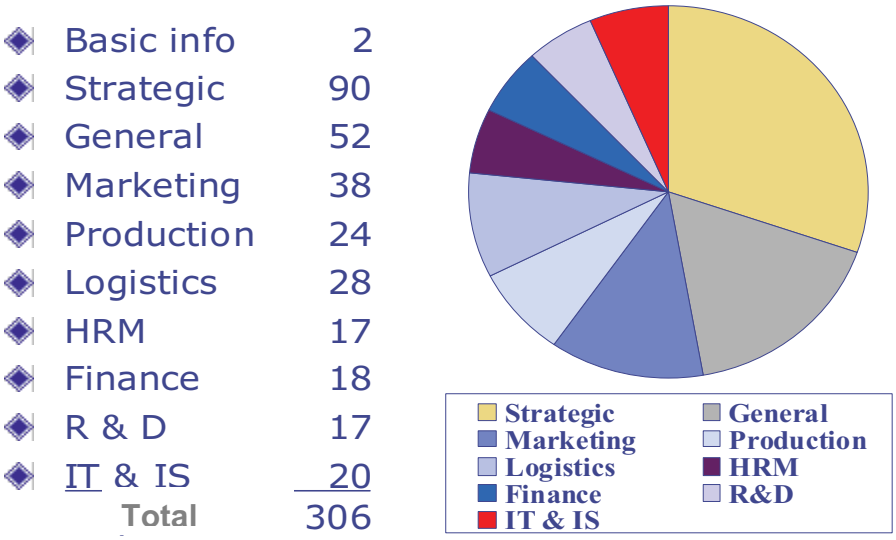

Figure 55 The division of questions into different business processes

Preparing the questionnaire

Before publishing the questionnaire on the web, respondents held a training session in connection to the case organization's global management meeting. Instructions were also e-mailed to all respondents.

The link to the questionnaire was sent to respondents by e-mail. Technically, no one experienced problems in answering the questions.

After completing the questionnaires, the respondents were sent another questionnaire asking their opinion about the method used, and then another asking how easy or difficult the questions had been to answer.

Regarding feedback, the only problem with the questionnaire seemed to be that too many questions had been asked and thus respondents thought it took them a little too long to complete.

Applications used

A commercial application (Atbusiness's Surveyor) for making questionnaires and asking questions was used. Unfortunately this application had some practical pitfalls. First, it was still heavily under development and this meant that there were severe bugs in the software, making the preparation of the questionnaire difficult and time consuming. Another major pitfall of the system is that it is a "closed" system, i.e. no open interfaces to any general commercial software are available. This meant that, in practice, no further development nor completion of the software vision was possible. Hence, the decision was made to develop our own questionnaire application.

Test environment

The test environment was open, i.e. all respondents received a link to the questionnaire and were free to answer it anytime, anywhere, within the given time frame. No detailed analysis of the time and place of answering the questionnaire was made, but some stated that they completed it at work and

some later stated that they completed it at home when no phone calls would disturb them.

Test situation

As described previously, the respondents were free to select the time and place to complete the questionnaire. This means that there were no formalities in the test situation.

Duration of the Tests

The questionnaire was published on-line in the summer of 2001.

It was planned that all the responses would be received within four weeks. However, due to the summer holidays and the international nature of the project, the response time was extended to 11 weeks.

Individual respondents took between 2 and 8 hours to complete the questionnaire.

Respondents

Respondents represented the top and middle management of the case organization. 14 persons took part in the questionnaire. They came from Scandinavia, Central Europe, North America and the Global Organization (responsible for co-coordinating development activities globally).

Test results

Analysis

As stated in earlier, respondents found that there were too many questions in the questionnaire. Fortunately all the respondents replied to all the questions so the coverage was complete and global.

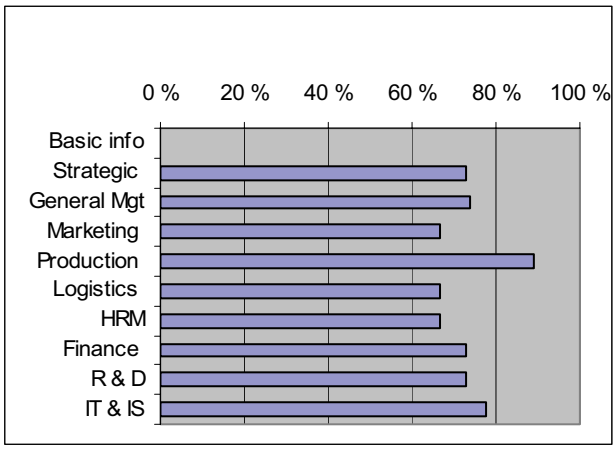

Figure 56 Positive attitudes per section

When examining the overall evaluation, the levels of satisfaction and positive attitude was very good in production, which seems quite obvious when most of the respondents had some kind of background in production and were specialists in that area. One of the poorest areas was marketing, and this was reflected in the sales of case organization outside Scandinavia.

Management was considered to be the best area of the case organization, and this may have been due to its very motivated and dynamic manager. In addition to strategic management, the worst areas in the analysis came out as marketing and human resource management.

In the management of marketing, the most serious problem was that personnel did not know the products well enough, and many of them only had experience from their current positions in the company, i.e. they had no experience in the customer environment which is essential in this kind of expert business. Hence, the problems related to marketing are interrelated with human resource management. There was a lack of suitable persons in the business worldwide, although the need for them was enormous. The dilemma was clear; it was not possible to get skilled experts fast enough to meet the company's rapid growth.

In this case study computer software was used for the questionnaires, for the first time. This method, the Woven Strategy method as such, proved to be viable once again. For the first time, this case showed that all Mintzberg's

fallacies in strategic planning could be overcome. This will be discussed in more detail in Chapter 8. A lot of new knowledge was captured for the strategy making process.

Verification

This case was the first one in which the web-based questionnaire tool was used, and it showed that it is possible to obtain good strategic ideas from the organization and that the tool is viable, even when the people are residing all over the world.

In this case the analysis was done manually because no automatic analysis tool was as yet available.

Validation

The goal was first to test the method, and this was successful. All respondents accepted the method and new ideas for business development were collected.

7.6 Case Study 5 in Case Company C

The main goal was to test the application and the questionnaire method. A further goal was to draw a new strategy for Case Organization 5.

The empirical tests were conducted by the researcher and assisted by Kimmo Liinamaa (2003) who at the same time wrote his master's thesis.

Table 19 Summary of Case Study 5

Time	**Specific research topic**	**Relation to hypothesis of the main research**	**Applications used**
2004	Testing of developed tools and theories	Use of questionnaires and IT, Mintzberg's fallacies of strategic planning	Developed questionnaire application

7.6.1 Case Organization 5

The case organization is quite large. It produces equipment and services mainly for the chemical pulp industry, and has operations in all continents. The organization is also a result of several mergers and this is clearly evident in the company. Compared to the previous case, however, this organization's operating procedures were somewhat different.

7.6.2 Empirical Tests

Research focus and the test assignment

The purpose of the case was to create a new strategy for the case organization. Its units are located mainly in Finland, Sweden and USA, and its product range covers manufactured products to expert services.

The questions used were very similar to those used in previous studies. It became clear that the set of questions collected in the very beginning of the study was usable in different company environments and could easily be modified depending on each company's circumstances.

Research methodology and test methods

Questionnaire

The questionnaire was very similar to that of the previous case study. The management of the organization discussed it beforehand and some corrections related to the questions were made.

Preparing the questionnaire

Instructions and reasoning behind the questionnaire were sent by e-mail to all of the respondents. Due to some firewall-related problems, the questionnaire was also sent in MS Word format, so respondents had a choice between completing the web-based or MS Word questionnaire.

Applications used

In the case of the questionnaire, our developed application and MS Word files were used. For the analysis, the self-developed concept map, dialogue tool and Woven Strategies tool were available.

Test environment

In this case there were two servers, one for the questionnaire in Pori and another one for analysis at the University of Joensuu.

The respondents were situated all over the world and therefore freely selected the time and place to complete the questionnaire.

Test situation

No formal test situation was arranged.

Duration of the tests

The questionnaire was distributed in the summer of 2004 and respondents were given until the end of August 2004 to answer the questions. However, because no answers were received by August, a reminder was sent to respondents and then answers and comments were received by the end of September.

Respondents

The questionnaire was sent to 20 people in Scandinavia, Central Europe and North America. They represented the top and middle management of the subject organization.

Test results

Analysis

This case was very interesting because only three persons completed the questionnaire, but around ten others sent the following e-mail (this e-mail was written by one respondent and forwarded by nine):

> "*You have for sure taken on a challenging task. Hopefully, something good will come out of your work. I started to fill in the form but found out that it got increasingly more difficult for a number of reasons. A key reason is perhaps the one important criterion, which I mention below; to implement a successful strategy is not fulfilled. Another reason might be that frequent reorganizations have made the strategy process slow down. Maybe this questionnaire or a similar but simpler would be more appropriate at about this time next year?*
>
> *Company vision and strategy should be shared and committed to by all employees of the company.*
>
> *The vision should be created by the Board and the Management of Company. However, for the creation of the strategy it is important that this process involves people from management down to the different business units in an iteration type of process. Thus, the strategy will look different for different business units.*
>
> *Key is also that when settled, the vision and strategy should be communicated and discussed at all levels of the company in order to get commitment from all employees.*
>
> *I stopped filling in the form at the section "FBL Strategy". I am not aware of that the strategy forming process of FBL has started.*
>
> *It is good to have a strategy, but I think it is also very important that the strategy is short, flexible and can be modified to meet changing requirements.* "

As it can be seen from the above response, there was major frustration concerning the continuous re-organization of the company and its style of management. This had lead to a situation in which personnel's motivation has been completely lost.

The researcher conveyed this message to the company's top management. No more analysis was needed as it was very clear that the company had internal problems, which were also evident at that time from the company's results.

This case study also fulfilled it purpose. The questionnaires revealed the real situation in the organization for the top management.

Verification

The tested application proved to function although strict firewalls set some limitations, however they these could be overcome with technical help. The analysis tool also functioned although there was not much need for it, because the e-mail forwarded by the ten respondents itself indicated the situation in the case organization.

Validation

About half of the 20 respondents shared the view that the company did not as yet have a clear strategy and vision, and were waiting for them. On the other hand, one can always ask why they did not create these for themselves. This is apparently what they were ready to do, but only after the organization had settled down. For proper validation purposes of this case only a new questionnaire must be made, yet the ensuing tight top-down approach in the company has not seemed to have brought along results.

7.7 Case Study 6 in Case Company C

The main goal was to test the application and questionnaire method. A further goal was to draw a new strategy for Case Organization 6.

The empirical tests were conducted by the researcher and assisted by Kimmo Liinamaa (2003) who wrote his master's thesis at the same time.

Table 20 Summary of Case Study 6

Time	Specific research topic	Relation to hypothesis of the main research	Applications used
2004	Testing of developed tools and theories	Use of questionnaires and IT, Mintzberg's fallacies of strategic planning	Developed questionnaire application

7.7.1 Case Organization 6

Between previous questionnaires (Case Studies 4 and 5) the case company had been reorganized several times. The biggest change was that the whole service organization was set under other business lines.

Another major change was that a new business concept was launched (Figure 57).

The goal of these changes was to streamline the organizational structure and its way of operating.

Maintenance-related services were split under product lines and there was little co-ordination. For the moment, this case study is still under progress. All the comments valid for the previous cases seem to be valid in this case also.

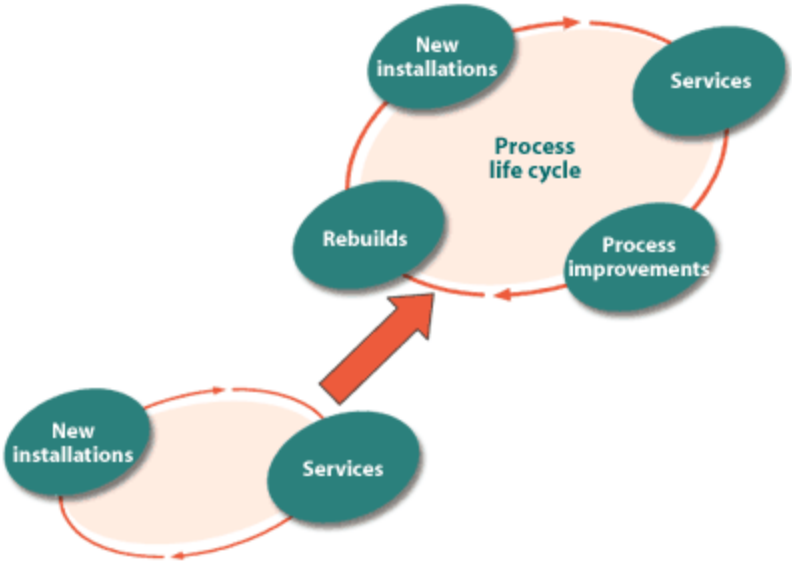

Figure 57 The new business concept of Case Company C

7.7.2 Empirical Test

Research focus and the test assignment

This case is more or less similar to that of Case Study 4. However, this questionnaire took place three years after the first one and the most important topic which has now emerged is the content of the questionnaire, and not the tool. The main target of this case was to create a new strategy for maintenance activities in the company.

Research methodology and test methods

Questionnaire

The questionnaire was very much alike that of Case Study 4. Some minor changes were made but the principle, as well as most of the questions, remained exactly the same. The number of questions was reduced slightly.

Preparing the questionnaire

All the respondents were sent a notice and instructions for completing the questionnaire by e-mail.

The case company had made changes to its firewall so in some cases the respondents were not able to access the web-based system. Therefore the questionnaire was also sent to everyone as a MS Word format text file that they were able to return by e-mail.

Applications used

The application developed in the “BrainPoweri” project was used in creating the questionnaire. Also, a MS Word file was used to collect the answers. For the data analysis, the new tools developed for the project were used.

However, more developed tools were available in this case than in earlier cases. One good example of this was the use of SOM analysis on the corporate level.

Test environment

The questionnaire's web server was located in Pori, the data analysis software was located on a server in Joensuu, and the respondents were located all over the world.

Test situation

The test situation was informal; the respondents were given a time frame within which to answer the questions and they were freely able to choose the location and time of answering them.

Duration of the Tests

The test was initiated in summer 2004 and finalized in September 2004.

Respondents

The questionnaire was sent to around 20 persons. Unfortunately, up until now only four persons have responded to the questionnaire. The main reason for this can be seen from Case Study 5 that forms part of the same company.

Test results

Analysis

Due to the low number of respondents no reliable analysis can be made, although the same comments and analysis as made in the previous case are very much valid.

At an aggregate level, SOM-analysis also gave some hints for areas of development in the case organization. In the future these maps could be utilized in all analyses. For instance, the following clusters (Figures 58, 59) have been established from the collected data (at a higher lever research):

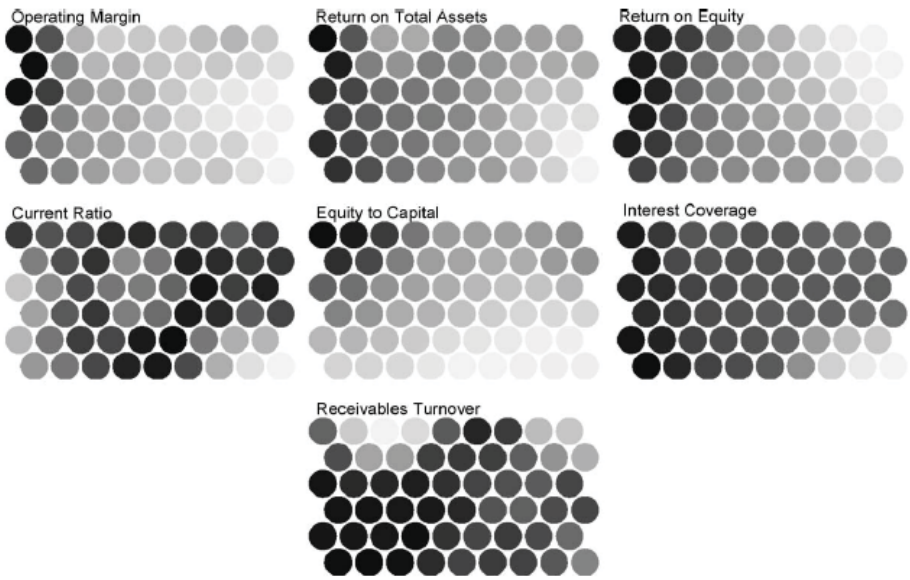

Figure 58 An example of SOM feature planes for the case company (Magnusson et al., 2005)

As a result of this analysis, Figure 59 shows the relative positions of one of the company's divisions and its competitors:

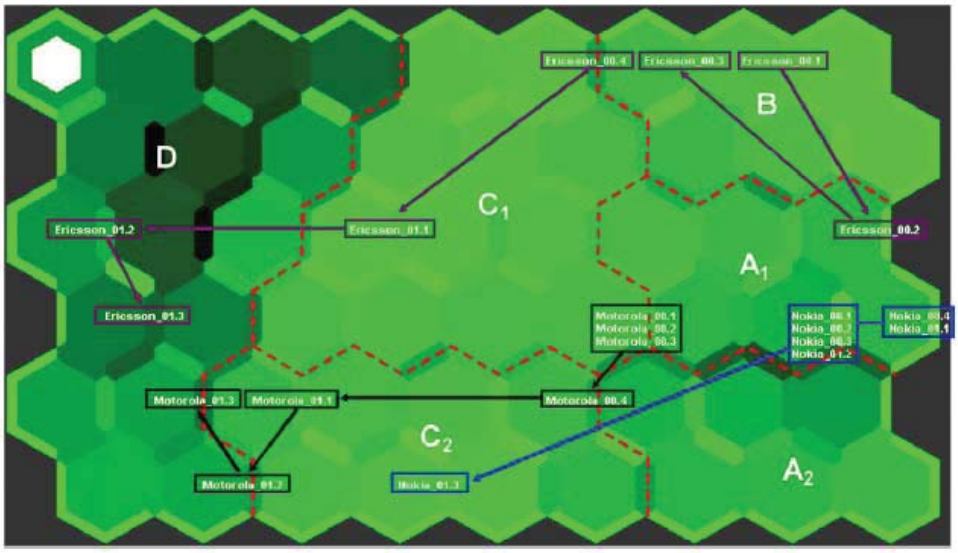

Figure 59 The competitive positioning of some example companies (Magnusson et al., 2005)

From this slide the financial performance of the analyzed companies can clearly be seen. Of course, in a practical situation the next question would be why other companies have performed so much better than Case Company C and what should be done in the case company to bring it to the same level.

The next step in the development has been the simulation of the above-mentioned data (Figure 60). In the simulation a selected number of variables can be simulated and the future position of the company can be seen on a map.

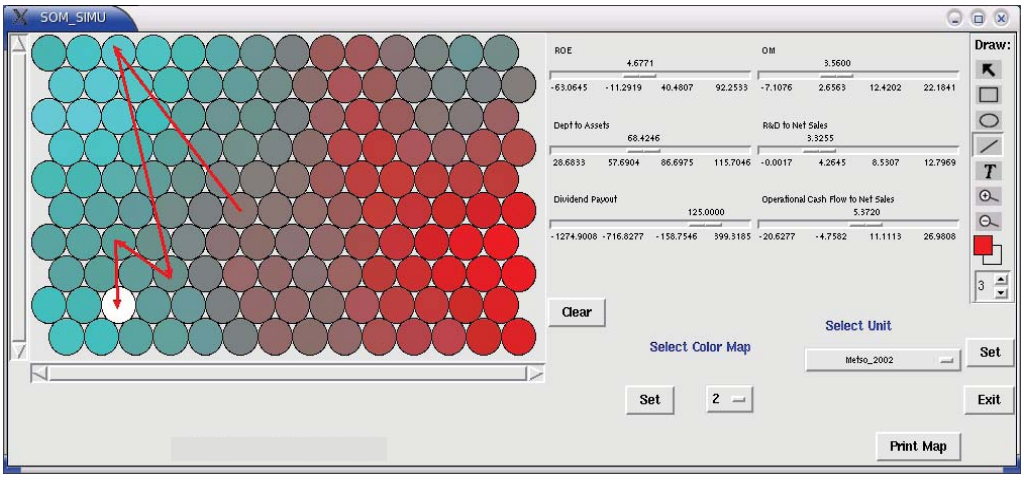

Figure 60 Data simulation

The analysis tools were also further developed and some analysis was available.

The research questions and thesis were also answered in this case. The Woven Strategy method worked as planned, as did the Woven Strategy tools. This topic will be discussed more closely in Chapter 8.

Verification

The application used was suitable for its purpose and new possibilities to use the simulation tool were evaluated. The simulation tool looks promising, but it needs to be validated and verified separately.

Validation

The continuous reorganization of the company caused a lot of confusion for this business. The top management of the company set up a work group to clarify the future of this promising business. That work is still on-going. One reason why the planning is taking so long is that this case organization's

business is so different from the company's traditional business that the management is cautious in taking any major steps.

7.8 Case Study 7 in Case Company C

The researcher conducted the empirical tests. Research assistant Jussi Nuutinen assisted a lot in the development and use of the Woven Strategies tool.

Table 21 Summary of Case Study 7

Time	**Specific research topic**	**Relation to hypothesis of the main research**	**Applications used**
2005	Testing of developed tools and theories	Use of questionnaires and IT, Mintzberg's fallacies of strategic planning	Developed questionnaire and Woven Strategy tools

7.8.1 Case Organization 7

This case organization is an independent unit of the corporation within its venture organization. It has had some difficult business years, but recently its financial development has been quite positive. It is one of the world's largest suppliers of equipment and after-market services for its industry, designing and supplying entire production lines. Its main customer industries are the furniture industry and the construction industry. Its customers are from all over the world, but nowadays more and more customers are coming from Eastern Europe and Asia.

7.8.2 Empirical Test

Research focus and the test assignment

The test case is more or less similar to Case Studies 4, 5 and 6. The main focus is to verify the suitability of the developed tools and the method through the whole strategy process.

Research methodology and test methods

Questionnaire

The questionnaire was very much alike that used in Case Studies 4, 5 and 6. Only some minor changes were made but the principle, as well as most of the questions, remained exactly the same.

Preparing the questionnaire

All the respondents were sent a notice and instructions on how to complete the questionnaire by e-mail.

Applications used

The application developed in the "BrainPoweri" project was used in creating the questionnaire. Some respondents used MS Word paper format questionnaires too. For the data analysis, new tools developed for the project were used. The strategy concept and Woven Strategies tools were also utilized to create a new strategy for the organization.

Test environment

The questionnaire's web server was located in Pori, the data analysis, strategy concept and Woven Strategy software were located on a server in Joensuu and the respondents were located all over the world.

Test situation

The test situation was informal; the respondents were given a time frame in which to answer the questions and they were able to freely choose the location and time of answering them.

Duration of the tests

The test was initiated in the beginning of April 2005 and finalized in May 2005.

Test subjects

The questionnaire was sent to around 10 persons. They represented the top and middle management of the research organization and were situated in several units across Europe.

Test results

Analysis

Due to the low number of respondents, no reliable analysis can be made. Nevertheless, it was very clear that there was a need for a new strategy because in the beginning no strategy existed at all. For most of the questions, the answer was given that either a strategy was needed, more development was needed, or that no specific strategy existed. However, even in this case the Woven Strategy approach seemed to bring the desired results. The Woven Strategy tool also showed its power; the strategy process was made much smoother than in previous cases and the time spent on it was shortened considerably.

Verification

The tested application proved to function well. The analysis tool also functioned well. There were some problems with the questionnaire tool due to the updating of the database software.

Validation

The results in this case were interesting. For the first time there were a lot of questions regarding the questions themselves. The questions were not easily understood, although they were the same as in previous cases. On the other hand, it turned out that the unit took the questionnaire very seriously and really wanted to understand all the questions. However, it turned out that this was because there was no real strategy in the unit. The development of it started after this project.

7.9 Case Study 8 in Case Company C

The empirical tests were conducted by the researcher. Research assistant Jussi Nuutinen assisted a lot in the development and the use of Woven Strategies tool.

Table 22 Summary of Case Study 8

Time	**Specific research topic**	**Relation to hypothesis of the main research**	**Applications used**
2005	Testing of developed tools and theories	Use of questionnaires and IT, Mintzberg's fallacies of strategic planning	Developed questionnaire and Woven Strategy tools

7.9.1 Case Organization 8

The case organization in Case Study 8 was the same as in Case Study 7, but the test assignment and test subjects were different.

7.9.2 Empirical Test

Research focus and the test assignment

In addition to testing the methodology and tools, the goal was to assist in developing R&D strategy for the organization

Research methodology and test methods

Questionnaire

The questionnaire was a standard strategy questionnaire, but it only included the sections related to product, research and development.

Preparing the questionnaire

All the respondents were sent a notice and instructions on completing the questionnaires by e-mail.

Applications used

In the questionnaire, the application developed in the “BrainPoweri” project was used. Some respondents used MS Word paper format questionnaires too. For the data analysis, new tools developed for the project were used. The Woven Strategies tools were also utilized to create a new strategy for the organization.

Test environment

The questionnaire’s web server was located in Pori, and the data analysis, strategy concept and Woven Strategy software were located on a server in Joensuu. Respondents were located all over the world.

Test situation

The test situation was informal; the respondents were given a time frame in which to answer the questions and they were able to freely choose the location and time of answering them.

Duration of the tests

The test was initiated in the beginning of April 2005 and finalized in September 2005.

Test subjects

The questionnaire was sent to 6 persons. They represented the top and middle management of the research organization and were situated in several units across Europe.

Test results

Analysis

A lot of discussion about R&D strategy was undertaken. Everyone agreed on the need to have a uniform strategy and on putting it into practice at all levels of the organization. During the strategy concept building stage based on the

analyses, the most critical strategic issues were identified and further developed. The development of a new strategy was initiated.

Verification

The tested applications proved to function well. There were some database-related problems when questions were answered, due to the updating of the database. The Woven Strategy tool proved to be useful in getting the opinions of the experts for the strategy process and then providing an easy tool for analyzing the answers.

Validation

Practically all respondents shared the view that the company had not yet a clear strategy and vision and were waiting for them. However, in this case the organization was eager to create them and results were as expected. The Woven Strategy tool was tested thoroughly, and the idea was regarded as very good. One comment made stated that a separate administrator for doing the "typing work" was needed and that young or computer literate people should be involved.

7.10. Summary of Case Studies

In the eight case studies presented in this chapter the main goal has been to analyze the suitability of questionnaires in strategic planning, and the use of information technology, especially that of the Woven Strategy application in the strategic planning process. The case studies have been conducted in three different international companies and the participants have included those from ordinary workers to top company management. However, the majority of the respondents have come from middle management. In addition to these two research goals, there has also been a separate strategy or information technology-related theme.

The contribution of the developed tools to the success of case studies has been enormous. The studies could not have been possible on such a scale without the

applications developed. The strategy planning process has been made much shorter and easier than before.

The cases have been successful from the research point of view, although there is still a lot of development work left in the information technology-related areas related to this thesis.

8. DISCUSSION AND CONCLUSIONS

This research was carried out during 1999-2005 at Tampere University of Technology, Pori. Both the theoretical and practical research was done under the umbrella of the "BrainPoweri" project, under the supervision of Professor Vanharanta who developed the Continuous Strategy concept. The research began from a research plan and the collection of strategic questions in a database. At the same time, a vision of the application to be developed was formed, which progressed in different stages after each new application was developed. The methodology and application was tested in three case companies. Altogether eight case studies were completed.

The initial task was very challenging and interesting, but all the challenges have been overcome step by step, although there is still a lot of development work to be done over the future years.

8.1 Evaluation of the Methodology

The approach presented in this thesis heavily utilizes the developed Woven Strategy application. However, a similar methodology and approach could also be applied without any software tool. Likewise, the main stages in this approach would be:

- collecting strategic questions
- answering the questionnaires
- analyzing the answers
- drawing the strategy
- following-up the implementation of the strategy

When looking at the different strategy approaches in Chapter 2, none of them really discuss involving large numbers of personnel in the strategy process. The main theme in those presented strategies seems to be the analysis of various competing factors like markets and competitors. Mintzberg discussed different design schools and ways to formulate strategy, but he does not think much about the whole organization, its contribution or intuition. Knowledge and intuition, as well as organizational learning, seem to be forgotten. Those are the

areas this thesis focuses on. Another major difference compared to existing strategy approaches is the use of the bottom-middle-up approach. In this new approach the biggest advantage, in addition to organizational commitment, is the gathering of organizational know-how for the benefit of the whole company. Vanharanta (1995) has discussed different metaphors in his Continuous Strategy concept. Using his work, a company's knowledge assets can be efficiently utilized. It has clearly been shown in Case Studies 2 and 3 that by using this method it has been possible to obtain a uniform vision for the company and increase the organization's level of commitment to the company's strategy.

When compared to the previous strategy methods used in the companies, it can be seen that the presented approach has also shortened the strategy cycle. This has made it possible to react faster to the changing business world.

The methodology used in this research with the developed Woven Strategy tools was divided into four main methods:

- **collecting strategic questions for the database**

The first set of questions was collected directly from literature. This desk test showed that the questions collected in this way required a lot of modification and therefore most of the questions were altered or totally reinvented.

In another attempt, more qualified questions were found and not so much modification was needed anymore. The questions collected were now quite usable and mainly only the name of the company, the department, etc. had to be modified. During the third round, it was obvious that the questions were so developed that only minor changes were needed even for different cases. However, if more people were to spend more time developing the questionnaires, new questions could most probably be formulated. These questions are all now available in the question database and can be used in future questionnaires.

Along with the questions, the idea was also to generate new strategic ideas and to question the present one. Unfortunately, there seldom was a sufficient

challenge in the existing strategy and this showed – therefore, especially if long planning cycles are being used, unpleasant surprises could occur. This was most evidently seen in the case of Company C which, because of this, had entered into financial problems.

- **collecting concept maps for the database**

Collecting concept maps in a database is perhaps one of the biggest challenges. Based on the answers, and also in strategists' and executives' experience and intuition, only a small group of people can create concept maps. There is always the question of how many of these maps can be reutilized in different types of new cases. Nevertheless, within the same organization, concept maps are very valuable making it possible to straightaway see what the key issues during the previous round were and how things have developed since.

The respondents represent different organizational levels. Their knowledge about strategic management varies greatly from one organizational level to another. The tool should be used to teach strategic management, but at the same time more training on strategic management should be given in all organizations. By utilizing a bottom-up approach in strategic management, the commitment of the organization is achieved. Also, this ensures that communication is already present because all the participants will know the strategy by and large, and will feel that they are part of the process and that they have given something to it, even if their ideas and opinions may not be part of the final strategy. As presented in the theoretical part of this thesis, the communication of strategy has been the biggest problem for companies. This was clearly a problem in the case companies, too. It is very difficult to motivate personnel if they do not know the vision, targets or strategy of the company. Of course, there are always people who are not interested in learning about these, but today more and more people are. It is also very harmful for a company if the lower levels of organization do not know the company strategy and are just implementing their own actions, for these may contradict with corporate strategy. This is especially clear in Case Study 2.

- **creating a questionnaire for the research of each case study**

Creating a new questionnaire is always something that has to be prepared carefully, because it provides the foundation for the success or failure of the case study. Therefore, all key persons should be involved at this stage. However, the questionnaire tool makes it very easy to create new questionnaires and it saves a lot of the organization's time, due to the fact that the results of previous questionnaires and their analyses are always immediately available.

The major issue related to questionnaires has been the number of questions included. The complete questionnaires that include all functions (management, strategic management, finance, marketing, etc.) contain in some cases, up to 300 different questions, while in the shortest versions the number of questions has been restricted to around 50. The majority of comments have focused on the quantity of questions. One major area of development therefore is to try to find out around ten of the most important areas for each function so that with the help of these most important questions, new vision, targets and strategy can be drawn.

- **collecting the answers either manually or through the Internet for the strategic question database**

The basic software takes care of making the questionnaires and distributing them to respondents either through the Internet or with a MS Word file. The developed method works well, the only problems that have been faced being related to company firewalls. The present system runs on a university server meaning that participating companies have to use the Internet instead of their intranet. At the moment, the developed application does not use gate 80 which is standard for most Internet applications, and therefore some companies' firewalls may not accept access from the Internet. Hence, a MS Word file can be created to collect questions.

After these stages, the following additional methods were used:

- **analysis of the results**

The analyzing application is developing all the time and there is a real need to improve its usability in the areas of the dialogue tool and the Woven Strategies

tool. However, this application already makes formulating the strategy process and analyzing the questions much easier than before.

When looking at different questions types used, all of them have proved to be useful, and it has been fairly easy to analyze all but textual question types with the help of available IT tools. The dialogue tool makes it possible to organize answers into categories. Using scale questions, it is important to select a scale, for example, from 1-6 rather than 1-7, because then the respondents have to give a clear opinion instead of selecting a neutral 4, which in most cases they tend to give if available.

- **use of application**

Questionnaire application testing started in another project in which questions related to an investment project were created. This test showed that the basic approach was correct and that there was room for further testing and development. The application itself was easy to use. The problems relating to the first commercial application that was used concerned some technical bugs and mainly the ability to link with other software. There are nowadays many commercial software products available for making questionnaires, but their main pitfall is that they are not very open applications which can be easy linked to new modules.

The analyzing and Woven Strategies applications proved to be very useful and made the strategy analyzing and creation process much more efficient than without the tool. This was measured in terms of time spent on the strategy process.

8.2. Discussion of Results

In the following sections the results of the methods and questionnaires are evaluated in each of the cases.

The case studies show that personnel's commitment to the strategy of the company is one of the most important key success factors. However, first there must be a vision and strategy that can be shared by people. One advantage in

having a continuous strategy concept is that it makes it possible to react quickly to changes in the business world or the external world, but it also makes it possible to develop the operations of a firm so that there is no need for any drastic, sudden changes. On the other hand, it is unfortunate that some companies do not see any need for strategic planning. In these cases it is very difficult to introduce any strategy concept, and to talk about continuous strategy and related systems because these terms are not so well known.

8.2.1 Experience of the Method and Application

8.2.1.1 Case Company A

In this case organization the main issue was to find out the ways to improve the role of middle management in the strategy process and in their implementation of actions. Many ideas for development were found, but in order to get their full effect and to ensure the right actions, further studies were proposed. Another major conclusion was that middle management should be allowed to participate more in strategic management.

When analyzing the results more thoroughly, it was obvious that managers have the most difficult task in converting strategy into actions. This has also been stated in the literature (Kaplan and Norton, 2004). Furthermore, when analyzing the situation in Company A, one can see that its biggest problem has been to put the planned strategy into action. Middle management is at a level where visions are turned into concrete action plans. Those further up in an organization can be more visionary and they do not have to directly implement the concepts drawn. On the other hand, directors also have more experience so strategy making is naturally easier for them. Some of the younger persons might not even value strategy work as much.

Top management and senior managers carry most of the responsibility for planning in the long and middle-term. Specialists and controllers also influence this process. Managers and team leaders can be unsatisfied with their role in long-term planning. Manager level middle management can have the most difficulties in adapting upper level strategy to lower level sub-strategies and

actions. This suggests that managers face the most challenging strategy conversion work from visionary strategies to concrete actions.

The results indicate that by utilizing the bottom-up method in strategic planning, the satisfaction and commitment of middle management increases if they can participate in the strategy process.

Middle management's barriers were categorized as follows:

- structural hinders
- lack of skills
- lack of opportunity
- lack of positive reinforcement

In the case organization, self-interest and power play seemed to dominate opinions largely. This seems to also be the case in Company B and especially in Company C.

The results were very useful from a research point of view. First of all, many problem areas in strategic planning were identified. These problems also provided ideas on how to improve the situation and what should be done in future cases. This also reassured the research team that they were focusing on the right issues. More confidence in the developed methods was also gained.

The major development area made in the case organization was in deepening the level of analysis. Now analysis is only made at a higher level.

The main findings of this study were:

- The identification of four strategic roles of middle management
- The identification of four main barriers for the strategic involvement of middle management
- The identification and development of enablers to overcome barriers of strategic involvement
- The strategic roles of middle managers were well applied in the case organization
- Structural barriers such as lack of positive reinforcement exist in the case organization

- The main two enablers to overcome the barriers in this organization are: 1) to increase strategic interaction between organizational levels, and 2) the development of an advanced measurement system

Structural barriers derive from values, cultures and attitudes in the case company. These barriers are the most difficult to overcome and change. In the case organization, top management set the targets and they did not see much value in involving lower level management into the formulation of broad strategy.

A reason for the lack of skills was mainly the lack of strategic experience and strategic tools, as well as that people were not able to think strategically. The main reason for this lack of opportunity was the lack of time for strategic planning and thinking, due to the fact that middle management is heavily involved with daily operations and problem solving. This problem could be overcome by utilizing the developed tool for teaching the organization strategic thinking. With the help of the application less time is also needed for strategic planning.

Another major problem seemed to be the big gap between middle management and higher management levels. Middle management had little influence on the long-term planning process and they found it difficult to transform top level strategies into action plans and sub-objectives.

Middle management and team leaders should be much more involved in strategic discussions that deal with a company's long-term and strategic objectives. This way there would be much more interaction between operational actions and strategy. These should also be discussed at the same time to avoid a long time-lapse between them, and also to avoid middle management's frustration when they feel that their opinions are not being listened to. The developed method and tool would improve this situation.

Actions and Future Development in the Case Organization

One key development area that was identified was that of measurement systems. These should be developed so that each individual's achievements and input into strategy and operational matters can be evaluated.

The Case Organization from the Research Point of View

In this case, the selected method was found to be suitable for its purpose. First of all, there were no difficulties in using the questionnaire. However, there was a difficulty in getting prompt and complete answers from respondents. Hence, the web-based tools can be regarded as useful for initial data collection and analysis. This way strategy processes can be considerably shortened. However, all the final discussions should be conducted face-to-face in order to accurately communicate details and in order to ensure the commitment of all participants. This is much more difficult to see if people sit at their computers. It is also important to have people from several organizational levels at these sessions, at least for some of the time.

The method used proved to be viable in this case, and no negative comments regarding the methodology was received.

8.2.1.2 Case Company B

In these case studies the test was a success. First of all, the organizations noticed that strategy implementation was not very successful at the lower levels of the organizations, and that the strategy itself was not clear, being understood in a completely different way than top management intended.

The method initiated a complete restructuring and re-engineering of the whole organization starting from vision, strategy, target setting, etc. The strategy process developed was adopted in other units as well.

Case Study 2

The method used supports the hypothesis that questionnaires can be used in the strategy process. The results in this case were very positive and encouraging. Perhaps for the organization, the most important result was that the gap and position of each function was analyzed and understood, and the action plans were made.

These findings are consistent with the findings of Kaplan and Norton (2004) who state that in most companies, strategies fail due to bad communication and are only known to top management. On the other hand, this case company has been very successful in its business area. The strategic moves it has made have proved to be successful. Nevertheless, the study shows that the company most probably would have been able to be even more successful if the strategy had been implemented as it had been planned.

In addition to corporate strategy, the case company also needed a strategy for each business segment and function that derived from the corporate strategy. The following main actions and areas of development were identified and implemented:

- Deeper SWOT analysis for each SBU with the web-based system
- Strategic management to become a continuous process
- Continuous world and competitive environment changes, challenges to be faced with networks and partnerships
- Information technology to assist in strategic management
- Based on SWOT analysis, a common vision for the company was drawn
- Functional organization was changed to process organization improving the communication between units and individuals
- The life cycle of personnel and HR management must also be long-term and there has to be development at individual levels too
- The measurement system was renewed

Based on the above and many other factors, the case organization attempted to improve its situation. In order to make the organization work, the company had to develop the status of middle management and change the thinking to middle-top-down. Building something new should start from the middle, and the company should identify what a SBU leader needs from the top, improving

his/her service processes to match the needs of the customers in order to create value added for customers and other stakeholders (the bottom-up view).

As we can see from the short summary above, as a result of the research a profound development project was started. The methods presented here practically and theoretically were found to be useful and were decided to be used also in the future.

It first of all became clear from the very beginning that the planned approach of using questionnaires to find out the status of strategic thinking and management in the case organization was correct. The replies clearly revealed the status, situation and position of the organization at that time and gave indications to what was wrong with communication. From the research point of view, by using the question methodology it is possible to track down how effectively communication within a company works. Also, the questions formulated and asked proved to be correct enough to show the problems. What the research also showed was very typical: top management does not know how strategy has been understood and implemented in practice. This was already known before the research had started, and was one of the main reasons for developing the strategic planning tool, i.e. to get more people and organization levels to participate in strategic planning, making them aware of corporate targets, vision and strategy and getting them committed to following these. In this respect the study was successful.

In the case organization the computer system was not used initially, but all the questions were planned so that during the next stages they could be transferred to the question database easily. The Woven Strategy software was used in later questionnaires without problems. The clear advantage of using computer-based systems is that both the analysis of the study as well as making the questionnaire is much quicker.

As this case shows, computers can be very helpful tools in strategy making, even for other than number crunching purposes. We can even argue against Mintzberg's fallacies of strategic planning as in the following:

- *The fallacy of formalization*;

The researcher's opinion is that with the system and methods presented here, we integrate intuitiveness and creativity into the strategy process, and how creative strategy can be formulated is more a question of participants than models and tools. It is also very obvious that the tools created now are in a very early developmental stage and will be much more versatile and flexible in the future, i.e. within the next 3-5 years. A new way of thinking about what formal strategy making and the planning model is, will follow.

- *The grand fallacy*;

Once again, thinking about what is the analytical method will be re-engineered. Formerly it has been regarded as something more or less related to number crunching, but when thinking about the development in information technology, practically everything can be analyzed and forecasted or simulated with "analytical" tools.

When thinking about the research project from the business point of view, which is not the most important issue in an academic study but is what interests the management of companies the most, it is more than clear that the research project has contributed to changes and improvements inside the case organization. The first changes took place immediately after the results were available for the top management. After the first results, a decision was made to carry out a similar project in other units of the company as well. We can state that with the help of the research, the need for change was identified and the relevant actions were taken to improve the situation.

Case Study 3

The application developed in the "BrainPoweri" project proved to be a good tool to collect data from the organization and especially from those workers who had the best knowledge of specific issues. Preparing the questionnaires was easy and pre-prepared questions were easy to use or modify. Also,

answering using the web-based applications was easy and possible wherever an Internet connection was available.

The analysis tool still needs more development. It was quite difficult and time consuming to use.

The user interface of the application also needs some development, but the case organization felt that the use of the system will make the strategy process much easier in the future. It is also a good tool to teach the strategy process to new employees in the organization.

One year after the study, the progress in the strategy making process and its implementation has been good. Also, the financial results from the organization's point of view have been positive. The only criticism has been directed at the analyzing application and its usability, which has been regarded as too complicated and difficult to use.

Regardless, the developed method has been put into permanent use, although the organization has developed its own application for its internal use.

In the case organization, the need to formulate a strategy that identifies and uses the core know-how of the organization as effectively as possible was identified. This change might look small when compared to the previous strategy, but it requires a complete change of mindset. The strategy cannot be built only around environmental and competitor changes and actions, but needs to analyze the company's own resources and know-how. Capital, personnel and time resources are scarce and therefore the organization has to concentrate on those areas that are critical in the business in which the company is operating. Thus when analyzing resources, not only the company's own resources must be analyzed, but also those of existing and potential future partners.

With the help of the "BrainPoweri" project application, more people can be involved in the strategy process. This way all of them commit themselves to the strategy and its implementation.

In order to future utilize the “BrainPoweri” project application, an easier to use version is expected. However, the developed method continues to be used in the organization.

From the research point of view, the case organization was almost ideal for the purpose of this study. It already had experience in using questionnaires and had already made some changes to its strategy processes. However, this study also showed that there was still a lot of potential for improvement in communicating strategy to the organization and all its members. The company was also spread wide enough globally so that the benefits of web-based tools could be seen and recognized.

8.2.1.3 Case Company C

In Case Study 4 the main goal was to test a software application and its suitability for planned work. The test showed some technical and practical deficiencies in the software used. The software supplier was not very eager to solve these problems. The major deficiency was with external links. Already at that time the goal was to integrate different software modules with each other. Based on this experience the decision to build new software for constructing questionnaires was made. The plans and implementation of other software modules was also started.

In Case Studies 5 and 6, all the developed applications were ready to use, even though the use of the application was not very wide, due to organizational reasons. Despite this, the main comments given stated that the method used was correct, but the timing should have been different.

In Case Studies 7 and 8 the developed technology was available from the beginning and in Case Study 8 was thoroughly tested.

Case Study 4

The conclusion made as based on the findings was to increase knowledge transfer to different areas, as well to different strategic business lines. Most of

the development work had been done for the main production line machinery, but all development actions for service products for other machinery were still in the initial stages. Unfortunately, there was a complete reorganization of the organization and all planned actions were put on hold.

However, when analyzing the results of this study, in total over 1200 answers were received showing that in all areas positive thinking was bigger than negative thinking. Also, the development need was seen and people agreed on the vision and strategy for the future. Many new ideas were also captured using the methodology.

From the strategic questions, a lot of emphasis was put on the new business concept and how it was understood. There was a clear vision and everyone realized the business potential, as well as the existing threats and weaknesses. The case company was still regarded more as a workshop company than a service company. Everyone understood that there was a lack of suitable resources which they considered the biggest problem. On the other hand, when the management was either too marketing or sales-oriented at that time, one of the weakest points remained the knowledge transfer to areas outside Finland. Trying to make a change with a very limited number of resources made things happen very slowly. Even from the responses of key persons, implementation was considered a primary weakness and area for improvement. Furthermore, though most people knew the strategy, the strategy process was not known to many. Most people wished to have a continuous strategy process, because in the service business area changes in the business environment could be much faster than in traditional capital equipment business.

This case study clearly showed the need to develop our own application due to the amount of drawbacks in using the commercial application, and thus the decision was made to start building one. This was mainly due to the fact that the commercial application was not open, i.e. there were no possibilities to link it with other applications. On the other hand, there were too many bugs in our application, making it difficult to utilize it efficiently.

In the case organization itself, much potential for development was identified. However, due to several structural reorganizations this implementation became impossible.

The primary goal in the research was to test the questionnaire methodology and the related software in assisting strategy making process. The methodology itself proved to be viable; a lot of valuable responses were obtained. Management, which had a very motivated and dynamic manager, was considered to be the best area of the case organization. The worst areas from the analysis emerged as strategic management, marketing and human resource management.

In the management of marketing, the most serious problem was that personnel did not know the products well enough and many of them only had experience within their own company, i.e. no experience from the customer environment which is essential in this kind of expert business. Hence, the problems related to marketing are interrelated with human resource management. There was a lack of suitable persons in the business worldwide, although the need for them was great. The dilemma was clear; it was not possible to get skilled experts fast enough to meet the company's rapid growth.

For the success of the company, a thorough re-engineering of strategy and the strategy process should have been done, as in at Case Study 2, Company B. Unfortunately this was not done and as a consequence a series of reorganizations followed.

Case Study 5

This case clearly shows what can happen even in today's business world, if strategy planning and management are not taken care of properly.

It seems that at the company's higher level, several issues should be first clarified and settled, after which the developed application and approach could be utilized to develop new business strategies.

From the research point of view, the organization is very interesting. Everyone, including external people, knows the company's situation and there is a lot of potential for its improvement. It would be most interesting to continue research in this organization after the confusion at the higher level is over.

Case Study 6

In this case the comments from Case Study 5 are very valid. It is interesting to see that even when the organizations are, in principle, different, the feelings and attitudes towards development remain very much the same. After all, if the company has no clear vision which is communicated to all sub-organizations, the motivation of personnel degrades considerably, and the strategy will not be implemented.

Case Study 7

Case Study 7 proved the fact that in other divisions of Company C no clear strategy existed at all and the strategy process was not systematic. This case also showed that the company's top management must initiate the strategy process and set targets and visions, otherwise no lower organization level would think of them.

Case Study 8

In this case there was a positive attitude to develop R&D strategy for the organization. New strategy was created and very positive comments from participants were obtained. They became much more motivated than before. The only negative comment made was that young enough people should be involved in using of the tool.

8.2.2 Experience of the Questions

The methodology developed in this thesis was seen as a positive approach by the respondents. All forms of questions were used, i.e. open, alternative, scale,

etc. The questions were either directly taken from literature, were modified from those questions or were completely tailor-made for the organization.

The feedback received on the questions and the questionnaires has been very positive, and after eight rounds it seems that there is, for the moment, no need for any major changes, although as stated earlier, the main challenge is to limit the number of questions. This would enable a faster and more efficient strategy making process. The biggest challenge is to ensure that the questions and answers received this way contribute towards the "right" strategy. This presupposes that the right questions are being asked of the right persons.

When looking at strategic questions, one can see that the literature poses more questions for some areas than for others. Many questions are available especially for financial and economical areas, as well as for many strategy and management-related topics. For manufacturing, information technology, research and development areas, less questions could be found.

8.2.3 Relevance of the Questions

In the beginning some of the questions required modifications, but in practice they could almost be copied as such or used with only minor modifications.

Depending on the organizational status of the respondents, the relevance of the questions varied a lot. People who were decision-makers and contributed to the strategy making in their work naturally knew the corporate strategy and its development, whilst in the companies where only a top-down strategy process was followed, the knowledge transfer and communication did not happen and even the middle management did not exactly know the corporate/company strategy. When reaching lower organizational levels, the strategy was not known in practically all cases. There were two main reasons for this: The strategy was not communicated clearly or the strategy was deliberately not communicated.

With management, market and product-related questions, it was easier to obtain answers and comments. The reason for this is that middle and lower

level managers operate daily with product, marketing and sales-related issues. On the other hand, these daily operations take time away from strategic thinking and in the long-term may negatively contribute to the company's results. The questions were useful in this respect, making managers think of strategic issues as well.

As the questions were taken from strategic literature, they were theoretically related strongly to the respected area. However, once again it can be stated that by letting middle management participate in strategic planning, its commitment to strategy would be much higher than in a situation in which the strategy is dictated from top to bottom.

8.2.4 The Developed Woven Strategy tool

After many difficulties, the tool was finalized after several years of development and testing. This mainly included overcoming the availability of suitable resources for programming and also the firewall-related problems. The tool makes the strategy process much more efficient than traditional strategy rounds in the companies. A lot of data can be collected from experts all over the world and analyzed immediately. In the traditional model, this implementation is impossible. The latest development in each global business area and/or technology is captured to the benefit of the strategy process. A small strategy team can, with the help of the tool, easily create alternate strategic scenarios and strategies. Working further with the collected data opens the possibility to discuss strategic issues with anyone wished. Finally, a Woven Strategy can be created.

The intuition of the users could be easily captured with the developed tool. This was due to the fact that the decision-makers received a lot of useful and relevant data from a much larger group of people than previously. By having more market and product-related data, they could utilize this information in their decision-making process. Therefore, a small elite group no longer created the strategy alone by using very limited amounts of data, but that of the whole organization was available. The ordinary respondent is now also required to use his/her intuition when answering the questions. Without the questionnaire,

the respondents would not have to think about strategic thinking. With the questionnaire, they have to answer questions and use their intuition for the benefit of the top management and the whole organization. When creating the new strategy the decision-makers have to further use their intuition while analyzing the questions and drawing conclusions based on these.

The usability of the developed tools should be further tested and developed.

In practice it has been proved that the system works and makes the strategy process much more efficient and easier to understand. The time saved is considerable. The only obstacles that have been encountered in the use of the system are the attitudes towards it. If managers are not willing to develop strategies and the tools to make it, there will be no benefit. Unfortunately, as seen in these cases, the less interest in development, corporate strategy, etc. that a company's management has, the less successful these areas are.

8.3 Theoretical and Practical Contributions of the Thesis

8.3.1 Theoretical Contributions of the Thesis

In practical business life and also in strategy making, often one of the easiest ways to make the strategy for the next year is to take the strategy of the previous year and adjust the numbers accordingly. In addition to this, it is often the same people who participate in this work and who may have become blind to the changes in their business environment and in the world economy, etc. This can be seen in many of the questionnaires' replies, and it forms the biggest threat to the use of this kind of system. It can even be said that for the success of this methodology, the most important criteria is to select the right people and the right questions for the assignment.

As we remember from the previous theoretical section, Mintzberg (1994a) has delineated four main fallacies of the strategy process:

1) *The fallacy of predetermination*;

It is certainly true that business environments are changing more and more rapidly. However, there are many industries in which the business cycles are much longer than quartiles. Examples of these kinds of industries are the pulp and paper industry, the pulp and paper machinery industry and the mining industry. Even in businesses that are more short-term focused like that of mobile phones, many long-term decisions also affect short-term success. For example, though the mobile phone industry is a business area in which investors and analysts focus on the short-term success of the company, if a company has selected to produce certain types of phones, this is a decision that affects the future ahead for more than a few months to come. To change a product portfolio completely requires designing new models and also adjusting other supply chains accordingly. On the other hand, if we think about the paper machinery manufacturing industry, the investment projects often last 16-20 months from machine order to start-up, and the calculated lifetime of the investment is about 15-30 years, with a calculated payback time of several years. For example, the short-term business thinking during 1980s and 1990s has almost destroyed the North American pulp and paper industry. The main reason for this was the short-term financial optimization of the companies who let their production equipment deteriorate so badly that the only profitable measure to be taken was to close the mills and production lines.

By utilizing questionnaires, the intangible abstract concepts that exist in the minds of people are captured to be used is strategy making. Therefore, we can state that it is also possible to re-evaluate this fallacy.

The strategy formulation process should be continuous, taking into account the rapid changes in the business environment. Hence, more emphasis should be put on developing a continuous strategy-model.

However, there are many abstract concepts available in an organization, and it has been interesting to see how these concepts have developed over time. If people have had a chance to participate in the strategy process and its implementation, the company has been more successful than those

organizations where the traditional and top-down strategy process has been implemented. We can also state that our hypothesis turned out to be correct. Information technology has made the strategy process more efficient and the forecasting of the future is definitely more reliable with the system. This was due to the fact that with the system more accurate data closer to markets and customers is captured.

2) *The fallacy of detachment*;

This fallacy is partially true, but as discussed in this thesis with the assistance of modern IT tools it is possible to spread strategic planning to all levels of the organization. The persons who participate in strategic planning with the developed tool become attached to the strategy process and to the strategy itself. They are therefore much more committed to the planned strategy. This could clearly be seen in the case of Case Study 2, Company B. Also, as discussed in the test results section of this thesis, it is critical both for the successful implementation of strategy as well as for the planning of the strategy to involve middle management in the strategic planning process. This was also confirmed by Kaplan and Norton's studies.

3) *The fallacy of formalization*;

This statement is very much true. It is evident that in old, rigid organizations in which the annual planning cycle exists, new ideas do not emerge easily. The same people develop old ideas based on previous years' results and forecasted budgets. New businesses are rarely developed this way. Also, the ideas from the rest of the organization are often ignored. This is very much true in one of the case organizations which has actually moved towards a top-bottom strategy approach during the research period. In this case, strategic thinking has mainly been replaced by monthly income statements.

However, we can state that by utilizing questionnaires, the strategy process can be formalized and many new ideas can be still captured and developed. This is clearly seen in Companies B and C.

4) *The grand fallacy*;

This fallacy is also very much true to a certain degree. Therefore, this thesis puts a lot of effort in putting the intuition of decision-makers into the decision-making process. However, when looking at present decision-making in Finland as well as in other countries, it is obvious that in many cases good analytical tools might give better results than decision made without any support. There are not so many excellent decision-makers who always make intuitively the right decision globally as well as locally. On the other hand, even an excellent executive could check his decisions against the proposal made by the application. This would enable a second thought. At the end of the day, all the decision-makers should be humble enough to consider alternative approaches to their decisions and think of the long-term future of their companies, more then that of the next few months. Furthermore, by utilizing the Woven Strategies tool, a synthesis of the strategy process can easily be achieved and compiled. The results and the drawn strategy can be seen on one screen and the decision-maker obtains a clear picture of the strategy immediately. In writing about Nokia, Mintzberg et al. (2005) comment that 250 people in the company were invited to participate in the strategy process because the company had found that by engaging more people, the ability to implement strategy became more viable. Nokia gained more commitment from its employees and found a lot of new options they had never thought of before. Mintzberg (2004) has also discussed the training of managers more. Our developed tool also supports this kind of training process.

When looking at other authors who have written on strategic management, we can see that the basic thinking of Day, Porter and Kaplan and Norton can easily be adopted in the analytic part of the Woven Strategies approach. Kaplan and Norton have put a lot of emphasis on the implementation of strategy, and that is the area in which the Woven Strategy tool is most useful. Also Ansoff's and Drucker's thinking can be included in the application. Ansoff especially has written many articles in response to Mintzberg's fallacies of strategic planning.

The researcher's opinion is that there has not been much theoretical development in the area of strategy, strategic decision-making and their

processes during the last five years. The main focus has been on discussing the theories of Mintzberg, and on the strategic decision-making process and its effectiveness.

This thesis has brought a new perspective to the strategy process. It has developed a methodology in which the intuition and the knowledge of the organization have been captured in the strategy process. A new framework for the strategy making process has been developed. Now strategy can be created and implemented where there is real knowledge and competence.

8.3.2 Practical Contributions

The theories, methods and tools presented in this thesis show the path of future strategic planning and strategy processes.

First of all, it has been proved that using questionnaires at several levels of an organization gives the top management an understanding of the strategic knowledge level of the company. In these cases it has become clear that communication has often not been adequate enough in informing everyone on what the vision of the company is, its values, goals, strategies, etc. When top management has realized this, positive actions can be taken and the situation can be improved. In practice positive actions were taken in all companies, even though in some companies it took longer to implement the changes. Questionnaires can be used in two ways; first they can be utilized as a test tool to analyze the level of knowledge in an organization, and secondly they can be used as strategy generators. In the latter case, new ideas from experts and from the whole organization can be captured.

Using web-based IT tools in the strategy making process makes the preparation of strategy much easier and cost effective for the organization. The managers and executives do not have to travel to internal meetings from country to country, or continent to continent, to collect basic data for the strategy process. All this can be done with the help of web-based tools. In this case, although it is also good to have face to face discussions, the number of them can be reduced and they can be made much more efficient.

New IT tools also enable much more reliable and efficient strategy, as well as environmental and competitor analysis. Intelligent agents collect data from the web and this can then easily be entered into a strategy database, in which data can be analyzed. The most sophisticated analysis can be made with a neural network based tool that creates a map of several factors, as presented earlier in this thesis. The dialogue tool also presented in this thesis makes the analysis of written answers and texts much easier than any other tool. The analysis of numerical data is very easy with commercial software like Cognos, Oracle Discover, MS Excel, etc.

Also, when thinking about the quality of the strategy process and strategy implementation, it has been proved that the more middle management is involved with the process, the more they are committed to implementing the strategy itself. This also improves the communication within the organization. So in practical terms, the developed method turned out to be viable and organizations that used it effectively were much more successful than those that did not.

Finally, it is also possible by using the Woven Strategy tool to ensure that the created strategy is implemented efficiently. Firstly, when a large number of people in the organization participate in the strategy process and thus get information about the company's objectives and overall strategy, they most importantly of all become committed to the strategy and its implementation. As discussed earlier, especially in Chapter 2, the main problem in the strategy process is the strategy's implementation. This manly fails due to a lack of commitment of the personnel, and especially that of middle management. This commitment is achieved by letting the organization's members contribute to the strategy. Secondly, it is possible to continuously review the drawn strategy with the help of the tool, because it is easy to use and changes and comments can be quickly integrated into the existing strategy.

8.3.3 Lessons Learned

While writing this thesis, the researcher has obtained a lot of experience of strategy processes in large corporations as well as in the challenges in planning and implementing strategies. Looking at the development of related information systems has been also of the utmost interest.

When a strategy is first planned and implemented or a new system is developed, nothing succeeds if the full support and commitment from the top management is not given. All the practical cases in this thesis show that this is the area which has not been very successful up until now. However, as we have shown in the case studies, by using fresh, new ideas and methods in strategic planning, it is possible to increase the motivation, commitment and enthusiasm of the whole company for a more successful implementation of business targets and strategy. However, the researcher's view is very firm. If a company does not have a vision and strategy, and these have not been properly communicated to the whole organization, the company is floating without any guided direction and is not able to be successful in the medium and long-term. Short-term strategy is easy to create in order to increase rapidly profitability with cost cutting programs. Yet one can ask if that is a strategy at all.

Also when making decisions, questions like When, What and Why should be posed, along with utilizing the knowledge of the organization. This is possible using the application developed here or another similar method. This way we can assume strategy to be like a system with a feedback function that is continuously being updated.

During the project, new tools have been developed to analyze the data. Therefore, the researcher recommends that new research is initiated in the same organizations to re-analyze the situation and the development needs.

An application development work takes a lot of time and resources. In this project a lot of students were needed for the practical work. As they never had time to concentrate 100% on this work, there were several personnel changes that contributed negatively to the quality of the implemented application. More

thought should thus be put into the selection of potential resources and the testing of the applications.

8.4 Limitation of the Study and Directions for Further Research

Even though the study has been carried out in many large, global organizations, more studies need to be carried out, and also smaller and less international organizations should be studied in order to test whether this method is valid for all kinds of organizations. Also, the results must be verified by using mathematics, although the results do seem to be rather clear without a complete mathematical analysis.

Completely new kinds of strategy theories should be developed to further the existing theories. Vanharanta's visual Continuous Strategy model is one attempt in this direction, yet some totally fresh thinking is still needed. Unfortunately, it now seems that too many people think that strategy is no longer required because the world is too turbulent a place. Yet technologies and systems also develop all the time and bring along many new possibilities for this interesting arena of research.

Regarding the development of the tool, there is still much to do and much potential for several years work. The development of the SOM system should be more closely integrated with the application, and the development of a key figure system as part of the tool should also follow.

There are several research questions that have come to the mind of the researcher during the writing of this thesis. First, the research approach and methods in this field of science need more studying. The strategy process itself should be also studied further. The potential to use information technology in strategic planning gives many possibilities for this further research.

8.5 Conclusions

This thesis has presented a new strategy method and computer-supported approach to strategic management. The method and system developed help

executives make strategic decisions with a system that goes well beyond traditional ESSs, it is easy to use and can be used anywhere in the world where computers and/or the Internet are available.

The challenge in making the prototype of the system was not in information technology but in how to combine intuition, human factors, existing knowledge and the learning capabilities of executives and organizations.

The use of strategic questions is not common and presents new challenges for strategy researchers. We tested this framework and application with executives and researchers so that we better understood the practical problems in the field.

We have shown that despite the fallacies of strategic planning presented by Mintzberg, these can be minimized or avoided by taking into account the holistic concept of man theory and systems like the memory system, interpreting system, motivational system and automatic system. These can be embedded into future systems so that when an executive uses the planned system he learns the strategy planning process better, and at the same time the application itself learns new situations and questions. We fully agree with Mintzberg's grand fallacy that strategic planning through analytical methods alone cannot lead to the synthesis needed in strategy making. Here lies a real challenge to develop the interaction between the human and decision support system.

In the case studies, the ideas and methods have been proved and verified to work in practice, but a lot still depends on people. If people are not willing to accept new ideas or implement new strategies, none of the tools are of any use.

Nevertheless, it is clear that new technologies will also improve and assist strategic decision-making now and in the future, if applied correctly and actively. Furthermore, this area is developing rapidly like all areas of information technology. Hardware has not been a restricting factor for years and software tool development has been very fast, with new application areas continuously emerging.

Still, the final decision-making responsibility lies with human beings. It is important for people to analyze available data and knowledge from various sides and aspects, and effectively utilize available tools. It is worth being open-minded to utilize both the whole of the organization's knowledge as well as available technology to improve the profitability and growth of the business.

The literature and case studies showed that strategic management and planning is needed and is beneficial for the company. The recent studies have also verified that the involvement of a wide range of employees and a bottom-up approach greatly improves the communication and success of strategic planning, and thus of the company.

One thing that is surprising is that there are only few strategic planning systems available and they are mainly for number crunching and the support of short-term, quartile result making. Therefore, the implemented prototype is really needed and definitely worth developing in the future.

In conclusion, we can state that the Woven Strategy and the Woven Strategy tool that we have developed fully supports the theories and case studies. We can also state that in practice, the intuition and capabilities of middle management especially have not been utilized even close to their full potential.

The usability of the application is a key for its successful use. If the application is too complicated for end-users, they will not be willing to use it again. It is also very important for the administrator of the system that questionnaires can easily be edited and created. This is for the moment the most important area for development. There are many small details that need improvement, but do not require a lot of effort. These details are related to using old questionnaires and questions to create new ones, as well as to some of the search functions.

The questionnaire tool forms the core of the application, yet there is still a lot to be done to develop other modules of the application. The main challenges are in seamlessly integrating the different modules with each other.

By utilizing the system we also support knowledge management and other system theories. The application supports the memory system; a lot of data is stored in the system and it is not necessary to always start the process from scratch. The motivational system is also supported. People obtain new tools and techniques for their use. This, and the possibility to participate in the strategy process, motivates the majority of employees. Interpretational systems are furthermore supported. By using neural networks the interpretation of data is much more reliable than that done by human beings, who cannot analyze that much information at once and especially without doing a lot of work. Automatic systems are supported too. Many things should be available automatically for decision-makers and participants. With the systems developed, questionnaires, analyses, reports, etc. are automatically available for the end users.

In short, all the Woven Strategy processes support strategists.

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APPENDIX 1

Appendix 1
Examples of questions

Could the internal IT department provide the system needed more efficiently than an outside provider?
How would you describe an ecological model for information management?
How would you describe the different IS organizational models?
Do database management systems encompass all corporate data?
How can IS affect competitive advantage?
How can we design a contract that minimizes risks and maximizes control and flexibility?
How can we find information about competitors?
How can we find information about customers?
How can we find information about suppliers?
How can we get computerized structured information?
How could an enterprise system be configured?
How does IT affect information behavior?
Is it sensible to buy external information?
Is it sensible to sell your own information?
What kind of enterprise model should be expressed?
What is the job content of management levels?
What are the key information tasks?
What are market-based models?
What are the priority criteria in selecting an IS?
What are the qualifications of telecommunications managers?
What are the stages in analyzing IS?
What are the steps in analyzing the external environment?
What are the idea-generation steps in Strategies Information Systems (SIS)?
What are the success factors for information management?
What are the tactics used in information behavior management?
What are the best ways of choosing suppliers?
What do executive support systems include?
What is the content of an IS plan?
What kind of information behavior should we encourage?
Why won't most architecture change behavior?
What is the scope of the problem in the organization?
What is the source of the problem in the organization?
Is the problem temporary or permanent, unique or recurrent?
At what level in the organization is the problem located?
Should jobs be broken down into narrow areas of work and responsibility so as to secure the benefits of specialization, or should the degree of specialization be kept to a minimum in order to simplify communication and to offer members of the organization greater scope and responsibility in their work?
To what extent should employees be given discretion in how to organize and perform their work?
Should the overall structure of an organization be "tall" rather than "flat" in terms of its levels of management and spans of control?
What are the implications for communication, motivation and overhead costs in moving towards one of the alternatives rather than the other?
Should jobs and departments be grouped together in a "functional" way according to shared specialist expertise and interests, or should they be grouped according to the different services and products that are being offered? Or according to the different geographical areas being served? Or according to yet another criterion?

Appendix 1
Examples of questions

Is it appropriate or not to aim for an intensive form of integration between the different segments of an organization? What kind of integrative mechanisms are there to choose from?
What approach should management take towards maintaining adequate control over work done? Should it centralize or delegate decisions? All decisions or only some of them?
Should a policy of extensive formalization be adopted in which standing orders and written records are used for control purposes?
Should work be subject to close supervision? Could control also be assisted by the development of a common culture and identity within the organization?
What considerations should be taken into account when designing reward systems? How can these be made consistent with the general approach adopted within the organization?
What are the changing structural requirements posed by the strategic development of the organization?
What are the practical implications for the planning of change that can be drawn from research to the relation between organizational design and performance?
How might the need for change in the organization be recognized, and what problems commonly arise with reorganization? How can these be tackled so that change can be implemented successfully?
Should we centralize or decentralize the control of application development?
Should we establish a market research capability within R&D?
Should we integrate the R&D ability of our recent acquisition or manage it at an arm's length?
What organizational changes might reduce product development lead time?
Where, geographically, should we locate our R&D capabilities?
Are the labor productivity and total-factor productivities good enough?
Is the manufacturing role reactive or proactive in corporate strategy?
Do managers of different functions measure departmental efficiency or overall effectiveness?
Does manufacturing strategy concern the achievement of efficiency rather than the effective support of market needs?
Are investment decisions based on winner-strategy order?
Do investments linked to product life cycles reduce risks?
Are productivity and satisfaction being maximized through the development of human resource strategies, policies, practices and programs?
Are productivity and quality the firm commitment of top management?

APPENDIX 2

Appendix 2
Example of questionnaire

Background information
For how many years have you worked in your current position?

How many years in total have you worked for the company?

What is your business area?

What is your position in the company regarding strategic issues (company planner, company implementer, unit strategy planner, unit implementer, no clear participation in the strategy process)?

Strategic Management

Are you familiar with the overall Corporate/Company Strategy?
☐ Yes
☐ No

If yes, please describe it briefly:

Did you participate in the Corporate/Company strategy formation?
☐ Yes
☐ No

If yes, please describe your role in the process:

The Company's strategy exploits market possibilities effectively
1☐ 2☐ 3☐ 4☐

The Company's strategy is flexible enough to avoid market threats (1 = strongly disagree, 4 = strongly agree)
1☐ 2☐ 3☐ 4☐

The Company's strategy exploits/develops company strengths effectively
1☐ 2☐ 3☐ 4☐

The Company's strategy avoids/develops company weaknesses effectively
1☐ 2☐ 3☐ 4☐

Your business line can exploit its full potential in accordance with the Company's strategy
1☐ 2☐ 3☐ 4☐

Appendix 2
Example of questionnaire

Strategy has been thoroughly implemented
1☐ 2☐ 3☐ 4☐

Please describe any shortcomings of the process used to create the strategy

Please describe any shortcomings in the content of the strategy (e.g. in terms of competition, market developments, value creation, etc.)

Should the strategies be planned at all?

What is the Company's strategy (briefly)?

What is Life Cycle Management?

Business Line Strategy

How well do the Company's and your business line/unit's strategies fit together? (1 = poorly, 7 = very well)
1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

What are the major incompatibilities between your unit's and the Company's strategy?

Please describe any limitations that the Company's strategy creates in exploiting the full business potential of your unit/business line

Please describe any factors that limit the possibility of your unit/business line in shaping its own strategy

How well do you think your unit/business line's strategy has been implemented?
1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

What is the Company's strategy for your business line/unit?

Define a common vision for the Company and your unit/business line

Define a common vision for your own area of responsibility

Appendix 2
Example of questionnaire

Management in the Company

Have the targets been set according to company objectives, and has strategic thinking been involved?
☐ Yes
☐ No

How well have we succeeded in this?
1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

Are the set objectives consistent with the actual basic operations?
☐ Yes
☐ No

Do you have a manager competent enough to convert objectives into daily jobs and tasks?
☐ Yes
☐ No

Are the objectives focused on critical issues?
☐ Yes
☐ No

Are there enough resources at hand to achieve company objectives?
☐ Yes
☐ No

When a manager organizes a job, does s/he analyze what kind of tasks there are and what kind decision-making is needed?
☐ Yes
☐ No

Does the manager draw a detailed plan for achieving the objectives?
☐ Yes
☐ No

Is the balance between the demands of a task and the competence of a worker checked out beforehand?
☐ Yes
☐ No

Appendix 2
Example of questionnaire

Does everybody involved get a copy of the project plan?
☐ Yes
☐ No

Does the manager motivate everybody involved in each project as s/he should?
☐ Yes
☐ No

Does the manager support each employee enough to achieve his/her objectives and does s/he give any response back?
☐ Yes
☐ No

Does the manager give jobs where one can develop one's own competences?
☐ Yes
☐ No

Does the manager help employees to grow along with the job to achieve higher competence?
☐ Yes
☐ No

Does your manager develop him/herself as a better leader?
☐ Yes
☐ No

Does your manager guide you to develop yourself if you want to?
☐ Yes
☐ No

Is the development of competence a continuous and systematic procedure?
☐ Yes
☐ No

Do you think that enough is invested in R&D, and is this a systematic procedure?

How good is communication in the organization? (Attitude, ambition, competent and understanding knowledge.)

Appendix 2
Example of questionnaire

Does everyone know, at every moment in time, how objectives have been achieved and if things have been done in the right, effective way?
☐ Yes
☐ No

Have any measuring methods been set up and do they have any influence on behavior?

Could you describe the basic principles of your company's value management concepts?

Do you use a value-based compensation? What kind of objectives does it include?

Can you define the strategic goal of your Company?

Could you describe the modes of your strategic planning?

They say that nothing is as permanent as change. What is your opinion on the corporate transformation process? What kind of objectives does it include?

What is the best way to make decisions?

Have the targets been set according to company objectives, and has strategic thinking been involved?
☐ Yes
☐ No

How well have we succeeded in this?
1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

Marketing Strategy

How well does the marketing strategy support business strategy (1 = poorly, 7 = very well)?
1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

What is the Company's marketing strategy?

Appendix 2
Example of questionnaire

How would customers perceive the organization's products and services?

What products or services should be marketed?

Who would the customers be?

What would happen to sales / market share / profitability / income?

What attributes do customers' value in our products or services?

How does what you do create value for the customer?

What are customer-service requirements, i.e. the basic and distinctive service needs of the customer?

What is the Company's customer-service position and gap in regard to that of competitors?

What are the environmental factors of the customer-service requirements?

What is the Company's customer service strategy?

Should the Company serve all or part of the market directly or should it use distributors?

Does the Company bundle the marketing and logistics services together in a "packed price"?

Are the Company's logistics really customer-driven or only internal asset-driven?

Which of our product or service varieties are the most distinctive?

Which of our product or service varieties are the most profitable?

Appendix 2
Example of questionnaire

Which of our customers are the most satisfied?

Which customers, channels, or purchase occasions are the most profitable?

Should service and capital products be sold together in new projects?
☐ Yes
☐ No

Should service and capital products be sold for old customers?
☐ Yes
☐ No

Are all the specific needs of different areas known?
☐ Yes
☐ No

How well does the production strategy support business strategy (1 = poorly, 7 = very well)?
1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

Production Strategy

How well does the production strategy support business strategy (1-7)
1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

What do the stakeholders expect from production?

What are the competitive advantages of the logistics (e.g. low cost, superior customer service, value-added services, flexibility or innovation)?

Are our manufacturing costs known in each of our locations?
☐ Yes
☐ No

What are the best functioning areas in warehousing, transportation, materials management, information systems and within the organization generally?

How are logistics and manufacturing integrated (e.g. flexible manufacturing, warehouse conversion, structural alignment)?

Appendix 2
Example of questionnaire

To what extent are suppliers organized on a similar geographical basis and where are customers located?

Which of the activities in our value chain are the most different and effective?

Does information technology make it feasible to produce new items related to the Company's product?

Is our subcontractor network good enough and skilled enough?

Finance Strategy

How well does the finance strategy support business strategy (1 = poorly,, 7 = very well)?
1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

How can a new manufacturing cost structure be created?

Are tax effects included in your Company's investment appraisal? What kinds of techniques have been used?

Some criticisms are mentioned in the use of traditional indicators as controlling measures. Do you use anything other than financial indicators? Have they improved your control?

What kind of value drivers have you set?

Logistics Strategy

How well does the logistics strategy support business strategy (1 = poorly, 7 = very well)?
1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

What is the Company's value-added logistics strategy, i.e. performance criteria (service level and cost objectives,) that the logistics system must maintain?

What is most important about supply chain management?

How can a vision for the future be developed?

Appendix 2
Example of questionnaire

Does the Company obtain any value-added by using "third party logistics service"?

How does the Company manage carriers and develop logistics partnerships?

Does the Company get any value-added by using advanced information systems in logistics?

Does the Company's logistics system support overall quality?
☐ Yes
☐ No

How does the Company manage the "niche distribution" (e.g. smaller shipment sizes, broader variety of channels, flexibility)?

How does the Company manage "time-based logistics" to reduce the total lead times (e.g. order processing and inventory movement)?

Does the Company need "JIT logistics" (stable production schedules, efficient communication, co-ordinated transportation and quality control)?
☐ Yes
☐ No

Do manufacturer alliances bring any value-added benefits?

How does customer segmentation bring a logistics advantage?

What is the foundation process as in the transformation of the supply chain?

Why is the quality process so important?

How is the quality process designed?

How is the supply chain designed?

Appendix 2
Example of questionnaire

What is the Company's logistics planning, i.e. how the logistics resources are planned to attain the desired cost-service performance? Does the Company need to reconfigure its logistics network?

Does the Company need to restructure its distribution facilities (e.g. inventory)?

What are the organizational, resource and infrastructure implications of implementing global sourcing?

What is the current suppliers' performance and how has this been measured?

What is the quality of management within the prime suppliers?

What are the potential sources of risk and vulnerability with the core suppliers?

Which are the non-value-adding work steps in the purchase process?

How can the potential supplier's financial strength be measured?

When is it wise to use competitive bidding for source selection?

What could be the possible pricing strategies a supplier may have in use?

How can Strategic Supply Management be considered as a competitive weapon?

HR Strategy

How well does the Human Resource (HR) strategy support business strategy (1 = poorly, 7 = very well)?
1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

What are core competences?

What specific skills does the organization have?

Appendix 2
Example of questionnaire

Does the organization have the infrastructural support to exploit these skills?
☐ Yes
☐ No

Is the use of these skills adequately awarded?
☐ Yes
☐ No

What levels of efficiency / quality / innovation is the organization achieving?

What are the key problems concerning the organization's managers?

How are these problems impacting on the organization's objectives and targets, vision of its ideal or desired future state, and core values or beliefs?

Can we form teams that span activities on the value chain to create even more value by combining activities in novel and imaginative ways?

How willing and committed are members of the organization to making strategic changes?

Which organizational processes need to be strengthened to ensure that knowledge and the best practices can be successfully transferred from one country to another?

Research and Development Strategy

Why is superior technology integration important?

How can an effective technology integration process be built?

Where can technology integration be used?

What kind of approach should be taken to technology integration?

How can the company accomplish the difficult task of co-ordination?

Appendix 2
Example of questionnaire

How can the organization be matched with innovation?

How does the development of manufacturing technology influence new product introductions?

Can patents protect innovative process technologies?
☐ Yes
☐ No

Why should rapid process development be achieved before the product's launch?

Why is an integration team important in R&D?

How should R&D be organized?

What kind of synergy possibilities is there between different corporate units?

Which of our current products are superior in comparison to competitors?

Which new products should we develop?

Which products need most development?

ITC Strategy

What part of the information in MIS should be orally communicated?

What information should be stored in documents?

What are the facts on which the long-term plan is based?

Is there any way to measure the results of a Management Information System?

What is the corporate scope of Information Recourse Management?

Appendix 2
Example of questionnaire

Is the Management Information System plan consistent with the corporate business plan?
☐ Yes
☐ No

Are there enough and relevant elements for a long-term plan?
☐ Yes
☐ No

Is there any approved business model to approach a Management Information System?

Does the database structure support all organizational needs?

What kind of Management Information System architecture is needed: centralized or decentralized?

What kind of communication network should be used?

Should all units be integrated into the corporate network?

Is there a detailed and documented plan to go through the application development?
☐ Yes
☐ No

Have every management level been involved in the Management Information System's development?
☐ Yes
☐ No

Is the impact of the Management Information System on operating management as expected?
☐ Yes
☐ No

Does the Management Information System turn data into information or does it just produce "information glut"?
☐ Yes
☐ No

Appendix 2
Example of questionnaire

Is there enough know-how on data processing and system administration and management?

☐ Yes
☐ No

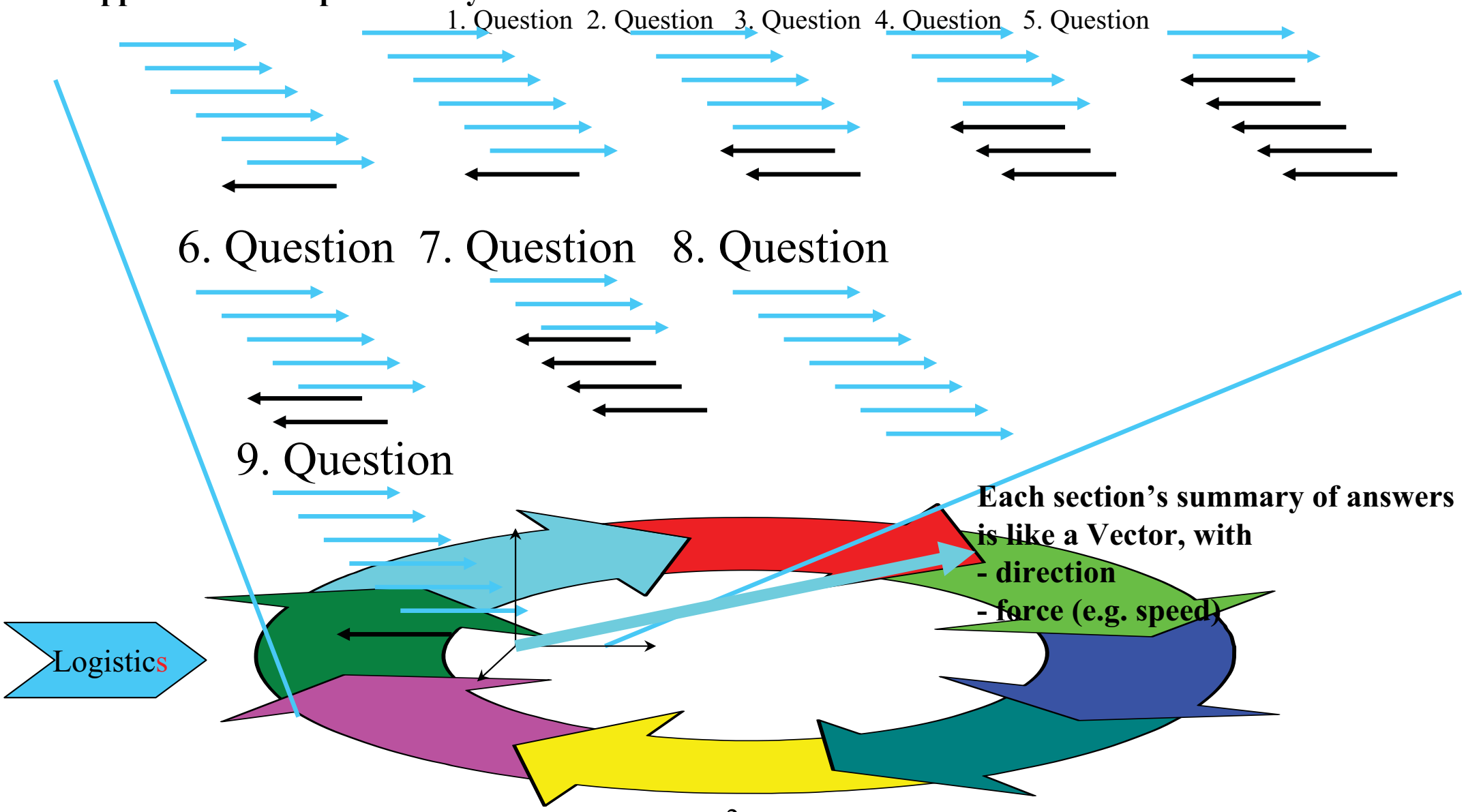
How should the management be involved in influencing the Management Information System's development?

Is the Management Information System's architecture compatible with further needs?

☐ Yes
☐ No

APPENDIX 3

Appendix 3 Example of Analysis



Appendix 3 Example of Analysis

Questionnaire Statistics

Respons ID	Basic	Strategi	Genera	Marketin	Productio n	Logistic	HRM	Financ	R&D	IT &IS	Answer	Text ans	Response start time	Response stop time	Delay	Time / Quest.
Sum	28	628	302	222	114	114	87	80	88	72	1728	371	21 %			
N.o. Qst.	2	93	52	38	24	28	17	18	17	20	309	109				
569	2										2		13.6.2001 11:28	13.6.2001 11:28	0:00	0:00:00
570	2	32	1	16	13	13	11	9	8	6	111		13.6.2001 15:54	13.6.2001 16:03	0:09	0:00:05
571	2	93	51	38	24	28	11	16	17	19	299	88	13.6.2001 16:10	13.6.2001 19:27	3:17	0:00:40
572	2	76									78	32	13.6.2001 22:54	14.6.2001 0:10	1:16	0:00:59
582	2										2		18.6.2001 13:58	18.6.2001 13:58	0:00	0:00:00
605	2	32	52								86	1	17.7.2001 12:20	17.7.2001 12:34	0:14	0:00:10
606	2										2		19.7.2001 11:55	19.7.2001 11:55	0:00	0:00:00
612	2										2		22.7.2001 0:00	22.7.2001 0:00	0:00	0:00:00
614	2	93	52	38	13	13	17	14	17	19	278	55	23.7.2001 20:23	23.7.2001 20:58	0:35	0:00:08
634	2	84	48	36	13	13	11	9	16	6	238	32	7.8.2001 10:58	7.8.2001 12:21	1:23	0:00:21
638	2	90	50	37	13	13	11	9	8	6	232	30	10.8.2001 11:01	10.8.2001 14:41	3:40	0:00:57
643	2	71	24	30	22	18	15	14	14	10	220	85	24.8.2001 14:43	24.8.2001 16:56	2:13	0:00:36
644	2										2		24.8.2001 23:03	24.8.2001 23:03	0:00	0:00:00
647	2	57	24	27	16	16	11	9	8	6	176	48	31.8.2001 13:06	31.8.2001 14:11	1:05	0:00:22
	State of 15. Sep. 2001										0					
											0					
											0					

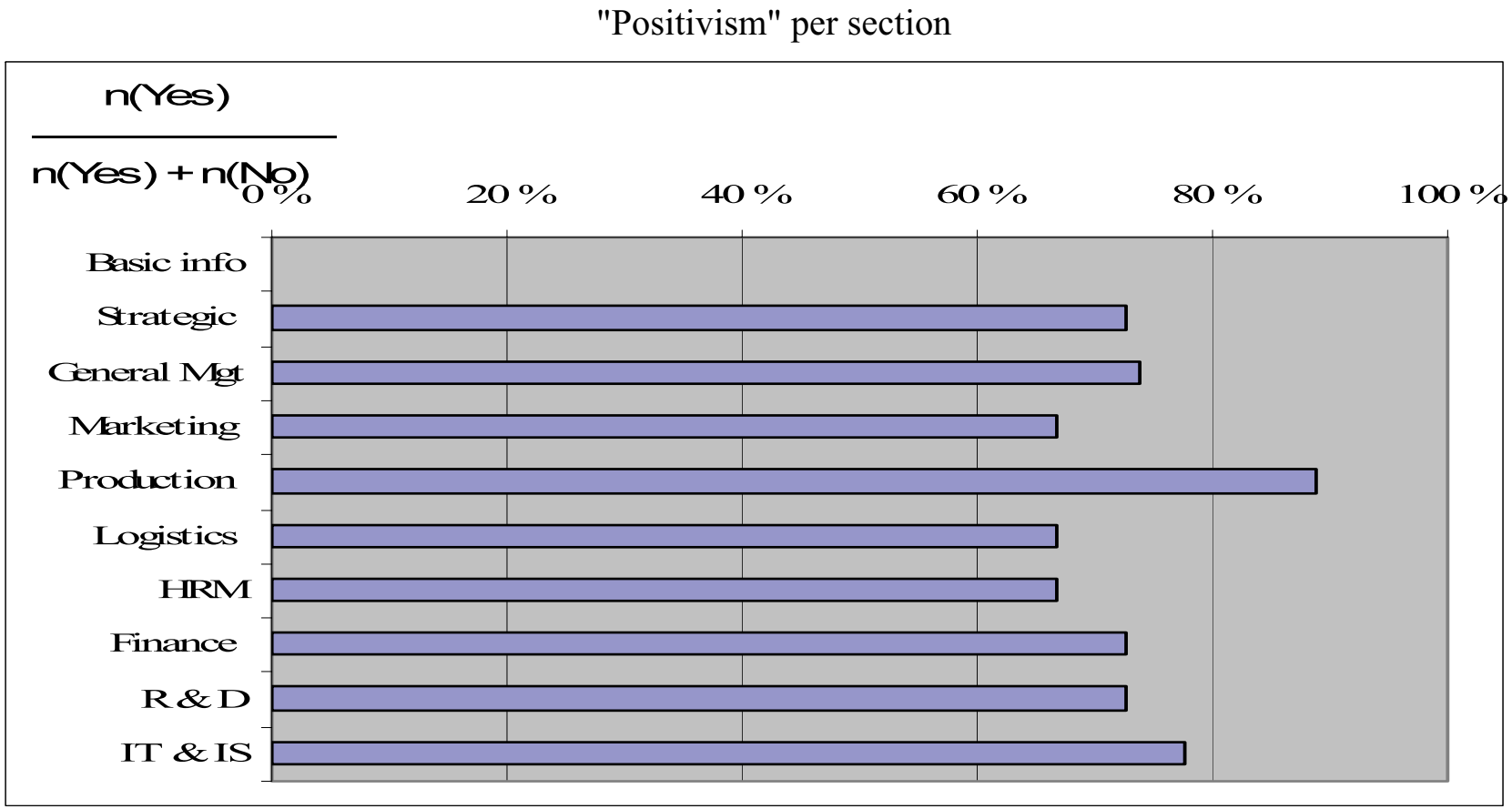
Written text answers

Appendix 3 Example of Analysis

Statistics of Answers
(actual amounts)

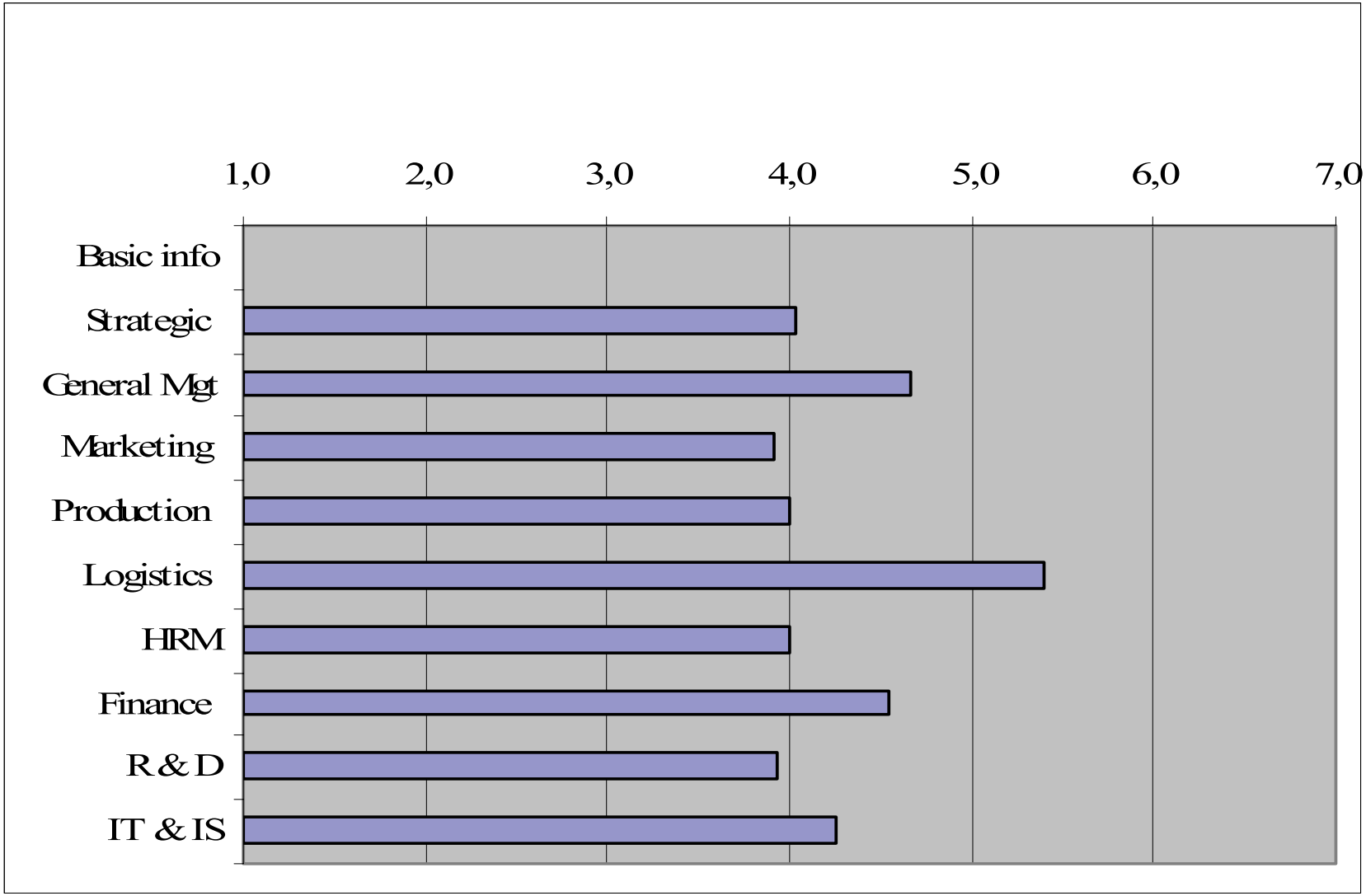
				Answers	Number of ans. / type of quest.		
		Y/ (Y+N)	Scala	n, Total	n, Y/N	n, Scala	n, Text
Sect.	Sections name	73 %	Avg. 4.3	1256	485	400	371
1	Basic info			28	28		0
2	Strategic	73 %	4,0	517	165	155	197
3	General Mgt	74 %	4,7	298	165	129	4
4	Marketing	67 %	3,9	165	63	47	55
5	Production	89 %	4,0	56	9	14	33
6	Logistics	67 %	5,4	42	9	11	22
7	HRM	67 %	4,0	29	6	4	19
8	Finance	73 %	4,5	25	11	7	7
9	R&D	73 %	3,9	58	11	21	26
10	IT & IS	78 %	4,3	38	18	12	8

Appendix 3 Example of Analysis



Appendix 3 Example of Analysis

Rate per section
(1 = poor ... 7 = very good)



Appendix 3 Example of Analysis

Strategic Management

Define a common PRS-vision: **4.5**

- To provide modular sets of services that can be linked together into a millwide service agreement.
- To be a financial success
- To be a leading innovative customer process supporter in the pulp and paper industry, taking advantage of the latest IT and process developments
- To be a preferred partner of the Customers by offering services for the continuous improvement of Customers' equipment and processes
- To be a preferred supplier of maintenance work

- It is our vision that the Company shall unquestionably be recognized as the leading supplier of processes and services in the pulp, paper, converting and panelboard industries globally.

Appendix 3 Example of Analysis

Strategic Management

02.16. Is the environment of the Company stable enough for us to plan our future? **71 %**

02.17. If the scenarios are built, does PRS have alternate plans to deal with them? **83 %**

02.19. What trends have affected PRS over the last three to five years?

- To the service business, from the repairs business
- I have not been with PRS for this length of time, but, in general, one trend which has affected this business is the global consolidation of our customers and the economic conditions affecting them
- Outsourcing of maintenance, IT-development, and process development
- Global and bigger customers, outsourcing
- Customer behavior expertise services appreciated, e.g. audits & analysis
- Outsourcing of maintenance, increased complexity of paper machines, controlling growth (personnel)

02.20. Will these same trends continue to impact over the next three to five years? 100 **%**

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