The Process of Process Documentation

- A case study at Volvo IT -

Abstract

This study concerned business process documentation at Volvo IT and focused
on the internal processes that are the actual work at the organization. The issue
was analysed in purpose to identify factors that define good process
documentation, in order to create a requirements specification for further
development. The work was conducted by a qualitative approach with a series
of semi structured interviews and a literature study. The found requirements
were divided into five areas, with accordance to the chosen theories and the
empirical study. These were: organisation for processes, process vision, process
mapping, process documentation and managing process documentation. A focus
on this study was to describe how to create an easily understandable overview,
in order to minimise the current confusion among the employees understanding
of purpose, boundaries and relations between processes.

Keywords:	business process management; process vision; process map; documentation management; hierarchy; structure
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Master Thesis, 20p

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1 Introduction

We open the scene with this thesis by presenting the background and problem area of the concept Business Process Management and besides this, the problems identified at Volvo IT. Even the purpose with the problem statement, expected results, delimitation, target group, previous research and occurring concepts are described. All of these in order to prepare the further reading in a good way for the reader.

1.1 Background

Recently, there has been an increasing usage of the concept "process" in everyday business language. This signifies that many organizations adopt a process-based approach to manage their operations (Zairi, 1997) in order to recognise the processes as the key to competitive survival (Aguilar et al, 1999). Organizations tend to pursuing quality and customer satisfaction as a strategy, and a move from an organization orientation to a process organization results in a different culture change which demands new way of thinking and requires a major change in the way the organization is managed (Harrington, 1991). The time for process thinking has come. We are living in the customer's epoch and the managers have to treat processes as core activities. They cannot be managed on the outskirts of the organization's activity (Hammer, 1996).

Hammer (1996) argues that prevailing problems in organizations arise from the overall processes, not the individual activities. Employees do not misunderstand their tasks, instead they have difficulties in setting their role in a context. No employee has enough information to make an overview. Consequently, the problem is situated in how the separated parts create a well-defined and understandable process.

A process crosses the organizational boundaries either internal or external and is the mainly way for the organization to achieve its stated objectives. Thus, the complexity of describing processes is widely difficult. There is an enormous need of been given a brief overview of the processes. To describe these, process modelling is a way to visualise the organizations processes which can be simulated and modified to give maximum efficiency, regardless of the complexity (Bal, 1998).

Processes are fragmental, anarchistic, nameless and invisible (they do not appear on the organizational map) phenomenon that results in difficulties in creating process documentation. Therefore, it is important to adapt the "process language" to the internal and external everyday communication (Willoch, 1994).

Process orientation requires all employees to work towards a common objective, otherwise contradiction and narrow-minded ambitions appear. Every single employee has to be aware of all the organizations processes, including name, input, output and relations (Hammer, 1996). Harrington (1991) emphasizes that standardization of work procedures is important to ensure that all current and future employees use the best way to fulfil the activities related to the process. Standards have to be communicated to the employees and are also created to set limits of authority and responsibilities. The main reasons in using standards are, according to

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Harrington, that the documentation describes how the process is to be carried out, what training of the internal personnel is required and finally what is acceptable performance.

According to Harrington (1991) there are some factual reasons why the employees deviate from the process:

1. They misunderstand the procedures
2. They do not now about the procedures
3. The documented method is to difficult to understand
4. They do not understand why they should follow the procedures

Giagilis et al (1996) report that significant practical problems occur when organizations try to model processes in a detailed way. The reasons are derived from the informal nature of many tasks, which make the analysis and documentation problematic. These kinds of problems especially appear in large, complex organizations where more than one business is involved.

Documents have an important role in every business's activities because information has become a more important part as a strategic role. To use the information documents they have to be functioned as interfaces to help users in navigating through the information. How documents can be created to correspond the processes in a process oriented organization and how the user of the document can involve in it deals with a design problem (Haimes, 1994). Many organizations develop excellent processes but fail when to use the documentation especially as new staff is attempting to use it (Schiesser, 2002).

The Sarbanes-Oxley corporate-reform act (SOX), that was recently introduced, is said to be the biggest improvement in American Business rules since the 1930s. It concerns every company listed on the American stock exchange and the purpose of the act is to prevent corporate malfeasance. To achieve this, the act has a section named 404 that says that companies must establish, document, and maintain internal controls and procedures for financial reporting. It also sets rules for how, and by whom the financial systems works, is maintained and operated. This implies heavily on the IT-department that has to work in a new way. The IT department has to be more process oriented and work in a process oriented manner.

ITIL is a process oriented standard for conducting IT Management in an organization. In recent years, ITIL has grown to be a worldwide accepted standard, and many organizations in Sweden have been interested in the framework. Even though ITIL works with processes, it is from a very high level. A lot of companies have discovered that their processes need to be accurate and completely documented to conduct their IT Management according to the ITIL framework.

Volvo IT expressed the same problems in our contacts with them. The part within Volvo IT, working with infrastructure and operations are currently working with the implementation of ITIL in their organization. This process-based way of conducting IT Management has raised the need for a better and more uniform documentation of their internal global processes. As Volvo is listed on the American stock exchange, another source contributing to the problem is the US Government and SOX, and their requirements and demands.

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To make process descriptions easy to understand there are advantages in defining a standardized way to do this in an organization. A standardized methodology and language facilitates the understanding but will also result in implications. For example, the processes may evolve to static processes which do not have the abilities in flexibility and adaptability. A centralized process management will lead to decreased involvement by the participants which in turn lead to absent process improvement (Rentzhog, 1998).

Most of the existing literature within business processes, manages the concept in a briefly manner. Many of the existing standards were designed for documenting process flows in an industrial production environment. Today's business processes have other needs and need to be presented in a more complex context. The relations to other processes are vital information, as well as relations to other artifacts and enablers. The reason that we are conducting this study is that there is an urgent need for better process documentation in many organizations.

1.2 Purpose and problem statement

Our purpose with this thesis is to create a requirements specification that covers all needs in the area of documentation of complex business processes in a global process oriented IT company. The purpose of the master thesis is not to explain how to formulate business processes but to explain the requirements on how to document them. The requirements specification shall be useable at Volvo IT as our reference organization, but also general to fit other similar organizations.

On the basis of the problem area, we are supposed to answer the following problem statement:

> *What are the requirements on the description of global processes in a global organization?*

To facilitate the problem statement, we have generated five sub questions:

- How shall the organisation supporting the actual work with business process documentation be designed?
- What shall be included in the process vision to make the process as complete as possible?
- How shall a process map be designed to best explain the vision of a process?
- How shall the three areas above be documented to gain the highest level of understanding for the whole of business process management in an organisation?
- How shall the continuous work with process documentation be managed?

1.3 Expected results

The main result of this thesis is a complete requirements specification of process documentation. The specification shall include:

- Requirements on the content in process documentation.
- Requirements on rules to maintain a high level of process documentation.

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- Requirements on the description of roles and responsibilities for process documentation.
- Requirements on process maps and their relations.

1.4 Delimitation

The work is focused on the processes relevant to the holistic overview of an organization. Regional procedures at Volvo IT are not covered in our scope. The aim is to include all documents and necessary information for processes. We shall not change any processes or implement the solution at Volvo IT. Furthermore, the result shall not be limited by any previous Volvo material or recommendations.

1.5 Target group

The main target group is our sponsor Volvo IT, but the thesis is also of interest for anybody who recognizes the problems described above, for example other large IT organizations and researchers in the area of interest.

1.6 Outline

This thesis is divided into six parts:

- **Introduction:** In the introduction we discuss the background of the study, its purpose and the reasons behind the study.

- **Methodology:** The part starts with a short explanation of the scientific approach and continues with some research methods. We also discuss the reasons of our methodology choice and a view of the practical performance of the study.

- **Theoretical framework:** The theoretical framework deals at first with a brief overview of Business Process Management. Thereafter, organization for process management and process vision are described. How processes are modeled is presented within the area of process mapping. Next area of the framework is how the previous presented parts can be documented and how the documentations shall be managed.

- **Empirical result:** This part starts with a section where we describe the organization Volvo IT and also how process documentation is performed today. Furthermore, this part presents the interview results with the quotations and sometimes we have expanded the quotations in order to clarify the respondents´ opinions.

- **Analysis and discussion:** Here, we analyze the empirical result with accordance to the chosen theories and because this also is a discussion, we use our own opinions to achieve a result.

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- **Conclusion:** Our conclusion consists a requirements specification which is a compilation of the analysis and discussion. Also, we have some suggestions of what areas that should be of interest for further research.

1.7 Previous research

There has not been conducted much previous research in the specific area of process documentation, but there is research conducted in the wide area of Process Management and Business Process Management. Most of the researches are from the development point of view, for example different standards such as IDEF, UML etc. The area of Business Process Management is mainly concerning Business Process Reengineering which was a popular management method in the early 90's. The most prominent researchers in this area are Michael Hammer, Thomas Davenport, James Champy and Dr. H. J. Harrington.

1.8 Definitions of occurring concepts

BMS (Business Management System)
BMS is primary a document management system at Volvo IT. The application is a web based tool for managing and presenting the information in a structured and controlling way. The information can be different kinds of instructions and process descriptions at different levels. Even organization policies and work instructions are described. All important documents at Volvo IT are stored in BMS (Violin, 2005).

ITIL (IT Infrastructure Library)
ITIL is a collection of processes and its approach is to reach best practices for delivering IT services. The framework covers a standardized vocabulary where for example roles and responsibilities are clearly defined in a standardized way. The framework facilitates relationships between the IT service provider and the customer (Violin, 2005).

Enterprise Architecture
Enterprise Architecture is a part of IT Governance at Volvo IT and their mission is to define and implement an IT Architecture that in the best way supports the business of the Volvo Group. The vision is to create a homogenous IT architecture that is cost effective and can cope with continuous changes. To do this, they have formulated a set of work procedures (Violin, 2005):

- Develop IT Architecture in a business focused way by active participation in strategic projects.
- A business-value prioritised way of working that is iterative and focused on delivery.
- Encourage challenges to the IT architecture at any time, with an understanding that business project schedules may affect decisions in the short term.
- Produce concise, easy-to-understand and easy-to-use documentation. Prioritise practical usage over theoretical excellence.

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2   Methodology

In this chapter we discuss the choice of methods performed when working with the study. We start with the two alternatives of philosophical traditions which are followed by some research methods that can be used in different types of studies. The focus lies in the practical method. We discuss our motivation for chosen methodology. The chapter of methodology is a guideline of how our work was performed.

Before starting a research there are some fundamental issues that have to be taking into consideration. There is no all-round method when to choose among different methods. The choice of method depends on the problem and problem formulation which is going to be illuminated (Holme & Solvang, 1997).

2.1   Philosophical traditions

An understanding of the philosophical issues will clarify research designs and helps the researcher to recognize which of the designs that will work or not (Easterby-Smith (2002). According to Easterby-smith et al (2002) there are two mainly alignments of approaches: *positivism* and *social constructivism*. We have conducted this research according the tradition of social constructivism because the approach assumes the researcher as a part of the area which is studied. We, as observers, can impossible be objective and will consequently interpret data in different ways comparing to what other researchers would do. The constructing of interview questions is a practical example.

2.2   Qualitative and quantitative studies

Quantitative studies are used when the purpose is to achieve a numerous result and measurements and statistical methods are well used. The result is quantitative data. On the other hand, qualitative studies are used when the information is transformed to verbal forms. Qualitative studies are characterized by its purpose to give an understanding, interpretation and explanation of a specific phenomenon (Easterby-Smith et al, 2002). The study treats the surrounding reality as subjective where the reality is an individual, social and cultural construction. The interest lies in how the human understands and interprets the surrounding reality. There is no separation between human and its surrounding reality (Backman, 1998). We have in this research used a comprehensive traditional qualitative method where the goal was to receive a holistic understanding of the problem area. In agreement with the qualitative method, the study was performed in a real situation and we have also chosen to do the study with a focus of broadness rather than deepness. A quantitative study would give us a more statistical result which not was the aim.

According to Backman (1998) qualitative studies are predominantly of inductive strategy. The theoretical framework derives from the empirical framework. The researcher does not assume from any hypothesis or theories but instead from the collected qualitative material. Through an analysis of the material patterns, ideas and connections to hypothesis and theories will be brought out. The theoretical framework will successively be found while finding patterns in empirical studies. This study has mainly been characterized by an inductive strategy as we started with a feasibility study concerning the initial position in process documentation at

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Volvo IT. If we, for example, have not had a specialized case study sponsored by Volvo IT, the research had been made with another strategy which is called deductive. This strategy aims to start from a theoretical study from where the researcher creates a hypothesis. Deductive strategies are most common within positivism.

2.2.1 Case study

A common use of a qualitative study is to accomplish case studies where interviews and observations are performing in an organization or at a company. A case study examines a phenomenon in its real environment where the limits between phenomena and context not are given. Case studies offer the possibilities to study the deepness in its wholeness and have the possibilities to show the dependence between the parts. Accordingly, a case study has its focus on relations and processes because these are linked and affects each other just as it is holistic and not focuses on one situation (Denscombe, 2000). There are two different intentions among case studies: describing (descriptive) or explaining (explorative) (Backman, 1998). While the study takes place in a natural environment, the case study renders us as researcher to use body language and informal interviews. We used an explaining intention during the work because the need of receiving the problems in documenting processes.

2.3 Practical method

Fig 1: Practical method of the study

2.3.1 Pre study

According to Backman (1998), the collection of data is separated into primer data and secondary data. Primer data is collected through observations and interviews. Secondary data is for example collected from literature and current material. The collection of secondary data was done during the pre study.

After the subject was decided and we had contacted our reference organization, we started of with a pre study. We had an initial meeting with our contacts at Volvo IT where we analyzed their problem and compared it with our problem statement. Next step in the pre study was to analyze the present situation on Volvo IT regarding how they document their processes today. This was done by searching in their intranet (Violin) for material regarding business process management at Volvo and their partner companies. After the pre study, we had a picture of how organizations define process documentation. We formulated a problem statement, expected results and limitations. Also, a method to conduct the study was also designed.

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2.3.2 Theory studies

All scientific researches must, according to Backman (1998), contain an extensible literature study where the researcher's aim is to receive an understanding of the researched area. Furthermore, the literature study will give a deep meaningful and delimitated problem statement which finally eases the choice of research method.

With the use of our pre study, we were able to better target our theory studies. Library databases and the Internet were used to track usable articles and books to build the theoretical fundaments for our study. We divided the theories and problem statement in different areas that we used in the remaining part of the study to ensure that we covered all necessary aspects and to emphasize the logical precision.

2.3.3 Interviews

The major part of the primer data was collected through interviews, mainly formal interviews but also informal interviews with our supervisors. Interviews are a powerful tool in receiving deep insight of human's values and thoughts regarding a special occurrence (Easterby-Smith et al, 2002).

There are three forms of methods for interviews: *structured, semi structured and unstructured*. A structured interview is predictable by the questions and is very similar to formal questionnaires. If the interview is semi structured, the interview is based on a couple of constructed questions and the interviewer lets the respondent discuss on the basis of the questions and the probes that follows. The disadvantage is that it is relatively difficult in analyzing the collected data. Simultaneously, the advantage is that the respondent is not steered by the questions. An unstructured interview is completely unpredictable and contains a discussion between the interviewer and the respondent (Easterby-Smith et al, 2002).

In the pre study we decided that qualitative interviews had to be conducted in order to deeply penetrate the problem and to find problems we did not yet know of. With the help of theories and our assistant leaders at Volvo and at the University we created a set of semi-structured questions. Then, we looked at the problem statement and identified interested parties. The aim of the interviews was to receive a deep understanding of the respondents' perceived problems. We used the semi structured interview method because we wanted the respondent to discuss the problems simultaneously, but we still wanted to steer the interview into our area of interest. With the use of the unstructured method, we would risk to get too much information and loose the topic.

2.3.3.1 Selection of respondents

We had a discussion together with our supervisors and the executives of Volvo IT to find out 10-15 respondents for our empirical study. The target groups for our research were:

- Persons responsible for process documentation
- Creators of process documentation
- Users of process documentation
- Other respondents with knowledge of special areas of interests in our scope
- A broad spectrum of nationalities and departments

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We could have chosen more respondents in order to get a wider perspective of the problem area. But, the choice of semi structured interviews led to deeper and more time-consuming interviews which resulted in a fewer numbers of interviews. Especially, the area of documentation users could be of more respondents.

Respondent	Department	Duties	Contact with processdocumentation	Special area
HL	8034, Operation support	Responsibility for development	User	ITIL
MB	2000, Infrastructure & Operations	CEO for Infrastructure & Operations	Process Owner	
TE	9012, Culture & Quality	Culture & Quality Manager	Responsibility for quality	
MP	9012, Culture & Quality	Responsibility for administration of BMS	Responsibility for administration of BMS	
CN	9013, Business Operational Development	CIO at Volvo IT	Responsibility for documentation	
DB	Region North America Local Delivery	Responsibility for deliveries of I&O products	User	
ET	9110, Industrial Applications	Department Manager	Process Manager	
IO	9068, Volvo IT Trollhättan	Business Developer	Process Developer	
LD	9611, Business Consulting Group	Business Consultant	Process Developer	
RR	2590, Infrastructure Solutions, Unix	Product Manager SOE Unix	User	
BI	2120, Global I&O Processes	Operates and follows-up process	Process Manager	SOX
AR	Region France, Quality Department	Quality Manager France	User	
CJ	9025, Enterprise Architecture Team (EAT)	Mangager for EAT	Process Developer	Enterprise Architecture

Table 1: Respondents of the research

The selected respondents were finally 13 respondents. The interviews lasted for one hour and were recorded to a computer. We sent the semi structured questions to the respondents in advance to make the respondents think of the issues concerned and be more prepared at the time for the interview. After each interview we transcribed it into text for better comparison possibilities. The interviews gave us the requirements on process documentation, and ideas of how to meet them.

2.3.4 Method for analysis

On the basis of a social constructivist approach it is assumed that the preconceived opinions will affect the collection of data. The constructed questions will indirectly determine the result. Because the analysis will affect the data and the data will affect the analysis the term "way of analyse" is more right than the term "method for analysis" in a qualitative research. Analysis of qualitative data mainly means analysing texts (Easterby-Smith et al, 2002).

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According to Easterby-Smith et al (2002) there are two different ways in analysing qualitative data. The first one is called "content analysis" and the other is called "grounded analysis". In content analysis, a couple of keywords or phrases are selected which furthermore will be counted and analysed. The selection of keywords and phrases are depended of the hypothesis that will be proved. In content analysis, the researcher looks at the study in an objective way and selects fragment from the interview in order to bring clarity.

In grounded analysis, initially the structure from the collected data will be selected. This means to systematically collect data to find out underlying themes, patterns and categories. This will help to create a sort of framework from where it is possible to perform an analysis. The investigation of collected data will be subjective and this method is preferred by researchers in qualitative studies (Easterby-Smith et al, 2002). Grounded analysis is the technique of analyse data that we used in this study. On the basis of the empirical result, we tried to figure out a structure and expounded with our own opinions in order to create a genuine analysis. We did not use a content analysis because we thought we would loose the holistic perspective of the respondents´ opinions.

2.3.5 Creation of requirements specification

The last step in our study was to create a requirements specification. This specification works as a conclusion of the thesis and is a summary of the analysis and discussion section. The requirements specification content aspects that are necessary to improve within process documentations at Volvo IT.

2.4 Validity and reliability

In judgements of the credibility of the research, concepts as reliability and validity were used. The reliability explains the objectivity of the research and the degree of secure in reliability. The reliability will also cover if the result would be similar if other researchers perform the study (Easterby-Smith et al, 2002). Validity refers to how secure the measurements will measure that actual are measured. Does the data reflect the truth or the reality and will it cover the decisive questions? To treat the problem statement from different points of view is on way to strengthen the validity. This will hint that the problem statement agrees with the used methods (Easterby-Smith et al, 2002).

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3 Theoretical framework

The theoretical framework is divided into three mainly parts where the first part concerns what a process is and how it is created. We have chosen to affect this because this covers the area which is to be documented. The second part concerns the actual principles of documentation and the last part concerns documentation managing.

3.1 Business Process Management

The management of processes has its origin in American organizations which lost their competitive power to the Japanese advancement of the global market. Managers frustrated tried to increase the organizations efficiency without any successes. The main problems indicated inadequate solutions for efficiency. For example, time of delivery for products with normally short time of delivery was unacceptable long. With time, the managers realised their mistake: They were stuck because they tried to solve process problems by task oriented solutions (Hammer, 1996).

Hammer (1996) declares the substantial difference between task and process where task appears as an activity conducted by one person or a group of persons. Process, on the other hand, is a group of tasks that jointly creates a value for the customer. Hammer compares the difference above with the difference between the whole and its parts.

The purpose of process orientation is to reach improvements in cost, time and quality. Process orientation enables the organization to a flexibility and ability change. Traditional hierarchical organizations tend to be stable and inflexible. A process oriented organization has the feasibilities to act in a rapid and changing environment (Rentzhog, 1998; Aguilar et al, 1993).

3.1.1 What is a business process?

There is a difference between 'process' and 'business process' where the first designation refers to production processes and the latter refer to processes recovering the whole of the organization's activity (Rentzhog, 1998). The designation 'process' is used as comprehensive concept for all kinds of processes. For the reader's convenience, we use the word 'process' as concept because that designation is most common at Volvo IT.

Processes are defined as a series of interrelated activities that takes an input, adds value to it and provides an output to an internal or external customer (Harrington, 1991; Zairi, 1997; van Rensburg, 1998; Willoch, 1994). Customers of a process are those who receive the output of the process (Anjard, 1998). A process is consequently performed across time and place. A well defined process is characterized by a beginning and ends with identified inputs and outputs (Bal, 1998). Processes are the essential link between the customer's requirements and the delivery of the products or services. Processes are the instruments the organizations use to fulfil their purpose or mission (Anjard, 1998; Jones, 1994) and according to Willoch, processes have two important distinguishing features: 1) they have customers, either internal or external 2) they cross organizational boundaries, either internal between functions or external between organizations which co-operate in a customer-supplier relation (Willoch, 1994).

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Well defined processes have, according to Harrington (1991), some important characterises:

- They contain a role which is responsible for the performing of the process (process owner)
- They have well defined boundaries (process scope)
- They have documented procedures, work tasks and training requirements
- They have known cycle times
- They have well defined internal interfaces and responsibilities

3.2 Organisation for processes management

To understand business process management it is important to consider the *people view* of the organization. This includes components as organization structures, culture, roles, responsibilities, competencies, jobs and communication. Among the people in the organization: skills, knowledge and attitudes have to be recognized (van Rensburg, 1998). A similar view is what Curtis et al (1992) and Bal (1998) call the *organizational view* which represent where and by whom the detailed process steps are performed. Other important views are, according to Curtis et al (1992) and Bal (1998) also:

- *Functional view*
  Which represent what activity of the process is being performed? The view is representing the act or activity that is being done by the actor.

- *Behavioural view*
  How is the process being performed and how is it done?

- *Informational view*
  This view is representing the information details or entities that are being manipulated by the process.

3.2.1 Process actors, activities and responsibilities

All persons included in a process have responsibilities to fulfil the process but the concentration of responsibilities is placed at the process owner. The responsibilities of the process owner should, according to Hammer (1996), be divided into three categorizes:

- Designing
  The mainly responsibility of the process owner is to ensure that the process is both effective, efficient continuously improving (Harrington, 1991) and to provide the members of the process team with information (Willoch, 1994). He is not the owner of the process, but the designing of it and its documentation. To design and formulate a process is not a one mans job, but it is up to the process owner to coordinate the work. The process owner has the comprehensive responsibility for the process improvement cycle (Hammer, 1996). In a practical way, he also has to appoint the membership of the process (Willoch, 1994).

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- Coaching

The process owner shall possess expertise of the process and use this to support the including personnel of the process (Harrington, 1991; Hammer, 1996). The knowledge he possesses is not necessary detail problems (e.g. technical problems) but comprehensive problems as sluggish going work or economical problems. The process owner shall act as guide, not as a boss, and he is not a controller or supervisor but shall be treated as a resource. Furthermore, the process owner does not participate in the process which means that a well established communication is necessary (Hammer, 1996).

- Representation

The process owner represents a council which exist to coordinate the overall processes of the organization. It is important that the processes suit each other (Hammer, 1996). A process owner shall defend and market his process both externally and internally (Willoch, 1994).

If there is a need of dividing the processes into sub processes it is also unavoidable to introduce a new process owner for respective sub process.

Process managers perform the processes and have also the responsibilities to support the process owners (Harrington, 1991). The same role but other terms use Rentzhog (1998) when he suggests that a sub process owner is required to assist the process owner with more detailed work. A business analyst is a manager who analyses the history of an executed process and has also the responsibilities to define improvements (Dayal et al, 2001).

The workers of the process have some tasks and responsibilities: participate in the activities, implement changes within the process, obtain appropriate resources for the activities, solve process-related problems, provide his department with better understanding how his process suit with the overall processes (Harrington, 1991), be able to attend all team meetings and be able to serve as spokesman for their process (Anjard, 1998).

3.3 Process Vision

All aspects of the vision must be stated with a high degree of specificity and the process vision shall be determined on the basis of the importance from a business standpoint. Process visions are formulated and driven by the top management of the organization. The vision is a mean to perform the objectives and the objectives derives from the vision. The objectives fulfils by the middle-ranged level and according to this, the process implementation is not a "top-down vision, bottom-up implementation"; the best method would be "middle-up" (Davenport, 1993).

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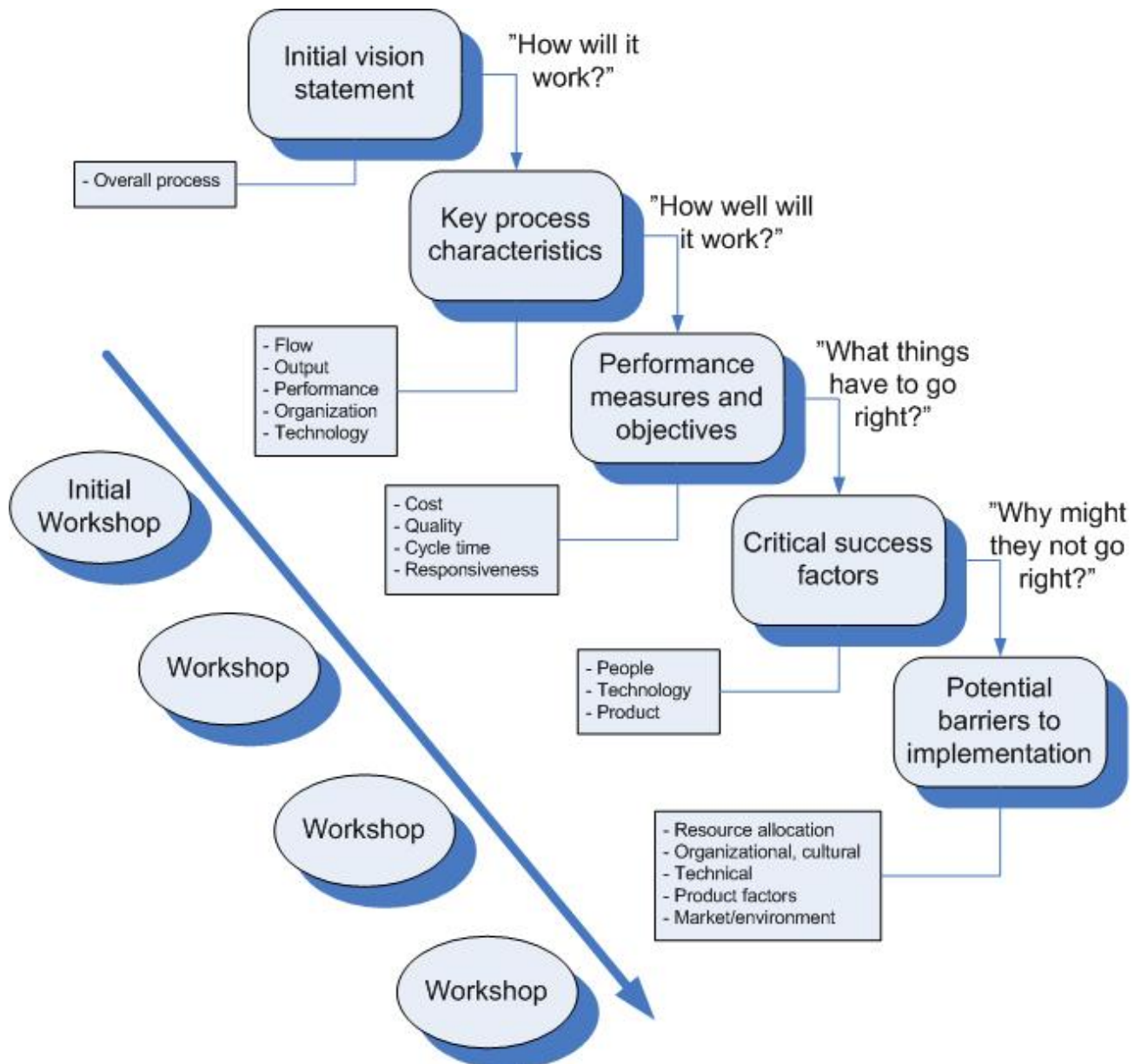
Fig 2: The Visioning Process (Davenport, 1993).

Process visions link strategy into action and they translate manager's highly set strategies into measurable and performable targets for process performance. Visions are the meeting point where top managers and those who manage the processes are met (Davenport, 1993). Objectives, attributes and measurements are all derived from visions and the relationships between these are not a one-way relationship (figure 3).

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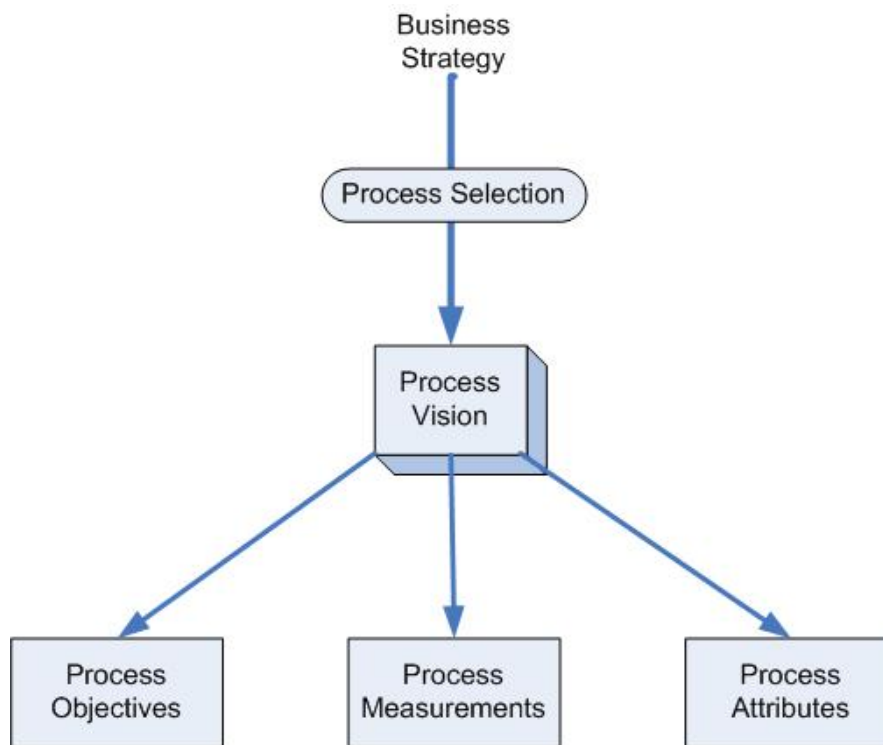
*Fig 3: Strategies, Visions, Objectives, Attributes and Measurements. Modified picture
(Davenport, 1993).*

The process shall have a well defined purpose statement and also the boundaries of the process identified. These formulations will express the extent and focus of the process and its management. If the formulations of purpose and boundaries are to narrow, it can contribute a limitation of the customers demand. On the other hand, if the formulations are too wide, there is a risk to loose focus of the process (Rentzhog, 1998). The process boundaries define what is included in the process, what is not included and what departments are included in the process. It is also necessary that the boundaries and the mission statement of the process agree (Harrington, 1991). According to Rentzhog, a good formulation expresses why the process exists, who it creates value for and how it supplies the value. A definition of the process boundaries shall also clarify the interfaces between the processes within the organization.

3.3.1 Objectives and measurements

Each process exists to contribute one or more specific objectives. Therefore shall each process be measured against process objectives that reflect the contribution that the process is expected to do. According to Hunt (1996), problems appear in measurements because most processes do not have objectives. Instead, the departments which perform the process have objectives.

Hunt (1996) and Davenport (1993) argue process objectives derive from three sources: business enterprise objectives and strategy, customer's requirements and benchmarking information. Process objectives are linked to business objectives, business strategy and customer's requirements. Process benchmarking is a very popular method to measure the processes.

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Often, the measurements concern efficiency, effectiveness and adaptability of the process and the fundamentals of measuring are to improve the total process. Harrington (1991) discusses the reasons to perform measurements:

- It focuses attention in achieving missions and objectives
- It shows how effectively the resources are used
- It helps monitor progress
- It gives the managers means of knowing whether the organization is winning or loosing

3.3.2 Attributes

Every process includes process attributes which for example specify whom the process is performed by. One person or a team? They also specify what technology that is required for process execution. Information, information technology and organizational factors are also examples of process attributes. Systems or tools that are a part of the process or are required for process execution are described. Common to all attributes is that they all are enablers which support the process (Davenport, 1993).

A process can for example be triggered by a business event (e.g. invoice or request for proposal). The process is driven by business rules that work as triggers for sub processes with each state shift being executed within a transaction and checked when business reasons are required (Dayal et al, 2001).

3.3.3 Connections

All the processes in an organization are connected through links and these links are more or less easy to identify. An effect in a process generates effects in another process, system or other enablers. It is requested a well systematic description to identify the enterprise and its connections (Nilsson, 2000). Links symbolizes relationships between documents or resources. There is an urgent need for capture links more dynamically and the relationships between the attributes have to show what kind of relationship it is. An example of description of relationships is a text comment or a place-holder that indicates the relationship. In different contexts, different approaches are required (Dourish et al, 1999).

Dourish et al (1999) suggest for imaging relationships with pattern or as a network. A good navigation pattern will facilitate the understanding of the relationships. The disadvantage of patterns or network of relationships is that they will change over time and the people's opinion of the relationships will vary.

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3.4 Process Mapping

Process mapping is a widely practised method for reengineering since the method is very quick and effective in describing a process flow. The map easily describes the process from a graphical point of view. Process maps are static models of processes because they are unable to express the dynamics of the processes. They are also classified as qualitative models while they only express processes in a conceptualised and documented way. There is a little or almost no quantitative analysis (Harrell & Field, 1996). Process maps are relatively detailed, formal or semi-formal represented. The aim of producing maps is to help process engineers in analysing, assessing, designing and monitoring processes. Furthermore, the aim is to support process participants who perform the process (Kellner et al, 1998).

A process map is an overview to identify, document, analyse and develop an improved process. It shows how inputs, outputs and tasks are related. The process map declares the major steps included in a process (e.g. produced output, who performs the steps and where possible problems can occur (Anjard, 1998).

A process map is never illustrated wrong, it is subjective. However, a process map can be described in different ways depending on the organization's situation. A well defined process map is easy to understand (for the organization's employees, customers and suppliers) and shall reflect the organization's wholeness without being too complex (Willoch, 1994).

Nilson (2000) recommends that input and output are described as nouns, and activities are described by verbs, and properties are described by adjectives.

3.4.1 Drill down a process

There are several methods for drilling a process down. The reason of different approaches is that processes vary in complexity and reasons of existence. When modelling processes, the modeller wants to explain different important issues. Rentzhog (1998) defines different approaches for this task.

Vertical approach

The vertical approach is a commonly used method. You take the actual process and vertically slice it down into more or less sequential chains of sub processes. See the example below for further information (Rentzhog, 1998).

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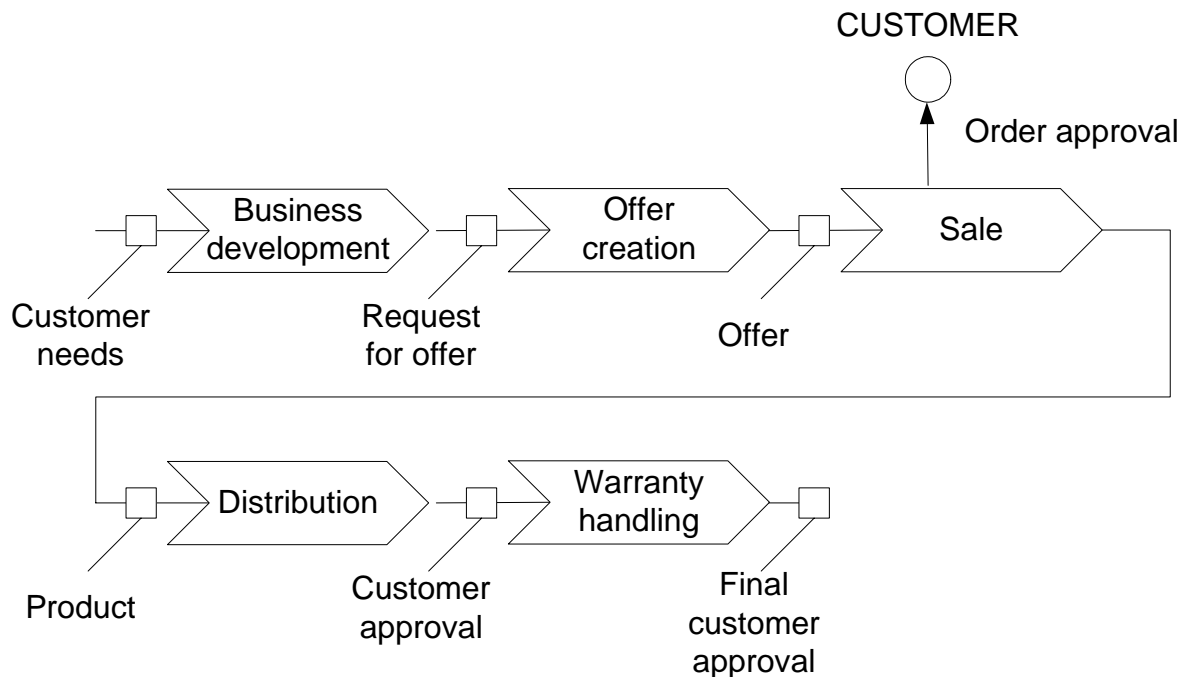
Fig 4: Vertical approach, Sjögren & Zenk (1994) from Rentzhog (1998), modified picture.

Phase approach

The phase approach has very much in common with the vertical approach. In this case you also slice the process vertically, but the process is divided into artificially defined phases instead of activities. The phase approach is common for describing project processes, like product development processes (Rentzhog, 1998). Rentzhog (1998) describes a five phase model for product development, (fig 5).
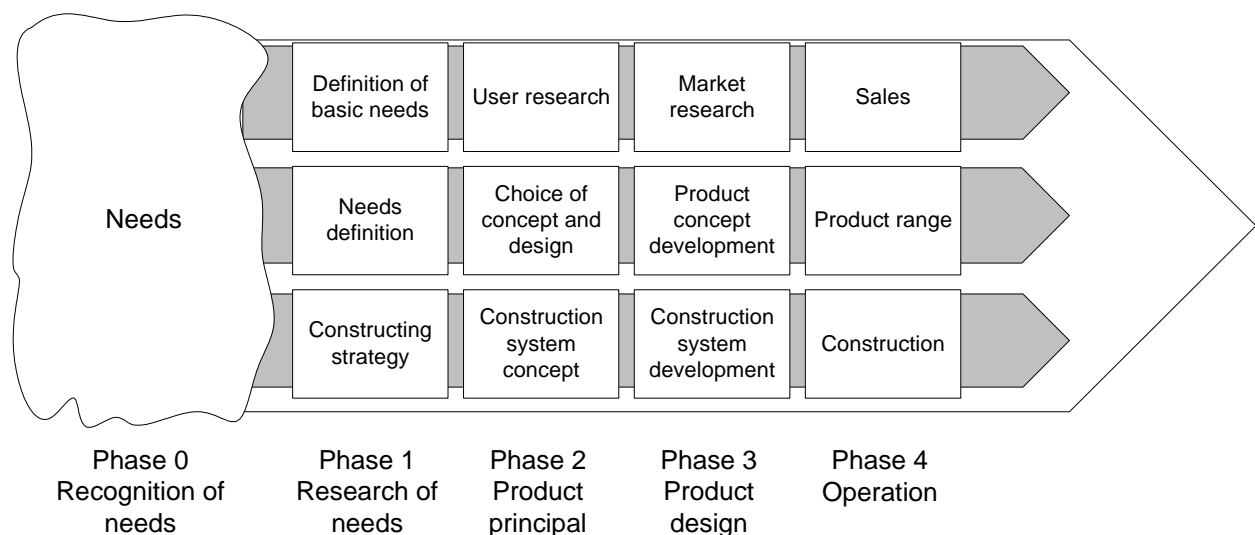
Fig 5: Phase approach for product development (Andreasen, 1991) from Rentzhog (1998), modified

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The phase approach can also be strong for processes where it is hard to identify activities. This might be ongoing processes as education, like in the example below from Linköpings University where they wanted to map the process for research studies. The first map they came up with, (fig 6) was too functional in their point of view so instead, they created a more process oriented model with the phase approach (fig 7). The benefit with the new model is that it focuses on the purpose with the process, to see that the researcher develops the knowledge and abilities to be good researcher (Rentzhog, 1998).

Research studies process

| Education | Research courses |

| Thesis | Industrial projects |

Fig 6: Research studies process Rentzhog (1998), modified.

Engineer

Employment phase

Tutoring process

Introduction phase

Project process

Search phase

Writing process

Maturity phase

Course process

Delivery phase
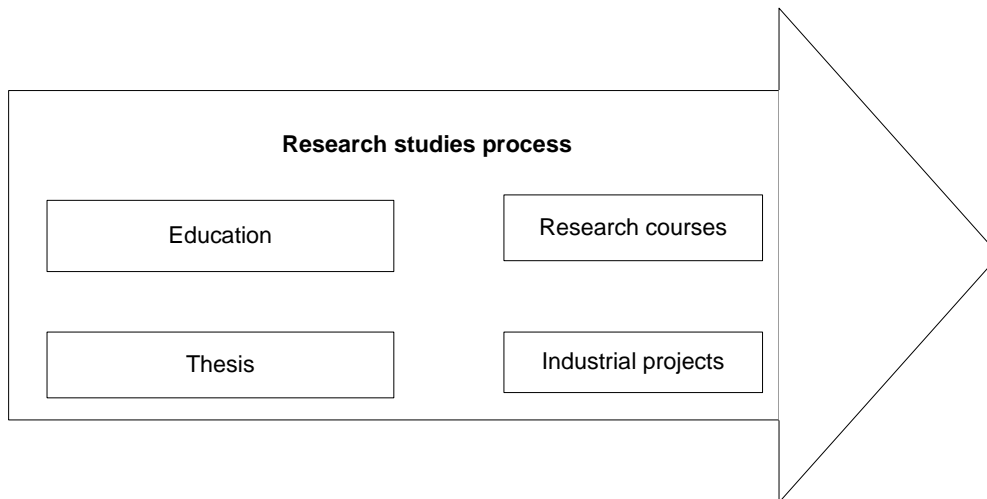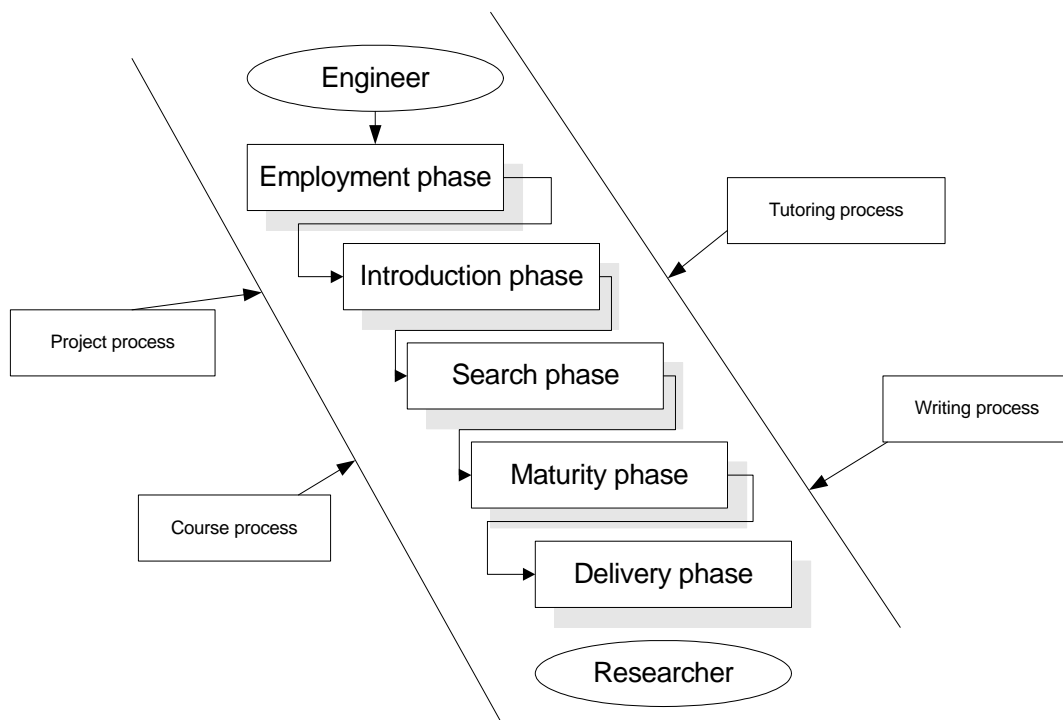
Researcher

Fig 7: A more process oriented model for the research studies process Rentzhog (1998), modified.

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Horizontal approach

The vertical approach makes an accurate picture of how the process activities create chains of internal customers and suppliers that together fulfils the purpose of the process. In some cases, this approach is not suitable, e.g. when the same process is used to handle different kind of cases that have differences in complexity, nature, customer needs, etc. To cover all alternatives, a vertical drill down must be based on the most complex case. A more suitable approach for this kind of processes is the horizontal approach. This means that the process is sliced into different versions (Rentzhog, 1998). (See fig 8 below for an example.)
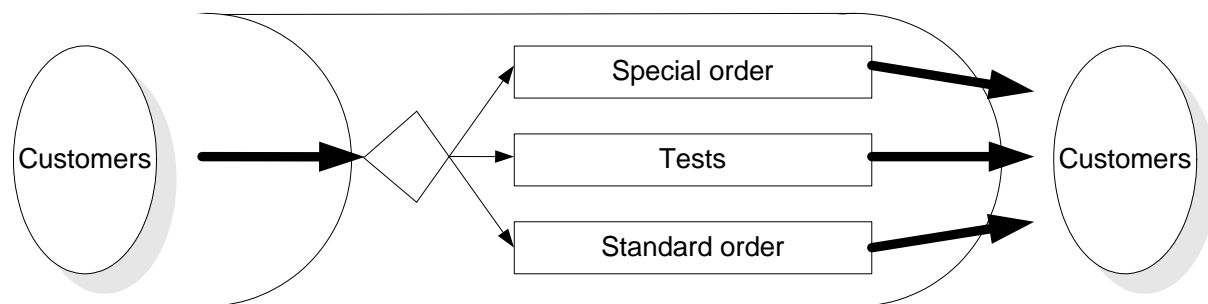
Fig 8: Horizontal approach Rentzhog (1998), modified

The Pareto principal

One interesting phenomenon that is applicable in many areas is the Pareto principal, or more commonly called the "80/20-rule". This states that only a vital few, (20%), of causes will have a greater impact than the many, (80%), causes e.g. 80% of the problems come from 20% of the causes, 80% of a company's profits come from 20% of their customers (Rentzhog, 1998).

This principal is also used in the process mapping area. It is important to not get stuck in the mapping phase when designing a process. The Pareto principal can be helpful when deciding how much of the different activities that should be described. The principal is good rule for both vertical and horizontal approaches. E.g. if 80% of the customer value is created by 20% of the process activities, and a horizontal approach will create a large number of process versions, then it might be better to describe only the 20% of the activities or versions in the process map (Rentzhog, 1998).

3.4.2 Process hierarchy

A process map can be shown in different levels where all levels describe the process in various detail. Anjard (1998) illustrates the levels of detail as "peeling the onion". The process hierarchy shall be developed from a top-down approach where the hierarchy starts with modelling at the macro-level of the process (Anjard, 1998). The next level shall illustrate a more in-depth view of the business processes comparing to the last one (Cochran & King, 1993). When the hierarchy is structured with major functions at the top, each following level should be internally consistent. Hunt (1996) further argues that an upper limit of six process boxes forces the creator to use hierarchy to describe complex processes. A lower level of

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three boxes is often preferred to ensure that enough detail is introduced in the process map (Hunt, 1996).

In a process oriented organization almost all work are included in processes which are highly complex and includes many people. A process is from the first sight seen as a macro process which can be divided into related sub processes. These sub processes are supposed to facilitate and minimize the time required to improve the macro process. All the macro- and sub processes are divided into activities which constitute the major part of flowcharts. Activities are things that consequently are ongoing within all processes (Harrington, 1991; Davenport, 1993; Willoch, 1994). An activity is containing a number of tasks which are performed by individuals or teams and the tasks constitute the micro parts of a process (Harrington, 1991). Figure 1 illustrates the relationships between above described concepts.
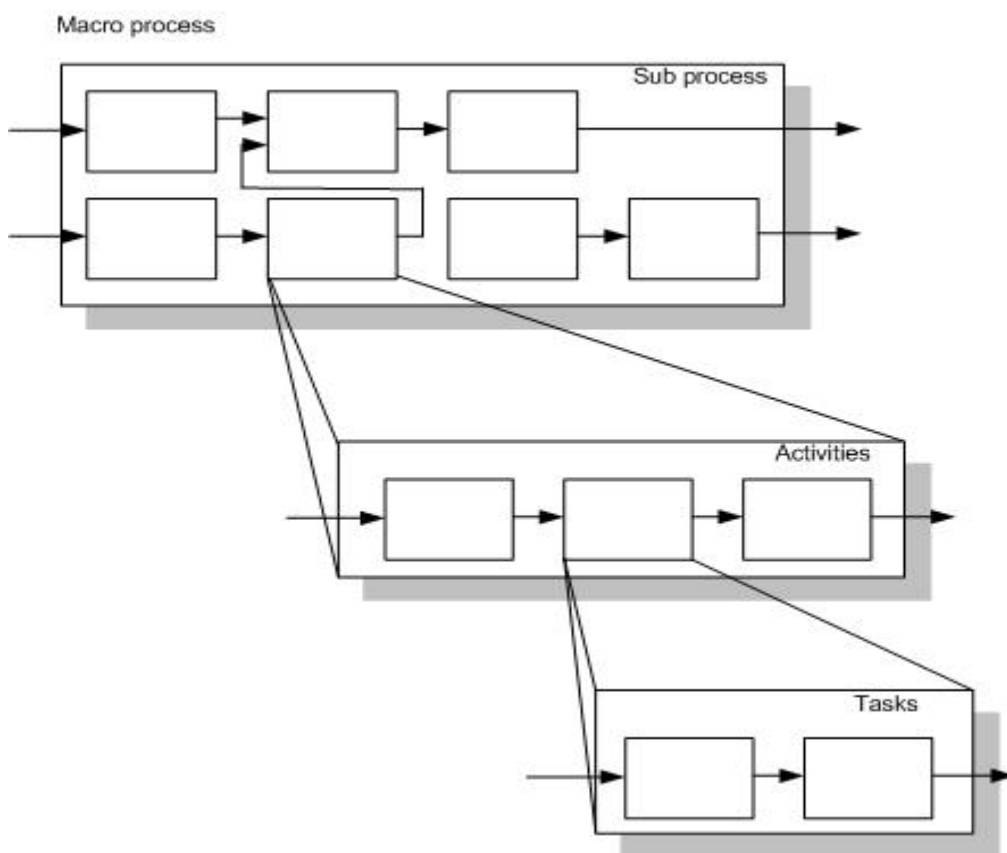
Fig 9: Relationships between macro processes, sub processes, activities and tasks (Harrington, 1991).

Harrington (1991) discusses the importance of a process overview. Before a detailed analysis of the process it is necessary to observe the overview, which describes: who the suppliers of the inputs are, who the customers of the output are and what other processes it interacts with.

Nyström (1999) identifies five levels in the hierarchy (see fig 10). A mapping from top-down should not go deeper then the first three levels. Level 1 is the overview process map, level 2 represents one process and its sub processes and level 3 represents one sub process and its main activities. Nyström further argues that from a management point of view this is the

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deepest one can reach. The real process flow with all activities in the operative work must be described from bottom-up. These processes should be the focus for improvements, therefore the manager in charge for the actual operation should describe the process and be responsible for improving it.
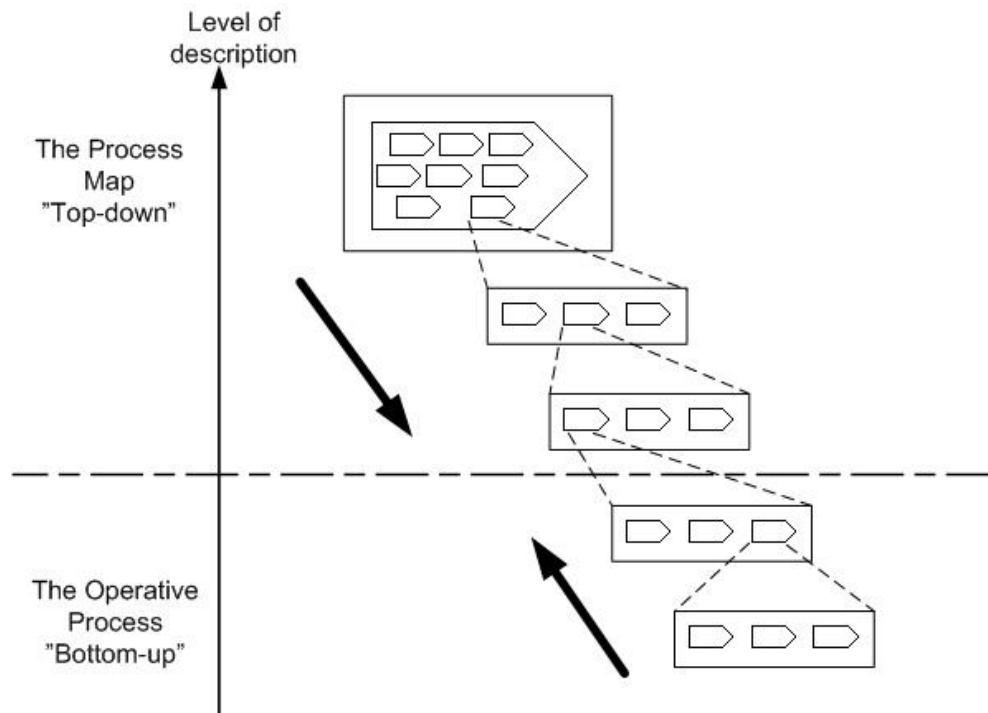
Fig 10: The process map (Nyström, 1999)
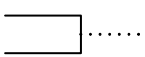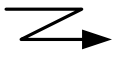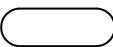
3.4.3 Symbols

There have been several methods developed for structured process mapping. Different structured techniques are used as IDEF0 (IDEF0 is described in next section) and standard process flow symbols. Harrington (1991) and Harrell & Field (1996) suggest following standard process flow symbols:

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Symbol:	**Description:**
☐	Operation
⇨	Transportation
▽	Storage
⊐	Delay
○	Inspection
⊡	Combination of Operation and Inspection

Fig 11: Standard symbols for process mapping (Harrington, 1991; Harrell & Field, 1996).

Harrington (1991) presents additional symbols for structured mapping that not are presented by Harrell & Field (1996):

Symbol:	**Description:**
◇	Decision point
⬓	Connector
▭······	Annotation
→	Direction of flow
⟋→	Transmission
○	Connector
⬭	Boundaries

Fig 12: Additional symbols for structured mapping (Harrington, 1991).

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The advantages of using structured methods for mapping symbols are several. Mapping becomes easy to communicate and they are consistent. Furthermore, it provides categories for all elements of the process. However, problems will occur in translating structured maps into mapping tool. Often the maps need to be revised (Harrell & Field, 1996).

Unstructured process mapping offers no strict rules as long as the map is easy to communicate to the participants. Boxes represent activities, diamonds represent decisions and arrows represent the sequence of the activity, data or interfaces. The use of different symbols is fewer than structured mapping. However, the unstructured maps become extremely complex (Harrell & Field, 1996).

3.4.4 IDEF0 Standard

There are several standards to visualise a process map with all the criteria above. The most widely used standard for process modelling is IDEF0 (Bal, 1998). IDEF0 is a method designed to model the decisions, actions, and activities of an organization or system. The United States Air Force developed a graphical language named Structured Analysis and Design Technique (SADT), with led to the development of IDEF0. In December 1993, the Computer Systems Laboratory of the National Institute of Standards and Technology (NIST) released IDEF0 as a standard for Function Modelling in IDEF0 Method Report, 1993. Many of the other modelling languages used for BPM is more or less based on the IDEF0 standard.

IDEF0 uses Cell Modelling Graphic Representation, also called "box and arrow" graphics. A function is represented as a box and the interfaces to or from the function as arrows entering or leaving the box. Boxes operate with other boxes with the interface arrows as rules deciding when and how operations are triggered or controlled. The figure below further describes the symbols in IDEF0.
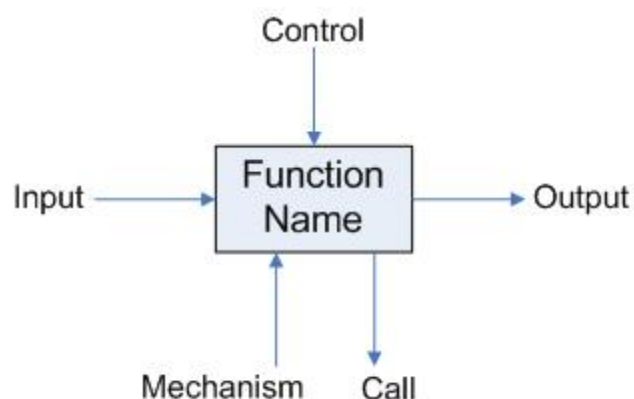
Fig 13: IDEF0 Symbol (IDEF0 Method Report, 1993).

Each side of a function box shall have a standard box/arrow relationship. Input arrows shall interface with the left side of a box. Functions are activities, processes or transformations, identified by a verb or verb phrase that describes what must be accomplished. Control arrows shall interface with the topside of a box. Output arrows shall interface with the right side of the box. Mechanism arrows (except call arrows) shall point upward and shall connect to the bottom side of the box. Mechanism call arrows shall point downward, shall connect to the bottom side of the box, and shall be labelled with the reference expression for the box which

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details the subject box. Control is conditions required producing correct output, mechanism is the means used to perform a function, and call is a type of mechanism that enables the sharing of detail between models or within a model. *(IDEF0 Method Report, 1993).*

In IDEF0 there are different kinds of diagrams represented at different levels. The top level diagram is called A-0 diagram. This is a single box diagram, representing the outer boundaries and subject of the model. The arrows on this diagram interfaces with functions outside of the context to visualise where in the larger context the subject in question is located *(IDEF0 Method Report, 1993).*

The A-0 diagram can be decomposed into major sub functions by creating its child diagram. Each one of the sub functions can, in turn, be decomposed into several lower level child diagrams. A child diagram covers the same scope as the diagram it decomposed and is therefore covering the same scope as the parent box *(IDEF0 Method Report, 1993).*

A diagram containing one or more parent boxes is referred to as a parent diagram. Every diagram, except the A-0 diagram, is also a child diagram. This means that a diagram can be both parent and child. The figure below illustrates the relationship between the different diagrams.

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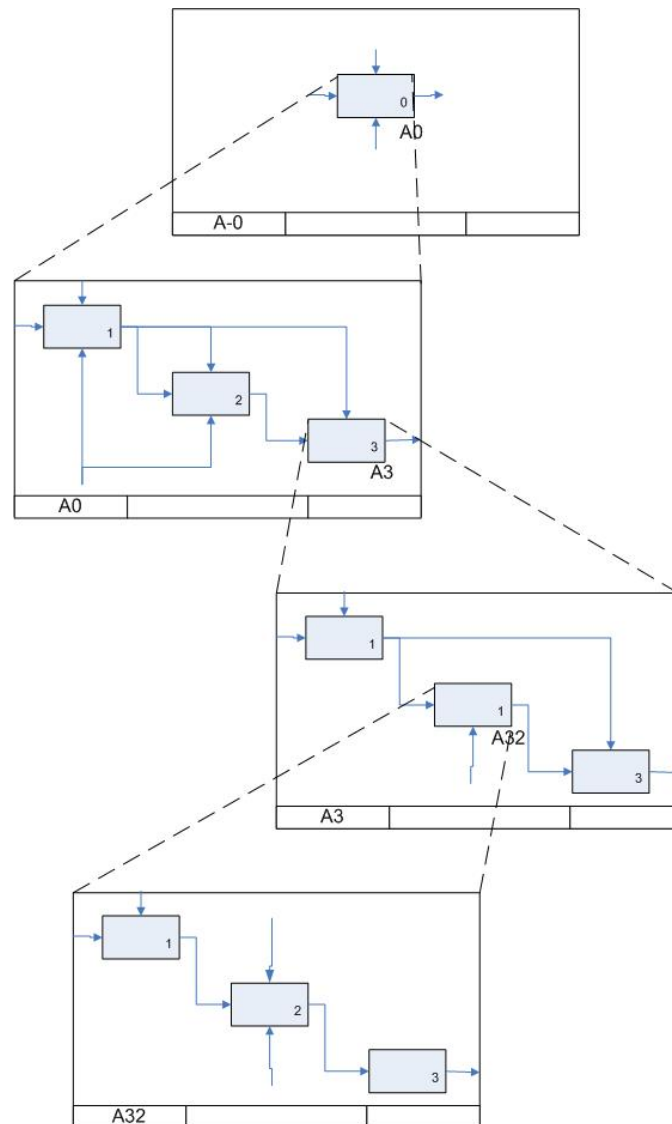
Fig 14: Relations between diagrams in IDEF0 (IDEF0 Method Report, 1993).

IDEF0 uses a numbering system to identify each box within the process. It is also used to cross-reference descriptive text and glossary in the process documentation to the boxes in the diagram. The single box in the A-0 diagram shall be labelled 0. The boxes in the other levels of diagrams shall be named 1, 2, 3, to at most 6. The numbering system also contains node numbers. These numbers is based on the position of the box in the models hierarchy. Normally, appending the box number to the node number of the diagram on which it appears generates a node number. For example, the node number of box 2 on diagram A25 is A252. A hierarchy representing the node numbers might look like the figure below.

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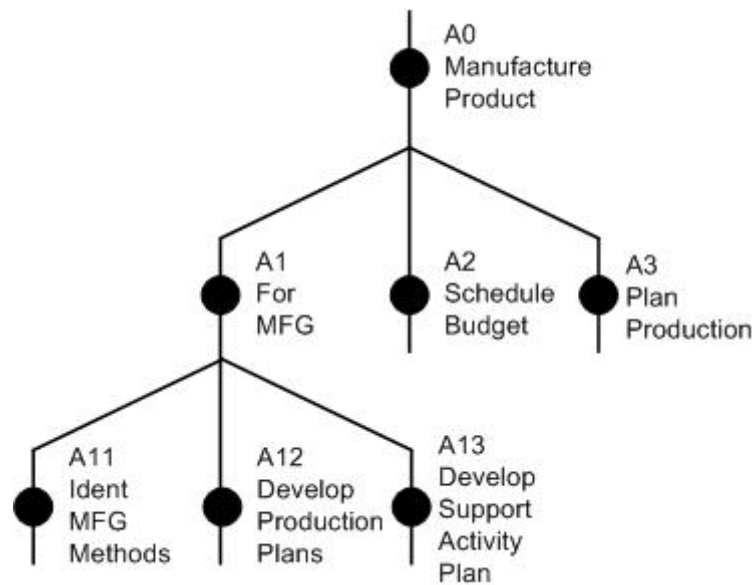
Fig 15: IDEF0 tree structure (IDEF0 Method Report, 1993).

Since IDEF0 is a method designed to model the decisions, actions, and activities of an organization or system, and not specifically designed for BPM are many users of IDEF0 in their specific situations configuring IDEF0 to fit their specific needs and demands.

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3.5 Process Documentation

A process documentation is a reference document for a specific process or a collection of processes which provides guidance for process participants in how to handle the process. Process participants are the primary users of process documentations and the purpose of the documentations is to support the human enactment (Kellner et al, 1998). The descriptions of processes, work as a translations from reality to words and pictures (Nilsson, 2000).

A good document consists of few and simple words and is very concise. When formulating a document, the document creator strives to create an understandable description of content.

The process documentation is characterized by a structured form, work-flow oriented and acts as a reference document for a particular process. A process definition which briefly covers the process shall be included (Kellner et al, 1998). It mostly presents narrative text and simple diagrams to express the process and the text is often in an unstructured way where inputs, outputs and activity descriptions are presented (Curtis et al, 1992).

According to Fowler & Rifkin (1990), a process documentation shall include:

- **Broad**   This includes descriptions of all activities, standards and constraints.
- **Deep**   Informal connections among tasks and phases in different levels of abstraction.
- **Flexible**   Descriptions of flows and exceptions.
- **Measurable** The process documentation shall be measurable.
- **Evolvable**   The process definition must be able to be continually changed.
- **Auditable**   It should be so specific and concrete that an independent consultant or other outsiders understand the documentation to make an objective judgment.

The main reason of using process documentations is to give the participants an understanding of the process for better communication (Kellner et al, 1998), education, creation of comprehension, analyzing and improving the process (Nilsson, 2000). Process participants need to understand the processes to perform what is expected from them (Kellner et al, 1998). Similar to all documentations is that purpose, structure and content depend on the demands (Nilsson, 2000).

Nilsson (2000) claims that there are also strategic purposes of documentations:

- Set up guidelines for the work
- Secure responsibilities and authority
- Using as basis for decision making

Kellner et al (1998) proclaim that process documentations include both text and graphics and furthermore, contain underlying process models and specific methods concerning the process. The documentations may be available either electronic or in physical form. We will henceforth discuss process documentation as electronic ones.

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3.5.1 The content and structure of process documentation

The process documentation should according to (Kellner et al, 1998) contain:

- an introduction which describes how the document is organized with short instructions how to read and understand the document.
- a list of checkpoints which manages all questions the participants of the process need to know to manage the process
- a conceptual schema which provides interconnections with other relevant elements
- an overview of the activities (e.g. purpose, input, output, roles and responsibilities)
    - details regarding the process itself (e.g. objectives, input artifacts and sources, output artifacts and destinations and sub-activity relationships)
- details regarding the roles involved in respective process or activity (relationships between roles and responsibilities)
- details regarding the sub-processes in the same way as above

An electronic process documentation has the advantage in navigating between relevant documents or information and other connected attributes (e.g. other systems). The hyperlinks support the flexibility in navigating. Another advantage in electronic variants is the possibility for participants to quickly access the information and there should be no need to navigate through other processes (Kellner et al, 1998).

The orientation of documents shall easily be recognized by the users and to reach this, the electronic template shall be well-structured and all processes descriptions have to be similar. The documentation layout has to be familiar to the user (Kellner et al, 1998).

The number of active windows shall be limited, otherwise the user will lose his overview. To solve this issue, the number of windows have to be well-managed and the user need to has direct control over the opening, closing, sizing and positioning of the windows (Kellner et al, 1998).

3.5.2 Electronic process documentations

Documents are interfaces in which the user navigates and uses a collection of information. The documents work as windows into the process and can evolve in the same shapes as the process. When creating the documents into electronic, they can be used in a better way. Electronic documents provide the user to be more involved because the documents interface richer information than a physical one. It is up to the user how the information is viewed (Haimes, 1994). Documentations should not only be easy for the employee to read, it shall also be easy and flexible to update (Rentzhog, 1998). Electronic documentations have advantages in distribution of new versions of documents. The dissemination of the documents is facilitating and there are advantageous in managing of versions (Kellner et al, 1998) and furthermore, this technique saves money and time and shifts the methodology to a dynamic and paperless environment (Cochran & King, 1993).

These documents can be of Microsoft Word or PDF format and available to download from a website or be displayed in a web-browser. There exists some hyperlinks facilitating navigating to references to other sections. A table of content may also be presented in order to

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navigate into the process and its content. Electronic documents are constructed in HTML and can easily be maintained and updated (Kellner et al, 1998).

The issue in documenting processes is that to document customers, suppliers, input, output, who is doing what, strengths and weaknesses is a good theoretical approach but very difficult to formulate (Kellner et al, 1998).

3.6 Manage process documentation

A problem with process documentation is that processes tend to change while the documentation remains. One way to maintain a high level of documentation is to evaluate it frequently. Schiesser (2002) has come up with a model for evaluating process documentation. The model consists of ten characteristics of quality and five characteristics of value. The characteristics of quality are:

1. **Ownership**: Rates which degree the three key ownership roles are identified, understood and supported. The three roles are process owner, documentation custodian and technical writer. One person can have all roles, the issue is that every role must be identified.
2. **Readability**: This characteristic rates how well the text in the document is written. How well matches the material the audience?
3. **Accuracy**: Rates the technical accuracy of the material.
4. **Thoroughness**: Is all relevant material included in the documentation?
5. **Format**: Rates the overall organisation of the material. How well it keeps a consistent level of technical depth, how easy it is to follow.
6. **Accessibility**: Rates the ease of accessibility.
7. **Currency**: Rates to what degree the documentation is up-to-date and the frequency with which it is kept current.
8. **Ease of update**: Rates the ease of updating the documentation, including revision dates and distribution of new version.
9. **Effectiveness**: Rates the usability of the documentation including examples, graphics, colour-coding, use on multiple platforms, compliance with existing standards, etc.
10. **Accountability**: Rates how well the documentation is being used by all appropriate users.

The characteristics for value are:

1. **Criticality of the process**: How critical is the process for business success?
2. **Frequency of use**: How frequently is the documentation used or referenced?
3. **Numbers of users**: Describes the variety of different functional areas or skill levels of personnel who is likely to use the documentation.
4. **Variety of users**: Describes the variety of different users who will use the documentation.
5. **Impact of non-use**: Describes the level of impact that will occur if the documentation is not used.

To these characteristics, Schiesser (2002) adds a 0-3 scale for measuring how well each characteristic are met.

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The ratings are:

   3: All aspects of the characteristics have been met or are met.
   2: A significant, though not entire, portion of the characteristic has been or is met.
   1: A small portion of the characteristic has been met.
   0: None or an insignificantly amount of the characteristic has been met.

With this rating system any type of documentation within the area can be evaluated. The maximum quality rating is 30 while the maximum value rating is 15. The benefits with this way of evaluating the documentation is that every process documentation can be shown in a quality/value matrix (see fig 16).
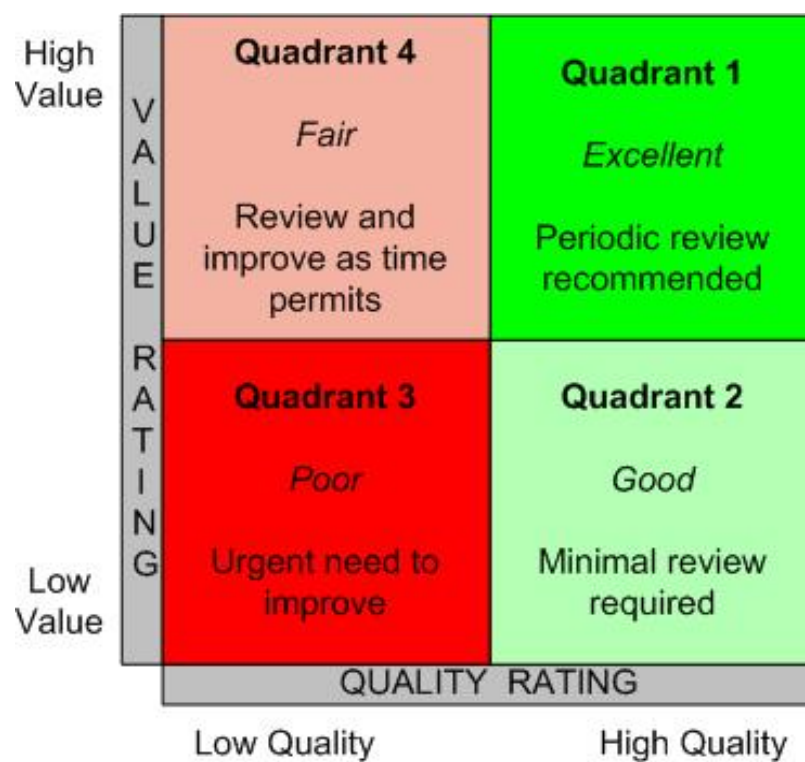
Fig 16: Quality/value matrix (Schiesser, 2002)

The quality ratings are shown on the horizontal axis increasing numerically from 0 to 30. The value ratings are shown on the vertical axis, valued 0 to 15. The matrix is then divided into four quadrants. The upper-right quadrant (1) represents documentation that is both high in value and high in quality. This is the desired place to be in. The lower-right quadrant (2) represents documentation with high quality but lower value. The lower-left quadrant (3) represents documentation with low quality and value. The upper-left quadrant represents documentation that is high in value but low in quality (Schiesser, 2002).

The strength with this matrix is that when you know where in the matrix the documentation is, you know what to improve. You can also see which process documentation that needs urgent improvement.

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4 Empirical result

In this section of the research we introduce the case study. The section starts with facts about Volvo IT and thereafter the result of our performed interviews. We have divided the empirical result in accordance with the theoretical framework in order to facilitate for the reader.

4.1 Case Volvo IT

This section contains secondary data which we collected from Volvo IT: s intranet (Violin) and other sources such as our supervisors at Volvo IT.

4.1.1 History and organization

In 1967, the IT operations included in Volvo was formed together. Later, in 1998, the organization Volvo Information Technology (Volvo IT) was created. In 2001, the IT operations of Renault Trucks and Mack Trucks became integrated parts of Volvo IT. The organization is today a wholly-owned subsidiary of AB Volvo. The head quarter is situated in Gothenburg and there are units in Europe, South America, North America and Asia. The customers of Volvo IT are AB Volvo, Volvo Car Corporation (which is a Ford-owned organization), Elof Hansson AB, Gambro, Kongsberg Automotive, Nobel Biocare, SCA, Skandia and YIT Building Systems. The turnover in 2004 totalled 6.3 billion SEK. Volvo IT consists of 5200 employees including consultants (Violin, 2005).

4.1.2 Long term focus areas

Volvo IT has stated some long term focus areas in which the company will focus on in order to always improve their businesses.

Growth means that the organization strives to increase the business in the Volvo Group's business area and with its partners. There will also be an attempt to advance in the external market, mainly the operational management (Violin, 2005).

Customer satisfaction contains to be professional, enterprising and easy to be doing business with its customers. Through new business opportunities, shorter lead-times, improved delivery precision, quality and cost-efficiency will deliver better value for customers be created (Violin, 2005).

To focus on *global providence* means that Volvo IT will build up a business that effectively supports the global expansion of Volvo Group and simultaneously ensures that the organization utilises possible synergy benefits within their own operations (Violin, 2005).

Volvo IT has received a couple of rewards, where among others were "Sweden's best workplace" and also high ratings in Employee Satisfaction Index, ESI. The focus to be considered as an *attractive workplace* will continue especially within the department of Human Resources (Violin, 2005).

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The newest part of Volvo IT: s long term focus is a focus on *industrial IT* where the aim is to work closer to the customers, offering business and IT-change and moreover, in a deeper participation which helps the customers in their operational strategies and key processes (Violin, 2005).

Figure 17 shows Volvo IT: s long term focuses:
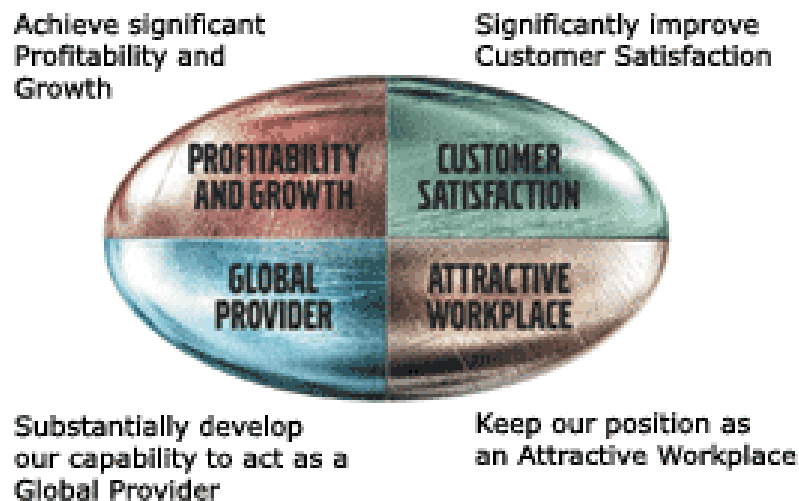
Fig 17: Long term focus areas within Volvo IT (Violin, 2005).

4.1.3 Field of activities

Volvo IT has long experience in using IT for solving industrial issues which has resulted in a separation to other modern IT organizations. Today, Volvo IT is the leading user of information technology in the automotive industry. The main business concept of industrial solutions is to keep complex IT solutions running.

Volvo IT says the organization covers the industrial customer's entire demands of IT solutions in offering (Violin, 2005):

- Product Development
- Sales and Marketing
- After-market
- Manufacturing
- Business Administration
- IT Infrastructure

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The services that Volvo IT provides are divided into three categories:
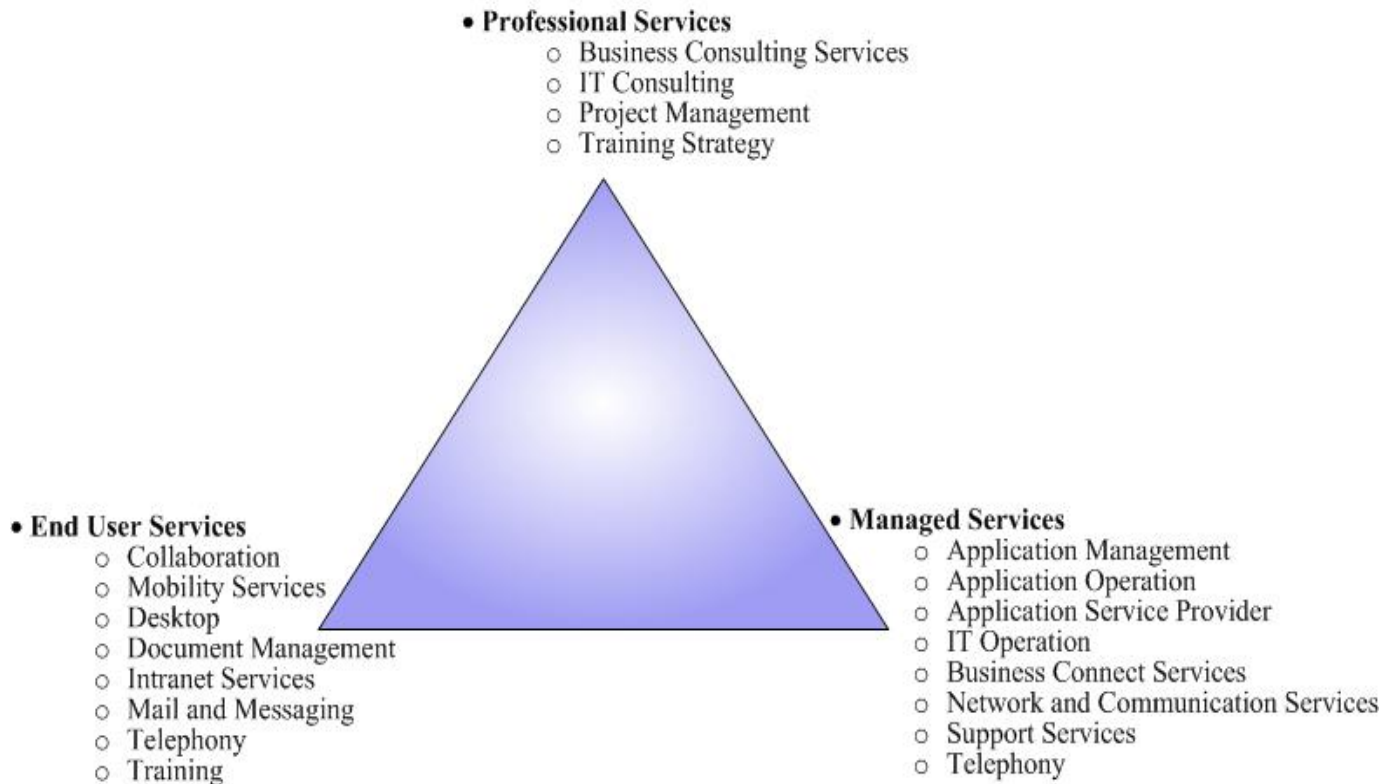
Fig 18: Volvo IT: s provided services (Violin, 2005).

4.1.4 Process documentation at Volvo IT

Today, Volvo IT has no mandatory standard for process documentation. In fact, they have many standards proposed by many different groups within the organization. The merger with Renault Trucks and Macks IT departments has added even more different ways to document processes. In the small department "Global Processes", almost every process is documented in its own way. The way of mapping processes is for example made unstructured where no specific rules for the way of developing documents are formulated. The only place where uniformity can be found is at the highest level of process descriptions. Volvo IT has a quality assurance system called BMS (Business Management System), where the Volvo IT Process Map is found with a brief description of each process and its inputs and outputs (Violin, 2005). See figure 19.

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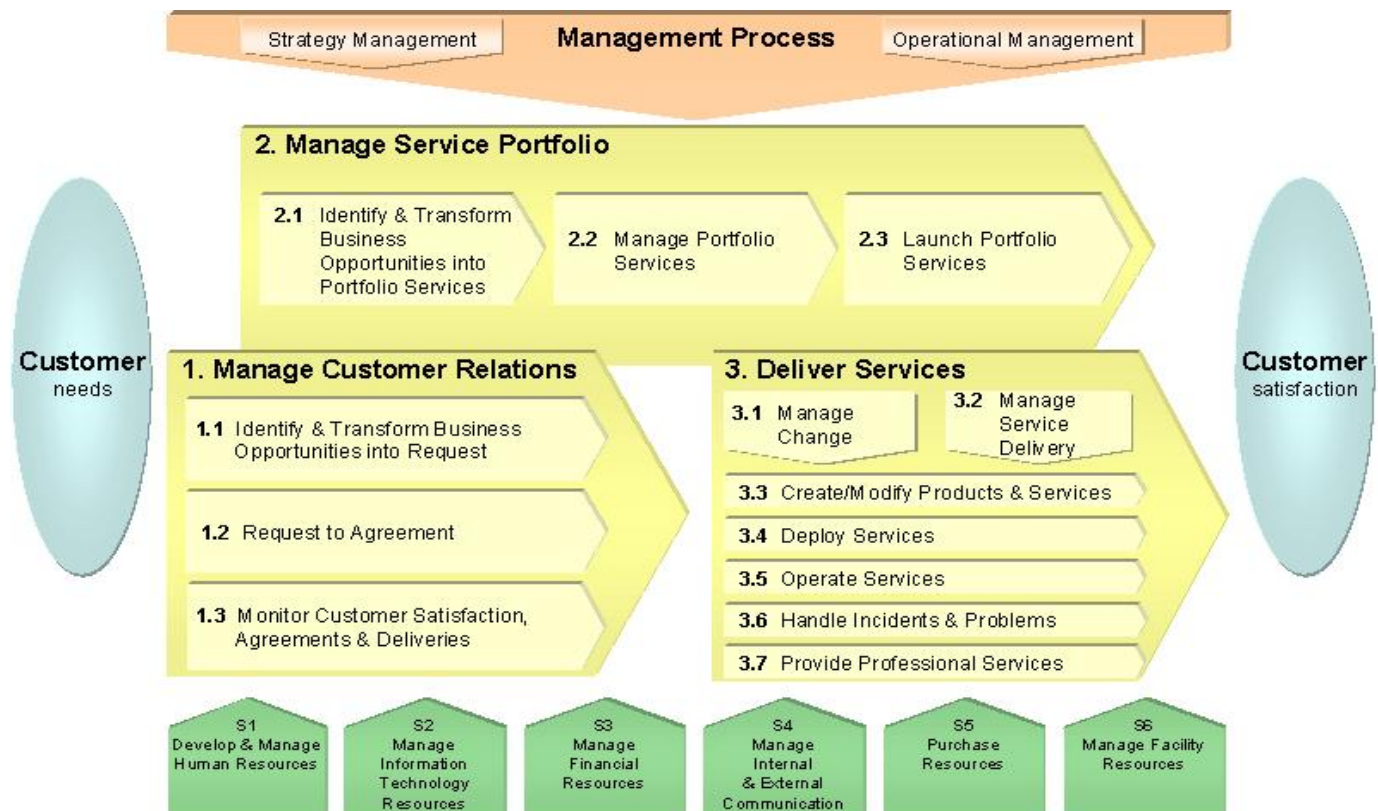
Fig 19: Volvo IT process map (Violin, 2005).

Volvo IT has long been a functional IT organization. With that it means that it has been divided into different departments with responsibilities for a selected function. This leads to departments with a very narrow view of their purpose for the organization. The workforce is not aware of where in the process they are working and what they contribute to the customers in the end of the process. In the past years, Volvo IT has started to implement the processes in the picture above. The main input for this work is the ITIL documentation which is a best practise approach for running an IT organization. The work is far from completed and only a few processes have been implemented. The inexperience from the process view has led to problems in the documentation areas, both the creation of documentation and the use of it.

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4.2 Organisation for process management

Our purpose with this area of research was to investigate how Volvo IT has organized their organization for process management. We wanted to know which roles and what responsibilities that exist for supporting the processes from a top level approach. The first section concerns what kind of apprehension there is within the concept Business Process Management within Volvo IT.

> *One problem is that we work too less with the concept Business Process Management. The organization has not a complete understanding of the concept. (CJ)*

Some respondents would like a better definition of what the aim of process documentation is and how the documentations shall be handled within the organization.

> *A process is not static, it is dynamic. Therefore, the process documentation must follow the evolvement of a process. Today, the documentation does not follow the changes of the reality. (ET)*

> *We have to reproduce the enterprise in a way that the people recognize and in a way where the level of insight will increase. (LD)*

> *Processes must continue to evolve with changing business needs otherwise they become irrelevant. (DB)*

As a solution of this issue, respondent ET argued that a better contact between developers of the process and other workers within the process will solve this issue.

> *Those who are working within the process in the reality must have an intensively collaboration with the developers of the process. (ET)*

Before the starting point of developing process documentation, Volvo IT has to consider what view to represent. Respondent LD argued for this implication:

> *We have to create a view which the user has a use of. To choose the best view is difficult. Customer view? Production view? (LD)*

Other problems of process documentations concerned organizational structures:

> *A problem is that we do not have documentations for all processes. This is a result of that the organizational structure is not yet entire. (CN)*

Another issue is how the documentation shall be used by each employee and in what situation the documentation shall be used.

> *We have an attitude that if it is not written down then I do not have to do it. That is a cultural and maturity issue. (DB)*

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*It is hard to get people to agree with the process management. Some people think
that as soon as the process is implemented, the documentation of it is of no use.
(LD)*

*If people do not work from the documentation, it is often because of lack of
knowledge and the lack of documentation quality. (MB)*

A problem is that many people do not use the process documentation. Instead, they use other
methods for supporting the work. Respondent HL told us about this problem:

*People do not read the process documentation. We need a description for the
user. Those methods that work are when we implement the process in a
supporting tool. People use their own ways to work within the process. (HL)*

4.2.1 Roles within the organization

Volvo IT has a well established official structure for the organization behind the process and
its documentation. The organization uses a lot of roles to perform each process but the official
roles for process management are process owner and process manager.

The process owner's mission is to assure that the process functions with a high level of
quality, efficiency and flexibility in order to exceed the organization and its customer's needs.
The corporation management selects the process owner who has responsibilities, authorities
and qualifications to lead the process development and to monitor and correct the process's
application and results from a holistic view. A global process owner's mission is to make use
of and create benefits from synergies in all places where the process is used. The tasks and the
responsibilities are:

- To decide and approve all development work within the process
- To request measurements data for a process to monitor the application of the process
  anywhere the process is used
- To establish the process scope and interfaces towards other processes
- To find methods for awarding the employees working in the process
- Develop process documentation and performance feedback and arrange education
  about the process
- Responsibility for the assurance that the process fulfils Volvo IT: s quality assurance
  system

The process manager shall support the process owner in his daily work and assure that the
process functions with a high level of quality, efficiency and flexibility in order to exceed the
organization's and its customers needs. Within Volvo IT, a process manager can be appointed
for a specific sub process. The process owner selects the process manager, which has the
responsibilities and authorities the process owner has delegated to him.

On the other hand, the interviews indicated that there is a high level of uncertainty in the area
of responsibilities and tasks. Some respondents have different opinions about the roles and
responsibilities.

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A process owner said he is not satisfied with the way it is working today. Today, the manager has too much responsibility. They are responsible for both development and performance of the process.

> *In their situation they have difficulties in having responsibility for the result of the process […] instead, the process manager should develop the process, the measurements and the process documentation to analyze what could be done better […] the line manager (process owner) should be responsible for the actual results. (MB)*

Another respondent said in the matter:

> *Process owners appoint a process manager which in turn appoints a process team. For this area, POT (Process Orientation Team) has formulated guidance. (CN)*

Many respondents agreed that the process owner has the responsibility for the maintenance of the process (ET, LD, DB).

4.3 Process vision

In this area of research we wanted to clarify how Volvo IT works with the process in a higher level of perspective. We wanted to know how they specify the purpose, scope and boundaries for a process. We also wanted to see how processes interact with each other on a higher level and with other specific areas. Attributes which are necessary for performance of the process are discussed. Measurements and local deviations are also relevant in this area.

Concerning connections between the process and a higher level of perspective, all the respondents agreed that an improvement is needed. The most important change that is required is that all processes must be represented in BMS.

Often, there is a space between the overview and the process itself and there is a need of more detailed specifications to minimize the complexity (HL). Furthermore, respondents emphasized that the overview increases when a relation between the process and BMS is present.

> *It is very important to know where the process is presented in a higher level of perspective, BMS helps with that, but all processes are not described. (RR)*

> *The processes must be connected to BMS which is our tool […] and collect all documents there […] and store the process descriptions in BMS. (RR)*

Respondent IO in Trollhättan told us about the managing of processes in accordance to overarching BMS:

> *We try to connect the required documents from BMS […] we have a list of those documents and we try to connect the documents with respective process. […] It is difficult to take each document and ask: What I shall do? It is better to go to our*

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*own processes and say: Now I am here, what shall I do? This will give us a better
connection to the steering documents in BMS. (IO)*

To gain a higher understanding of the overall perspective, many respondents recommended
that a drill down strategy should be used. On the other hand, some respondents argued that the
drill down strategy should not go to deep. For example, LD quoted:

*Volvo IT has mainly three processes, beneath them there are three-four processes
in each and beneath them there are another two-three processes. That shall be
enough.*

Most of the respondents agreed that an overall picture of the processes is a good way to
achieve a good overview of organization.

*An overall picture of the processes is today difficult see. I would like an
overarching process map which would give me a holistic picture. (HL)*

The respondent (AR) from France said the process itself does not show how the process
exists in a higher level of abstraction. From North Americas point of view, respondent DB
told us that the overriding process map shows the overview of processes, but at a lower level
of processes, they are not obviously tied, which result in an unclear illustration of a common
existence.

4.3.1 Purpose and boundaries

Many respondents told us that a clear specified description of purpose and boundaries helps to
clarify the overview of the process and simultaneously explains the purpose of the process in
a higher perspective. A clear understanding of the process's purpose will explain for whom
the process exists. Respondent HL told us the lack of boundaries within the processes.

It is difficult to know where a process begins and where it ends. (HL)

CN had a concrete answer of where the purpose and boundaries shall be defined:

Purpose and boundaries shall be defined in BMS. (CN)

Further on, CN argued that there is a need of knowing the boundaries between the processes.
Today there is a lack of that.

Respondent IO quoted that purpose and boundaries are important prerequisite to be able to
explain for people working in the process what they should do and why.

Even respondent TE thought that purpose and boundaries are important issues and would like
them visually described in a simple picture.

The implications in defining the purpose of processes are, according to respondent BI, based
in different kinds of process participants:

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*The documentations demand different pictures for different handlings and users.
The process has to have a clear purpose to solve this. (BI)*

4.3.2 Measurements

Measurements are an important part of process management and measurements are a way to
see how the process performs in relation to its purpose and objectives. With this part in the
interviews, we wanted to know how the respondents view measurements. Today,
measurements are performed and presented in some documentations at Volvo IT, but not in a
standardized way and not as a common practice.

Some respondents told us about the implications concerning measurements within
documentations:

*Today, there are no measurements in the documentations that I use. If you can not
measure the process, you can neither manage them. It is the most important
aspect in the process. (MB)*

*Today, the only measurements which are described are if the actual process is
good or not. (MP)*

*The measurements differ between processes. There is no standard of what to be
measured. (TE)*

Respondent TE discussed the need of measurements:

*Measurements are suitable to treat during the development of the process but
maybe unnecessary while I work with the documentation (TE).*

Some respondents had opinions concerning how process measurements will be done
according to strategies.

*You need to connect your process to the strategic ambitions we have at Volvo IT.
The strategic ambitions regard aspects as customer satisfaction, globalization,
growth and industrial IT. Thereby you can find measurements which secure your
process. […] if the process does not facilitate the strategic ambitions we can
doubt the existence of the process […] a better connection is needed. (TE)*

*Measurements need to be described, otherwise the concept process management
will fail, but it is difficult within administrative tasks [...] Measurements of
strategic objectives will be fuzzy. The strategy is an issue in the initial
development of a process and does not need to be described in the documentation.
(LD)*

Other respondents would like to have measurements of other elements:

Measurements as parameters are relevant in process documentations. (RR)

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I would like to have KPI and other targets measured. (DB)

You should measure things that you are worst on in order to always change measurements [...] for example, customer satisfaction is a relevant measurement. (ET)

Respondent CN proves the relation between process manager and process owner within measurements:

Measurements are an issue where process manager and process owner discuss the result of the process. [...] There are two ways of measurements: maturity level of the process (measured in BOD-council) and benefit for the organization (output is measured and presented at a company management meeting).

Other respondents, such as RR, argued that the measurements of processes shall be connected to those who work with the process:

The administrator of the process shall have much connections with the reality to get realistic measurements [...] My suggestion is that the documentation shall be reviewed before the release, so the responsible person of the process sends the documents to his network of people but also independent persons. (RR)

4.3.3 Attributes
We used the theoretical concept attribute when we asked questions concerning how the process shall be connected to tools (e g systems, documents) and how inputs and outputs are described. The attributes are objects which are necessary for the performance of the process. Many respondents answered as respondent MP did. The respondent argued that a process documentation needs to describe as much important things as possible concerning attributes. All information of high importance shall be described.

It is important to describe dependences within the process. You have to clearly define which systems and tools that are connected to the process [...] it shall clearly be defined that in this case of the process, we use a tool which supports the process. [...] otherwise you will not find the actual tool for the process. (HL)

A description of systems will add the documentation a lot of value in many cases but all systems can not be detailed described, only the most important ones. (LD) Another respondent (TE) continued the discussion concerning which systems that should be related to the process documentations:

I would like to have those systems which are established and important for the work. Furthermore, I would like to have systems which are used in strategic decisions described. I would not have optional systems described. (TE)

From a process documentation, it would be good to be able to reach instructions for systems that are used in the process. (RR)

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We use the approach that a tool shall support a process, not the opposite. (IO)

All respondents answered that input and output must be better described and this is one of the most important issues in process management.

4.3.4 Connections

Another issue that clarifies the holistic overview is to clearly specify how the processes interact. Many respondents thought that it is important to show the relations between processes in order to clarify its purpose. These connections are today missing within Volvo IT. Other reasons to show relations to other involved processes are to inform people which processes they depend on and which processes they affect.

With accordance to the lack of connections, respondent MB would like to have better interfaces between processes:

> *I would like to have more clarified interfaces and relations to other processes. (MB)*

Respondent IO argued that connections should be kept simple. Even if there exist connections, only the most important connections shall be described. The most important connections are those which are directly connected to the process such as inputs and outputs.

Respondent MP agreed with respondent IO and said that the processes should be connected via input and output to achieve a holistic view which today has failed to appear. Furthermore, respondent IO manages his work with another ambition which aims to handle each process separately.

> *We have intentionally tried to cut the connections between our processes, because otherwise it becomes too complex. Instead, we try to describe each process by it self. Otherwise we will have so many discussions regarding that "lines" that tires the processes […] discussions tend to treat just dependencies […] that does not give us any value. Instead, we try to see them as separate processes. (IO)*

Respondent BI would like to include more connections then just the input and output and he said that there are many ways to illustrate connections to other processes. All depends on what the developer of the document wants to show. Some connections may be described in textual forms.

> *The connections between processes may also differ depending on the developer of the process. Sometimes, the connections are visual and sometimes they are not. (DB)*

4.3.5 Deviations

In the area of deviations, which means deviations from the global process, we gained mainly two different opinions. The respondents who work actively for a globalization of Volvo IT were against the whole concept of deviations.

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Our ambition is to work in the same way at all sites [...] objects shall be named same in all countries. Avoid local processes and put them at a higher level of abstraction. [...] There are no good reasons to use local deviations within e.g. the "Change process" [...] We will focus on the implementation of a global process map where we globally work in the same way. We standardize the processes. (MB)

We should try to eliminate local procedures for the best of whole Volvo IT. (CN)

The respondents who were working more actively with the processes had another opinion.

It will never work to have a completely global organization because Volvo IT has too many different kinds of customers. It is not possible to adapt all sites to a global structure. (IO)

Respondent IO had a solution to this problem. He thought that the process map should be segmented from a global view, so that local deviations can exist at the lower levels of abstractions but be eliminated at the higher levels. Other respondents argued in the same way:

It is important for local units to be able to connect their local work to the global units and thereby ensure that the local processes support the different components that have to be present for the global flow. (TE)

The aim is that everyone shall follow the global processes and try to eliminate the local ones. But if they exist, we have to assure that the local sites have not copied the global process and made their deviations locally. In that case, they will not be updated when the global process changes. Local deviations will always exist but we have to be sure that the local sites receive up to date information of the changes in the global process. (MP)

Local deviations shall be approved centrally and documented in BMS. But, it is not necessary to have deviations in the global documentation. (BI)

The deviations from the global process shall be described. What differs? (ET)

In Trollhättan, they argue that not all deviations are possible to describe:

Common sense is the best! All deviations are not possible to describe. Those activities that are described do not need to be broken down, just for exceptions. (IO)

In region North America they have the following problem:

Typically no connections to local procedures are noted. It is desired so that we can see how we fit in. (DB)

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There are lacks in documentation which points out when and how deviations are required. For example, which rules let the process worker to diverge from the process?

> *There are lack of rules concerning diverges. Who will decide what is OK to do this diverges? (LD)*

4.3.6 Rules

All the respondents answered that it is important to describe the rules that regulates the process and the work within the process. The rules are different depending on process but it is important to define the rules.

> *Especially the rules of how to finance the process organization is very important. (CN)*

In France, rules are sometimes completely missing in today's documentation:

> *The rules concerning the rationalization of the documentation are missing. Most of the rules are available at our templace. (AR)*

Some respondents thought that SOX rules shall be described in the process.

> *Rules such as SOX should be described. (TE, ET)*

Respondent BI said that SOX demands certain things and that these things shall be considered while designing the process and its rules. Respondent BI also said that it is no benefit in separating the SOX rules from the other rules in the process work.

4.3.7 Roles and responsibilities

In today's documentations at Volvo IT, roles and responsibilities are described for each process but the spread and extent vary. All the respondents answered that a thoroughly description of the roles and responsibilities of the workers in the process must be present (HL, DB, ET, RR, IO, MB, TE). The respondents claimed that roles shall be independent of the line organization.

> *Avoid personal and organizational role descriptions. The roles shall be described from a functional point of view. […] Today, there is a lack in the description of roles and sometime roles are missing. (TE)*

Respondent MB said that when assigning a person to a role, it is a good thing to map the process map to the organization chart to see who is best suited. One respondent said that today's role descriptions and responsibilities are too comprehensive and that they must be better specified (RR). Respondent ET said that the roles must be adapted to SOX. Respondent RR answered that just to present an overview of responsibility is too unclear. Instead, a better specification is needed. Respondent ET suggested roles shall be described as a table with detailed tasks.

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4.4 Process mapping

In this area of questions, our aim was to get opinions from the selected respondents of how they experience the problematic within process maps in documentations. Also, the focus on this area was on the hierarchy of process maps and the use of symbols. Graphical connections between process and other elements, such as attributes or deviations, were also discussed.

> *The hierarchy of levels depends on the purpose. It is better to start top down than bottom up. Do not describe too detailed and with too many levels. It is both time-consuming and cost-consuming. (CJ)*

> *All details shall not be illustrated. The levels of details shall be in accordance to the purpose, and the levels shall be easy to remember. (BI)*

Some respondents discussed the details of the process map. How many levels shall be illustrated and when shall activities turn to instructions/routines?

> *What I call instructions shall not be described. Instead, I need to know in a briefly way what is important to know. A problem is that it is difficult to define "what is important to know" because this differs. (HL)*

> *Instructions can replace the lowest levels of hierarchy. Checklists, word files etc. Those things shall be described in the documentation. (LD)*

Respondent ET argued the process map will show input and output at a high level of abstraction:

> *A process map shall be comprehensive and role based. […] it must tell what input and output is to each process and what the interfaces are. For example, how is delivery and product connected?*

ET continued the discussion about descriptions at lower levels and told us that if a process will be broken down into a very low level, the map will be transformed into routines/instructions, which differ between processes.

> *A description at a lower level should be at a basic and understandable level. If you drill down the process furthermore you may come to an organization dependence because the process will differ from other sites. (ET)*

Many respondents had different opinions concerning the number of levels in the process map. The most common answer was 2-4 levels of hierarchy. The process map will also indicate graphical connections between a process and another process. (AR)

> *I would not go below 3 levels because people stop looking then. (DB)*

> *Before, I had an opinion that you could go down to infinitely number of levels, but nowadays I prefer 2-3, but a maximum of 4 levels is enough. (LD)*

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1,2,3 maybe 4 levels in the hierarchy. Otherwise it is too much work of updating and administration. […] The more people who work with the process, the deeper you have to describe. (TE)

Respondent LD emphasized the hierarchy by his suggestions:

It is important to show how processes connect horizontally. I sometimes use input from another process as a customer and output as a customer […] We also use the method where you start from the top and click down. (LD)

In Trollhättan, respondent IO told us that they use a process map as menu from where the participants can receive a specific process documentation. The process map shall be used as an entrance for all participants. Respondent IO continued the discussion of levels of the process map:

We do not describe to the lowest level of abstraction, instead we offer guidance in order to achieve a value […] our process map contains more than Volvo IT Process Map and our aim with that is to minimize the number of unnecessary levels. (IO)

To illustrate deviations in graphic, respondent CJ described the main flow of activities in a picture and thereafter a description of each deviation for itself and what is happening if they occur.

Some respondents would like a comprehensive process map plus a detailed process map, because the aim of using a process map will differ from persons. Two maps of different abstractions will facilitate the understanding:

One picture is not enough because the levels of activities will differ between processes. Moreover, a process map is subjective. I would like to have one comprehensive map plus one detailed map. (BI)

If there are very many levels of abstraction, maybe all levels do not have to be illustrated in one map even if it is relevant and necessary. (TE)

Respondents MP and TE argued as many others, that the process map shall be pedagogic and well-informed enough to all participants.

The more pedagogic and simple the map is, the deeper you can get without loosing perspective. (TE)

A pedagogic graphical structure which shows where you are in the hierarchy will facilitate the work. (MP)

4.4.1 Symbols

Today there is no usage of standard symbols within Volvo IT. Although POT and other instances (Volvo Group) have created directives for standardized symbols, these directives only cover the comprehensive level of the documentation. The directives are not generally

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accepted among all process developers. All respondents suggested that a standardized usage of symbols would facilitate the usage of process documentation. We also questioned about symbols for attributes.

> *I prefer IDEF when it is up to symbols. Those symbols are good at illustrate structures. I think each company shall choose the symbols that are best for them in accordance to their own experiences. (CJ)*

> *There are some ordinary symbols which Volvo Group has issued. "Fishes" as activity-symbol, document-symbol for documents and database-symbol for stock holding. (TE)*

> *I argue for one symbol for output, meanwhile others want different output-figures for different kinds of output. You can also put names for each output. The number of symbols would be 6-10. (LD)*

> *Systems are represented with a can, thereafter you can use input-output between the activity and the system. (LD)*

> *If we do not have a standardization of symbols, maybe I will mix the symbols with each other by mistake. We need a common visualization […] For example, this symbol means status and this symbol means action etc. (RR)*

Some respondents discussed the importance of separating symbols by the use of different colors:

> *The symbols can be of different colors. We need a standardized way where all process owners decide his symbols uniformed. For example, MCR-process and Delivery-process shall be designed in the same way. (ET)*

> *One united standard is to prefer. I describe objects as blue squares and indicate input and output. Activities are yellow. I also use a symbol for purpose and symbols for supporting documents. (IO)*

Volvo IT strives for ITIL and its ways of documentations and therefore answered respondent HL:

> *If there is a de facto-standard, we shall use that. I would like to use ITIL: s documentations symbols. It would be strange if we did not. (HL)*

Respondent IO told us how the graphical connections between a process and attributes are described in Trollhättan:

> *The supporting documents (guidance) are described as document-figures on which you click and receive documents of how the activities shall practically be performed. Systems and tools are described with the same principles. […] You come directly into the description of the actual tool or system and all this is steered from BMS. (IO)*

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Respondent CJ argued for the same principles:

> *I want to represent attributes at bottom of the process map. Then I can show which activity that belongs to which system. […] Anything that supports the activities shall be described, roles, departments, systems etc. (CJ)*

4.5 Process documentation

Before a deeper definition of how the documentations shall be formulated, some clarifications, regarding for whom the documentation is aimed, have to be taken into consideration. Many respondents were not agreed in defining who the addressees of the documentation are. Some respondents told us that all employees of the organizations are concerned of documentation and that everyone in the organization shall use the documentation, but the knowledge may vary between the employees.

Some respondents argued that everyone in the organization needs to come into contact with process documentations:

> *Those who use the documentation, the whole organization, in other words. Everyone must understand it. (RR)*

> *Everyone who works in the process shall read the documentation, especially new employees. (LD)*

> *All my employees should work with the documentation. Everyone in my team must have knowledge in documentation, because all tasks we perform arise from the documentation. (ET)*

Other respondents´ opinions concerned the roles of the documentation users and the employee's interests:

> *It depends on which role you have in the organization. If you are working as manager, you have to know which processes that flow through the area. The manager has to have superficial knowledge and the workers of the process have to have deeper knowledge […] Irrespective of what role you have, support staff, technician or manager, all employees have to be conscious of the process management view, because this creates value. Everyone needs to know the comprehending level. (MP)*

> *It depends on the employee's interests but everyone has to read it. If you are managing and improving a process, you need to have detailed knowledge. If you just use the process as a part of many other processes you use the documentation at a high level of abstraction. If you work from a holistic point of view, you use it overarching. (TE)*

Other opinions of who the audience of documentation is came up.

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The audience of documentation is those who use it in their daily work. (MB)

As manager for operational support, I do not directly read the documentation, but my fellow workers do. (HL)

A solution of these implications is according to respondent RR different kinds of documentations. One of other arguments of that solution is as RR told us:

As a technician I have to have knowledge in the process. Why do I need to do this change, and why not? […] I have to have knowledge in the causes behind. (RR)

Some respondents continued this discussion with the suggestions of different kinds of documentations in order to facilitate the understanding for different people:

[…] I maybe prefer two kinds of documents for this problem. Sometimes, I need to look back to the documentation and therefore a diminished version of the documentation is required, which I can use for occasional situations. (RR)

In the daily work you need manuals which describe the way of working. We need two separate documents. Everyone needs a comprehensive picture. […] There are implications in getting the people to use the processes with full completeness. […] I would like one thoroughly document plus one document which you use in the daily work. (MB)

4.5.1 The content and structure of process documentation

Many respondents had suggestions concerning improvements of documentations in order to make the documentation easier to use. The answers of improvements were of widely areas:

Pictures are easier to understand. (TE)

It shall be easy and fast to get an overview. (TE)

Documentations are written at such high level that it can be too wildly interpreted or be viewed as irrelevant. […] We need to find someway to augment this and make it real to the users. (DB)

A good documentation shall be easy-read. There are so many readers of the documentations. What is easy for me is maybe difficult for someone else. The most important thing is that you mediate what result you will get. (HL)

According to respondent HL, there are sometimes difficult to specify where in the process you are. This can be made clearer.

Many respondents would like an easier style of writing in documentations which would facilitate the understanding. Also, the choice of language was apparently important:

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Legibleness is an important part. It is not necessary with many words, instead, use a style of writing which all participants will understand. (RR)

The documentations have to be kept simple. Avoid abbreviations and make it easy to understand. Furthermore, avoid too powerful dialects as ITIL, because most of the participants of the documentations do not understand dialects as ITIL. (ET)

Today, we tend to use bombastic phrases. That is not the purpose. You have to mediate the message of the processes. All participants do not have English as native language. (RR)

We have implications within the use of language. Swedish users should read Swedish documentations. […] The user has to understand what is written. (IO)

Other opinions concerned the importance of a well-communicated documentation which shall reach all employees:

The documentation shall be easy accessible and well-communicated to the entire organization. […] As much as possible should be graphical because then you will reach the target faster. […] I would like to see more flowcharts than written text when it is up to process descriptions. I want to click down through levels and see a context. (TE)

My vision is that the process map should exist on the web and behind the map every respective document which describes the process. Both a comprehensive version and a detailed version of each document. Then, the participants could choose one of these documents on the basis of interests. (RR)

[…] In BMS, many processes are hidden, clicks will help the participant to find right document and so on. […] I have tried that many times, but still I have difficulties to succeed. Today's situation is not acceptable. (RR)

I usually put purpose, boundaries and roles in a separate document which the user of the process reaches through clicks on the process/activity. (CJ)

Some respondents found it difficult in finding relevant documents and especially new releases and updates are a problematic issue.

Sometimes, it is difficult to find where the document is and what I am looking for. (AR)

I am missing updates and improvements in today's documentations, but the process has to be changed because of SOX. Yet, this has not been done. (BI)

Often, problems occur in finding the updated version. […] Also, we have problems in the large amount of documents (AR)

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The area of instructions and routines was not a part of the scope but this is an area which we have recognized as a problematic issue within process documentations at Volvo IT. With instructions and routines we mean the actual documents which employees in the process use to perform their work. These are practical descriptions of their work. The instructions and routines vary from different sites.

> *What I miss in today's documentation is detailed routines for the daily work. (MB)*

> *Instructions and routines should not be described in the documentation. (HL)*

> *Today, there is one document for each process. Sometimes, there are manuals and shorter versions of the large document. Although, the full document is the most widely used. (RR)*

At Volvo IT Aero in Trollhättan, they have introduced connections between process descriptions and instructions. These connections are hyperlinks in the documentation where a detailed document is connected to respective activity in the process.

We also wanted to know if guidelines for reading the documentations are present in current documentations and if guidelines are required in process documentations. The respondents had many different views in this area. Respondent HL said.

> *Some documents are easy to follow, others are much harder to interpret. Sometimes it would be good to have a guide for how the document should be read, otherwise it might be several different interpretations depending on who the reader is.*

> *Guides are usually not followed, but it would be good if they were used. (LD)*

Other respondents thought that documentation should be so clear that guidelines would no be necessary.

> *We do not use any guidelines for how to read the documentation, it should be easy enough to read without. (ET)*

4.6 Manage process documentation

With manage process documentation we mean the area of updating, correcting and communicating the documentation. Regarding the managing of process documentation the respondents had quite the same opinions. The respondents thought that the managing is not working properly today. But they had many good ideas of how it can work in the future.

Regarding the area of change management, the respondents had different views of how it should be done.

> *Today process managers are performing the managing, but I am not satisfied. They are actually working more as process developers than process managers. In*

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that situation it is difficult to take responsibility for the process result. […] Today, they are responsible both for the development of the process and the actual result of the process. […] Instead, the process manager should be responsible for only development and the process owner (line manager) should be responsible for the result. […] Local procedures shall be updated by the process manager. (MB)

Respondent HL had a different approach to the local procedures area.

Local process owners should be responsible for updating local procedures. […] It is important that the connection between the local and global responsible persons works in a good way. […] We should have a globally accepted standard for how documentation shall be managed on both global and local level. (HL)

The process owner shall have the responsibility. Practically, the persons with knowledge in the area where changes shall be made should make the changes with the process owner's approval. (LD)

There needs to be a local group at each site. Perhaps the local group should report updates, changes, etc. to one person on the global team. (DB)

Another view in the area is that an administrative group is assigned for the changes in documentation. (ET, RR, IO) Respondent IO expounds this.

Administration is managed continuously. The process manager is responsible for updates, etc. The process manager shall have good contact with the workers in the process. He is also the one who asks about the process and who receives improvement suggestions. […] The process is administrated in the same way as a system with an administration directive. […] For the documents connected to the process documentation they use a documentation managing system. (IO)

The communication of changes in documentation is another important question. Respondent TE said:

The process manager is responsible for developing, establishing and maintaining the documentation. But the problems arise in the communication. It is important to communicate changes and new versions to everybody with interest in the process.

One way to minimize the need for updates is according to respondent MP to only have the most important information in the documentation.

4.7   Special areas of interest

Moreover, the scope of this thesis consists some other areas to be taken into consideration. These areas are SOX, ITIL and Enterprise Architecture. All these areas affect the managing of process documentations at Volvo IT. The areas sometimes demand special routines and also special ways of working within documentations.

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4.7.1 SOX

There are some demands from SOX but not among documentation standards. SOX does not tell what is allowed and what is not allowed. SOX has their own documentation standards and recommendations but those are no demands. […] They argue for clear descriptions of roles and responsibilities. (BI)

SOX's demands are that an external person shall be able to read and understand the documentations in a revision. […] I do not think any special SOX-adaptations are necessary to show in the documentations (BI)

Another respondent (ET) also argued for SOX-adaptations within descriptions of roles and their responsibilities.

4.7.2 ITIL

Because Volvo IT wants to follow the ITIL standard in some degree, it must be some kind of mapping between Volvo IT: s processes and ITIL: s processes. If ITIL changes some of its processes, the decision if Volvo IT will follow with their process or not, must be made, emphasized respondent HL:

Every time ITIL changes its process documentation, we also have to change our. […] We will be more governed in our way of work if we choose to continue in ITIL: s footsteps. (HL)

The danger when using ITIL is that it can make confusion whether we shall follow ITIL: s or Volvo IT: s standard. It must be perfectly clear how the process documentation relates to ITIL, said respondent HL.

4.7.3 Enterprise Architecture

Respondent CJ said that the goal for Enterprise Architecture Team is to coordinate development, and other work within Volvo Group, to cut cost and create value. To make this possible they often have to use process documentation to gain an understanding of how things are done. The team searches for information in many kinds of documentation and it is important that concepts and standards are similar, to avoid confusion. Another important aspect is to find out what differs between different local sites and different departments, in ways of work, structures, use of systems, definition of concepts, etc. This is crucial to their work.

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5 Analysis and discussion

In this part we use the opinions of the respondents together with the theoretical framework. Since this is an analysis and discussion, this part also consist our own opinions.

5.1 Organization for process management

The level of maturity within process management is not enough established at Volvo IT. We have found that confusions are common among respondents. Some employees do not always have full control of their tasks within processes. Furthermore, there are different opinions among the respondents in how the documentations shall be handled. This resulted in answers at different levels among the respondents. With standpoint from the theories, the organization has a common opinion concerning the organizational view. Many departments agree for whom the documentations are made but problems occur within the informational view, because people are not agreed in what relationships a process has to other processes or to BMS.

The behavioral view explains how and when a process is being performed. At Volvo IT, there are process participants who do not use the documentations with standpoint from its purpose. Some participants use their own methods instead of performing their work with use of documentations. To get people using the documentation according its purpose, a strengthening of the behavioral view is required.

Although there are different opinions within the area of roles and responsibilities in the process organization, Volvo IT has well formulated descriptions concerning roles which also agrees with the theories. The theory claims that a process owner is responsible for designing the documentation and he/she also may use a team if the resources are too less. Furthermore, the process owner has the overarching responsibility and not any detailed knowledge in the process. At Volvo IT, we found the same opinions. The process owner's mission is to assure the existence of a process at a higher level in quality efficiency and flexibility.

Theories and, for example, respondent CN argue for that the process owner appoints a process manager who supports the process owner. This is supported by respondent MB who meant that problems occur when the process manager has responsibilities for the result of the process. Instead, the manager should be responsible for developing and for the documentation of the process.

Our opinions within this area are that Volvo IT has a good description of roles with their responsibilities but this description is difficult to comply with. Furthermore, it is difficult to know what is delegated and what is not. Also, there are no rules for how to finance the process organization. Every process runs between many functions, therefore it is difficult to define to which function the financial costs for the process organization belong.

Our recommendation is that the responsibilities are described and documented for each process in order to assure that each function has an assigned supervisor. How to finance the process organization shall also be described. Our suggestion is a separate document, placed at the intranet of Volvo IT (Violin), in which the management persons involved in the process

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and their responsibilities are described. Hyperlinks from each documentation to this document facilitate the dynamic evolvement within documentations. The updates will be easier when the roles and responsibilities are at another place and no changes are needed to be done within the separate process documentation. This specification document will only describe the management of the process (process owner and process manager with their names). The reason of this document is to clarify the outer responsibilities of the process and the delegations of tasks. Finally, the primary goal of this document is for the management of the process, not for the user of the process documentations.

5.2   Process vision

In this area, we define the concept process vision as an overview where the employees can get a holistic view of all processes. Theories claim that process visions are a gathering opinion of objective, measurements and attributes which fulfill the strategies within an organization. Furthermore, the theories claim that purpose and boundaries are important to show and that these are connected to process visions and organizational strategies. Therefore the process vision is important to clearly specify, otherwise the employees within the process do not know how to fulfill the process and what the output is.

Today, at Volvo IT, the purpose of Volvo IT Process Map is to help to explain all the processes in a higher perspective and with the help of BMS, the participant should be able to understand a specific process in a larger context. But, today this is not properly working. Many respondents argued that a specific process does not help to describe itself in a larger context.

Our suggestion is that the global process map shall be better developed, with for example graphical connections between the processes to gain an overarching view of how processes interact. This will lead to a better understanding of the whole company's process vision. This will also explain for the employees where they fit in a higher perspective.

All documentations shall be able to reach from BMS, because this is Volvo IT: s comprehensive quality assurance system and all employees have knowledge in this system and everyone should be able to find in BMS. Furthermore, there is a need to minimize the gap between the process description in BMS and the separate process description. There is a need of having links between the specific documentation and the steering documents from BMS. This will result in a better overview when you will find the steering documents from BMS and the description of the process at one place.

5.2.1 Purpose and boundaries

The theories quoted that purpose of a process and its boundaries are some of the most important issues when you are working with processes. The reasons are that they are directions for further work within the process and they set directions for where and how other processes interact with the actual process.

The empirical study claims that there is lack of purpose and boundaries explanations within existing documentations. Thus this is a crucial area, according to theories, an improvement is required.

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Our suggestion is that in the beginning of the work of documentation, the purpose and boundaries explanation is reviewed by other persons with overarching knowledge of Volvo IT: s processes (e.g. owners of other processes, preferably processes that interact with the actual process). This will counteract the problem of overlapping processes and facilitate the interactions between processes and its documentations. After the description of purpose and boundaries, a section of rules shall be presented.

5.2.2 Connections

The connections between processes are not always easy to identify. Some of them are too detailed and do not help the user to understand the purpose of a specific process. Some respondents would like simple connections with only input and output. Others would like to have more detailed connections described, for example a connection between one activity in one process to one activity in another process.

Our suggestion is to strive for a simple description of how processes are connected thorough input and output, in order to make the overview as simple as possible. Problems will occur if every connection shall be included in the description. It is time-consuming to locate the connections and the document will be fuzzy to interpret. Preferably, the connections shall be visually explained with a picture.

5.2.3 Deviations

Among the established theories about business process management, the area of deviations is not present. One reason might be that the theories are developed with standpoint from smaller companies or not as complex companies as a global IT company. Another reason might be that the theories are not thoroughly tested or implemented. Anyway, our interviews showed this is a serious issue within process documentations.

There is an ambition that Volvo IT shall work globally, which means the work shall be done in same way throughout the world. But, at lower level within process hierarchies, deviations will always exist. For example, routine descriptions will differ between the work on UNIX or mainframe.

Our suggestion is that deviations shall be eliminated through a description of the general process, containing no routines. All routines and deviations can then be accessed through links in the general process documentation. Practically, those who want to reach the routines for how to perform an activity can choose that routine description they need. This also means that routine descriptions can be written by those who know them best and, by approval from the process owner, make them a part of the process documentation.

5.2.4 Roles and responsibilities

Regarding the roles in a specific process, the interviews showed that today's descriptions are not as complete as preferred. The structure and extent of roles and responsibilities also varies between different documentations. The theories points out the importance of thoroughly described roles and their responsibilities.

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Our suggestion is a detailed table for every process. The table shall include tasks and responsibilities for every role in the process and the roles shall be line organization independent.

5.2.5 Attributes

Within the theoretical framework, we named all objects that are needed to perform a process, as attributes. Enablers and controllers such as systems or tools are also a part of attributes.

Many respondents would like to have just those attributes that are most important and mandatory described in the documentation. If unimportant attributes are described, it will cause confusion and a loss of globalization will occur if the local attributes which may differ between sites, will be presented.

Therefore, only those attributes that are common to the process in a global use is required. If there are any other attributes necessary to describe, these shall be connected in the same way as deviations. In other words, describe all necessary and relevant attributes in the documentation and link all specific attributes as deviations. It is not necessary for all sites to know what specific attributes that are used at another site. Of course, strategic attributes are important for the global process and these shall be the same independent of site.

5.2.6 Measurements

According to discussed theories, it is important to measure a process against its objectives. A reason of this is to check that the process fulfills the desired objectives, missions and adaptability of the process, but also Service Level Agreements. Measurements are also concerning effectiveness. Today, measurements are often missing and respondents argued that it is impossible to manage a process if you are not able to measure it. Because measurements often are missing, a natural result is that there is no standard way of measure within documentations.

To give managers a view whether the process is winning or loosing, some respondents would like a better cooperation between the administrator of the process and the employees within the process. This will give more realistic measurements.

Our suggestion is that measurements shall be more standardized. With accordance to the theories, we think Volvo IT has to measure three important areas:

1. How the process contribute to the company's strategic ambitions
2. The internal efficiency of the process
3. The customer's demands on the process

5.3 Process mapping

The theories claim for different approaches of how to drill down process maps. The Volvo IT Process Map is similar to Rentzhog´s research studies process (fig 6). As Rentzhog argues, the phase approach is adequate to use in cases when it is difficult to identify activities and one

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single flow, we argue the Volvo IT Process Map is using the phase approach in a proper way. With standpoint from the empirical result, we know that the overall process map is widely accepted but still, we can find some reasons to change Volvo IT Process Map. Some respondents are missing the connections between the processes within the three main areas. We suggest a combination of the phase approach and the vertical approach, by Sjögren & Zenk (fig 4). The vertical approach could be used within the three main processes of Volvo IT Process Map for a better understanding of the flow between processes.

On the basis of the empirical result, respondents argued for a better communication within the comprehensive process map and would like all processes to be accessible from Volvo IT Process Map. Here from, it shall be possible to choose a specific process with the use of a hyperlink to enter that process and its documentation. After a click, an overview level of a process shall be shown. The overview level shall be of the vertical approach but if the process handles different kinds of cases that have differences, a combination of vertical and horizontal approach (fig 8) is used in order to visualize the flow for different cases. According to IDEF0 and Hunt, a maximum of six activities at each level is recommended. But if there is a need of an alternative flow, for example by a decision point, a use of another six activities is allowed. This map is equal to the level of 'sub process' according to Harrington (fig 9). One important issue to consider while designing the process map is that it has to be readable. Many respondents´ opinions were that, when all possible flows are described, the process maps become too fuzzy. Rentzhog solves this problem with the use of the Pareto principal. Practically, when designing process maps, 20 percent of the actual activities can describe 80 percent of the actual cases. This approach will counteract the fuzziness within process maps.

The empirical study showed that a maximum of three or four levels of hierarchy was requested. The reason might be that many respondents work at a higher level in the organization and we suppose some of them did not understand that our scope covers the work from the top to the absolute bottom. Those who work further down in the organization proposed for two versions of process documentation and we interpreted this result as two different demands. To meet these demands, we suggest two versions of verbal documents and one overview level of map that can be drilled down into a complete version.

The overview level covers only one level. Next level is equal to the level of 'activities', with accordance to Harrington (fig 9). This view is a complete level of the process which view is designed in same way as the overview level, but can be drilled further down into more levels if there is a need.

The last level which in Harrington's model (fig 9) is represented as 'tasks', is used when there is a need of more specific details (e.g. work instructions) of the process which might differ between sites, systems etc. This level may, for example, be expressed with checklists or simple verbal descriptions. In this view, areas of deviations are expressed. To enter this level, links from the complete level shall be used. This level is not the process owner's responsibility to explain, but to make sure of its existence.

Both the overview level and the complete level shall be graphical and work as an entrance for the users of the processes. An advantage of using these graphical maps is that the user clearly understands the boundaries of a specific process. The graphical maps easily indicate what

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parts are included in the process and what parts are outside. Appendix A shows the structure between Volvo IT Process Map, overview level, complete levels and work instructions.

The overview level and complete level shall be presented electronic and the issue is how to handle windows. All windows must be well-structured to minimize the complexity.

5.3.1 Overview level

As requested by the respondents and also discussed by Harrington, a briefly understanding of the process without too much information is important. Therefore, an overview level of each process is necessary. The level is structured with the process map at the top. Input and output to/from the whole process shall be visualized. Also, what is the input? What is the output? Where does it come from? What shall it be used for? In other words, to show where the process exists in a larger perspective. The thoughts of this design are similar to IDEF0 (fig 13) where steering documents come from top and attributes from the bottom. Input enters from left and output flows out from the right side of the map.

All activities shall be named with numbers. According to IDEF0, it is important to define activities, and today, Volvo IT Process Map has a numbering system which we suggest to continue with. If for example, 3.5 'Operate Services' is described, the first activity shall be numbered 3.5.1 and so on.

At the overview level, we would like to have a small picture of Volvo IT Process Map which highlights the actual process, in order to gain a better overview. In today's documentations, the overview is a missing part.

Some respondents use swim lanes to show the use of attributes in process documentations which we also prefer. Icons in respective swim lane will make the reader able to know what attributes that are used in respective activity. The icon shall be linked to a description of the attribute and in some cases a manual. We suggest this extraordinary variant to present connections to attributes, roles etc graphical.

The empirical study indicated a need of different colors within the activity symbols. Earlier, we discussed that sometimes when a flow comes to a decision point, an alternative flow is needed. To avoid a mess when the links between an activity and an attribute are described, the first activity symbols of the first flow shall have another color than the activity symbols of the second flow. At the overview level, only the most important systems, tools and roles shall be described. For example, only systems that are used within the whole process and only teams or groups with people are described.

All respondents agreed that the choice of symbols is not the most important issue. More important is that the symbols that are used are of a standardized way. We have not decided any standard symbols. But, we argue for as few symbols as possible.

Some symbols that also are used within theories are those we use in the example (Appendix A). The symbols are based on IDEF0 and also some symbols suggested by Harrington. Other symbols presented in the theories (Harrington; Harrell & Field) are superfluous and they also decrease the comprehending of a process map. Instead of using many symbols in the process

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map, we suggest that the user of the documentation shall be able to see a snapshot of an activity when the mouse pointer is put on the activity symbol. These short descriptions shall substitute many symbols that theorists suggest are adequate.

Above the map, links to steering documents in BMS shall be visualized and also a link to the verbal descriptions with the overview version and the complete version (which we will discuss further on). A link to the description of the process administration roles will also be available, to make it easier for the user to interact with the managers of the process.

5.3.2 Complete levels

As the overview levels works as a comprehensive understanding for the users, in order to give a briefly insight of the process, the aim of the complete version is to give the user a better and detailed description of the process. From the overview levels, it shall be possible to click on an activity which takes the user to the complete level.

The complete levels allow presenting all levels of hierarchy between the overview level and the level of work instructions and deviations. As theories claim, different processes need to be modeled in different ways. We recommend that the structure from the overview level is followed within the complete levels but with the differences explained below.

Connections to other processes at these levels are more detailed described. For example, connections to/from single activities can be shown. The activity or process that is connected will be represented below the flows and be marked with its notation number. The connections will be arrows, and a link will be available in order to reach the full documentation for the related process or activity.

In the overview version, the overview was represented with a snapshot of Volvo IT Process Map. When the numbers of levels increase, it will be too fuzzy if the picture is complete. Instead, a tree structure as the one in IDEF0 (fig 15) will be used to show where in the overall process map, the process or activity is located.

Links to other documents, principles of process hierarchy, symbols etc shall be of the same structure as the overview level. Attributes and its connections to the activities will also be of same structure except the difference that more attributes will be available as the depth of the process increases and the description of attributes must in the complete levels cover the whole explanation of the process.

When the process is drilled down as far as it reaches a level where the description can not be general, because of e.g. differences between how to perform certain activities in different systems, the rest of the process will be described as work instructions. Here stops the process administration's responsibilities of the development of descriptions. The work instructions will be made by someone who has deep knowledge in the area to be explained. It will then be the process administration's responsibilities to make the description available for the public. According to Nyström´s model (fig 10), the management of a process can only describe the process to a certain level. The respondents claimed that this level can be moved further down, if a close relationship is introduced between the workers in the process and the management.

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We agree with the respondents, and that is why the process administration will be responsible for such a deep description.

What is discussed in this section concerning process mapping, is presented by a figure in appendix B. The figure shows the overview level, but as discussed, the same graphical principles apply to the complete levels. With the picture, we only want to show *an example* of how the overview level *can be* presented.

5.4   Process documentation

As we discussed in previous section, the result is also two versions of verbal process documentations. The empirical result showed that the whole organization has an interest in process documentations but furthermore, we have also found two different kinds of target groups, which have different aims with the use of the documentation. Also, theories claim an advantage of verbal documentations, which is that the user is able to complement the graphical descriptions for further information by text information. Another advantage is that the user is able to print the documentation.

According to the theories, a broadness of the documentation is important, which the overview level will give. To achieve the deepness, the complete version is preferable to use.

Also, theories claim that process documentations consist narrative text and more detailed diagrams and connections. Therefore, we suggest a document for the overview level and a document for the complete levels. Respondents argued for both simple text and pictures in the documents. If complex pictures are presented, a short explanation with text is a requirement.

A huge problem is that documentations are too difficult to understand and there are also problems within the choice of language. Theories claim that a documentation must be auditable in order to give an understanding for many people with different kinds of backgrounds. Our suggestion is to use as simple English words as possible and to take into consideration that the users of the documentations are not specialists of the area, and that all employees of the organization are users.

Today, documentations are presented electronic which, according to theories, is the best way to present in order to communicate to the whole organization. The ease of distribution of updates is an advantage with electronic documentations and we see no advantages in distributing documentations physically and therefore, we have no objections to any changes of the communicational method.

In the empirical result the respondents argued for guidelines for the usage of documentations. Our suggestion is that an explanation of how the document is organized within the introduction section of each verbal documentation will solve that issue. The aim of the documentation is that it shall be as logic and structured that no misunderstandings will occur.

5.4.1 Content of the documents

The empirical result showed that two versions of the verbal description are needed, named overview and complete document. The documents shall contain the same content as the

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previous analysis and shall work as a substitute and also as a complement to the graphical versions. The empirical result focused on some fundamental areas that respondents thought are important to have described within each process documentation. With accordance to the theories, the empirical result and previous analysis, these headlines (except for the last one), shall be the same within the both versions of the documents:

- **Introduction:** All information for the actual document and other important information that is needed to completely understand the document shall be described. For example, how the document is organized, short instructions of how to read the document, documentation management history, abbreviations, definitions and a description of how to interpret the process maps.

- **Purpose and boundaries:** Purpose and boundaries shall be explained verbally.

- **Process overview:** The management level of the process graphically described with verbal description of each activity and its inputs and outputs.

- **Rules:** All the rules concerning the process shall be described. For example, generic rules, responsibility rules etc.

- **Connections and relations:** Connections to other processes or activities shall be verbally described.

- **Roles and responsibilities:** A table with roles, their tasks and responsibilities shall be presented.

- **Enablers:** Attributes as systems, tools, documents etc shall be described.

- **Measurements:** All measurements shall be described.

- **Complete process map:** The complete version of the process map and a verbal description of each activity and its inputs and outputs, in every level. This headline shall not be presented in the overview version.

The difference between the two versions of verbal description, except the last headline 'Complete process map', is that the five headlines: rules, connections and relations, roles and responsibilities and enablers will differ in depth. The overview version will only include rules, connections and relations, roles and responsibilities and enablers that can be related to the process overview map.

5.5 Manage process documentation

The empirical result indicated that a process documentation must be evolvable and changeable with its environment. Some respondents argued that processes are not static, instead they are dynamic and need to reproduce the enterprise and evolve with changing business needs. These arguments definitely agree with the theories (Fowler & Rifkin; Schiesser).

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There is a need for better interaction and collaboration between the employees within the process and the developers of the process and the documentation. This will help to fill the gap between the reality and the documentation. There is also, as mentioned before, a need for better description of the responsibilities for the people managing the process. This, very much, concerns the managing of the documentation. The document of roles and responsibilities described above would solve this problem. This document will also help people to suggest changes and updates in the documentation.

The respondents argued for a globally accepted standard for measuring the documentations. The theories also argue that a process documentation shall include measurements, but also be measured. Therefore, we would like to use the model by Schiesser which aims to define the quality of a process documentation.

Our recommendation is that Volvo IT uses Schiesser's model to its full extent, except for the first characteristic of usability which is 'Ownership'. This characteristic must be adapted to Volvo IT: s own roles for managing. With this model, Volvo IT knows which process documentation to improve and what to improve.

It is not enough to have a good model for valuation, if the valuation is not made regularly. The theories have not any recommendations of how often the documentation shall be valuated, but the respondents had some suggestions. With this as guidance, we suggest that all documentations need at least one evaluation per year and after a major change an evaluation should be made as well. The previous discussed areas in the analysis of this thesis consistently concerns all ten characteristics of the model and if these areas will improved as suggested, better scores within the managing model will be achieved.

5.6 Special areas of interest

Because there are no common accepted theories that focus on how these special areas affect process documentation, this part of the analysis is based on the respondents´ opinions and expertise of these areas.

The experts within SOX claimed that SOX has no demands for a specific documentation standard. SOX quotes that clear descriptions for roles and responsibilities are required and another demand is that those people who conduct an audit must be able to clearly understand how the process is performed. Both of these demands fulfils through previous analysis in this thesis.

For some people, mainly the managers, it may be important to know which Volvo IT-process that corresponds to respective ITIL-process. Our suggestions are that this corresponding shall briefly be described within the introduction of the process documentation and necessary links to the corresponding ITIL process. Because ITIL is global accepted best practice, it is necessary to compare and maybe develop a process with the guidance of ITIL, if it is necessary. Also, another reason is that Volvo IT strives to use ITIL further on.

The problems Enterprise Architecture Team encountered are that there are differences within process documentations. Furthermore, definitions and concepts differ. This is a problem

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because their tasks are to investigate and compare different areas. The occurring problems will be eliminated if a standardized process documentation, as we have suggested, is used. The advantages are that concepts, symbols, maps, etc will always be the same, irrespective of what processes they are investigating.

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6 Conclusion

The last section of the thesis is a summary of the analysis and discussion part. The conclusion is formulated as a requirements specification and shall answer the problem statement of the thesis. To answer the problem statement, we also formulated five sub questions, which represent the structure of the requirements specification.

How shall the organisation supporting the actual work with business process documentation be designed?

1. The organization itself shall be designed as explained in the empirical study, but areas of responsibility shall be described in a separate document. This document, placed at Volvo IT: s intranet (Violin), will describe the management roles and their tasks and responsibilities. The document shall also include how to finance the process organization.

2. The document shall be accessible from every single process documentation that is concerned of the management roles.

What shall be included in the process vision to make the process as complete as possible?

3. Graphical connections (where it is possible) between processes within Volvo IT Process Map.

4. All process documentations shall be able to reach from BMS Also, the steering documents concerning the specific process shall be reachable from each process documentation.

5. The purpose and boundaries must be clearly identified and must be reviewed by other stakeholders, such as owners and managers of nearby processes before continuing the development of the process.

6. Easy-read and visually described connections. At an overview level, only the most important levels of connections shall be described. As the depth increase, the connections must be more advanced in order to give a complete picture.

7. Work instructions must be able to connect to the process documentation, like the lowest level. The reader must be able to choose a specific work instruction among other work instructions. The work instructions shall be written by those who know them best and be integrated by approval.

8. All roles and responsibilities of the work in the actual processes shall be clearly described and shall be line organization independent.

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9. At an overview level, only the most important attributes shall be described. As the depth increase, the detail level will increase. Non-global or other specific attributes shall not be represented in the process documentations except as work instructions.

10. The process must be measured in three important areas:
    a. How the process contribute to the company's strategic ambitions
    b. The internal efficiency of the process
    c. The customer's demands on the process

How shall a process map be designed to best explain the vision of a process?

11. Every process needs an overview level and complete levels. The overview level covers only the uppermost level which will give a clear overview of the process without any fuzziness. If the reader needs more detailed descriptions, complete levels are available for further and deeper information of each activity. Complete levels shall be of same structure as overview level. After the complete levels, the work instructions are described outside the process. (Appendix A)

12. Every level must explain input, output, where the input comes from and what the output is used for.

13. The maps shall be constructed with accordance of vertical approach and follow the IDEF0 standard where it is possible.

14. Every activity shall be numbered in sequel of Volvo IT Process Map.

15. At the overview level, a small picture of Volvo IT Process Map with the actual process highlighted shall be available. At the complete levels, a tree structure shall be available.

16. Both levels shall be structured with swim lanes at the bottom in order to represent attributes.

17. Above the maps, steering documents shall be indicated with links and also links to the document versions of the processes. Also, links to the corresponding process within ITIL shall be presented.

18. A standardized way of modelling symbols is required to be used within all maps.

How shall the three areas above be documented to gain the highest level of understanding for the whole of business process management in an organisation?

19. Two verbal documents (overview and complete) shall explain the graphical levels more verbally.

20. The headlines shall be: Introduction, Purpose and boundaries, Process overview, Rules, Connections and relations, Roles and responsibilities, Enablers, Measurements, Complete process map (not in the overview version).

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How shall the continuous work with process documentation be managed?

> 21. The documentation shall be evaluated continuously, once a year or after major changes, with an evaluation model such as Schiesser´s quality/value matrix.

In order to be successful in all aspects of business process management, education among the employees is a must. During our research, we gained many different views of how process work should be conducted at Volvo IT. The view of business process management needs to be unified among the employees. An example of this is that respondents had different opinions concerning who the users of process documentations are. One way to facilitate this problem is to have a clear and understandable process management system.

Our research has raised some questions outside our scope that could be subjects for further research within the area of process documentation. The area of deviations is one of the most interesting areas. At Volvo IT, they claim that the use of deviations is a way of the past, but many other global organizations have deviations in their processes. For example, some organizations have one global process manager with responsibility for the process in a global perspective. In addition to that person, they have local process managers with responsibility for the process on a local level. Often, there is a difference among the local processes. This is an area that has not been completely studied in the academic world. How these deviations shall be documented is an important issue where they occur.

Another area of interest is to study which symbols that are the most widely accepted, in order to gain the level of understanding by the readers of the documentation.

7   Self criticism

In the beginning of the pre study, we received a project assignment specification (which included scope, expected results, delimitation etc) from the steering committee and the supervisors at Volvo IT. With that assignment, a wished way of working was attached. Although we had an assignment specification and a steering committee within the project, we have been allowed to steer the project a lot by ourselves. The project was conducted in consultation with the supervisors but managed by us. This study and its result are unique. Other researchers would surely find other conclusions in a similar study because everything depends on where the researchers put their focus. Other interview questions would presumably lead to another empirical result which results in other conclusions and so on. But one sure thing is that although the concrete conclusions would differ, all researchers would definitely find the most overarching and elementary problems within process documentations that are discussed in this thesis. Also, our conclusions would differ if we for example had followed the assignment specification strictly. The initial target of the project was to create a standardized way of foremost process maps, symbols etc. With time, we realized that there were more important all-embracing problems to focus on. Therefore, a requirements specification was created instead of a standardized way for documenting processes.

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8 References

8.1 Books and articles

Aguilar, M., Pater, A & Rautert, T. (1999). Business Process Simulation: A Fundamental Step Supporting Process Centered Management. *Proceedings of the 1999 Winter Simulation Conference. SCS,* 1383-1392

Anjard, R. (1998). Process Mapping: a valuable tool for construction management and other professionals. *Facilities, 16*, 79-81.

Backman, J. (1998). *Rapporter och uppsatser.* Lund: Studentlitteratur.

Bal, J. (1998). Process Analysis Tools for Process Improvement. *The TQM Magazine*, *10*, 342-354.

Curtis, B., Kellner, M I & Over, J. (1992). Process Modeling. *Communications of the ACM, 9.*

Davenport, T H. (1993). *Process Innovation.* Boston: Harvard Business School Press.

Denscombe, M. (2000). *Forskningshandboken.* Studentlitteratur: Lund

Dourish, P., Bentley, R., Jones, R & MacLean, A. (1999). Getting Some Perspective: Using Process Descriptions to Index Document History. *ACM*

Easterby-Smith, M., Thorpe, R & Lowe, A. (2002). *Management Research – An Introduction.* London: SAGE Publications.

Fowler, P & Rifkin, S. (1990). Software Engineering Process Group Guide. Software Engineering Institute.

Giagilis, G M., Doukikidis, G I & Paul, R J. (1996). Simulation for Intra- and Inter-Organisational Business Process Modelling. *Proceedings of the 1996 Winter Simulation Conference.*

Haimes, R. (1994). Document Interfaces. *Interactions*. Boston.

Hammer, M. (1996). *Beyond Reengineering*. HarperCollins Publishers, Inc: New York

Harrell, C R & Field. K C. (1996). Integrating Process Mapping and Simulation. *Proceedings of the 1996 Winter Simulation Conference.*

Harrington, Dr H J. (1991). *Business Process Improvement – The Breakthrough Strategy for Total Quality, Productivity and Completeness.* McGraw-Hill.

Holme, I.M & Solvang, B.K. (1997). *Forskningsmetodik: om kvalitativa och kvantitativa metoder.* Lund: Studentlitteratur.

School of Economics and
Commercial Law
University of Gothenburg
Department of Informatics

**The Process of
Process Documentation**

Mikael Ene
Christoffer Persson

Hunt, D. (1996). *Process Mapping*. New York: John Wiley & Sons, Inc.

Jones, C R. (1994). Improving Your Key Business Processes. *The TQM Magazine, 6*, 25-29.

Kellner, MI., Becker-Kornstaedt, U., Riddle, W E., Tomal, J & Verlage, M. (1998). Process Guides: Effective Guidance for Process Participants. *Proceedings of the Fifth International Conference on the Software Process.*

Nilsson, U. (2000). *Effektiv dokumentation.* Stockholm: SIS Forum.

Nyström, A. (1999). *Processen till framgång – hur ett svenskt företag lyckades med processorientering i praktiken.* Konsultföretaget, Uppsala Publishing House AB, Uppsala

van Rensberg, Dr A. (1998). A Framework for Business Process Management. *Computer ind. Engng, 35,* 217-220.

Rentzhog, O. (1998). *Processorientering – en grund för morgondagens organisationer.* Studentlitteratur: Lund

Scheisser, R. (2002). *IT Systems Management*. Upper Saddle River: Prentice Hall.

Willoch, B-E. (1994). *Business Process Reengineering – En praktisk introduktion och vägledning*. Stockholm: Docendo Läromedel AB

Zairi, M. (1997). Business Process Management: a Boundaryless Approach to Modern Competiveness. *Business Process Management Journal*, *3*, 64-80
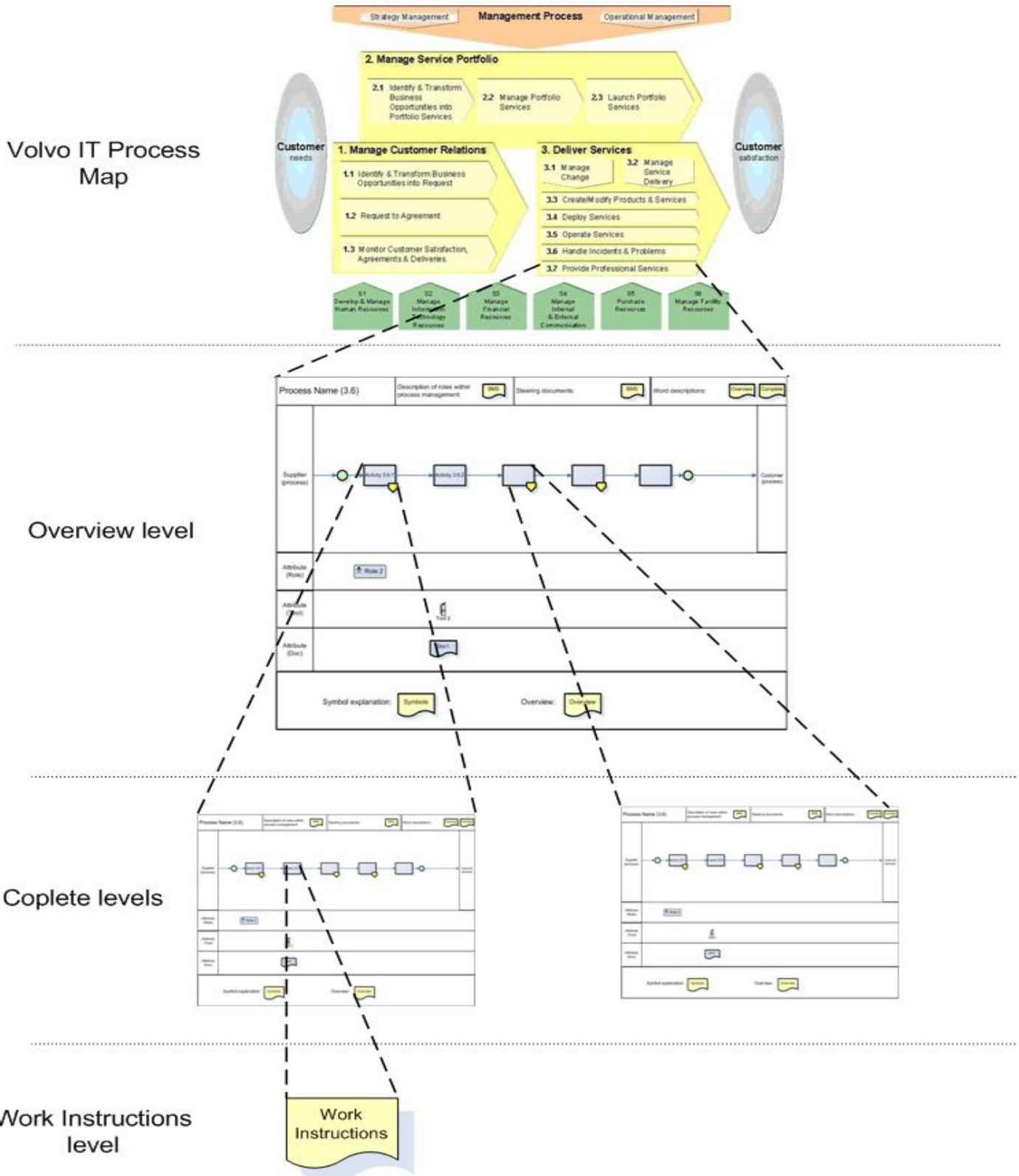
8.2 Publication
IDEF0 Method Report, (1993). "Integration Definition for Function Modeling (IDEF0)". *Draft Federal Information Processing Standards Publication 183*.
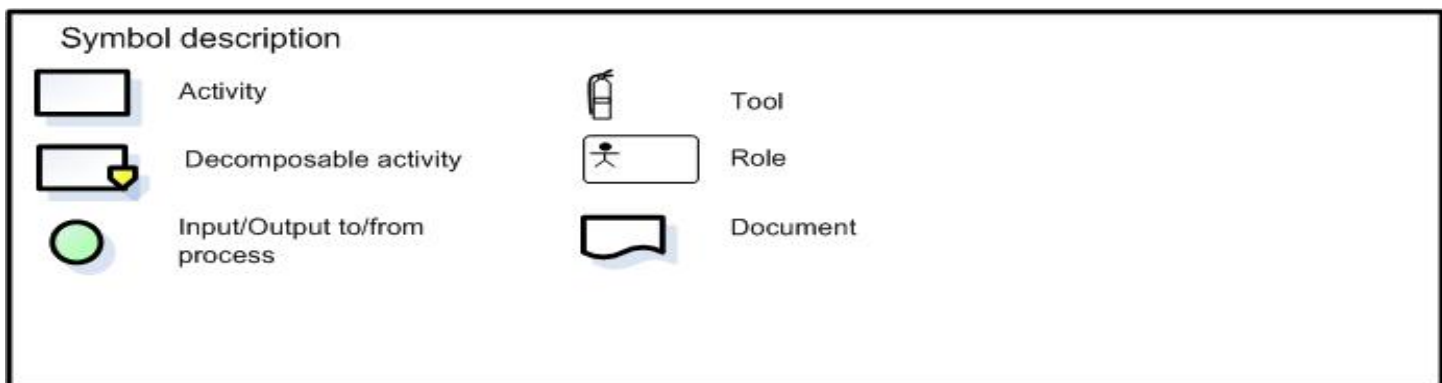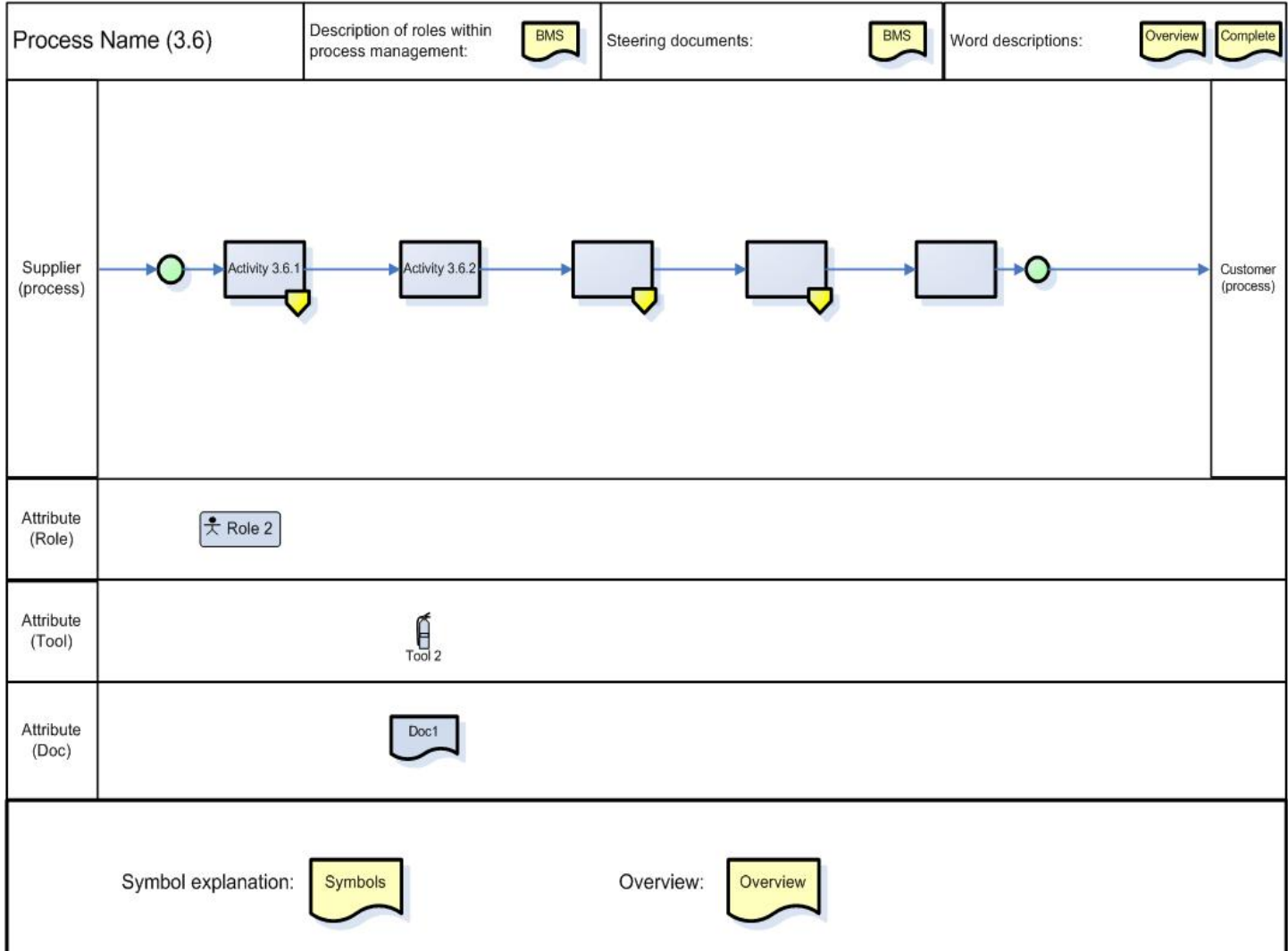
8.3 Intranet
Violin (2005). Volvo IT:s intranet. Available: [2005 2nd of Mars]

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Appendix A
Example of structure

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Appendix B
Example of overview level

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Appendix C
Interview questions

Introductory questions

- How long have you been working with processes?
- Which department are you working for?
- Where is your office located?
- What is your formal position?
- Describe your job - What is your assignment?
- Which processes do you get in touch with?

Organization for process management
- Regarding the organisation and roles supporting the process – What is good to have in the documentation?

Process vision
- Do you think that the documentation shows how the process exists in a larger context?
- Is there a clear overview of the content in the documentation?
- Is it clear what the purpose and scope is, for the process?
- Are there any connections to other processes visual?
- Are there any connections to local procedures? Is it desired?
- How shall measurements be clarified in the documentation?

Process mapping
- Are there any problems in navigating within the documentation?
- How detailed should a process map be?
- What should be present in the actual map?
- How many levels should a map is broken down in?
- Which symbols and standard do you consider is the most widely spread?

Process documentation

- Are there any guidelines for how you could use the documentation?
- What is missing in the documentation?
- How do you think the maintenance of the process documentation shall be performed?