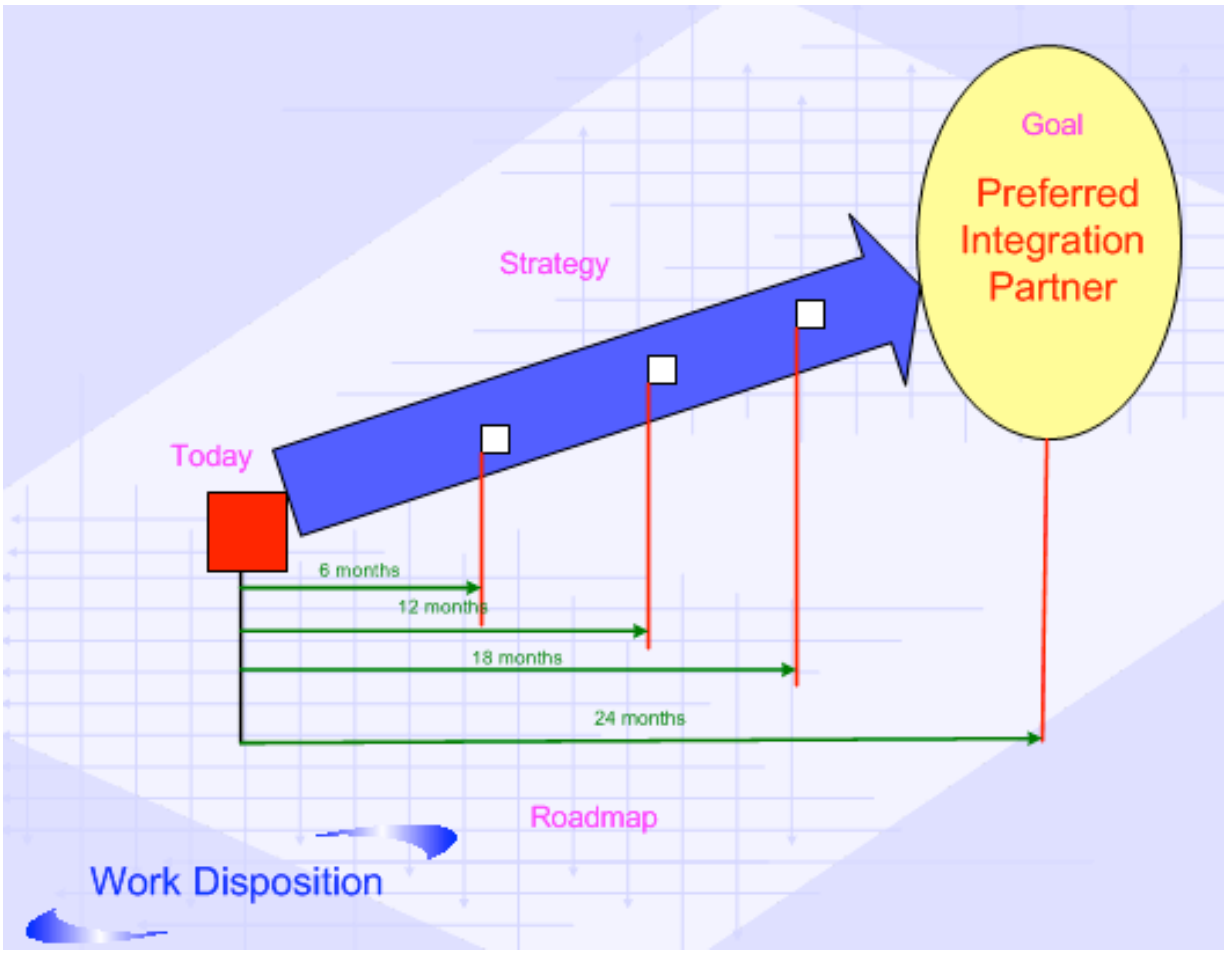
Chalmers University of Technology and
Gothenburg School of Economic and Commercial Law

Developing a Balanced Scorecard model for Volvo Information Technology

A new strategy for the integration unit



Thesis Work
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Supervisor: Ph.D. Christian Ax

Authors: Mr. Martin Magnuson
Mr. Rommel Narváez

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Martin Magnuson

Rommel Narváez

Gothenburg, May 28th 2003

Sweden

Abstract

In recent years, the area of financial control of companies has developed substantially. Traditionally, companies were using budget and simple product calculation but today companies need complementary methods for control in a broad perspective. Among these methods, the Balanced Scorecard has developed as a tool to meet the needs for financial control and measurement systems. The aim of the Balanced Scorecard is to increase the efficiency of companies both in the long and short time-perspectives by controlling, measuring, and implementing the results of a specific strategy.

Today, many companies suffer from internal problems associated with a lack of strategy in the integration of different departments. It is important for the business process to focus on obtaining favourable conditions for creation of new products and services, for increasing quality while reducing the costs by rationalization and simplification, and for reaching a faster delivery in terms of lead time. In order to become top of the line in the area of integration, Volvo IT has decided to perform an integration project incorporating a Balanced Scorecard.

The main objective for this thesis is to develop a proposal for the Balanced Scorecard, and to identify the critical factors for success and the corresponding strategic measures. The Balanced Scorecard methodology can be used to monitor and balance the whole company, as well as individual divisions, both on the long- and short-term time perspectives. At Volvo IT the vision is to be regarded as the ideal IT supplier among its customers. For Volvo IT we found that the following four perspectives are suitable: the financial, customer, internal, and development perspectives. These perspectives can be applied to processes and activities at all divisions and levels of the company where it is judged to be useful. The idea is that everyone in the organization should know exactly what he or she should be working on for increasing the efficiency both at the level of the own division and for the company as a whole. To reach its vision, the strategy of Volvo IT is to develop a profound competence in the area of integration.

Since introducing a Balanced Scorecard into an organization is a rather demanding project that normally takes one to two years, we have limited our work to create a proposal for Volvo IT. The design of the Balanced Scorecard also needs to be discussed in detail on the different levels at the company before the actual implementation. For the implementation phase, patience and flexibility is a prerequisite in order to obtain acceptance and understanding on all levels in the organization. Moreover, the use of a Balanced Scorecard is a dynamic process, where modifications are made regularly as internal and external conditions of the company are changing. We recommend Volvo IT to use the Balanced Scorecard, as described in this thesis, as a starting-point for the implementation phase. Based on the information obtained from our research interviews with key personnel, we have identified several critical factors for success and the corresponding strategic measures. We believe that introducing the Balanced Scorecard will be useful for the integration project at Volvo IT, strengthening the company with respect to future challenges.

Key words: Balanced Scorecard, IT Company, Strategy.

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1 Introduction

1.1 Problem Background

Volvo IT is a wholly owned subsidiary of AB Volvo, one of the largest industrial groups in the Nordic region of the European community. Volvo IT was formed in 1998 by integrating Volvo Data with the IT groups from the companies within AB Volvo. During the recent decades, AB Volvo has continuously expanded. Today, Volvo IT is a comprehensive, global IT company with about 4300 employees and annual sales in excess of SEK 5 billons. Since the company is global, it integrates work, company cultures and languages to work together. In addition to IT systems and applications, Volvo IT offers infrastructure and operations with a high level of cost efficiency and quality.

In this context, Volvo IT has developed a new strategy to meet its environment. Volvo IT must follow the globalization and business cycle of the customers of AB Volvo. The main strategy contains the following areas; Profitability and Growth, Customer Satisfaction, Global Provider and Attractive Workplace. An important subset of this strategy has been divided into the following three strategic areas:[1]

- Market and Customer
- Solutions and Services
- Operational Excellence, including Human Resources and Internal process efficiency

In order to realize this important part of the strategy, Volvo IT discussed on the Senior Executive level which areas that will be in focus. Since there are many different projects, in the company in need of investments, the internal process efficiency is crucial in order to reach higher efficiency. Here, efficiency is understood as "the relationship between the quantities of factor inputs (labour, materials, etc.) used by a firm and the quantity of output which it is able to produce using these inputs. When a firm is able to produce the same output using fewer inputs or produce more output using the same quantity of inputs then it has improved its efficiency"[2].

The senior executive group has therefore identified the main strategic innovation areas for the period between 2003 and 2005. These innovation areas include Integration, Mobility and Telematics. The question then arises what integration is in the context of AB Volvo? What does integration mean and what does this concept imply?

The aim of the integration is to improve the customer processes by the integration of systems for information technologies in different parts of AB Volvo and within Volvo IT. Consequently, integration will bridge the interdependence among several technologies and for several customers' projects within AB Volvo.

[1] Volvo IT Strategy 2003-2005
[2] Pass, C., Lowes. B., (1995, p. 213)

A concept that is used throughout this thesis is the *integration unit.* Recently, Volvo IT established a new organization named "the integration unit" which strives to integrate interactions and techniques between groups in the organization to increase its efficiency[3]. For Volvo IT, integration utilizes and reuses old experience, knowledge, competence, and lessons and techniques learned from previous large and complex projects.

Large-scale projects demand extensive resources and, consequently, if going through the whole procedure once again each time a new project is launched, the development cost will be high for Volvo IT. However, in many cases a suitable solution has already been reached in a previous project. If projects that rely on different systems at AB Volvo are left to develop completely independent, redundancy and incompatibility may result, raising costs, constraining growth, and limiting flexibility and responsiveness.

With integration, Volvo IT can achieve higher efficiency by reusing competence and experience from previews projects and at the same time improve the outcome for the customers. In this way, the company can improve profitability and growth, adding value for AB Volvo's shareholders. Traditionally, Volvo IT has not been expected to generate its own profit in financial terms, but has a demand from its owners to improve customer revenues and profitability.

In this context, Volvo IT aims to gain efficiency with increased integration and achieve this effectiveness in the integration area. Since integration has been identified as a strategic area for Volvo IT, a new business model is necessary for the purpose of being more effective in the future and accomplishes the goals of the top management.

Naturally, as in all kinds of companies and organizations, to meet the challenges of reaching operational excellence e.g., internal process efficiency, many problems must be solved on the way. The senior executives have already identified these problems, and delegated the mission to a project manager, who will thus be responsible for running the project.

The main problems that confront the integration unit today can be identified as the following;

Communication and internal processes: The organization suffers from differences regarding culture and education between the System Development unit and the Infrastructure unit at different levels. This is not only true within the organization but also with regard to Volvo IT's customers from which the requirements in some cases are unilateral. The differences in culture and education imply increased costs. For example, in case the demands on a product or a service from the customer side are not clear from the beginning, additional requirements may have to be added afterwards without being clearly stipulated in the contract (see Figure 4-4, p.42). This has therefore caused an inferior *functionality* of the delivered product or service, which is obvious when the product or service is confronted with the demands of the harsh reality. This has forced Volvo IT to pay additional costs after delivery to meet the

[3] Pass, C., Lowes. B., (1995, p. 213)

demands of the customers. The extra cost can be eliminated using tests and verifications of the infrastructure and ensuring that the demands of the customers are balanced from the beginning.

Quality: When a large scale project has reached its deadline, one of the major problems has been that the cost and time was according plan but the quality e.g., functionality of the delivery was insufficient. The quality factor must therefore be taken into account in the decision process before delivering to the customer. Additional time may be needed to modify an application, and it is very time consuming, and costly to change and correct the application after it has been delivered. Thus, quality is one of the critical factors to increase customer satisfaction.

Before delivering a product or a service, the question is: How can the quality be improved and which are the factors that give a feeling to the integration unit precisely what improvements should be accomplished? Moreover, a factor that is connected to quality is the procedure that Volvo IT and its customers use for making contracts, both internally and externally. The demands from the customers are expressed in available time for support, lead-time, seek-time, and functionality. To meet the demands is one of the most important issues for the integration unit, and it is necessary to be able to measure to which degree the demands have been realized.

Competence: After extensive investments in human capital e.g., consultant services, the know-how to run costly projects has largely been lost and employees are afraid to make modifications to the existing systems. As a consequence, the so-called "change management" process becomes significantly more expensive. Competence gained through earlier projects is important from an investment point of view. The company invests a considerable amount of time and money in integration and consultancy. As a result, competence often disappears after a finished project since it is often based on external consultancy and not on Volvo IT's own personnel. When external consults disappear, Volvo ITs own personnel do not venture to modify and update the products. In this way, the competence of customer experience is lost at Volvo IT. In many cases, the previous personnel has also been changed when the customer orders an extra functionality for the application e.g., Project Managers who worked with a previous project has left for another position.The customer has to explain for the new personnel and new Project Managers at Volvo IT how their applications work, and due to its complexity, this takes considerable time and effort.

The aim of the new organization in the integration unit is to maintain the competence and therefore it needs to measure some parameters to obtain an overview of the situation. How should the new integration organization make these measurements?

Functionality: The applications and services are often delivered at the time agreed upon, but with reduced functionality. In some cases a total reconstruction of the application may be necessary.

Efficiency: Resources and competences in the integration unit are not always used in an effective way. This implies that knowledge and experiences are not taken into account well enough. Volvo IT has identified the following problems e.g., communication and internal processes, quality, control, competence and functionality which have influenced the efficiency. However, there are also other factors to take

into account for Volvo IT in connection to AB Volvo such as e.g., customer satisfaction as well as customer loyalty. These last factors influence the future and growth of Volvo IT. We may ask, for example: Will the customer expectations become fulfilled in the future if the problems remain? Will Volvo IT retain its customers in the coming years?

1.2 Research Issue and Purpose

The integration unit of Volvo IT has given us the mission to present a suggestion of how the problems described above can be treated and resolved. We will suggest to Volvo IT an instrument that will give a solution and a methodology to reach this solution. As a point of departure, we feel that the Balanced Scorecard (see Chapter 3.1) is suitable. In this thesis, we will describe this methodology and apply it to the specific case, the integration unit at Volvo IT. The integration unit will thus receive a suggestion from us how the Balanced Scorecard can be designed.

As describe above the main problems at Volvo IT is the difficulty of communication associated with differences in culture. The suggestion of the Balanced Scorecard described in this thesis may serve as a model and should improve the communication, internal processes, quality, control, competence, functionality, efficiency and understanding between the different levels of Volvo ITs units. In addition, the development of the Balanced Scorecard model should provide the Senior Executives and personnel involved in the organization of the integration unit with new insights about their methods and goals, and in which direction they should be heading. Moreover, the Balanced Scorecard should provide insight for the members of the integration unit about their methods and goals. Finally, the model should provide insight of how Senior Executives and personnel can influence their own future and how the company can evolve.

The purpose of this thesis is thus to develop a suggestion on how the Balanced Scorecard can be designed for working as a tool when implementing the new strategy for integration at Volvo IT. Our recommendations can serve as a starting-point in the implementation phase and for future development of the Balanced Scorecard at Volvo IT. The theory behind the Balanced Scorecard will be explained in order to increase general understanding of the model to be used at Volvo IT. Previous experience from earlier projects in the organization is instrumental for identifying the key parameters for success and the strategic measures for the Balanced Scorecard.

1.3 Limitations

We have limited the work in this thesis to making a proposal of how the Balanced Scorecard can be implemented at Volvo IT with focus on integration. The purpose of this thesis is not to identify the vision and strategy for the integration unit since this has already been done during team workshops and discussion meetings. Although a number of suggestions are made, no thorough analysis of the possible risks of implementing the Balanced Scorecard into the organization is made. The actual implementation is not included in this work, and neither is the day-to-day use, or how the maintenance of the Balanced Scorecard shall be organized at the company, since this is a time consuming process that will settle during the course of one or two years.

However, in order to achieve a feeling of how this can be done, the implementation phase is mentioned in the theory section. Due to constraints of resources regarding time and money, we had to limit the number of persons who were interviewed. The development of this proposal only includes the internal customers for Volvo IT e.g., AB Volvo and the business within the company. The analysis concerns only the Gothenburg area.

1.4 Disposition

This thesis contains five chapters. The first is an introductory chapter describing the background, research issues and purpose of the thesis. In the second chapter, the choice of research method is motivated and described. The validity, reliability and analysis of the data are also discussed. Chapter three contains the theoretical framework of the Balanced Scorecard methodology. Chapter four presents the empirical results of the work. Chapter five contains our analysis and conclusions of the investigation, including our suggestions in terms of critical factors for success and strategic measures of the Balanced Scorecard.

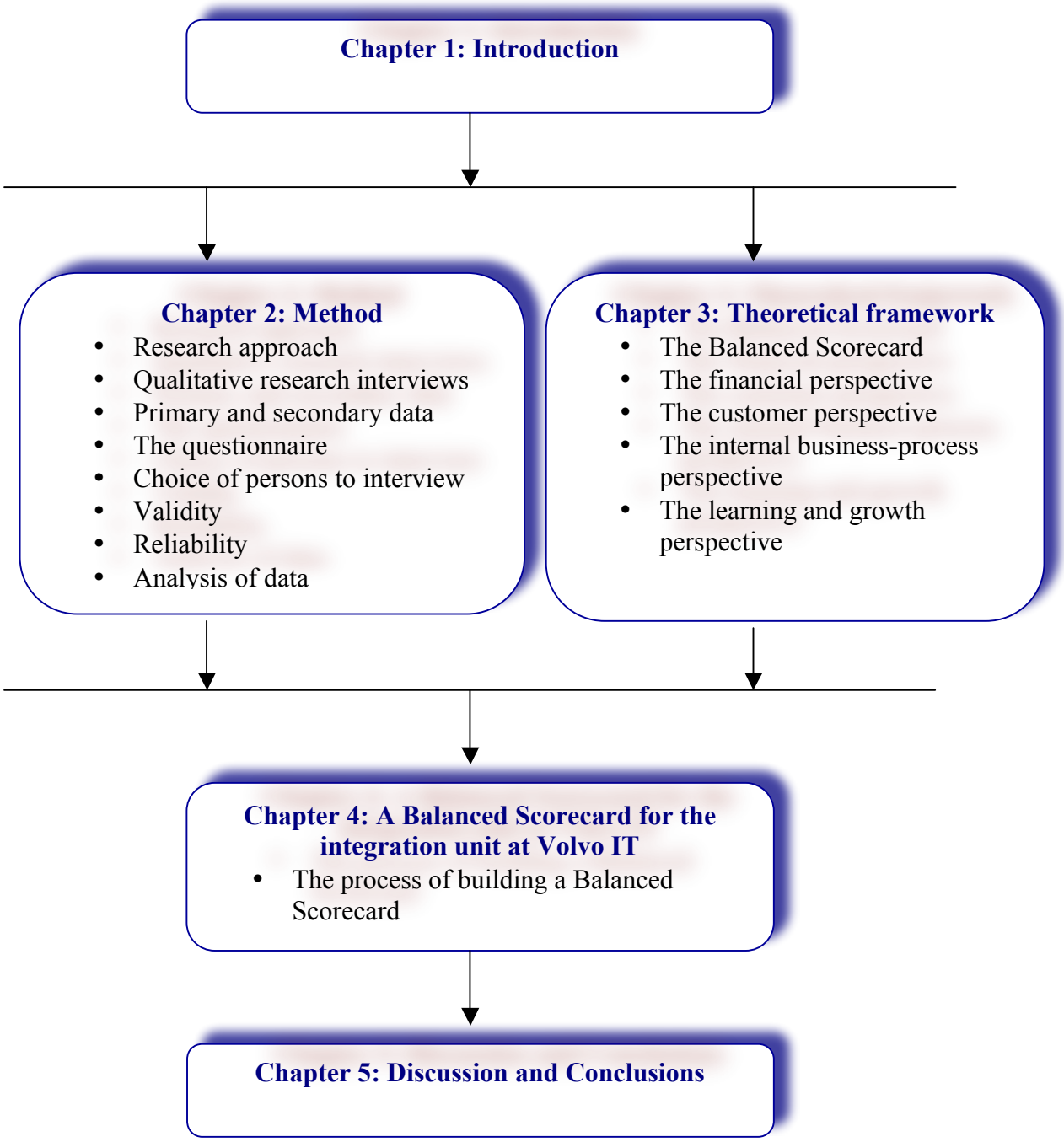

Figure 1-1: The disposition of the thesis.

2 Method

In this chapter we will first give a brief overview of different research approaches, and the methodology that was chosen for the present investigation. We will motivate the choice of research method and discuss the validity and reliability of our results.

2.1 Research Approach

Different research problems require different methods for investigation and, hence, a number of different research philosophies have been developed[4]. The actual choice of research approach depends crucially on the aim of the investigation as well as previous knowledge. Research procedures can generally be separated into descriptive, explanatory, exploratory and prescriptive approaches[5].

The *descriptive* approach is used when there already exists some knowledge and published material in the research area. The researcher can describe issues in the present or past, the background or consequences for different issues, and relations between them. Descriptive research is characterized by, and can be classified in terms of, the formal research procedures used when collecting information, such as, questionnaires. This kind of investigation can involve all members of a group or organisation (a total investigation), or a representative sample may be selected by randomisation.

The *explanatory* research approach is used, for example, to explain why different people in certain situations take different actions, and how their actions influence decisions. Knowledge obtained by previous descriptive studies is used to formulate theories that are subsequently tested empirically by experiments, enabling proper control of unrelated factors.

The *exploratory* research is more focussed on obtaining new research results, and is used when a problem area is insufficiently known. The aim is to collect as much information as possible regarding a specific area. In the exploratory research approach it is often suitable to start with literature studies to gain general understanding. Many different techniques for collection of raw data are used e.g., interviews, literature studies and field studies. An exploratory investigation is flexible in the meaning that it allows adjustment to the results and knowledge gained by the researcher during the course of the investigation.

The purpose of *prescriptive* research is to provide information and to select a course of action and, thus, aims to provide instructions in order to achieve a certain purpose. The prescriptive research is oriented towards designing processes and specifying properties, describing tools for diagnosing defects and to tell how to achieve desired changes e.g., within an organisation. Successful prescriptive scientists must convince other people that their theories are sufficiently complete and effective enough to predict rather accurately how their prescriptions will alter the trajectories of future

[4] Kvale S. 1997; Patel R. and Davidson B., 1994.
[5] Kerlinger F. N. 1997; Patel R. and Tebelius U., 1987; Nystrom P. C. and Starbuck W. H., 1977.

events. Prescription can contribute greatly to a science, which sees organizations as flexible, adaptive systems.

The investigation conducted in this thesis draws on the knowledge of those who were interviewed, people working in an organization. Our study can be classified as being composed of *explorative* elements, in which the information collection was done by literature studies, by participation in workshops at the company, and by performing qualitative research interviews with a number of key persons. This is combined with a *prescriptive* research approach aiming to characterising the collected information, and providing recommendations, parameters and instructions for the development of the Balanced Scorecard. The Balanced Scorecard is applied as a tool and a formal process for implementing the vision and strategy from an integrational point of view into the organization. The investigation is therefore flexible and adjusted according to the specific needs of the company.

Figure 2-1 illustrates our research approach as a funnel model involving eight steps. Firstly, we chose the general problem background, namely the development of a suggestion for a Balanced Scorecard at Volvo IT. Then we defined the limits of our assignment in relation with the company in terms of time constraints and resources. Thereafter, we defined and developed the objectives and research issues more in detail for the Balanced Scorecard and the integration project at Volvo IT. In the next step, we chose our research methods. Here, we chose to combine information and data obtained by interviews with material from our participation in team workshops at the company, and to some extent information from the literature. Then we performed the data collection and analysed the results. In the next step we chose the model of development of the Balanced Scorecard mainly from the step-by-step approach described in the Swedish model developed by Olve, Roy and Wetter[6]. We also used part of the original theoretical framework developed by the Harvard professors Kaplan and Norton[7]. The main difference between the two models is that the model by Olve, Roy and Wetter includes the identification of so-called *Critical Factors for Success*. This implementation process is comparatively much easier to use with its step-by-step procedure and with the aid of empirical examples from several companies. In contrast, the original model by Kaplan and Norton includes so-called *Cause-Effect Connections* as a chain between the objectives of the Balanced Scorecard in the time perspective, which can be quite difficult to apprehend (see chapter 3). In the next step, we designed the Balanced Scorecard using the chosen research method and the development model. In the final step, we discussed the investigation, concluded our findings, and outlined recommendations for future work in the integration unit.

[6] Olve N.-G., Roy J. and Wetter M., 1997.
[7] Kaplan R. S. and Norton D. P., 1996.

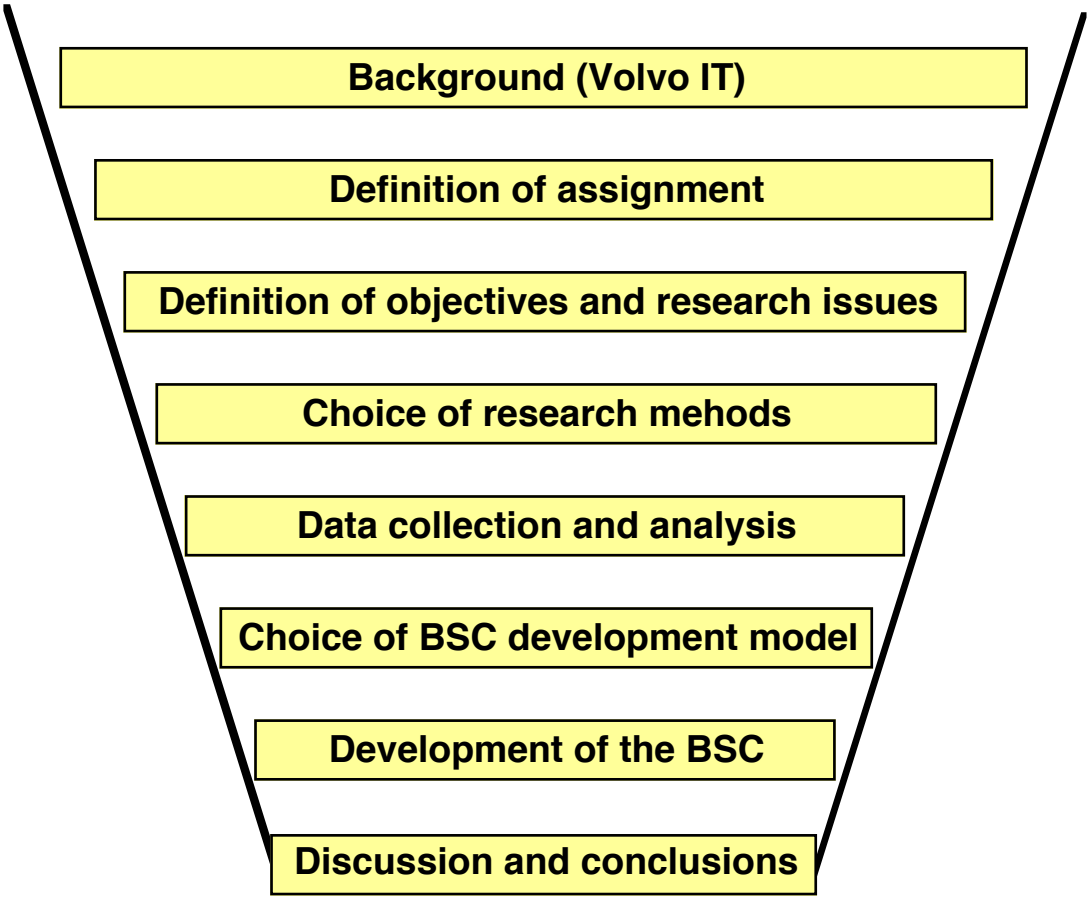

Figure 2-1: Illustration of the main steps contained in our research approach.

2.2 Qualitative Research Interviews

The discussion on which is the best method is frequently focussed on the polarity between quantitative and qualitative models; research methods are generally separated into *qualitative* and *quantitative*[8]. Qualitative studies differ from quantitative in several aspects. In qualitative studies the reality and the specific problems are understood from the starting-point of human beings, and how they perceive the situation. Thus, qualitative research is focussed more on evaluating the studied issue with words rather than using numbers and figures. Our aim for the present investigation is to identify the so-called Strategic Objectives, Success Factors and Strategic Measures, which by themselves are of a quantitative nature. However, the interviews were performed and analysed in a qualitative manner. This choice of method is motivated by the fact that the design of the Balanced Scorecard with its different perspectives should be based on experience from previous projects in the company with regard to management, performance, and outcome.

[8] Holme F. M. and Solvang B. K., 1997.

Our interviews can be classified as qualitative research interviews. Such interviews are commonly made with the aid of a *questionnaire* containing the topics that are focussed on in the study[9]. By having both structure and aim, a qualitative research interview thus differs from a spontaneous everyday exchange of opinions[10]. However, qualitative research interviews are not based on strictly standardised and structured questions. Even though the aim is to highlight predetermined topics by finding out the interviewed person's opinions, attitudes, and feelings – aspects that are essential for the investigation at the company – open questions provide a means to find out about important aspects that are à priori unknown to the researchers.

In order to identify the Strategic Objectives, Success Factors and Strategic Measures, it was necessary to become familiar with the company by interviewing persons with a thorough knowledge of the organization. The qualitative research interview implies an understanding of the environment of the study and how groups of individuals are influencing each other. Qualitative research interviews are generally focussed on the apprehension and interpretation by the investigators, and the research process is characterized by flexibility. For example, if questions in an interview are discovered to be unnecessary or can be misunderstood, they may be modified. Since the research issues can be rather complex, it is important to avoid the risk of misinterpretations, as discussed later in this chapter. The strength of the qualitative research interview is the increased understanding of social processes and contexts important for the integration process at the company. During the interpretation of the results, the flexibility of the method, and the close relationship with the interviewed persons, implies good possibilities for relevant interpretations and high quality.

2.3 Primary and Secondary Data

In a research investigation, the collected information can be either in the form of primary or secondary data.

The *primary data* do not exist in publications and must therefore be collected by the researcher. There are different ways of collecting primary data. The choice of technique depends on the character of the problem, the number of observations needed, and accessible resources. In order to develop the Balanced Scorecard, we found that interviewing people in their own environment was the most suitable technique for obtaining the necessary and critical information needed. However, in this thesis the primary data also consists of our own participation in team workshops at the company as well as regular meetings and discussions with the integration project leader. The purpose of the team workshops initiated by the project leader was to obtain and enlighten a view of the business area by discussing and identifying the potential strengths, weaknesses, opportunities and threats of the company. This was obtained using a regular so-called SWOT-analysis[11]. This analysis constitutes a fundamental basis for the following formulation of the company's vision and strategy, as well as for obtaining a general understanding of its problems and future prospects. In order to achieve this purpose, the participants at the team workshops were selected on grounds of their position in the organization, being key persons with the particular competences needed in the area of integration. Our participation in the team

[9] Trost J. 1997.
[10] Kvale S. 1997.
[11] SWOT=Strengths, Weaknesses, Opportunities and Threats.

workshops provided us with the necessary background[12] to grasp the organizational problems that preceded the integration project, and the motives for the decision to introduce a Balanced Scorecard.

The *secondary data* is easier to obtain and consists mainly of documented and published material. The secondary data is often used as a complement to the primary data, since it gives the possibility to evaluate the development over time. Our literature studies gave a good overview of how similar problems have been dealt with when implementing Balanced Scorecards in other organizations. By initial investigation of the literature using library databases and the Internet, we thus achieved a basic knowledge of Balanced Scorecard implementation in other companies.

2.4 The Questionnaire

In order to obtain the necessary information needed to develop a Balanced Scorecard at a company, it is necessary to have a close relationship with the persons working in the company. For the preparation of the interviews, we made a *questionnaire* (see Appendix) in accordance with the research aim i.e., to identify the Strategic Objectives, Success Factors and Strategic Measures, based on the vision and strategy that was not yet formulated in all its details. The development of the questionnaire was thus based on our knowledge obtained from the team workshops[13] as well as from the information available in the secondary data. The questions in the questionnaire were grouped according to the different areas in the perspectives of the Balanced Scorecard i.e., the financial, customer, learning and growth, and the internal perspectives. Before the first interviews, the questionnaire was tested on a few different persons at the company, and the questions were modified in cases of deficient clarity.

There are generally two kinds of questionnaires; *standardised* and *non-standardised*. The standardised questionnaires are characterised by questions with a predetermined order. The advantage of standardisation is the easiness of the analysis of the answers. An obvious disadvantage is that relevant information not asked about is left out and will remain unknown. In non-standardised questionnaires, the questions are not necessarily used in a certain order. The advantage of the non-standardised form is that additional questions and interesting discussions not included in the questionnaire are accepted. The non-standardised approach increases the probability of obtaining all the relevant information during the interviews. The disadvantage of the non-standardised form is that the collected information may be heterogeneous and, therefore, comparison between the interviewed persons is difficult.

Our qualitative research interviews at Volvo IT, visiting people in their own environment, can be classified as non-standardised[14]. The reason for our choice is mainly that there are no persons in the company, who have full overview of all the information and knowledge needed for our study, i.e., the strategic, tactic and

[12] Documentation was also provided in the form of PowerPoint slides.
[13] Integration workshops I-III at Volvo IT.
[14] Kvale S. 1997.

operative levels in the company. Moreover, it is not necessary or useful to obtain fully comparable answers to all questions.

2.5 Choice of Persons to Interview

In total, we made detailed interviews with 13 persons at Volvo IT e.g., key managers and project leaders on different levels in the organization, representing the different perspectives in the Balanced Scorecard. Since most of the interviewed persons had genuine knowledge of only a certain part of the strategy, it was necessary each time to prepare in advance a careful selection of the order to ask the questions from our questionnaire, depending on the specific area of knowledge of the interviewed person. At the end of each interview we asked for recommendations of additional persons to interview. After discussing the degree of integration knowledge and other capabilities of the recommended persons with our supervisor, and using his contacts, each next person to interview was asked to participate on a voluntary basis. The selected persons for the interviews were contacted a few days in advance by e-mail or telephone, shortly describing the aim of our study and allowing for preparation. Each interview lasted between one and two hours depending on the interest and knowledge of the interviewed person, and on the available time. Both authors were active asking questions and taking notes during each interview. After explaining and discussing the concepts of the Balanced Scorecard with the interviewed persons, we could ask secondary questions to widen the scope and obtain deeper knowledge. A few of the interviews were later complemented with additional questions for greater clarity.

The obtained information was relatively reliable owing to the careful selection of the interviewed persons, and the fact that we were able to ask secondary questions to obtain deeper knowledge of particular problems in the organization. All the interviews were performed in pre-booked conference rooms very close to the person's actual working environment at the different parts of Volvo IT, i.e., mostly at Volvo IT at Arendal, Torslanda, and Volvo Trucks. This arrangement was preferable since the interviewed persons could feel confidence in their normal working environment, did not need to move anywhere else and, further, they could easily check uncertain information asked for during the interviews. The notes from the interviews were transcribed word-by-word after each interview.

2.6 Validity

Does the result agree with the reality? It is usually important to determine the degree of validity, and to which extent the tool measures too much, too little, or even things that are not intended.

When judging the quality of an investigation, it is important to pay attention to the validity. By validity is meant that the method does indeed address the properties that are actually intended to be investigated[15]. A good validity ensures that the amount of systematic error is reduced to a minimum. Errors can occur throughout the whole investigation, and are systematic if introduced by the method itself. The validity can be separated in two classes; *internal* and *external* validity. Internal validity means to

[15] Lundahl U. 1982.

which degree the tool e.g., the questionnaire for research interviews measures what the investigation is supposed to measure. Ask: “Is the method relevant for the study”.

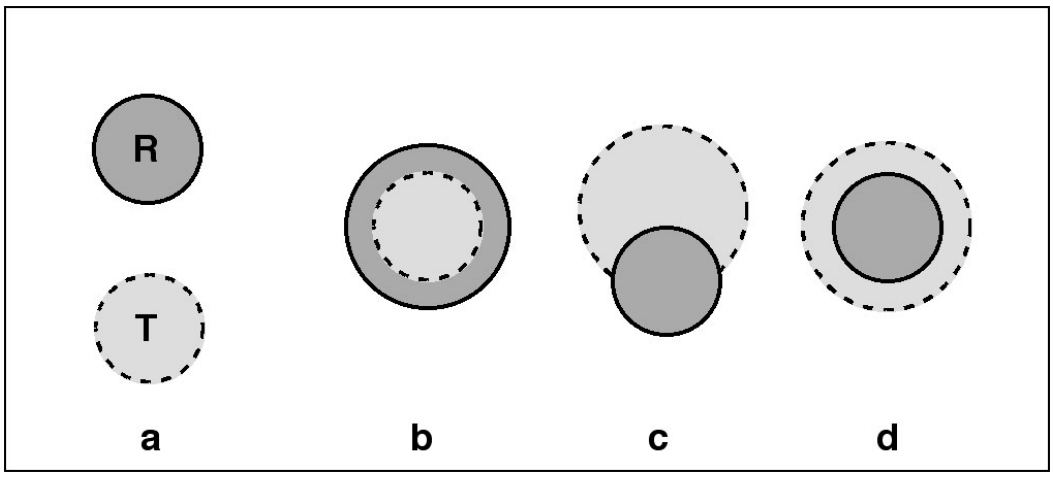

Figure 2-2: Good validity means that the quality measured by the tool (T) is the one that is intended, namely the real phenomenon (R). A few examples of lack of internal validity are shown: a) The measured phenomenon by the tool does not overlap with the real one. b) The tool measures too little. c) The tool measures diagonally. d) The tool measures too much, that is, some phenomena outside the intended target[16].

The external validity determines how well the result is applicable on other situations. Ask: ”To what contexts are the findings transferable”. In our more or less unique investigation of a Balanced Scorecard at a specific company, the aim is not primarily to compare the result with other groups or companies. Each company has its own vision, strategy, and success factors. Therefore, the internal validity is the most important one. The result of our investigation should reflect the reality of the development of a new operational model for integration in the organization at Volvo IT. Increasing the number of detailed interviews at Volvo IT might strengthen the inner validity. However, after interviewing 13 persons, we feel that we have reached a certain amount of saturation – although the answers are individual, the compound information obtained is similar between persons. We believe that our careful selection procedure of identifying persons with genuine knowledge in the integration unit who were working in different positions and levels at the company, e.g., key managers, project leaders, as well as other employees, has eliminated most of the systematic errors. The validity was also ensured by a discussion after each interview to control that the meaning in our notes were identical, verifying the correctness of our understanding of the answers.

2.7 Reliability

Reliability means that the tool can withstand the influence of random errors, that is, to what extent it can be relied on[17]. In qualitative interviews the concept ”credibility” is often used instead of “reliability”. The credibility does not only depend on the method, but also on the selection of subjects, and on the context in which the investigation is performed. Unless used correctly and carefully, even a perfect tool

[16] Lundahl U. 1982.
[17] Kvale S. 1997; Patel R. and Davidson B., 1994.

may lead to a useless investigation. The exactness during the collection of data depends on the effort of the researcher when conducting the work. Also, the exactness depends to a large degree on the precondition that questions and instructions are phrased such that the interviewed persons correctly understand them. Paying attention to the selection of subjects and their background, and the context, in which the issue is studied, is of utmost importance for enabling the reader to judge within which context the results are applicable. We believe that we have obtained a satisfying credibility by a careful selection of persons to be interviewed on different levels in the company, and by the fact that the two of us made a thorough analysis of the answers from the interviews and other collected data.

2.8 Analysis of Data

The method for analysis of the interviews that is the most suitable one depends on the aim and subject for the investigation, and the character of the inteview material[18]. In principle, the first impression and interpretation of the answers from the interviews begun already during the interviews. This first impression then persisted even when our notes were transcribed and processed. The work on the analysis and interpretation of the answers can be separated into four different phases with a different aim in each phase. To bring up and illuminate the essential, the analysis works as a systematic successive data reduction process ultimately leading to our results.

In the first phase, the aim was to become acquainted with the data and create an overview impression. All the interviews were read several times to reflect over what each person actually did say. After a certain amount of acquaintance with the interviews was gained, overall patterns of similarities and differences were observed. The first phase implied the possibility to search for and identify essential and clear statements in all interviews. Clear statements were identified, for example, by the fact they were repeated frequently, or emphasised in other ways. The degree of detail and precision in the descriptions was essential for the interpretation of the interviews.

The aim of the second phase was to systematically sort the statements made by the interviewed persons according to the different areas (Internal processes, Learning & Growth, Customer, Financial, and other common questions, see: Appendix), using colour codes in the transcribed notes.

In the third phase, an analysis of all statements within each respective area was done. This phase was selective in the sense that all other information was not concerned. At this point it was not an overall view that was of interest, but rather the different statements expressed with regard to each specific area.The different kinds of common problems in the organization were identified (as described in chapter 1) and a number of possible Strategic Objectives, Success Factors and Strategic Measures were set up.

In phase four, we identified what should be the most important Strategic Objectives, Success Factors and Strategic Measures in the different perspectives of the Balanced Scorecard. These are presented in the tables in chapter four.

[18] Kvale S. 1997.

3 Theoretical Framework

In this chapter we introduce the Balanced Scorecard as a concept and a method to help us in our discussion on where our business should be heading.

The Balanced Scorecard concept is an example under the latest years of the development of the management cost systems area. The Balanced Scorecard together with the ABC [19] methodology has been in focus in the whole world. In the last decade, the Balanced Scorecard became one of the most distinguished methods among the management cost systems as a framework of strategy implementation. The development of the Balanced Scorecard began in 1990 as a North American project and collaboration between the university and the industry [20]

The Balanced Scorecard is a Performance Management system that can be used for all sizes of organizations to align vision and mission with customer requirements and day-to-day work, manage and evaluate business strategy, monitor operation efficiency improvements, build organization capacity, and communicate progress to all employees. The scorecard allows us to measure financial and customer results, operations, and organization capacity.

In the book "*Relevance Lost*, *The Rise and Fall of Management Accounting*", H. Thomas Johnson and Robert S. Kaplan (1987), describes the insufficiency of managing an organization or company only by focusing on historical data e.g., traditional financial accounting, budgets, etc. Although financial information is indeed important for the management control, it should also be balanced with non-financial information e.g., short and long term and other considerations which provide good conditions for the organization or company in the future.

3.1 The Balanced Scorecard

Traditional financial measures in the Balanced Scorecard retains. As the result of past activities that has been measured. These historical data provides only little information about the future of the company. Traditionally, performance measurement systems have been focused on improving cost, quality and cycle times of existing processes. The Balanced Scorecard highlights those processes that are the most critical for achieving a breakthrough performance for customers and shareholders. This is the reason why the Balanced Scorecard methodology takes into account other areas of interest for the survival of the company or organization. These areas will create future value through investment in customers, suppliers, employees, processes technology and innovation.

The other parameter which complements the financial measures of past performance in the Balanced Scorecard originates from the organization's vision and strategy. The vision and strategy is utilized, measured and balanced. In this process, the different main parameters are grouped into perspectives.

[19] Activity Based Costing
[20] Ax C, Johansson C., Kullvén H., 2001, p 670

The Balanced Scorecard emphasizes that both financial and non financial measures should be included in the information system where employees at all levels of the organization will be involved[21]. In addition, both senior executives and employees should understand the financial consequences of their decisions and actions in the short and long-term.

The Balanced Scorecard methodology is a top down process driven by the vision and strategy of the business unit. The methodology translates both the vision and strategy of the organization to suitable measures. The measures will be a balance between external measures for the owners and customers, and the internal measures of critical business processes, innovation, learning and growth.

In the Balanced Scorecard methodology, the external and internal factors are classified in four perspectives; namely financial, customer, internal business process, learning and growth.

There are several reasons why a Balanced Scorecard can be useful for a business needs, for example;

- The renewed focus on the customer and process quality has caused many organizations to track and communicate measures on customer's satisfaction and complaints as well as product and process defect levels.

- Elimination of waste and defects; ceasing doing repetitive work, rescheduling engineering change of orders; gaining of greater integration among suppliers, and internal operations.

- The employees of the company or organization are the source of improvements in terms of quality, productivity and customer service.

- Improvements can only benefit a company when they can be translated into improved sales, reduced operating expenses or higher asset utilization.

According to Kaplan & Norton the Balanced Scorecard should retain a strong emphasis on financial outcomes e.g., all the measures on a Scorecard should be linked to financial objectives. The Balanced Scorecard obtains benefits from keeping financial measurements as ultimate outcomes avoiding the myopia and risk that arise from focussing on improving short-term financial measures only.

[21] Kaplan and Norton 2000

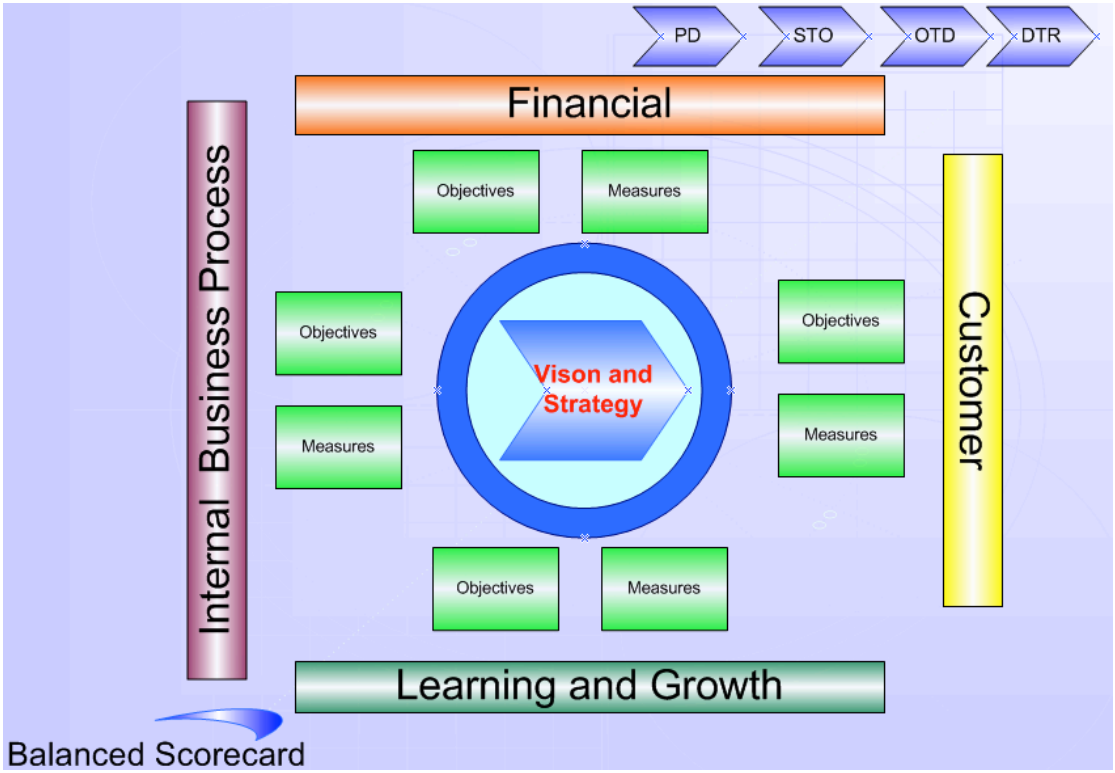

Figure 3-1: The Balanced Scorecard provides a framework to translate a strategy into operational terms[22]; PD=Product Development, STO=Sales to Order, OTD=Order to Delivery and DTR=Delivery to Repurchase.

3.2 Financial Perspective

The Balanced Scorecard includes the financial perspective since it is from the financial measures that control of effect of an action occurring under a certain period can be traced.The financial measures function as a target for the other perspectives. Financial objectives are e.g., profitability like operating income, and return on capital employed. Alternative financial objectives can be rapid sales of growth or generation of cash flow.

Each selected measure should be part of a link of cause-end-effect relationships which finally contribute in improved financial performance.

According to Kaplan and Norton[23], many corporations use identical objectives for all their divisions and business units. While this uniform approach is certainly feasible, since all business units' managers will be evaluated by the same metric, it fails to recognize that different units may follow quite different strategies.

[22] Kaplan and Norton 2000

3.3 The Customer Perspective

A company should create value for its customers in the market segments in which they have chosen to compete. The factors that are representative in this perspective are the core customer outcome measured by satisfaction, loyalty, retention, acquisition and profitability[23].

Retention is expressed by the way maintaining or increasing market share in the target customer segments and starts by retaining existing customers in those segments.

Customer acquisition is measured in absolute or relative terms, by the rate at which the business unit attracts or wins new customers or business.

Customer satisfaction assess the satisfaction level of the customers along specific performance criteria with the value proposition.

Customer profitability measures the net profit of a customer or a segment, after allowing for the unique expenses required to support that customer.

Retaining the customer loyalty is important if the company would like to grow. This loyalty must be worked up through good service. The companies, organizations or business units must understand the customer needs in terms of new products or services aligned with customer preferences before the competitors. The preferences of the customers are reflected in dimensions like quality, functionality, image, reputation and service.

The task of the managers of the company in this perspective is to satisfy and delight their customer as much as possible. The managers need to translate the vision and strategy statements into specific market-and customer based objectives. As a matter of fact, this strategy should be communicated throughout the whole organization or business unit.

3.4 The Internal-Business-Process Perspective

In this perspective, the managers should identify those processes that are the most critical for achieving the customer and shareholder objectives.

The company consists of operational and innovational processes (see Figure 3-2). Kaplan and Norton recommend that the metrics on the internal-business-processes should deliver the objectives established for the customers and shareholders. It is necessary to focus on the improvements on the innovation processes rather than to improve the existing operating processes. The innovation processes should be identified and based on current and future customer needs e.g., new solutions for the customers. The new solutions and innovation processes, should be based the operational processes i.e., delivering the existing products and services to existing customers and ends with post-sale service.

[23] Kaplan and Norton, 2000

In the context of improvements, one important aspect is that the improvements should include an integrated business process rather than improving performance of individual departments only. Apparently, traditional measurement systems focus on controlling and improving existing responsibility centres and departments. The limitations of financial measurements and monthly variance reports for controlling such departmental operations are well known, e.g. measure of quality, yield and cycle time.

One of the aspects to be taken into account is that the economic benefit will not be considerably improved only because the departmental business process is using a financial and non-financial measure system. Local improvements, like reengineering processes are not sufficient enough for the ambitious objectives of the customers. Another aspect to be considered is that most of the companies are always attempting to improve quality, reduce cycle times, increase yield and lower the cost for their business processes. However, these two aspects are not enough to create new business. The Balanced Scorecard methodology with a top down process for the implementation of the strategy will reveal new opportunities for the business.

A few examples of objectives in this perspective are to understand the customers' needs, create innovation services or products, customer satisfaction index and revenues from the new products. Important success factors could be lower cost for maintaining competitors under control, competence and committed personnel, time to market and creating an effective work process.

3.4.1 The Innovation Process

Most of the cost occurs and is accounted for during the research and development phase of a new product. According to Kaplan & Norton the innovation process will be recognized as an integral part of the internal process perspective. In this phase the size of the market and the customer's preference is under investigation. The research involves;

- Performing basic research to develop new products and services
- Research to exploit existing technology for the next generation of products and services
- Making efforts to bring the new products and services to the market

3.4.2 The Operation Process

Traditionally, the operating processes have been monitored and controlled by financial measures, such as standard costs, budgets and variances. The influence by Japanese manufactures has inspired western companies to complement their traditional cost and financial measurements with measurements of quality and cycle time e.g., by the methodologies for improvements known as Total Quality Management and Just in Time. These Japanese methodologies are of a generic character and can actually be incorporated in the Balanced Scorecard.

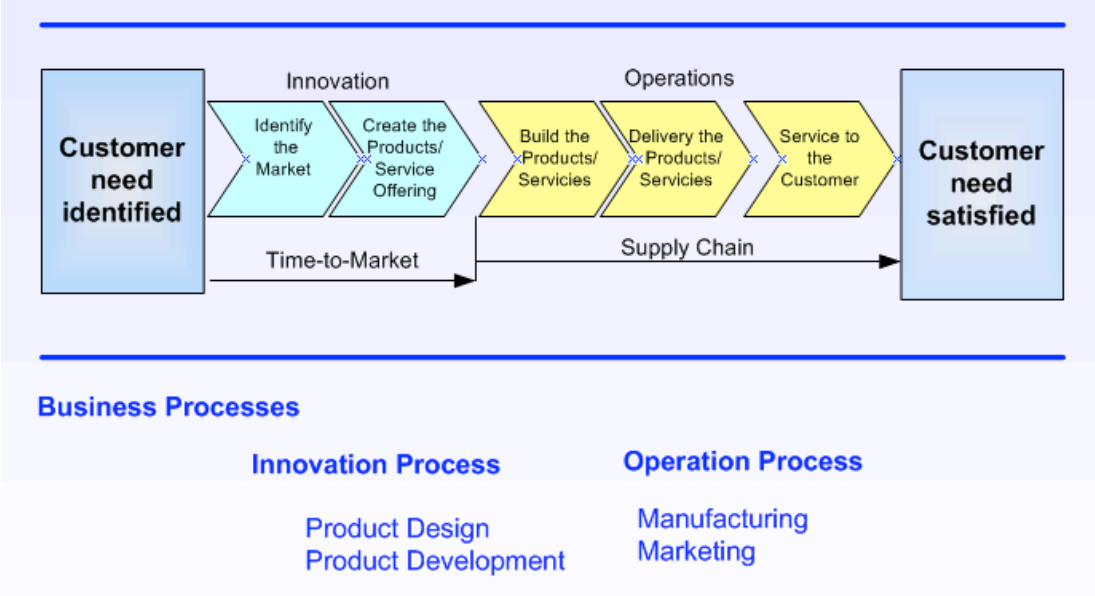

Figure 3-2: The internal-business-process value-chain perspective[24].

3.5 The Learning and Growth Perspective

The objectives for the Balanced Scorecard have so far been established by the financial, customer and internal-process-perspectives. It remains to discuss the learning and growth perspective. This is the fourth and last perspective that the inventors of the Balanced Scorecard[25] have developed in their theory. The objectives in the learning and growth perspective are the driving forces for achieving an excellent outcome in the first three perspectives discussed above.

The Balanced Scorecard emphasizes the importance of investing for the future. One of these investments is in the organizational structure of the company or organization in terms of people, systems and procedures. The main categories for the learning and growth perspective are[26]:

- Employee capabilities

[24] Kaplan and Norton, 2000
[25] Kaplan and Norton, 2000
[26] Kaplan and Norton, 2000, p 127

- Information system capabilities
- Motivation, empowerment and alignments

3.5.1 Employee capabilities

New ideas for operation and innovation not only emerge from managers but might also originate from employees. The main reason why ideas emerge from employees is that they are working in the front line and are closest to internal processes and the organization of the customers. The aim of innovation is to improve financial and customer performance.

3.5.2 Information system capabilities

The employees need to be efficient to achieve an internal target towards the customers. For this purpose, the employees benefit from an adequate competitive environment. In addition, employees need accurate and timely information about each customer's relationship within the organization.

3.5.3 Motivation, empowerment and alignments

The individual person within an organization needs to be motivated to act in the best interest of the company or organization. In addition, the individual needs to feel confidence in taking actions and making decisions for the best of his/her organization. There are many ways to measure the performance of the individuals:

- Measure the suggestions e.g., the number of suggestions per employee.
- Measure the improvement of quality, time or performance for specific internal and customer processes.
- Measure the individual and organizational alignment e.g., individual and departmental goals aligned with the objectives of the company.

Kaplan and Norton have identified three core employee measurements:

- *Employee satisfaction*: A satisfied employee is a precondition for increasing productivity, responsibility and customer service.
- *Employee retention*: The key individual which are of long-term interest for the organization.
- *Employee productivity*: The revenue per employee might increase as the profits decrease when additional orders are accepted below the incremental cost of providing the goods or services associated with the business.

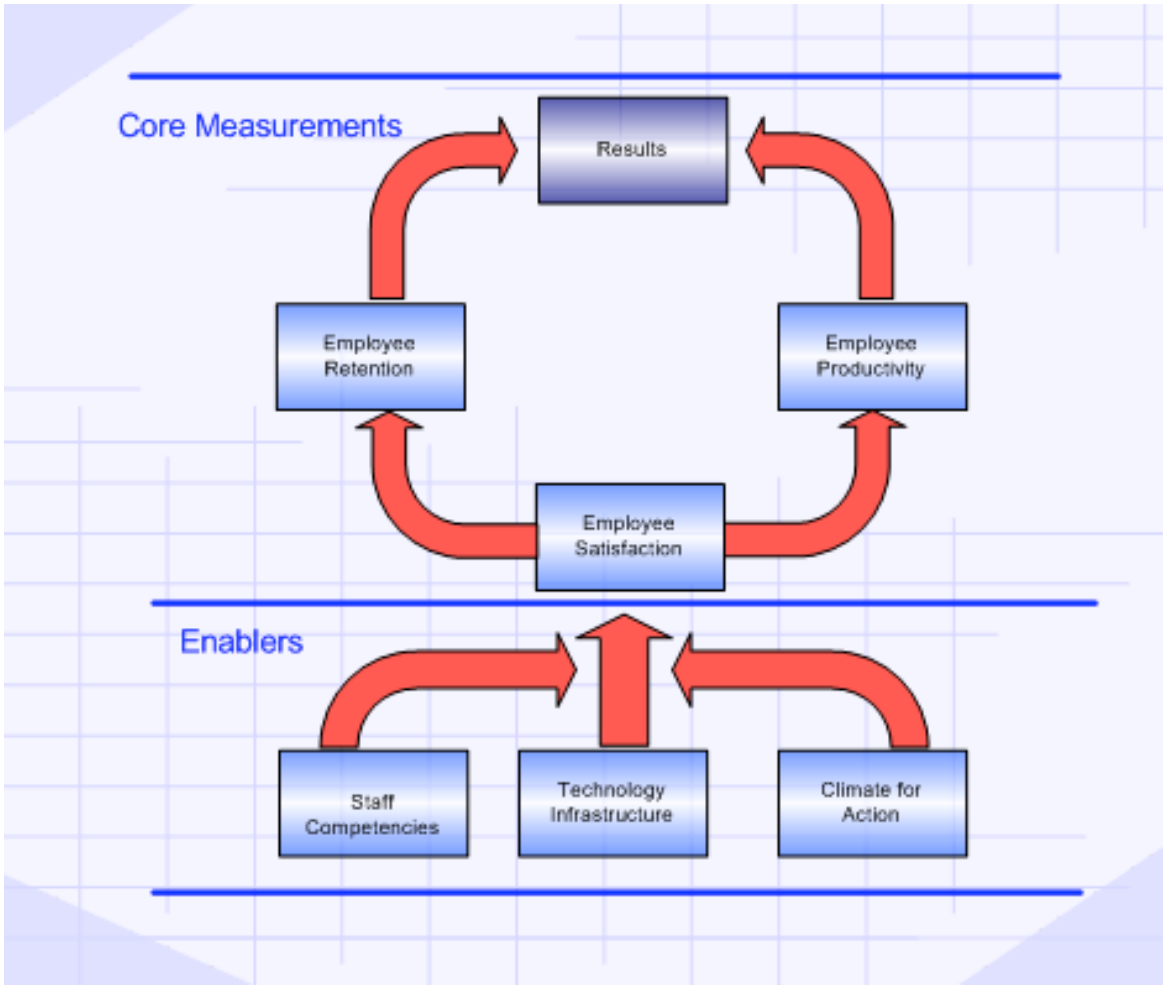

Figure 3-3: The framework of learning and growth measurements[27].

[27] Kaplan & Norton, 2000, p 129

3.6 Benefits of the Balanced Scorecard

One of the reasons why the Balanced Scorecard has been so successful among the several numbers of performance systems is that the Scorecard gives a great logical sense to the business of the company. The Scorecard provides to management a better tool for making decisions, and to meet their responsibilities.

Another reason for the success of the Balanced Scorecard methodology is the ability to ensure a correct implementation of the vision and strategy of the company. By using the Scorecard, managers can communicate the goals, and strategy from the top level to the lower levels of the organization.

3.7 Drawbacks of the Balanced Scorecard

According to Ax C., Johansson C., & Kullvén H., the implementation work is extensive, bureaucratic, and complex to realize. Moreover, to find the links between the goals through the cause and effect methodology is hard to establish. Another drawback is the difficulty to co-ordinate, and bring together different opinions and wills. A third drawback is that the implementation of the Scorecard requires new routines and a system for data collection, adaptation, and reporting. An additional drawback is that employees view the Scorecard as just another three-letter concept (like Total Quality Management, Business Process-Reengineering and Activity Based Costing) which will soon "blow away".

3.8 Alternative models

There are alternative models which are similar to Kaplan and Norton. All these models have one thing in common. This common denominator is the idea to measure a company's performance and linking the measures with the strategic management process.

Maisel´s Balanced-Scorecard Model

The model is similar to Kaplan and Norton but replace the Learning and & Growth perspective with the Human Resources perspective (Maisel, 1992)[28]

The performance Pyramid

The performance pyramid is based on the concepts of total quality management, industrial engineering and activity accounting. The basic idea with this methodology is that there is a two-way communication system, in which the vision/goals are broken down

from the top to the lower levels of the organization, but measures go upward.

[28] Olve, Roy, & Wetter, 1997

EP2M

The creators of the EP2M model are Adams & Roberts (1993)[29]. The model is recognized as "Effective progress and performance measurement". The method emphasizes four aspects: external measures, internal measures, top-down measures, and bottom-up measures. The basic idea according to Adams & Roberts is measuring the system that implement the strategy and to foster a culture in which change is a normal way of life.

3.9 The Process of building a Balanced Scorecard

The first condition for a successful implementation of the Balanced Scorecard is that all members in the organization have a common point of view for both the line of business and the company or the organization. This common point of view requires an investment or providing the resources and time for all the members in the organization.

Another requirement for a successful working Balanced Scorecard is that not only the managers have access to the strategy but even members in different levels should be participants in the internal and external preconditions.

According Olve, Roy, & Wetter[30], the Balanced Scorecard can be produced and designed, using the following step-by-step procedure;

A comprehensive view of the process

The Balanced Scorecard contains a numbers of different areas like: Strategy Development, Management Control System, Systems and IT Development, The Learning Organization

Strategy Development

The first steps in the Scorecard process outlined below are about developing a strategy.

Management Control System

Management Control starts with the company's vision and strategy, and the Scorecard is a method of controlling the business. The process presented in this section describes how company strategies are translated into measures and goals for various managers in charge and how the Scorecard provides comprehensive, balanced statements of their duties. The process should be repeated at every level of the company so that all the employees are given a sense of participation and can understand their part in the overall strategic scheme.

[29] Olve, Roy, & Wetter, 1997
[30] Olve, Roy, & Wetter, 1997

Systems and IT Development

Data must be recorded, verified and made available. In the design of the Scorecard for strategic control, it is natural to consider the empirical aspects of data collection and existing systems.

From vision to action plan

An overview of how the Scorecard should be modelled is shown in **Figure 3-4.**
First of all, at the top of the figure we have the vision of the company. This vision is at the highest level. The vision means the desired position of the company in the future. Secondly, we have the perspectives. The overall vision is decomposed and descried in terms of the numbers of perspectives. The most common perspectives are financial, customer, internal business processes and learning and growth. Thirdly, this portion of the Scorecard describes the measures and goals which have developed to enable management to follow the company's efforts to exploit the success factors considered to be most critical for goal achievement. Finally, there is a section describing the specific actions and steps which will be required in the future.

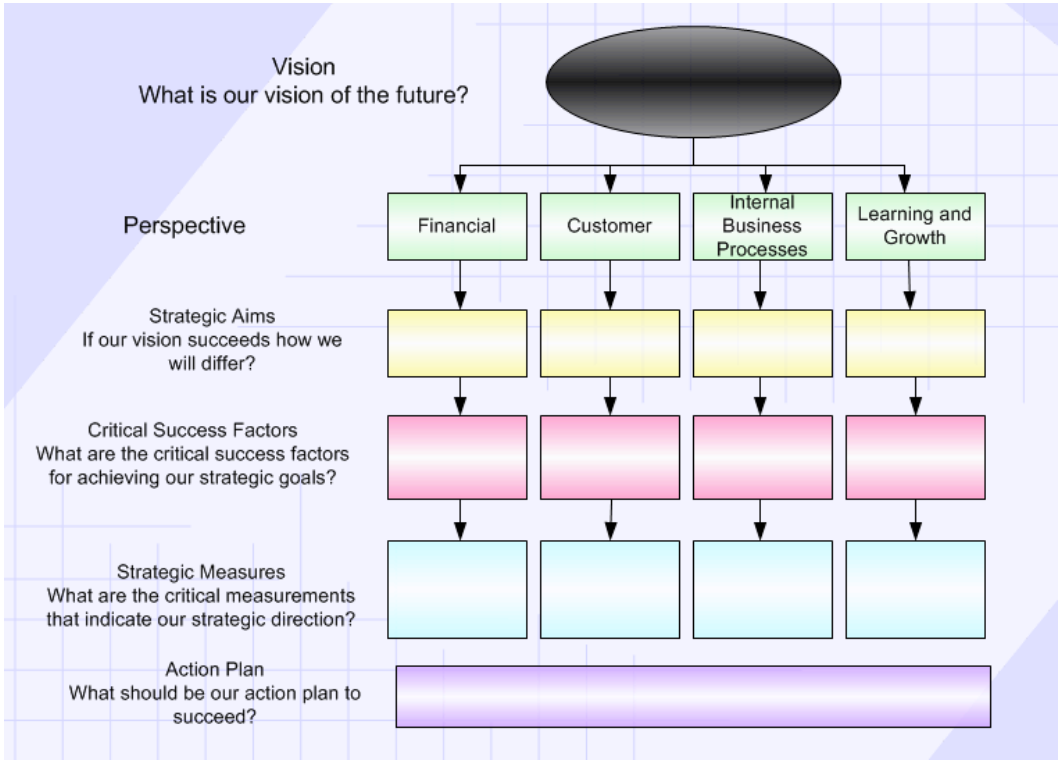

Figure 3-4: Comprehensive view of the process[31].

The choice of the appropriate unit

Depending on the size of the company, the Scorecard will be a model for the whole company or for part of the company e.g., units or departments. For small companies it

[31] Olve, Roy, & Wetter, 1999, p 42

is recommended to create a model for the whole company. Conversely, according to Olve[32], for lager companies and/or corporate groups, it is more suitable to begin with one or two projects. The choice of a unit should be based on a combination of willingness to participate and suitability for the project. To gain support, it is recommended to send the Scorecard to the top-level management to receive feedback.

How should we be organized and who should take part in the work?

The people involved in the development of the Balanced Scorecard will be on different levels. It is important to understand the vision itself. For this reason, as many employees as possible should be actively involved in this process. A consensus should be the result of the vision. A central part of the work that the involved persons will realize is identifying strategic perspectives and factors for success.

The importance of top-management commitment and motivation cannot be sufficiently emphasized.

The Chief Executive Officer (CEO) should be totally committed to the entire process and should take an active part in developing the first elements of the Scorecard. He or she should assure that the task is given high priority and is firmly supported by the entire organization.

Fundamental premises

One of the premises is that all persons concerned agree with the general characteristics of the industry and of the company itself. Therefore, the organization should be given enough time and resources for everyone involved in the project to obtain the information needed to form a well-founded opinion.

The risk for failure is often due to the of sort secrecy surrounding issues and information of this kind. The entire process of modelling the Balanced Scorecard depends on if the participants have been provided with the relevant background documentation as well as an opportunity both to question it and to develop it further. The quality of the work will improve if the participants have access to relevant information.

3.9.1 Define the industry; describe its development and the role of the company.

The aim of this step is to create the preconditions and requirements for identifying the company or organization's position and its role.

The strategic development is often based on a tool called the SWOT-analysis[33]. By the application of this model the company can analyze what it can do today and what should be done in relation to the external environment.

In the beginning of the 1980th, Porter introduced the theory about the "Five Forces"; focussing on how the company's viewpoint can move from the company itself to the

[3232] Olve, Roy, & Wetter, 1999, p 43
[33] Strength, Weaknesses, Opportunities and Threats

external competitor's way of doing business and how this can become a factor of success. In addition, the attention is focussed on how the profitability of the company is influenced by the structure of the core-business. This is the main reason why a SWOT analysis should be completed using the model developed by Porter[34].

Figure 3-5: A SWOT analysis[35].

3.9.2 Establish/confirm the company's vision

In this step, a tune must be made if a common point of view exists within the organization. By the common view, the organization should be effectively focussed. Alternatively, operating without a common vision through the different levels of the organization can be disastrous.

The environment surrounding an organization, both internal and external, changes continuously. This means that communication is a prerequisite to confront the dynamics around the business. In addition, finding ways of discussion and debate contributes to a common vision and mission.

3.9.3 Establish the perspectives

After the overall vision and mission have been established, it is time to investigate which perspectives are adequate for designing the Balanced Scorecard. As mentioned previously, Kaplan and Norton's original model contains four perspectives e.g., the financial, the customer, the internal processes, learning and growing perspectives.

[34] Olve, Roy, & Wetter, 1997, p 54
[35] Olve, Roy, and Wetter, 1999, p 50

There are organizations and companies which have chosen more than these four perspectives[36].

The choice of perspectives is based on the interested parties of the business logic. Naturally, the perspectives must contain a degree of connection based on the strategic success factors.

As the vision is decomposed, it becomes possible to determine the strategy and which perspectives should be used at the company. The Balanced Scorecard can be looked upon as a tool to translate the vision and strategies into a more direct plan of action with suitable strategic objectives, success factors and strategic measures. It is important that the perspectives include these parts of the company which are central to reach the vision. The defined strategies should be adapted to the chosen perspectives.

3.9.4 Break the vision down according to each perspective and formulate the overall strategic aims

Financial perspective

This perspective describes the expectations that the organization or company have in terms of growth and profitability. In addition, it is of importance to describe the economic risk that the organization is willing to accept e.g., negative cash flow. Furthermore, enlightened questions around costs and investment strategies should be investigated e.g., how large customer demands can be accepted.

Customer perspective

In this perspective there are questions like: How and which customer values will be satisfied and why will the customer be prepared to pay for those values? It is along this perspective, that the internal processes and development activities should be directed. If the flow of right products and services, in short and long terms does not work efficiently and if this flow is not satisfying the needs of the customer, the business will no longer generate revenues and will loose power and eventually die out.

Nowadays, there is a trend to be more highly involved in the customers buying process. An analysis of how products or services influence the customers is of great importance. Moreover, the understanding of how the customers choose price against other values like quality, functionality, delivery time, image, relations, etc. is a strong asset for the organization. All these factors are built into the customers own values rather than the organization's own established understandings.

The measurements within the customer perspective are based on:

- Market share
- Customer loyalty e.g., the customer repurchase frequency can be measured

[36] Olve, Roy, and Wetter, 1997, p 106

- Flow of new customers
- Customer satisfaction on products and services
- Profitability per customer

Internal-Business-Process Perspective

Which are the processes that create the right customer value so that even the owner's expectations can be satisfied? Meeting the customer needs requires making a survey of the overall company's or organization's processes. This survey can be done using Porter's tool as shown in Figure 3-2. Thereafter, the processes might be identified in terms of cost, lead times and how quality will be guaranteed. Among the most important processes that will be described and analyzed are those which have a direct influence on the customer loyalty.

Learning and Growth

In this last perspective, it is assured that the organization's long term renovation and its survival capacity for the organization's future are maintained. In this perspective it is important to take into account that it is necessary to maintain and develop the competence and knowledge to understand customer needs. In addition, the efficiency and the productivity of the processes that create customer values must be maintained. Since knowledge is a perishable factor it is at least as important as the strategy to identify and develop the main competences within the organization.

A competitive strategy contains, for example, the following questions:

- What competence will be compounded?
- For what will the competence be utilized?
- How does the competence influence customer values?
- How specialized is this competence?
- How do these competences change over time?
- How frequently is the competence used?

Beyond the strategy discussed above, developing competences is of great importance for describing the internal infrastructure for intermediary information and how decision processes are realized.

3.9.5 Identify critical factors for success

In this step of the design of the Balanced Scorecard, a discussion and establishment of which factors are the most important ones influencing the design of the Scorecard is

of great importance. Here, the most critical success factors are identified. These critical factors constitute the basis for the process of designing the Balanced Scorecard. Before the implementation phase of the Balanced Scorecard, is important to verify the correctness of the Scorecard both horizontally and vertically. Questions like; Is the Scorecard consistent in a reasonable and relevant way? Will it help in this process? The vertical-verification is made automatically, during the process of identifying the critical success factors. The horizontal verification can be accomplished by drawing a flow of relationships between the perspectives.

3.9.6 Develop measures, identify causes and effects and establish a balance

In this step, the relevant measures are established. A brainstorming procedure can be applied where no ideas should be stopped. During this phase, the designer of the Balanced Scorecard should identify and prioritize those measures with the most relevant significance of the Scorecard. The largest challenge is to find links and to create a balance between the different measures within the chosen perspectives. The measures within the Balanced Scorecard should not lead to sub-optimization. These strategic measures should also agree with the overall vision and strategy.

3.9.7 Establishment of the comprehensive scorecard

When the steps described above are done, the overall Balanced Scorecard should be presented for the purpose of approval. In order to facilitate the implementation of the Balanced Scorecard it is important that as many members of the organization as possible receive some kind of exposition through the process of designing the Balanced Scorecard. In addition, it is an advantage if the employees receive a complete documentation where the basic contents, text, suggestions and methodology are included.

3.9.8 Break down of the scorecard and measures into the organizational unit

Depending on the size of the company or organization, the top-level Scorecard with its measures is often decomposed and applied to lower-level organizational units. One of the purposes of the Scorecard is to enable employees to clearly see how the company's vision and overall goals affect the daily operations. Therefore, it is very useful to break down the Scorecard to a level where it becomes sufficiently tangible and understandable.

In cases where the organization is so flat and small so that everyone can see the effect of the top-level Scorecard on their own work, no further breakdown is usually necessary.

The appropriate level to start from in the process of breaking down the Scorecard is an important issue. According to Olve[37] it is usually appropriate for each unit/company to develop its own top-level Scorecard. When different parts of the company are clearly interrelated, it is often preferable to develop a common comprehensive vision and strategic goals. The different organizational units and groups can be asked to

[37] Olve and Roy, 1999 p 75

describe on their Scorecards how they can and will help the company to improve their score well on the top-level factors for success.

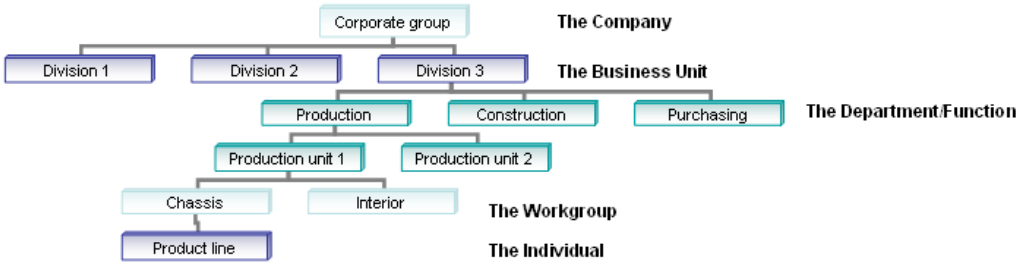

Figure 3-6: An example of an organizational breakdown of a top-level measure, customer satisfaction[38].

3.9.9 Formulating the goals

A company needs both short and long-term (see Table 3-1) goals so that it can continuously verify its course and make the necessary corrective actions from time to time. It is necessary and essential that the goals are consistent with the comprehensive vision and overall strategy and that they do not conflict with each other. For this reason, the goals should be aligned both horizontally and vertically. It is also important to create a process by specifying the responsibilities and setting the goals and for measuring the performance.

Table 3-1: An example of goals and results for measuring the market-share[39].

Customer Perspective		
Goals		Measures
LT[40]	ST[41]	
2	4	Customer satisfaction index
32%	22%	Market share
8.5	7	Brand image index
2	15	Customer-order stock
75%	60%	Customer-loyalty index

3.9.10 Develop an action plan

It is important to make action plans which include both the people responsible and a schedule for interim and final reporting. The group involved in the Balanced Scorecard should agree upon making a list of priorities and a schedule. This is done in order to avoid unspoken expectations which may later become sources of destructive

[38] Olve and Roy, 1999 p 73
[39] Olve, Roy, and Wetter, 1999 p.78
[40] Long terms
[41] Short terms

frustration and irritation. This list in combination with the strategic measures will be the top management's principal document of control.

3.9.11 Implementing the Scorecard

It is important that the Scorecard is used throughout the organization for the everyday control by the management. The use of the Balanced Scorecard is simplified by the utilization of an appropriable software and IT system for the reporting and collection of the measured data.

The implementation plan should include rules and ways to ensure that "Balanced Scorekeeping" becomes part of the daily work of control and should be replaced by more current ones. Olve[42] emphasizes the important use of the Scorecard in a way that only when this has become a dynamic functioning part of the everyday life of the company can its introduction be considered complete.

[42] Olve, Roy, and Wetter, 1999 p.80

4 A Balanced Scorecard for the Integration Unit

The Balanced Scorecard methodology (se Chapter 3.1 p. 15) will deal with the problems that the strategy wants to implement and balance all the parameters necessary to generate a higher efficiency for Volvo IT and their customers as well as maintaining a better position on the internal and external markets. However, it is not only in financial terms that the Balanced Scorecard will measure critical factors for the integration unit. For the managers, the measurements will provide a better foundation for the process of making decisions. In addition, the Balanced Scorecard will contribute to reach a better and more concrete level of communication between the units and senior executives which have different cultures, education and different involvements. We believe that the Balanced Scorecard will motivate senior executives to be more precise in the information and faster in the decision making process to the lower levels of the organization. Furthermore, with the utilization of the Balanced Scorecard in the integration unit, management staff may use their time in a more rational way focussing on the strategic issues rather than the operative problems and solutions solved by taskforce. Moreover, the Balanced Scorecard can increase the focus on the important issues which should be discussed or improved in each organizational unit or business area.

In the integration unit, the Balanced Scorecard gives an overview of the work process which is one of the major problems since nobody in the organization has a total overview of the development and the areas which are critical for the business. In addition, it can help Volvo IT to avoid suboptimization between the organizational units.

In this way, the Balanced Scorecard itself will be a factor of success for the integration unit and will create additional satisfaction to the investments at Volvo IT in terms of resources, human capital, internal processes and the learning and growth of the organization. The core issue of the Balanced Scorecard will be the vision towards customer satisfaction. Focussing on the needs of the customers, the organization will have a better chance of dealing with problems which contribute to unhappy customers

For the development of a suggestion of a tailor-made Balanced Scorecard for the integration unit of Volvo IT, we chose the model of development from the step-by-step approach described in the Swedish building process developed by Olve, Roy and Wetter[43], described in the previous chapter. We also used part of the original theoretical framework developed by the Harvard professors Kaplan and Norton[44]. As mentioned previously, the advantage of using the model by Olve, Roy and Wetter is that it includes the identification of critical factors for success. This implementation process is comparatively easier to use than the original model by Kaplan and Norton, which includes cause-effect connections as a chain between the objectives of the Balanced Scorecard in the time perspective. The step-by-step procedure contains 11 steps, where 7 of the steps are aimed at the design of the Balanced Scorecard and the other 4 steps treat the actual implementation into the organization. We have adjusted the procedure to fit the requirements of the situation for the integration unit at Volvo

[43] Olve, Roy and Wetter, 1997.
[44] Kaplan and Norton, 1996.

IT. The vision and strategy have already been partly defined by the integration project during the preceding team workshops. Since we do not take part in the implementation phase, we will only describe it in order to facilitate the procedure for the company. In the following, the most important points at each step for the design of a Balanced Scorecard in the integration unit of Volvo IT will be identified and described.

4.1 The industry, definition and description of its development, and the role of the company

As a first step, it was important to obtain an overview over the situation, and the general requirements and demands in the IT business area at Volvo IT. The position and role of today was identified during team workshops initiated by the integration's Project Manager. This was obtained using a regular so-called SWOT-analysis[45] schematically shown in Figure 3-5. The SWOT analysis constitutes a basis for the following formulation of the company's vision and strategy, as well as for obtaining a general understanding of its problems and future prospects. Numerous factors were identified consisting of the company's internal strengths and weaknesses, and external opportunities and threats. Our participation in the team workshops provided us with the necessary background information[46] to grasp a number of organizational problems that preceded the integration unit, and the motives for the decision to introduce a Balanced Scorecard. In the analysis, we examined in particular the internal strengths and weaknesses[47]. Since the new vision and strategy in the integration unit at Volvo IT is based on the SWOT analysis, it is important that this analysis is done thoroughly. If the SWOT analysis is incorrect, the vision may be wrong implying that also the strategy is wrong. For our work with the development of the Balanced Scorecard, it was important to identify which major factors influence the company and the IT business process. The SWOT analysis also contributes to the following identification of the strategic objectives, the critical factors for success and the strategic measures.

4.2 Establish and confirm the company's vision and strategy

The vision and strategy for the integration unit was determined during team workshops. Five important factors were identified during the discussions (see Figure 4-2).

4.2.1 Vision in Volvo IT's customer perspective:

Within 24 months be able to provide AB Volvo Business Areas and Business Units with world class integration solutions and services to enable the Business Areas and Business Units to supply their customers with

- New more competitive products and services

[45] SWOT=Strengths, Weaknesses, Opportunities and Threats.
[46] Documentation was also provided in the form of PowerPoint slides.
[47] For competitive reasons, all details are not discussed here.

- Existing products and services faster, to a higher quality and to lower and more competitive prices

and, hence, establish a more profitable and growing Volvo business.

4.2.2 Vision in Volvo IT's internal perspective:

Within 24 months to be Preferred Integration Partner[48] to AB Volvo Business Areas and Business Units as well as external customer companies.

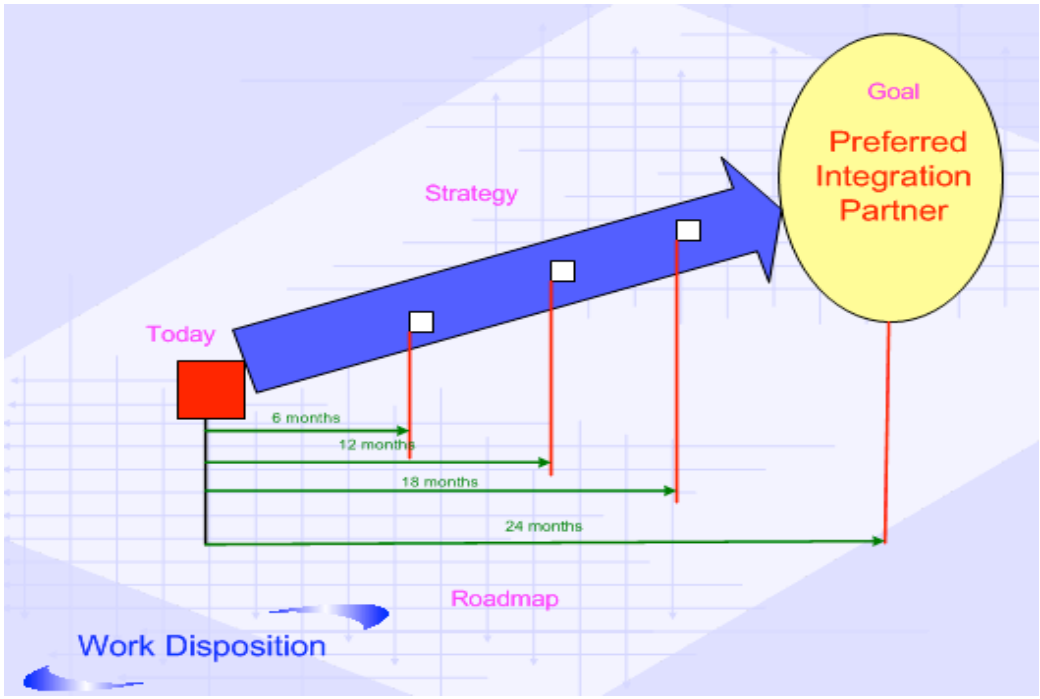

Figure 4-1: Work disposition to reach the goal for the itegration unit[49].

4.2.3 Volvo IT's strategy:

The strategy is to find the optimum set of integration functions, services and products that will solve present and future Volvo Business Area and Business Units integration problems. Continuing cost reduction efforts, software platform consolidation, maturing integration standards and ongoing integration solution innovation are and will be important prerequisites for the development.

Web Services and other broad standard based integration trends will reduce the complexity of integration. An important part of the strategy is, hence, that Volvo will acquire most integration capabilities from just a few strategic software vendors with only a minimum of best-of-breed exceptions.

Business integration competences will be a strategic resource. A way of working within Volvo will be developed and implemented. Roles and responsibilities shall be

[48] To be regarded as the ideal IT partner among the customers in the integration unit
[49]

defined to cover the entire business integration perspective in application-to-application and business-to-business integration.

Volvo Business Area and Business Unit IT strategies will be completed to include business integration strategies.

Strategic partners to be considered within the integration unit.

To tackle the sub goals described in Figure 4-3, Volvo IT will follow the new vision and strategy for the integration unit. This vision and strategy aim to bridge the problems that make the customer unsatisfied. In order to resolve all problem areas that Volvo IT has identified, the new organization in the integration unit has decided to use the Balanced Scorecard methodology for implementing its new vision and strategy. The Balanced Scorecard will be an integral part of the organization and a framework for the strategy of the integration unit.

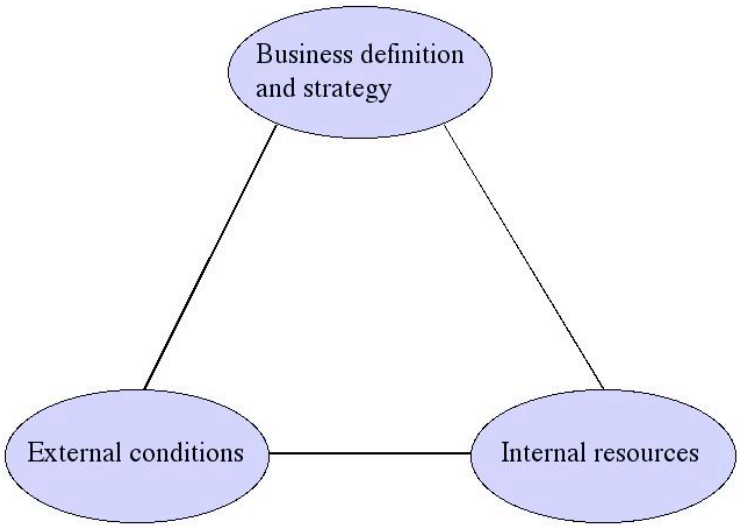

Figure 4-2: Three fundamental corners in a strategic development model; the business definition and strategy, the external conditions and the internal resources.

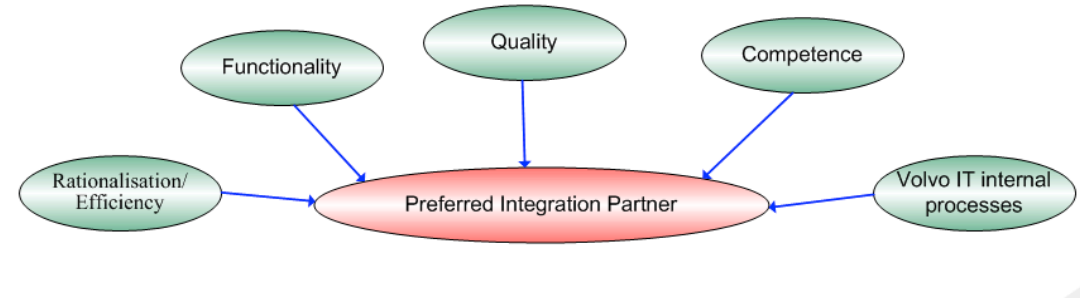

Figure 4-3: The major factors taken into account during the discussion for determining the vision at Volvo IT.

The suggestion of the Balanced Scorecard described in this thesis may serve as a model for Volvo IT in the integration unit and should improve the communication, internal processes, quality, competence, functionality, efficiency and understanding between the different levels of the Business units e.g., System development and Infrastructure and operations units..

4.3 Establish the perspectives

From our interviews, participation in team workshops and discussion meetings, we identified the overall strategic goals and the number of perspectives. During the interviews, we made an initial presentation of the Balanced Scorecard with its four perspectives (financial, customer, internal and development & growth). Afterwards, each interviewed person was asked to think and propose other perspectives, which can be important for Volvo IT. Nobody proposed any other perspective. All interviewed persons were also asked to place the perspectives in the order of importance according to their own judgement. The preferences were somewhat different depending on the particular field of interest of the interviewed person.

4.4 Break the vision down according to each perspective and formulate overall strategic goals and identify critical factors for success

4.4.1 Financial perspective

Satisfying profitability for a positive contribution to AB Volvo

The strategic choices of the other perspectives will eventually show up in the results of the financial perspective. The financial perspective also defines the financial frame for the other perspectives and reflects the demands and expectations of the owners of the organization. Volvo IT has a demand on higher efficiency and a positive profitability contribution to AB Volvo.

In order to reach the strategic objective of satisfying profitability for a positive contribution to AB Volvo, one of the most important factors of success factors is to increase the efficiency within the company. Since Volvo IT often works with large-scale systems, another important factor for success is to take advantage of the economies of scale.

The *chargeability* (measured from 0 to 100%) is the ratio between the chargeable amount of a service to the customers and the necessary amount of the service needed or available to the customers. The chargeability thus measures the amount the customers can be charged by a certain person or a service at Volvo IT e.g., an IT consultant. Ideally, the chargeability should be close to 100%.

The *productivity* (measured in %) measures the output per unit of labour for each product or service produced. The productivity measures the increase (or decrease) of the performance of the organization as e.g., the production time is decreased or standard solutions and recycling is utilized.

The *cost efficiency* (measured in kr/h) measures the result of the change in chargeability and/or productivity.

The *availability* (measured in %) measures how well the system or application with all its different components works for the customer.

The *man-time* (measured in hours, %, kr/h) measures the number of hours needed to develop a certain product or service by for example an IT consultant.

The *sales volume* (measured in Mkr) is useful when studying the growth of sales and as a complement to the other strategic measures. Studying the market share is not enough to determine a growth of the sales volume. An increased market share does not necessary imply an increased sales volume but rather an increased value of the sales. However, an increased sales volume does not necessarily imply an increased market share. It may therefore be useful to simultaneously study both the development of the market share and the sales volume.

The *investments* (measured in Mkr) aims to measure Volvo IT's own part of new monetary investments in the IT area. Since the strategy at is to increase the profitability, it is also useful to study the development of the investments. The advantage of using this strategic measure is that it is easy to compare with previous years.

The strategic objectives, factors for success and strategic measures for the financial perspective are summarized in Table 4-1.

4.4.2 Customer perspective

From our research interviews and the material of the team workshops, we have identified the major success factors for customer satisfaction, loyalty, retention and profitability (see chapter 3.3 p.18).

Proactive

The strategic objectives, to be proactive in the Volvo IT integration unit, are strongly connected to finding and seeking the innovation areas for the customers needs. When the integration unit has identified these kinds of areas, it is good practice to create sales concepts and proposals for the customers. The sales concepts and proposed success factors must be communicated in a professional way to the customers. This can be done through seminars or marketing over different levels where the Account Manager will be involved with a team work of technical sales and Project Managers. Since Volvo IT is a rather large company with many techniques it is very important that the members of the core sale team speak the same language before they meet the customers. The risk of not speaking the same language towards of the customers is that Volvo IT will be perceived as a company with internal problems where each technical branch try to drive its own specialization race. The properties of the personnel involved in sales should be lifted up from the technical myopia and to a higher level of commercial focus. The importance of working in core teams' sales should be emphasized. Three factors are important here; sales, techniques and internal

processes. Moreover, a critical factor is the number of prospects identified by the Account Managers. These prospects are for example, the number of improvements offered to the customers. It is useful to make a list of these prospects. The list can be useful for active contacts with the customers. Establishment of a provision as a performance measure for the Account Manager function can improve the number of sales for the integration unit.

Customer satisfaction and customer loyalty

The process of creating customer satisfaction is one of the most important issues. This process begins with a dialog between the customer and Volvo IT. The participants involved in the dialog are the Account Manager from Volvo IT's side and the customer. If the customer is satisfied, Volvo IT becomes more productive in the systems that are delivered. In this context, the customers' expectations are a decrease on the product or service that Volvo IT deliver. The customer satisfaction is measured once a year on a scale between 1 and 5. Naturally, accomplishing customer satisfaction is one of the requirements that assure customers' loyalty. Another factor is targeting particular customer segments e.g., AB Volvo, VCC and others.

The review contract

The review contract is one of the most important processes to be taken into account. The requirements of the agreements between the integration unit of Volvo IT- and the customer should be reviewed to assure that the solution is in agreement with the initial customer contracts. Here there are a few factors crucial for customer satisfaction like functionality (functionality is the level of realization acquired by the product development on the bass of the customers requirements), time and money. In the best of cases the integration unit of Volvo IT can deliver at the right time and cost but with reduced functionality. Naturally, this choice will influence the future way of making agreements from the customers' side. In this case, the review contract will be the goal measured in terms of percent (%) e.g., value for money and functionality in % of the whole deal. It is important to deliver but not to over-deliver (see Figure 4-4); errors in the contract must be clarified. In this way, the integration unit will have a reservation to deliver services. The main purpose for this reservation is to protect the integration units image and prestige towards the customer.

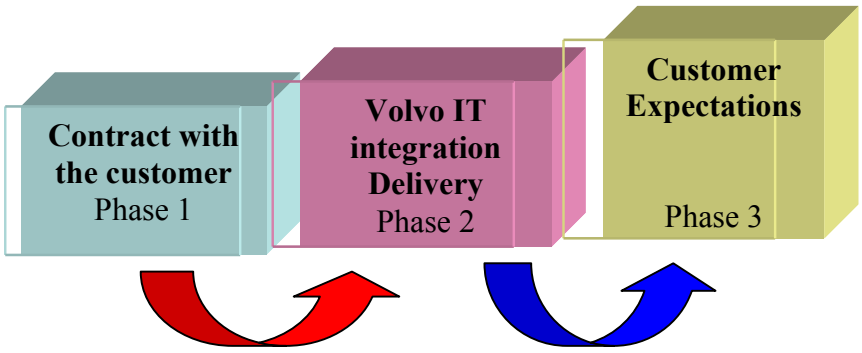

Figure 4-4: Example of the process of over-delivery[50]. The contract between the customer and Volvo IT(phase 1), the customer satisfaction should occur in this phase but an unclear contract trigger the other two phases. Volvo IT over-deliver (phase 2) but the customer expectations are even higher (phase 3. Consequently, Volvo IT will be an inefficient delivery organization.

On a high level, the information quality is measured by the customer survey that Volvo IT arranges once a year. This includes questions about how Volvo IT is perceived and which information is given to the customers. On a lower level, review meetings are made where a group of Volvo IT's personnel meets. In the preceding review period, an evaluation is carried out after the services have been delivered. Among these evaluations, the information quality to the customers is evaluated. In addition, it is planned to send a communication nine times per year to the customers with additional information about the services.

Services (descriptions)

If the integration unit at Volvo IT would create services from scratch, the process will be both tedious and time consuming. The integration unit at Volvo IT has classified its services in two different categories; general and standard services. There are services which contain similar services on different levels during the development and final stages. This is the reason why the integration unit at Volvo IT will try to attain more services that can offer a faster way to meet customer needs.

The services that the integration unit at Volvo IT are expected to generate to meet customer needs are both the general and standard services. A general service is for example integration between two systems e.g., PDM[51] and ERP[52], where information can be exchanged between the systems and adjusted throughout customization. In this sense if the numbers of integrations between systems increase, the income for the integration unit of Volvo IT will increase and the customers will also improve their processes. In addition, a standard service is a finished packet of systems ready to be sold without adjustments i.e., finished products. Consequently, a large number of standard services are desired for the future of the integration unit of Volvo IT and a track of these kinds of services will be an asset for the company.

[50] Source: interview 030506
[51] Product Data Management
[52] Enterprise Resource Planning

Customer Profitability

The integration unit at Volvo IT will contribute to the customers in different ways. One way is to be proactive and provide competitive solutions, support levels and competence. The strategic factors for success can measure the order level both in % an in Kr. and by measuring the gross marginal, in particular for large customers.

Rationalisation/Efficiency

When Volvo IT makes agreements and contracts with its customers, reply time or reply offer time is of great importance for the business. An example of this is when an Account Manager receives an order from a customer and the requirement is to reply in a short time. The Account Manager then tries to find a person with the right competence in the organization. This is to make sure that the order does not wander over several instances and makes sure that the right person will be working with the order. This lead-time is a critical factor from the customers' point of view and in many cases the order is not attended at a satisfactory time. The customer dissatisfaction, based on the reply time in many cases, is influenced from the inefficiency at the internal processes at Volvo IT but in other cases the origin is coming from the way that the Account Manager's function is performing the work (see above, under the heading "proactive").

The customers aim to rationalize the prices of the basic services e.g., client PC or minimize the prices of the projects. The price and performance of the systems and services delivered is a indicator for the trends of similar services and projects for the integration unit of Volvo IT

4.4.3 Internal-Business-Process Perspective

Quality

In a support process, a deviation in an application is measured by the number of failures. When the customer sends a request, the support team must respond with a solution. The solution can be measured in terms of time needed for the case to be closed. It is important not only to fix the time to achieve a solution but also how good this solution is for the customer. This is something that standard measures might not take into account. This goal is of course connected to functionality. The creation of guidelines of how processes can be measured will be a good asset to improve the quality for the integration unit of Volvo IT.

The service level is another success factor to achieve a better quality on the services that the integration unit of Volvo IT will offer to the customer. The capacity to deliver means to be able to deliver according to the expectations stipulated in the contract with the customer. This capacity to deliver can be measured in terms of one time delivery[53] and in run time delivery[54].

[53] One time delivery are the applications under development at SU
[54] Run time delivery are the applications that has been delivered to I/O

The complaints process is very important. Two roles can be identified in this process; the initiator and the person that actually orders the service or application. Between these two roles is the complaint process of developing. In the complaint process two factors are decisive: man/h and investments.

Rationalisation/Efficiency

Delivery time and diligence time as success factors has already been treated in the Customer Perspective (see above). They are connected to this perspective since the integration unit of Volvo IT's internal processes are the basis of customer satisfaction. This implies that if the integration unit at Volvo IT will become more efficient in the operational processes, (see Figure 3-2) the integration unit will also increase control over standard costs, budgets and variances.

Diligence time is measured in terms of money but a clear role is needed in order to specify the responsibility when a stop process has occurred e.g., by a chief in the group or in the unit. Conversely, there are individuals acting to solve the stop process rather than being actually responsible. This reaction to the stop process will especially be taken into account when customers complain over the functionality of the product. This is the reason why the integration unit of Volvo IT needs a role that will take the overall responsibility. This role should drive general questions to clarify and be objective to resolve the problems that nobody wants to take.

It is important to involve I/O-generalists in an early phase on the projects that the integration unit of Volvo IT will realize. The reason is to bridge the ditch between the SU and I/O units. The I/O-generalist should be involved during the development process of a new product or service for the customer. Nowadays, this engagement is missing and brings problems in terms of both costs and customers satisfaction.

Functionality

After a project has been finished, it is necessary to make some kind of interview to different members of the project and receive feedback. This information is important for the next phase which is the delivery process. In the PCM[55] model, there are a number of gates in order to assure the completion of a certain phase. The question on each of these gates is if it should be opened (yes or no). The answer to this question depends on if the activities have been finished or not for the next phase of the gate. A problem occurs when the gate must be opened anyway if there is a customer with lack of time, and without a complete assurance of the gate, the project continues anyway. After project termination and delivery to the run time phase, after some time, a monitoring should be made where the problem might be. Has the project enough quality despite the fact that the different gates were not closed as the PCM requires? Does the application work with satisfaction? The project should be monitored in percent (%) of the total number of activities in the different gates. This percentage will not only measure time quality but process quality as well.The "change management process" is another critical factor to obtain sufficient functionality. This process ensures that the system development follows the rules by the Method and

[55] Project Control Model

Technique unit. A successful use of this process will have an impact on the quality of the product or service.

Competence

Today, integration is not a well known area within Volvo IT. This is due to lack of information in the organization. The exchange of information is one of the most critical success factors for the integration unit at Volvo IT. The interchange of information within Volvo IT about the internal processes needs to be considerably improved if the company should be able to reach a higher profitability for the customer and for the efficiency. Company competence does not only meantechnical competence but also, include competence about the customers. One way to achieve customer competence is for example to send an internal survey. The survey will contain customer oriented questions to Volvo IT's personnel. This type of survey will be distinguished from the Volvo groups "Attitude Survey" (see Learning and Growth perspective). Volvo IT has recently created a database for reuse of competence. The integration unit at Volvo IT can use this database in order to avoid external consultancy and rationalize the human resources within the company.

Integration

A strategic development team working with the goal to assist the distribution of the resources will be an asset for the task of monitoring. This team will monitor the behaviour of the strategic collaboration partners. Depending on the behaviour of the project, they will be able to supply together with "Human Resources" the necessary resources for faster integration. Naturally, this team will be able to track the behaviour of the strategic collaboration partners. The operative team will work on the basis of understanding the behaviour of the projects and prioritize the resources from an overall perspective. It is important to be aware of the difference between operative and strategic responsibility e.g., the business unit chief has an operative responsibility while the strategic team will monitor and take the strategic responsibility for the overall projects.

Supervision is one of the critical success factors, e.g., a service that has been delivered to a customer and may be compounded with thousands of components. This service needs to be supervised and the success factor should be measured in relation to the number of stops, available time and reply time.

4.4.4 Learning and Growth

Increased integration competence in all involved organizational units

As described in the previous chapter, the learning and growth perspective emphasizes the significance of long-term investments. It is necessary to invest in the so-called infrastructure i.e., the personnel, systems and routines. The comfort among the personnel is an important aspect in the learning and growth perspective. Indirectly, this leads to an increase of productivity, quality and customer service. The aim of this perspective is to be a step forward in comparison to the competitors and to create the

necessary qualities for an independent and learning organization by open communication and increased competence among the personnel. The learning and growth perspective thus secure the long-term renewal and survival of the organization. The three main categories of this perspective are 1. The personnel, 2. The information and 3. The motivation.

One of the most important strategic objectives for the integration unit at Volvo IT is to increase the integration competence between the organizational units. As observed by the other perspectives, there are ditches between the organizational units. In order to compensate, Volvo IT should invest in increased integration competence among its personnel. This objective is expressed in the Balanced Scorecard methodology as satisfaction, loyalty and productivity among the personnel. It is important to increase and obtain more homogeneous information sharing among all the different organizational units at Volvo IT. In particular, this should be emphasized between the I/O and SU (software development) departments. Increased integration competence is important in order to avoid suboptimization in the organizational units.

One of the most important critical factors of success, which we have identified in the learning and growth perspective, is increased integration competence among the personnel. A homogeneous sharing of information between different organizational units obtained by participation in courses, seminars and other activities will also become a factor of success.

Customer thinking

An important strategic objective is that Volvo IT needs to think more about its customers. This should include all the personnel at all organizational units and not only the Account Managers and others who actually confront the customers face-to-face.

An increasing proactivity and customer thinking among the personnel will be a factor of success in the future.

The *overview knowledge tests* (measured by surveys on a scale (1-5) aims to measure the extent of overview, integration, pro-activity and customer thinking/knowledge among the personnel and/or the customers. It can measure how the personnel perceive their own situation and role in the organization and their own effectiveness and contribution. With the test it may also be possible to determine how the personnel in one organizational unit perceive the other organizational units at Volvo IT.

The *number of persons and places with integration competence* can be useful to measure as the integration project evolves into an organizational unit of its own. Since Volvo IT is a global company, it is interesting to study how the integration knowledge is spread in the organization.

The *number of participants in integration courses and seminars* aims to study if the personnel attend the integration courses given at Volvo IT. The personnel should be encouraged to attend at least one basic two-day course and a seminar.

The number of courses and seminars with integration topics measures how active the integration project is in educating the personnel in the area of integration. As the integration project turns into an organization of its own, it is interesting to study if the number of courses and seminars increases.

The *number of projects between the organizational units'* measures to what degree the organizational units are collaborating. If the number of projects between the organizational units increase, the integration is likely to increase.

The *number of customer courses and seminars* aims to measure if the customers receive enough information and hands-on experience before delivery to be able to use their new products. This has been identified as an important success factor for customer satisfaction.

The *customer satisfaction survey (scale 1-5)* aims to measure how the customers perceive the products and services provided from Volvo IT and how satisfied they are.

The strategic objectives, factors for success and strategic measures for the learning and growth perspective are summarized in Table 4-4 below.

4.5 Develop measures, establish a balance and a comprehensive Scorecard

In this section we have chosen to make two steps at the same time. In these steps, the relevant measures are developed. A brain storming can be applied where no ideas should be stopped. It is during this phase the designer of the Balanced Scorecard should specify and prioritize the measures with the most relevant significance for the Scorecard.
The largest challenge is to find links and create a balance between the different measures within the chosen perspectives.

The measures within the Balanced Scorecard should not lead to sub optimization. The measures should also agree with the overall vision and strategy.

Table 4-1: The Strategic Objectives, Success Factors and Strategic Measures of the Financial perspective; Source: Own.

Strategic Objectives	Success Factors	Strategic Measures
Satisfying profitability for a positive contribution to AB Volvo	Efficiency. Economies of scale.	Chargeability (%) Productivity (%) Cost efficiency (kr/h) Availability (%, min/year) Man-time (hours, %, kr/h) Sales volume (Mkr) Investments (Mkr)

Table 4-2: The Strategic Objectives, Success Factors and Strategic Measures for the Customer perspective; Source: Own.

Strategic Objectives	Success Factors	Strategic Measures
Proactive	Seminars/Marketing Proposals (number/year) Sales Concepts Prospects (provision)[56]	No. No. No. No.
Customer satisfaction and Customer loyalty	Once/year Reduction Production Costs Delivery Quality (number of complaints) Delivery Precision Availability/Reply Reduce Price Educating customer personnel how to use the products before delivery	survey (1-5) Kr or % scale (1-5) No. % h. /min.[57] Kr. No. of customer projects with education included
Review Contract	Once/year	%
Services (descriptions)	Information quality General services (number) Standard services (number)	survey (1-5) No. No.
Customer profitability	Gross Marginal	Kr.
Rationalisation/Efficiency	Functionality Reply Time/Offer Increase Productivity Lead time Price/Performance	% % % h %

[56] Potential customers identified
[57] Reply time

Table 4-3: The Strategic Objectives, Success Factors and Strategic Measures for the Volvo IT Internal perspective; Source: Own.

Strategic Objectives	Success Factors	Strategic Measures
Quality		
	Low number of incidents	No.
	Time to close case	h.
	Service level	yes/no
	Complaints	Nr
	Guide lines (process quality)	No.
Rationalisation/Efficiency		
	Delivery Precision	%
	One time delivery	%
	Run time delivery	%
	Diligence[58] time	h. /min..
	Owner processes/Number processes	%
	I/O generalists/project	No.
Functionality		
	One time delivery	%
	Run time delivery	%
	Change Management process	%[59].
	Internal Review Contract	%.
	External Review Contract	%.
	Project quality	Customer feedback[60]
Competence		
	Information sharing/exchange	No.[61]
	Internal /year	survey (1-5)
	Database bank	No.[62]
	Investments	h.[63]
Integration		
	Supervision[64]	No.
	Availability /Reply	h. /min.
	Customer meetings	No.

[58] Response
[59] According to the change management function
[60] Judgement
[61] No. of information seminars
62 Number of employees with integration experience
[63] No. of education in hours /person
64 Delivery Precision plus resources efficiency

Table 4-4: The Strategic Objectives, Success Factors and Strategic Measures of the Learning and Growth perspective; Source: Own.

Strategic Objectives	Success Factors	Strategic Measures
Increased integration competence in all involved organizational units. Customer thinking.	Proactivity and customer thinking	Overview knowledge tests by customer surveys (scale 1-5).
	Increased integration competence among the personnel e.g., account managers, developers and architects. Homogeneous information sharing between SU and I/O.	No. of persons and places with integration competence. No. of participants in integration courses and seminars. No. of courses and seminars. No. of participants from several organizational units.

4.6 Break down of the Scorecard and measures by organizational unit

In the previous two steps, we have developed the strategic measures, established balance, and identified the relations between the success factors, and the partial goals of the strategy for the integration unit. We have presented the results of the Balanced Scorecard to the supervisor and Project Manager of the integration unit at Volvo IT for approval. We recommend presenting the design of the Balanced Scorecard to the personnel involved in the team workshops and those who we have interviewed.

With the results obtained so far, we propose to the Project Manager to again assemble the group that were involved in the team workshops in order to obtain additional feedback and make final adjustments to the Balanced Scorecard. The opinions of the integration team will be of great value for continuing breaking the Scorecard down into the organization.

Here, the question is in which way the Balanced Scorecard should be broken down? The answer to this question is that the process of breaking down the Scorecard depends on Volvo IT and the reorganization of the integration unit into an efficient integration unit. The aim of this process is to break down the Scorecard in a tangible way according to the vision of the organization. The overall vision and goal will influence the daily work. This is the reason why the level of breaking down is very important for the understanding of the aim of the Scorecard.

There is a risk that separate strategic measures will be poorly understood since, each strategic measure influence a chain of activities at the company. This is the reason why all the personnel should be aware of the purpose of the Scorecard, and its contents. Those members who become aware of the significance of the strategic measures can identify their own score and how this will influence the collected result of their daily work.

4.7 Formulating the goals

After the organization has implemented the Balanced Scorecard, it will probably be necessary to add modifications to the original strategy. Those who are responsible for maintaining the Scorecard need to take risks through experiment to receive more insight about the strategy. The organization requires to know where it is heading and what measures should be taken. This is the reason why the organization needs to establish a process of responsibility for both the measures and for the outcome of the Scorecard.

4.8 Develop an action plan

During the design process, preceding the implementation phase of the Scorecard, it is necessary to specify more precisely what the strategic objectives are and confirm the vision that the integration unit has established from the beginning. It is important that the organization develops an action plan. The action plan should include both the responsible persons and a schedule for short-term and final reporting. The organization should agree on a list of priorities and a schedule in order to to avoid problems of misunderstanding about the different roles for the personnel responsible for the Scorecard. It is good practice to produce a well prepared documentation to explain the control parameters and to avoid frustration and irritation.

The strategic formulation and the continuous update of the Scorecard will be important for the organization and for the responsible managers. For the managers involved in the operative organization, there will be an opportunity to guide the organization in a top-down manner. In the process of guiding the organization, the managers need to update or to couple the Scorecard to a long-term plan for each year.

4.9 Implementing the Scorecard

When a new management control and measurement system has been established, the new system often meet resistance. This resistance is common practise in any change process. In order to deal with the problems that the implementation of the Scorecard set out, it will be useful to choose a project leader for the implementation. The role of this person will be to help to establish the Scorecard. In addition, the project leader will work and deal with the responsibility of the managers of the organization. If the project leader needs more resources, it may become necessary to employ an architect (Kaplan and Norton[65]). The architect should be responsible for the process of implementing the Scorecard. Since the implementation of the Scorecard represents a

[65] Kaplan and Norton, (1997), p. 267

large change in the way that management think, the first role of this person will be to educate the management in the task of implementing the Scorecard.

After the implementation of the Scorecard, it will be necessary to perform reviews on a more continuous basis. For this purpose, an IT-system is useful. and facilitates the data collection and the reporting.

For the integration management team, the Scorecard should be a part of the everyday life of the management. The Scorecard will be a useful tool to control in a natural form, and a way of reporting through the organization. This is the reason why the implementation plan should include rules, and suggest a way to ensure that the scorecard is kept alive and is well maintained for the day-to-day operations.

5 Discussion and Conclusions

In the last few years, the competition in the IT business area has increased substantially. In general, IT companies are characterized by high flexibility when compared to other more stable business. This implies that financial control and measurement systems of IT-companies must also be highly flexible and ready for adjustments. This is also true for Volvo IT. An additional factor to take into account is that Volvo Cars, one of Volvo IT's former most important internal customers, has become an external customer belonging to the Ford-owned Volvo Cars Corporation. Gradually, the financial objective of Volvo IT has changed towards becoming profitable enough for giving a positive contribution to AB Volvo. In order to reach this goal, one of Volvo IT's strategies is to increase its efficiency by focusing on integration of information flow and work within the company as well as in collaboration with customers. The vision is to be regarded as the ideal IT supplier among the customers.

The traditional financial measures at Volvo IT do not correlate closely with the contemporary vision and strategies at Volvo IT. There is indeed a need for a new control system, which takes not only financial but also non-financial perspectives and parameters into account. A new vision and strategy at Volvo IT focussing on integration has recently initiated a new unit within the organization, here referred to as "the integration unit". The detailed structure of the integration unit in the organization is presently under consideration.

A modern financial control system such as a well-maintained Balanced Scorecard should be a useful tool to focus on the central issues. Volvo IT has decided to perform an integration project incorporating a Balanced Scorecard, which offers a comprehensive formal procedure for performance data collection and analysis within vital areas (Learning & Growth, Customer, Internal processes and financial factors). Using the Balanced Scorecard, we believe that Volvo IT will have a better chance of reaching its vision, namely to become top of the line in the area of integration.

The main objective for this thesis was to develop a proposal for the Balanced Scorecard for the integration unit, and to identify the critical factors for success and the corresponding strategic measures. Due to time constraints, our work deals with the development and design of the Balanced Scorecard, and not the actual implementation into the organization. This is a rather demanding project that normally takes one to two years. Naturally, our design of the Balanced Scorecard in this thesis should not be looked upon as a final product but, rather, as a study report of what is now starting up at Volvo IT. However, it may serve as a basis for discussion and a source of inspiration for the future work with the implementation. The use of a Scorecard should be a dynamic process where the parameters are continuously updated as the vision and strategy is modified. The basic idea of designing a Balanced Scorecard is that the vision and strategy is formulated and defined at an early stage. It must be noted, however, that during our work with this thesis and the design of the Scorecard, the new vision and strategy for the integration unit at Volvo IT was not yet fully settled in a definite form.

Naturally, when starting the present investigation it would be straightforward to simply follow the prescribed step-by-step textbook procedures, but it would hardly be the most efficient way. During the course of our work when we performed research interviews, participated in team workshops and continuous discussion meetings with the integration project manager, we found that we had obtained enough information to grasp the important parts of the new vision and strategy for the integration unit of Volvo IT.

With our research interviews with key managers and project leaders on different levels in the organization at Volvo IT who represent the different perspectives in the Balanced Scorecard, we obtained a rich material. From the analysis of this material we obtained much information about the various underlying problems preceding the integration project (chapter 1), as well as concrete information and suggestions of different parameters that are useful for the design of the Balanced Scorecard (chapter 3). We tried to make a thorough analysis of the obtained information (chapter 2). The final choice of critical success factors and strategic measures described in chapter 4 is a matter of subjective judgement. In some cases, there is of course a degree of uncertainty with regard to our choice, (although we used all the information available to us). During our analysis and discussions, we have chosen the most reasonable success factors and strategic measures. We believe that our careful selection procedure of identifying persons with genuine knowledge in the integration unit has eliminated most of the systematic errors.

The aim of the Balanced Scorecard is not to measure everything, but rather to use the most important critical factors for success identified as being currently of interest for the company and its vision and strategy. It should be emphasised that the Balanced Scorecard is a financial control and measurement system, which, if used improperly, does not by itself increase the efficiency or profitability of the company. Rather, in order to increase the probability of making the right decisions, the use of the Balanced Scorecard can be an important tool for the management and personnel at the company. Adjustments and re-evaluations of the parameters contained in the Balanced Scorecard should be made continuously for best performance and optimal control of the company. In fact, one outstanding advantage of using the Balanced Scorecard as a financial control and measurement system is its flexibility i.e., it can be evaluated and adjusted as the internal and external conditions of the company and the IT business area change.

It is important that the implementation phase shall provide motivation and understanding of the company's vision and strategy among the personnel. As the personnel become aware of the Balanced Scorecard, they will hopefully become more motivated, and better understand their own role in the organization. Using the strategic measures to control the development of the business, it will be possible to ensure that the people at Volvo IT are working towards the same goal. Previous large-scale projects performed at Volvo IT might in fact have worked better, had the Balanced Scorecard been introduced a couple of years ago.

The prime prerequisite for implementing the Scorecard is that executive leaders of Volvo IT understand its strategic usefulness and give their full support to the project. During our interviews we realized that there are personnel at Volvo IT, both in the

I/O[66] unit and in the SU[67] unit, who are not aware of the integration unit. It is important to market the integration unit and its services throughout Volvo IT and among the customers. Today, Volvo IT appears to lack a development and education program specifically for the integration unit. We recommend realizing a new program, taking the results in the Learning and Growth perspective into account. It would probably be appropriate to create a basic educational package in integration knowledge for all employees at Volvo IT. There may also be need for advanced educational programs providing deeper insights for members of the integration unit.

We propose that Volvo IT should continue the development work presented in this thesis and proceed with implementation of the Balanced Scorecard. However, it may become necessary to complement our qualitative research interviews with a more complete investigation of the critical factors for success and the strategic measures, using the work presented here as a starting point. We have reached our goal to provide the integration unit of Volvo IT with a solution to the problem defined in Chapter 1.2. The achievement of this goal has to be understood as a partial solution. It is a partial solution due to the limitations using the methodology of the critical success factors suggested by Olve[68]. During our analysis, we discovered that the critical success factors have several connections with factors in other perspectives of the Kaplan & Norton model. If the business of the integration unit of Volvo IT desire a deep implementation of the strategy and establish the links between the critical success factors, we recommend a complementary analysis with the methodology of the cause and effect relationships. The advantage will be the establishment of the relationships between objectives and measures in the Balanced Scorecard. Afterwards, the relationships can be managed and validated.

Most of the business at Volvo IT is performed though the Account Manager function. This function is extremely important for Volvo IT's strategy, regarding customer satisfaction and internal processes. From several of our interviews we obtained indications that this function is a bottleneck (see Chapter 4.4p.39-41 under *Proactive* and *Efficiency*)of Volvo IT's business. Therefore, our recommendation to the company is to oversee this function towards the customer and the internal processes and provide it with an efficient role for the business of the company.

During our interviews, we realized that there are personnel at Volvo IT both in the I/O[69] unit and in the SU[70] unit which are not aware of the integration unit. Strategically, it is important to market the effect of the integration service throughout Volvo IT and among the customers.

When we started the development of this Balanced Scorecard proposal, the focus was on the internal customers, i.e., those within AB Volvo and Volvo IT. We suggested to extend the analysis to include also the external customers. It is necessary for the integration unit to includethe global and overall goals that Volvo IT has in the integration strategy. This implies that the development of the Balanced Scorecard should be complemented with success factors from personnel from other areas of AB

[66] Infrastructure and Operations
[67] System development
[68] Olve, Roy and Wetter, 1997
[69] Infrastructure and Operations
[70] System development

Volvo e.g., North America., Europe, Asia and Latin America. The contribution that personnel of the other areas will give to the integration unit will be of an invaluable assets to the business andthe whole company.

In the beginning of this thesis (see Chapter 1.1 p. 1) we mentioned a subset of Volvo IT's strategy e.g., Market and Customer, Solutions and Services and Operational Excellence. The integration unit will deliver a result to each of these areas of the subset strategy. In addition, the integration unit will contribute to the customer projects and new projects. The idea of improve the subset strategy and the customer projects through the integration unit it will be an asset to the company without doubts. Many other projects will benefit of the effect that the integration unit offers to Volvo IT and its customers but if in case the integration unit needs to report concrete results to the senior executives, it is important that Volvo IT links the short-term financial budget with the key factors that we have identified in this thesis. After linking to the short-term budget, Volvo IT may test the Scorecard under a period of one to two years. Provided the results of the tests are satisfactory, other units can design and implement their Scorecards following the methodology that we have presented in this thesis.

During the process of establishing the vision and strategies for other units within Volvo IT, the SWOT analysis is a useful strategic tool to define the industry, describe its development and the role of the organization. Team workshops, scheduled meetings and joint seminars can be arranged for establishing the organization's vision, perspectives etc. The strategy of the organization can be established with the tool called CAMP (se Chapter 8.4.1) that already exists at Volvo IT. In the future, if Volvo IT would like to establish a Balanced Scorecard in another part of the organization, the CAMP methodology can be combined with the Balanced Scorecard methodology presented in this thesis.

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7 Abbreviations

BSC	Balanced Scorecard
CAMP	Change Analysis Methods for Pre-studies
CEO	Chief Executive Officer
DTR	Delivery to Repurchase
ERP	Enterprise Resource Planning
I/O	Infrastructure and Operations
OTD	Order To Delivery
PCM	Project Control Model
PD	Product Development
PDM	Product Data Management
PIP	Preferred Integration Partner
PLM	Product Life Cycle Management
STO	Sales To Order
SU	System Development (Systemutveckling)
SWOT	Strengths Weaknesses Opportunities Threats
TOP	Total Order Process
VCC	Volvo Car Corporation
VEBIS	Volvo E-Business
VIT	Volvo Information Technology

8 Appendix

8.1 Questionnaire for the Volvo IT integration unit

Conditions for the interview: We informed and showed pictures of the Balanced Scorecard and the integration project. We explained that the Balanced Scorecard can be used for control, both in monetary and non-monetary terms. In business terms, the control is performed in terms of profit, reduced lead-time, quality improvements, contents, functionality, safety and environment. The order of questions in the questionnaire was not followed strictly from one point to the next but, rather, the order was adapted to the interview subject, and the phrasing of the questions was slightly adjusted (see chapter 2).

Internal processes

1. Which internal processes at Volvo IT should be improved? How?

2. What critical factors for success are needed to succeed with these internal processes?

3. How can internal bottle-necks be measured in order to eliminate them?

4. How can the co-ordination of a process be improved? Is it necessary to have a responsible person to obtain an overview over the activities in a process? How can activities be measured?

5. How can the needs of strategic partners be measured?

6. Is it important and/or necessary that "Account Managers" are involved in the work? Why? How can this be measured?

7. How can the working methods be rationalised at Volvo IT to eliminate the need for new solutions for each customer?

8. In the context of rationalisation it may be possible to use parallel processes. In which way can these be measured?

9. What are the criteria for following up the integration services, and how can these be measured?

10. How do you measure that the quality is sufficient?

11. How can the administrative costs be reduced? Which are the most important critical factors for success when trying to reduce the administration costs?

Learning and Growth

1. Is there a program for developing the competence of the personnel? Please describe!

2. How can competence be measured (skills, education and loyalty)? How do you maintain a high enough competence?

3. What factors are crucial for the development of the competence of the personnel in the integration unit?

4. Which critical factors for success can be identified?

Customers responsible for deals

1. How do you identify the need of the customer, and how do you measure the satisfaction of the customer?

2. Which factors affect customer loyalty?

3. Can the customer loyalty increase if Volvo IT significantly improves the integration skills? In which way?

4. How do you identify the repurchasing process today?

5. How do you recruit new customers?

6. How do you categorise the different customers today?

7. How do you measure the customer profitability? In which way do you recommend to do this?

8. How do you know that you have the competence to meet the customers on the right level?

9. What factors are crucial for rationalisation? How can this be measured?

10. In which context can reduction of lead-time be used, and what are the critical factors of success to reach these goals?

11. How can increased quality of information be measured at the customer level?

12. Which are the criteria for integration services, and how can these be measured?

13. How can proactivity be measured at Volvo IT in an integration perspective?

14. Is the process of functionality crucial for Volvo IT? Which are the critical factors for success to achieve this? How can this be measured?

Financial

1. What performance measures (e.g., ratios) do you use today? Why do you use these?

2. How does your finical process work?

3. How does the ROI-model work for the integration project?

4. Which factors does this model measure?

5. How do you measure the growth of turnover?

6. How do you measure the reduction of costs?

7. How do you measure production improvement?

8. How do you measure resource utilisation?

Common questions

1. Except for the strategic perspectives we have mentioned, are there any other perspectives which are important?

2. External markets are important for the integration strategy. Which critical factors for success take this vision into account, and in which way can this be measured?

3. Which of these perspectives do you believe is the most important one?

4. What are the most important factors to achieve successful projects? What is your recommendation to achieve successful projects?

5. Do you believe it is important that the personnel adopt overview thinking?

6. Do you think that earlier projects (e.g., TOP, VEBIZ, ERP) could have worked better if the integration project had been introduced earlier, e.g., three years ago? In these projects, was there something that did malfunction? In that case, what? Which problems could have been solved with the Balanced Scorecard in these projects?

7. Would the Balanced Scorecard have helped, if it had been introduced before the projects were carried out?

8. Could it be strength for future projects to utilise CAMP with Balanced Scorecard as a frame of rules?

9. Do you anticipate any risks with the introduction of the Balanced Scorecard? Counter activities? Defence? Prevention?

Other questions

1. Can you suggest other persons who we should talk to about these questions?
2. Is there anyone abroad we should talk to?
3. Is there anything you would like to add?
4. Thank you very much for the interview!

8.2 Type of personnel

Customer	Sales & Marketing and Customer Project Manager
Internal-Business-Process	Personnel at Methods and Technique, Project Manager, Quality Manager, Problem Manager, Systems Architects Project Manager
Financial	Business Controls Project Manager
Learning and Growth	Project Manager

8.3 Interviews at Volvo IT

Person	Function
Torsten Möller	CIO, Manager (Volvo Trucks)
Ingemar Tillberg	Account Manager
Christer Ericsson	Market Development
Elizabeth Hansson	System Architect
Tammo Wellemets	Senior Management Consultant
Peter Wallin	Product Specialist
Jan Alberg	Problem Manager
Maria Nordström	Quality Manager
Leif Carlsson	Team Leader
Jurong Li	Business Control
Christina Johansson	Business Control
Matias Södersten	Project Manager
Björn Ekman	Department Manager
Mats Nilsson	Customer Service Manager

8.4 Additional Sources

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8.4.1 Change Analysis Methods for Pre-studies (CAMP)

The CAMP method is a Volvo IT's own method. The purpose of CAMP is process-mapping the business results in a supporting document that describes the modification of the organization and mode of operation[71].

Since the purpose of this thesis is not to formulate the vision and strategy for the integration unit, we will describe the methodology that the integration unit could have followed. For more detailed information about the development of the vision and strategy and the CAMP methodology, we refer to Volvo IT's Method & Technique unit.

CAMP is a tool with much functionality as a method and therefore we only quote the major steps[72] that CAMP would have used for the integration unit:

[71] Volvo IT's SAP business solution practice brochure
[72] http://camp.volvo.se, 021220

1. Business Agreement
   - Specify Assignment
   - Document & Communicate Result
2. Business Definition
   - Perform Interested Party Modelling
   - Perform Objectives Modelling
   - Describe Business Structure
   - Perform Conceptual Modelling
   - Document & Communicate Result
3. Business Analysis
   - Perform SWOT Analysis
   - Describe Scenarios
   - Perform Problem Analysis
   - Prioritise Core Capabilities
   - Document & Communicate Result
4. Solution Definition
   - Propose Solution
   - Detail Solution
   - Define Ownership
   - Define Functional Requirements
   - Document & Communicate Result
5. Planning & Consequence Analysis
   - Create Milestone Plan
   - Create Risk Management Plan
   - Describe Effects
   - Review & Document Result