A SMOOTH DOCUMENTATION PROCESS –
A DREAM OR A REALITY:
A CASE STUDY OF THE DOCUMENTATION PROCESS
AT RAUTE WOOD NASTOLA
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Käännöstieteen laitos

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a Case Study of the Documentation Process at Raute Wood Nastola

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Työn tavoitteena on kehittää dokumentointiprosessimalli, joka soveltuu tutkittavaan yritykseen ja jonka avulla yrityksessä varmistetaan korkealaatuiset asiakasdokumentit ja niiden toimittaminen asiakkaalle ajallaan. Tutkimuksessa esitellään sekä teoriatausta dokumentointiprosessin kehittämiselle että tarkastellaan dokumentointia yhtenä prosessin osana Raute Woodissa. Teoriaa soveltaen on pyritty luomaan vahva runko dokumentointiprosessille, jossa on huomioitu prosessin nykytilanne ja lähtökohdat sen kehittämiselle. Tutkimuksen tuloksia raportoitaessa on tähdätty mahdollisimman monipuoliseen prosessin eri vaiheet kattavaan esitykseen. Ratkaisumalleissa pääpaino on kuitenkin nykyisessä käytännössä havaittuissa ongelmissa.

Yhtenä osana tutkimusta on kartoitettu asentajanmapin sisältö ja sen ohjautuminen projektin aikana. Tätä tutkimuksen osaa varten haastateltiin asentajia ja projektinhoitajia. Haastattelujen perusteella mapin sisältö ohjeistettiin, sekä määritettiin sisältöön kuuluvien dokumenttien tuottajat ja toimittajat eli dokumenteista vastuussa olevat henkilöt.

AVAINSANAT: dokumentointi, dokumentointiprosessi, asentajanmappi
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1 INTRODUCTION

This Master’s Thesis is the result of cooperation with Raute Wood. The main goal of the study is to explore the characteristics of a smooth documentation process so that the high quality of documents can be achieved in each project. The subject of the study is approached from two viewpoints: the theoretical and the practical. In other words, theory is compared with how a documentation process is managed in practice at Raute Wood Nastola. The study was carried out during a period of seven months.

The objective of this study is to develop the documentation process at Raute Wood Nastola (RWN). RWN is the largest section of the Raute Wood business group. Other sections and the other business group, Raute Precision, are excluded from this study. The model for a documentation process is designed especially for RWN and thus, it cannot be adopted as such in other sections of Raute Group without any modifications.

This study aims at answering the following question: How should a documentation process be managed so that it would run smoothly and that the outcome would satisfy the customer in every project? The main focus is on the process and not on the documents or on their contents. There are also many other areas of interest that could have been included in the study but which had to be left out since the time was limited. These include user and task analysis, terminology work and a thorough look at the wide range of document production tools, although I will touch upon this area in chapter 4.

The qualitative method is used in this study. To be more precise, this is a case study about the documentation process at RWN. There is also a subcase which is one fragment of the documentation process and which was taken under closer inspection. It is a good representative of the types of documents that are produced in the course of a project. The subcase in this study is the installation manual. An installation manual is a folder or a series of folders that contains all the
information a mechanic or an electrician needs when he\(^1\) is installing or supervising an installation of a production line. The term *installation manual* was chosen since there is no established English equivalent for the Finnish term *asentajanmappi*. The term used was chosen since it is user independent; it includes both the mechanics and electricians as users regardless of their status at the installation site (supervising or not).

The study material was gathered by interviews. I interviewed mechanics, electricians, project managers, designers and a translator. The interviews were used in order to get information about the installation process and also about the documentation process as a whole. The interviews and the results will be presented and discussed in chapter 4.

This study continues the development work on documentation at RWN which Sari Pehkonen started in 1998. She did a survey on customers’ opinions on project documents produced by RWN and she also concentrated on the documents themselves and their content. (Pehkonen 1999.) Therefore, it was appropriate in this study to concentrate on the documentation process.

This study is written mainly for two target audiences: the research community, especially in translation and language studies, and for the people at RWN who are interested in documentation. With the latter group of people in mind, I have included some background information on the field of technical documentation in this study (see section 1.4).

1.1 **Purpose of this Study**

The purpose of this study is to set up a smooth documentation process that will guarantee the customers of RWN high-quality documentation that is delivered to them on time. Within RWN, the documentation process should run smoothly and there should be a continuous evaluation of the quality of the documents. Making changes to the current process includes analyzing the methods used at the moment and studying what elements could be changed so that the process as a whole improves.

\(^1\) The pronoun he is used in this study to indicate both the female and the male persons.
whole would improve. The division of responsibility has to be taken into consideration as well as the creation of model documents which will be the basis of all future project documents.

By model and project documents I mean the two types of technical customer documents that are produced at RWN. Model documents are created so that they can be used as the basis for project documents, which are tailored according to the specific project and the customer. The term technical customer document covers both of these types and it is the one used in this study.

Stephen Doheny-Farina says that there are two kinds of research that are promoted by researchers in technical documentation. One type of research attempts to discover fundamental principles. The other type of research is very localized: “research, for example, that is geared to the specific demands of a particular task in a particular company.” (Doheny-Farina 1988: 3.) This study qualifies as the latter type of research in the field of technical documentation. The task that is studied is that of documenting and producing high-quality technical customer documents and the particular company is in this case Raute Wood Nastola.

In the preface to the classic work in the field of technical documentation, The Presentation of Technical Information, Reginald Kapp says that “There is a field of study here, I feel sure, worthy of a scholar’s attention, and one in which many ought to help” (1948/1998: 8). Although that preface was written more than fifty years ago I am sure that Kapp would still feel the same way about the need for research in this field. This study is an answer to Kapp’s request and hopefully, this study will serve to improve the status of technical documentation as a field of highly skilled professionals.

1.2 Focus

A documentation process offers many aspects to be studied and thus, they must be narrowed down. I have concentrated on the main points along the way of the process while keeping in mind the problems with the current documentation
process at RWN and the solutions that have to be found to those problems. It is important to know the current state of the documentation process before it can be developed.

The main focus will be on the process and several aspects of it that have proved to be problematic in this specific case. There has been inconsistency in the way the technical customer documents are produced and it results in inconsistent project documents. Another problem has been that the project documents have been delivered late to the customer, and that there is no practice of updating them after the installation is completed. In chapter 4, I will deal with solutions to these and other problems.

There are many interesting subject matters that had to be left out of the study. For example, there are the customers who do not participate in the process as such, but they have to be taken into consideration as the users of the documents. User and task analysis was also left out, because that is such a vast area of study that one whole study could be written solely on it. And as I mentioned earlier, Pehkonen did a survey on internal and external customers concerning their opinions on project documents in 1998, so it is appropriate that the focus of this study is different from hers.

1.3 Raute Group

To set the scene where the documentation process to be studied takes place, I will briefly describe the Raute Group. Lahden Rauta- ja Metalliteollisuustehdas Oy, today known as Raute Group, was founded in Lahti in 1908. In the beginning, the small workshop constructed inland waterway vessels and steam boilers and engines. Product range changed towards wood processing machinery when the production of plywood machinery began in the 1930s. During the World Wars, Raute manufactured ammunitions, and after the Second World War, Raute supplied over a thousand machines in reparations to the Soviet Union. That marked the beginning of important business relations with the Soviet Union which remained the main market area up until the 1980s. (Raute Group History, 2000.)
Today, Raute Group consists of two business groups: Raute Wood and Raute Precision. Raute Group employs a little over 800 people, of whom almost a half work for Raute Wood Nastola. A fourth of all the employees work abroad either permanently or temporarily. Raute’s main market areas are, besides Europe, in North America, Russia and Asia. Raute Wood yields 75% of the net sales of Raute Group. The company is listed in the Helsinki stock exchange.

Raute Wood develops, produces and supplies complete plants, production lines and machinery to customers in the mechanical wood processing industry all over the world. Raute Wood also offers services that cover the whole range from wood supply to end products. These include consulting, research and product development, maintenance and training. Raute Wood has two production plants: one is in Nastola and the other one is in Vancouver, Canada. In addition, Raute Wood has a global sales network with sales offices, for example, in China and Chile.

Raute Precision covers several business areas which utilize weighing and dosing technology. Raute Precision has evolved into one of the leading suppliers of glass batch plants and mortar and plaster plants globally. In Finland, almost all airports rely on Raute scales for weighing customer baggage.

### 1.4 Overview of Technical Documentation

There are a number of terms related to the subject at hand which will be used throughout this study. The term *technical documentation* is used in this study and it can be defined by using the words of Katherine Haramundanis: “Technical documentation is both the work you do when you prepare technical documents and the result of your work” (1998: 1). Haramundanis offers a further definition by saying that:

Some suggest, for example, that technical writing is writing for a purpose, while others suggest that it is a language a social group has agreed is useful. All technical documentation is nonfiction (though sometimes you may feel you are writing fiction!), and all technical documentation has technical content – whether the purpose of the piece is reportage, instruction, or persuasion. (Haramundanis 1998: 2.)
Technical documentation is used along with technical writing because many sources used in this study use them side by side as can be seen from the previous citation. The term used for a person working in this field is a technical communicator. It is widely used in the field since it does not limit the job title to just writing (as opposed to a technical writer).

Haramundanis also differentiates what she calls “engineering documentation” which consists of, for example, part lists for a product, engineering drawings, or specifications prepared by engineers (1998: 2). In this study, technical documentation will include these types of documents, because they form a great part of all project documents that are delivered to the customer by RWN. The emphasis, however, will be on the written documents instead of drawings and part lists.

The outcome of technical documentation, a document, can be defined in several different ways. A very general definition is provided by the Document Management Avenue: “A document is any container of coherent information which has been assembled for human understanding” (2001). According to the same source, document management is “the process of managing documents through their lifecycle. From inception through creation, review, storage and dissemination all the way to their destruction.” (Document Management Avenue 2001.)

Anneli Heimbürger defines a document as being “information that is in the form in which people can understand it. A document can be a document written on paper, a technical manual, a publication of some kind, an audiotape, a movie, a video or something in the form of hypermedia.” (Heimbürger 1993: 13, my translation.) She continues by defining the function of a document: “The purpose of a document can be, for example, to teach, guide, warn, present or to prove something. It can also be saved to be reused later.” (Heimbürger 1993: 13, my translation.)
Haramundanis divides technical documents into three different types: marketing materials, materials that report, and instructional materials. The instructional type includes different kinds of manuals and specifications as well as tutorials and training material. (Haramundanis 1998: 2-3.) In this study the focus will be on the type of a technical document that is meant to instruct the user.

In the future, the definition of a document will change as Barbara C. McNurlin and Ralph H. Sprague, Jr. point out. *Electronic documents*, according to them, “use a variety of symbols and media to represent a set of ideas and concepts” (McNurlin & Sprague 1998: 454). They say that “In addition to traditional letters and numbers (text), an electronic document may contain graphical symbols, photographs and other images, voice, video clips, and animation” (McNurlin & Sprague 1998: 454). It remains to be seen whether or not this will become the standard definition of a document in the future, and to what extent these features will be taken advantage of in technical documentation in general and at RWN.

Since the documentation process is the main subject of this study, it needs to be defined. JoAnn T. Hackos defines a sound process for producing publications by listing some characteristics of it:

- It allows you to produce high-quality technical publications consistently.
- It gives you the ability to estimate a budget and schedule and meet your commitments.
- It allows you to respond thoughtfully to changes in the product development cycle.
- It allows you to meet the expectations of your customers in a predictable way. (Hackos 1994: 20.)

Hackos also says that a process consists of a set of procedures, standards and management methods that are used to produce consistently high-quality publications (1994: 20). In this study, process is also understood along the same lines.

Technical documentation is not a recent phenomenon even though it may seem that way to many. As long as humans have developed technologies and they have
had the need to share information with others, there has been some sort of technical documentation. It was during World War II with the development of the defense industry that the field of technical documentation started to gain its professional status. In 1953, the people working in technical documentation formed the first two professional organizations which merged and formed the Society of Technical Writers and Editors in 1957. The first degree program was established the following year by the Carnegie Institute of Technology (now Carnegie Mellon University) in Pennsylvania. The 1960s and 1970s were decades of growth in the field because of the computer industry and the need for plain language laws and insurance policies. The growth continued in the 1980s and 1990s, and the trend for the future seems to remain the same with increasing challenges for technical communicators to keep up with the fast pace of development. (Carliner 2001b.)

Technical documentation is still an emerging field in Finland and to many it is not familiar at all. However, an increasing number of Finnish companies are investing in technical documentation and there is a constant need for professional technical communicators. Companies have realized the value of high-quality documentation and the fact that professional technical communicators can meet the challenges of producing and developing documentation in a field of fast paced development.

Technical documentation is gaining more ground in Finland thanks to two programs on technical writing; one is in Tampere and the other one is in Vaasa. Vaasa University has an interdisciplinary program which is offered in the Department of Communication Studies since 1996 (Department of Communication Studies 2001.) The Technical Communications Programme at Tampere University was launched by the Department of Translation Studies in 1997. Both programs emphasize the importance of cooperation with companies that participate in the program and thus ensure that there are professional technical communicators in the employment market. (Technical Communications Programme at Tampere University 2001.)
Worldwide, the number of academic programs in the field of technical communication has grown significantly in the past 15 years, and there are over 200 academic programs in the United States alone (Carliner 2001a). The situation in Finland is still developing with the two programs. Also, there is not yet an established tradition in Finland of skilled and experienced technical communicators to shift from the working life into the academic world to guide students in technical communication programs. There has not been much research carried out in Finland, and thus, this study is one contribution to what hopefully will some day be a firm research basis on which professional technical communicators can base their decisions.

Technical documentation has gained more and more respect in the recent years and companies are investing in developing it more than ever. User documentation is crucial when the user is learning to use a product that he has already bought. Companies have realized that high-quality user documentation can be a decisive factor when customers decide which companies products they will buy. Hackos discusses quality documentation from the user’s and the company’s point of view:

> When publications are carefully planned and well executed by trained professional communicators, they add value. They help customers understand and use a product or perform a process more effectively; they communicate ideas and help to transfer knowledge from those who originate it to those who need to use it. (Hackos 1994: 9.)

Companies can no longer deliver poorly prepared documents to customers who can and will demand for better ones since it is always possible to do business with another company. Finnish companies are competing in international markets with foreign companies that invest, some of them more and some of them less, in high-quality documentation. A well-designed and functional documentation is one of the key elements to keep up in the harsh competition.

1.5 Organization of this Study

This study is organized in the following manner. First, the documentation process will be approached from a theoretical viewpoint in chapter 2. The chapter is
largely based on selected models on managing a documentation process. The issue of quality and customer satisfaction will also be addressed.

Once the theoretical framework has been presented, the focus will be on the documentation process in practice in chapter 3. I will describe a typical project and the types of technical customer documents that are produced at RWN. I will also discuss the main points of the documentation process in order to show how it is managed at the moment at RWN.

In chapter 4, I will present and analyze the results of the interviews. I will also put forward the new documentation process model and a few other suggestions for improving the documentation process at RWN. As one part of presenting the results will be the installation manual which serves as one specific area of research in this study.

Chapter 5 will bring together solutions presented in chapter 4 and offer further thoughts on the future of the documentation process at RWN.
2 TECHNICAL DOCUMENTATION

A majority of the research in the field of technical documentation has been carried out in the United States of America and thus, much of the theoretical framework presented here is American. However, before the theoretical background is set as the basis for this study, I will briefly outline the legal requirements that are set on technical documents, because they are one of the fundamental reasons for producing technical customer documents and they are also relevant with respect to the case study at hand.

2.1 Legal Requirements on Documents

Manuals and technical documents in general are not optional or additional bonuses that companies offer their customers. Their contents are to some extent set by law and standards. There are three acts in the Finnish law that affect technical documentation: Product Liability Act (694/1990), Product Safety Act (914/1986) and the Labour Protection Act (299/58). There is also the directive adopted by the Council of the European Communities (89/392/EEC), which was adopted in Finland in 1994 by the decision issued by the Council of State (Council of State Decision on Machinery Safety 1314/1994). (Danska, Herranen & Reunanen 1993: 20-21.)

The contents of the three acts mentioned above justify the production of documents for customers from the legal perspective. There is also another factor that companies have to consider when producing customer documentation. It has to be taken into account that companies can be sued for errors in the technical customer documents. As Joan G. Nagle points out:

> Bad documentation can lead to a lawsuit. It is essential that we say exactly what we mean (nothing more, nothing less) to avoid liability for exaggerated claims or wrong or incomplete instructions. (Nagle 1996: 3.)

According to Nagle there is a growing tendency for ‘litigiousness’ in the modern society; in other words, people take legal action more easily than before (1996: 3). Gretchen Schoff emphasizes the manufacturer’s duty to warn product users...
against possible hazards. Schoff is along the same lines with Nagle when she says that “if a manual is well designed and worded, it may help to protect the manufacturer against charges of failure to give adequate warning (1991: 3). These kinds of lawsuits can cost a company great amounts of money, and through high-quality documentation, lawsuits can be avoided. This has not been a problem at RWN, but nevertheless, it has to be taken into consideration when the documentation process is developed and the quality of the technical customer documents is evaluated.

2.2 Other Sources of Guidance

There are also other institutions besides the Finnish law system that are interested in how documentation is managed in companies and what documents should contain in order to fulfill all the legal requirements. There is, for example, a Finnish insurance company that has published an instruction booklet on how to write and manage manuals (Pohjola-yhtiöt 1991). The instruction booklet includes general information about manuals, advice on how to design a manual and what to include in it. They emphasize the fact that a manual is a part of the product and thus the quality of a manual increases or decreases the quality of the product. (Pohjola-yhtiöt 1991.) The issues presented below can be taken advantage of when developing the documentation process at RWN, and that is why they are presented here.

The most relevant pieces of information in the booklet with regard to this study deal with the development and the follow-up of a manual and the further steps to be taken in a company. The follow-up of a manual means that the documents have to be changed every time that a particular product is changed. It is stated in the instruction booklet that updating a manual and making the required corrections pointed out by the customer are self-evident phases when developing a particular product. It is important to get feedback from the customer and to be able to take advantage of all the information gathered from feedback reports, reclamations, data collected from repairs made under warranty and from spare parts deliveries, for example. (Pohjola-yhtiöt 1991: 37.)
The booklet also deals with the importance of manuals to a company, defining the current state of manuals, and setting goals and procedures for developing them. First of all, a company has to decide whether or not they want to deliver quality documents to the customer. They have to think of the kind of goals they want to set on the quality of the documents, the kind of documents they wish to produce so that they are on the level hoped for, and the kind of a competing factor they are on the market. The decision to develop documentation has to be made in the management level of the company and it has to become part of the quality policy of the company. The development includes keeping track of results in the development work, setting new goals and adopting new procedures. (Pohjola-yhtiöt 1991: 40.)

In addition to the issues mentioned above, there is a list of principles in the instruction booklet that companies should consider when they are beginning to develop their documentation:

- define with good reasoning the importance and goals of manuals and make the organization realize these goals.
- delegate the responsibility for producing the manuals clearly to a person or a unit with set goals and resources.
- adopt an organized procedure to produce manuals in which:
  - the situations where manuals are being used are analyzed in order to find out what kind of information the user needs, where he needs it and how the information should be presented.
  - it is ensured that the information is adequate, understandable and that it has been well-organized.
  - the manuals are tested before printing and delivering.
  - the delivery and updating are taken care of.
- monitor and evaluate the manuals and the process of producing them in the company: reaching the goals and comparing the results and the investments as a whole. (Pohjola-yhtiöt 1991: 41.)
These are important principles that I will return to in chapter 4 when I present the model of a documentation process designed for RWN and a few other suggestions that would improve the process.

2.3 **Previous Study on Documentation at RWN**

Pehkonen studied documentation at RWN in 1998 under the title *Development of Technical Customer Documentation*. She concentrated on the documents and created a division and definition for the contents of the technical customer documents. One of her goals was to develop a production process for technical customer documents. She compared the documentation processes in two other companies by using the benchmarking\(^2\) method. In the process part of the study she concentrated on the creation and maintenance of a library of model documents. (Pehkonen 1999.) This study continues to study the process, but with a slightly different focus and a more theoretical approach.

The information most useful for this study in Pehkonen’s study were the results of the survey on both internal and external customers of the project documents produced at RWN. By doing the survey, Pehkonen wanted to find out the level of existing customer documents. The results of the survey indicated that there is a need to improve the quality of the technical customer documents. (Pehkonen 1999.) Interestingly enough, the internal customers were more critical about the quality of the documents than the external customers.

The results of Pehkonen’s study have been taken advantage of to some extent at RWN. One example is the adoption of a template for writing manuals. However, there is still room for improvement in the whole process, and that is the starting point for this study.

2.4 **Documentation Process**

In the following sections, I will present five different models which deal with the documentation process. Two of them will be used to evaluate the current

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\(^2\) “Benchmarking is a performance measurement tool used in conjunction with improvement initiatives to measure comparative operating performance and identify Best Practices” (Benchmarking Network 2001).
documentation process at RWN. The last three models will be presented here as
the basis for creating a new model of the documentation process at RWN. The
new model is presented in chapter 4.

Before I present the models, I would like to point out that these models are only
the basis for developing the documentation process and that they have to be
adapted when used in a unique real life situation. Frank Watson says that “The
problems come when theory meets the real world…. Applying planning
principles in a real life situation – where personalities, entrenched behaviors,
corporate culture, shifting schedules and changing priorities are common – is
another matter.” (Watson 2000: 1). In Watson’s opinion, “Even as detailed a
work as Managing Your Documentation Projects [by Hackos] is essentially only
a set of guidelines (2000: 1).

2.4.1 Hackos’ Process-Maturity Model
The current documentation process at RWN can be analyzed through the process-
maturity model for publications organizations which has been presented by
Hackos, a recognized figure in the field of technical communication. According
to the model, organizations can be divided into six different levels with regard to
how well their documentation process is managed (Hackos 1994: 44-74). The
levels are described in the following figure:
Hackos says that it is common in many publications organizations that deadlines are missed, there is little or no planning and that documents are written in a hurry until someone blows the whistle and insists that the more or less ready documents are shipped to the customer. In other words, most companies can be placed on levels 1 to 2 of the model, but there are also companies that have reached level 3 of the model. Levels 4 and 5 are more or less theoretical, but they too can be reached when a company has a sound and functioning documentation process in place. (Hackos 1994: 44-46.)
In order to decide which level the documentation process at RWN could be placed at, I will describe the three lowest levels more thoroughly. Here are some typical features of levels 0-2:

- **level 0**: no technical communicators, no planning or scheduling, documents are produced by anyone who is available and has time.
- **level 1**: due to little or no planning, projects begin late, there is no quality assurance, for example, editing, and there is no project management to keep track of budgets and schedules.
- **level 2**: there are some signs of a process and coordination among technical communicators to assure consistency, style standards for all technical publications have been developed and taken into use, there is still no firm project management. (Hackos 1994: 50-63.)

The documentation process currently in place at RWN can be analyzed with regard to Hackos’ maturity model. The process at RWN can be placed between the two lowest levels, levels 0 and 1. This can be justified by the fact that there are no professional technical communicators at RWN. On the other hand, there are people in the company who are aware of the need for professionally produced publications. Attempts have also been made to develop the documentation process and to improve the quality of the technical customer documents. The question which is important in this study is how do we step from level 0 or 1 to a higher level?

Stepping from level 0 to level 1 is simple according to the instructions given by Hackos. She says that it can be achieved simply by hiring a technical communicator or a group of technical communicators depending on the size of the company. (Hackos 1994: 52.) However, a company should not be content to have a level 1 publications process. The goal should be set to reach level 2, first, and then once the process is beginning to go into place, the aim should be set at level 3 where a sound development process is in place.
Even though a sound development process is in place at level 3, project management is still in the beginning stages. All work is edited by specialists in editing and writers work as teams on different projects. Projects are estimated carefully based on data collected from previous projects. There is also careful planning to ensure an organized and repeatable process. (Hackos 1994: 48.)

According to Hackos, stepping from level 1 to the next level is a difficult task. The people responsible for developing the documentation process along with the management of a company have to set goals high or else there will be no improvement in the process and the way that it is managed. As Hackos points out: “The journey is possible and worth taking, because the rewards are great.” (1994: 45.)

2.4.2 Chisholm’s Models and Practices

Richard M. Chisholm says that “The purpose of the management of writing in the computer industry is the same as the purpose of management in any industry: to maximize profits by producing quality products that satisfy customers while keeping costs down” (1988: 299). Although Chisholm’s study concentrated on the computer industry, the results can prove to be useful also in the case of RWN. In my opinion, there are similarities between the results of Chisholm’s study and the current documentation process at RWN.

Chisholm carried out a research where he sent a questionnaire to technical writers. He received 38 responses out of the 310 questionnaires that he sent out. As a result, he compiled three models of the documentation cycle: the end-loaded cycle, the middle-loaded cycle and the modern team-based cycle. (Chisholm 1988: 300.) These three cycles will be presented in the following.

The end-loaded cycle has been used for many years in those American organizations where the respondents to Chisholm’s study worked as technical writers. However, the end-loaded cycle is inadequate since the documentation of a product is left to the end of the product cycle. In other words, the product is designed and produced before the managers ask a writer to produce documents at
the last minute before the product is shipped off to the customer. (Chisholm 1988: 301-302.)

The middle-loaded cycle, which Chisholm also calls the in-the-middle document cycle, is a step up from the end-loaded cycle and it is the most common model of a document cycle used in the computer industry. Managers who use this model realize halfway through the product-development cycle that the project is in a crisis and that is when they call in the writers. These two models fail mainly because of poor or non-existent planning. (Chisholm 1988: 302-303.)

The collaborative team-based cycle which is the most modern model of the three is becoming the standard model in many well-run computer firms. The writers are part of the team that is working on the product, and the documentation process runs along with the whole project cycle from beginning to end. This model improves communication between designers and writers, and it ensures an orderly production of documents. (Chisholm 1988: 303-304.)

The documentation process at RWN falls into the two models mentioned first, the end-loaded cycle and the middle-loaded cycle. In many projects, the project documents are produced toward the end of the project cycle and there is no concrete planning of the documentation process. The documentation process at RWN will be discussed in more detail in the following chapter.

Chisholm also compiled practices that create problems for writers and practices that alleviate those problems. I will first present the problems and then the solutions to those problems.

The results of the survey indicated that there are three kinds of problems that writers felt affected their work. These practices that create problems for writers according to Chisholm’s study are:

- Managers fail to understand documentation and writers.
- Managers fail to plan and schedule writing projects.
Managers fail to support writers. (Chisholm 1988: 304.)

First of all, the most common complaint among writers was that they are not understood. Writers said that management does not understand the importance of documentation; it is often the case that documentation is not seen as a part of a product. In addition, writers who participated in Chisholm’s study claimed that management does not understand what the documentation cycle is, how it works and how long it takes to write a high-quality document. (Chisholm 1988: 305.)

Misunderstanding documentation leads to unrealistic schedules and that creates problems and anxiety for writers. Due to failing to plan and schedule documentation, documents are produced in a hurry and that in turn results in inferior documents. Chisholm also states that “The most critical problem is failure to plan for updating the documentation at the same time that the hardware and software are updated.” (1988: 306.) Thus, by the time the manual is drafted, it is no longer accurate. This creates problems for both the customer and the company’s service personnel, for example. (Chisholm 1988: 305-306.)

Two of the causes for problems suit the current documentation process at RWN but the third cause, the need for information and support, is not such a problematic issue since it is the designers who write the documents, and thus, they are themselves experts on the subject. Writers who participated in Chisholm’s study said that they often get inadequate information to write the documents. Another cause for problems was the lack of consistent policies which causes problems also at RWN. According to Chisholm, many companies either have no policies at all or they do have them but they fail to enforce them. (1988: 306-307.) This is a problem that is an important issue in this study, too, and a possible solution to it will be discussed in chapter 4.

Chisholm also lists practices that alleviate problems that writers have. The writers urge managers to

- understand computer documentation and writers.
• plan and schedule writing projects.
• support writing with suitable procedures. (Chisholm 1988: 307.)

Next, I will briefly review the solutions presented by Chisholm, because some of them could prove useful for developing the documentation process at RWN.

The fact that managers fail to understand documentation and writers was mentioned as one of the problems. The solution to this problem, according to Chisholm, is that we help managers to better understand documentation and writers, and as a result, documentation should be given a higher priority in a company. Furthermore, there are two points that Chisholm would like to get across to managers:

• Documentation helps to shape the system it describes, and in fact, it is itself a product.
• Good documentation is an important marketing tool. (Chisholm 1988: 309.)

The second solution, planning and scheduling, is an important factor in a documentation process and writers even state that “the key to successful documentation is scheduling” (Chisholm 1988: 313). It is essential for a well-managed documentation process that writers are included in the scheduling process. They are the experts on answering the question on how long it will take to produce high-quality customer documents.

The third solution, supporting writers with suitable procedures, means that writers have the right equipment and support in the work that they do. This includes appropriate administrative support, such as budget, personnel, status, recognition, timetables and organizational relationships. (Chisholm 1988: 315-316.)

Some of these solutions would help to improve the documentation process at RWN. For example, it is very important that the management understands the value of high-quality documentation. Documentation as a whole and also the
people who produce documents at RWN should be given the status they deserve.
Another solution that Chisholm mentions is planning, which, in my opinion,
would make the documentation process more efficient at RWN, too.

2.4.3 Haramundanis’ Quality Documentation Process

Haramundanis’ model for a quality documentation process and the following two
models will be used as the basis for developing a new model for the
documentation process at RWN. They are put forward here to show that there are
different ways to look at the documentation process and different phases that can
be included in it. I will present the three models here and return to them in
chapter 4 when I present the new model.

Haramundanis presents several task categories which make up a process that has
proved to be successful in producing high-quality documentation. These tasks
are:

- researching
- understanding
- planning
- writing
- reworking
- receiving the results. (Haramundanis 1998: 79-80.)

These six tasks form an entity where the basis for the last three phases is
prepared in the researching, understanding and the planning phases. The six tasks
also form pairs which are closely linked: researching is essential for
understanding and so is planning for the writing process. Reworking and
receiving the results are not as clearly intertwined, but they are the two important
phases at the end of the documentation process cycle. (Haramundanis 1998: 79-
80.)

Researching is the very first phase in the beginning of a new project. Researching
includes searching for and reading through any existing material that will help in
producing documents for the project at hand. Discussing the product with experts and attending project meetings are other ways of gathering information. Researching should also cover the potential readers of the documents. Researching is an important task that will help produce quality documents with accurate information and which are written with the appropriate audience in mind. (Haramundanis 1998: 80-81.)

Comprehensive research is the key to understanding the project, the product and the users of the documents. Understanding is the result of organizing the material collected in the previous phase so that it forms entities which make sense to the producer of documents. According to Haramundanis, experienced writers develop techniques in order to understand complex products. She lists brainstorming, decomposition, metaphor, mapping and modeling as techniques, which help writers perform the second task of understanding. (Haramundanis 1998: 81-87.)

Planning is the third task category. Haramundanis states that planning is “essential to accurate scheduling and for establishing the direction that leads to project deliverables being produced on time” (1998: 87). Planning is documented in a documentation plan or a documentation strategy. These documents usually contain information on the items to be written and a schedule about when the drafts and the final copies will be ready. In large projects the plan or the strategy contains a list of the document titles and a schedule for their production. (Haramundanis 1998: 87.)

Writing is the next task which is in many cases the most visible task of the six. Writing is affected by the three previous phases and the writer uses the material gathered to produce the documents. This phase also includes cooperation with other team members and keeping up with possible changes in the product. The outcome of this phase is a draft which leads to the next phase. (Haramundanis 1998: 92.)
In the reworking phase, the draft is tested and edited. Testing can consist of reviews by members of the technical team or by peer writers. The technical reviewers check the completeness, accuracy and appropriateness of the information in a document. A technical editor checks the document for grammar, punctuation and typographical errors. If there is a company style guide for producing documents, the document is also checked for adherence to the style guide. Usability testing is usually performed with the help of questionnaires, interviews or contextual inquiries. Reworking is time-consuming if it is thoroughly done. In Haramundanis’ model, there are three rounds of reviews which lead to the final draft of a document. Haramundanis does point out that there must be enough time reserved for testing and editing or else it is likely that they will not be properly done. (1998: 95-114.)

Receiving the results, which is the last task on Haramundanis’ list, means seeing the finished document in the form that it is published, whether it is in the form of a book or an online help file, for example (1998: 114). In that sense, receiving the results is hardly a task; it is rather just a rewarding experience for writers. I first thought that receiving the results meant getting feedback from customers but that is not the case in Haramundanis’ model. I suppose receiving results from the customers is so uncommon in this field of business that that is why Haramundanis did not include it in the last phase of her model.

Next, two models for managing a documentation process will be presented and compared with each other and the tasks listed by Haramundanis. The results of the analysis will be used in chapter 4.

2.4.4 Carliner’s Model

Saul Carliner presents one model for producing technical communication products (2001a). Carliner points out that the exact process varies among organizations, but that it usually has these four phases:

1. Design
2. Development
3. Production

The first phase refers to the process of planning a communication product. Carliner compares the planning phase to preparing a blueprint of a building. The appropriate content must be chosen as well as the strategy for communicating the information to the customer. (Carliner 2001a.)

The development phase refers to the process of turning the design into a finished product. The tasks in the second phase are the writing and editing of the information. Graphics are prepared and the whole document is reviewed to make sure that the information is accurate and usable. (Carliner 2001a.)

The production phase is the third phase where the document is printed, duplicated and delivered to the customer (Carliner 2001a).

The fourth phase includes updating the document but Carliner also includes tracking user satisfaction and document usability in this phase as part of maintenance (2001a).

2.4.5 Hayhoe’s Model

George Hayhoe says that “It is axiomatic in too many businesses these days that there’s always time to do things over but never enough time to do them right the first time” (2000: 4). According to Hayhoe, there has been a lot of discussion among technical communicators “about the need for consistent, repeatable processes for creating information products, whether manuals, online help systems, or multimedia presentations” (2000: 3). He says that the simplest form of the recommended method for technical and professional communication is:

1. Plan
2. Draft
3. Test
4. Revise (Hayhoe 2000: 3).
Hayhoe continues by saying that this approach is “essentially an engineering methodology applied to communication tasks” (2000: 4). He does not deal with the four phases of the recommended method in more detail in his article, which is unfortunate. Hayhoe’s model is, in fact, the most superficial of the three models presented here.

The models by Haramundanis, Carliner and Hayhoe are similar in many of the phases. All of them have the planning phase as one important task in the documentation process as well as the writing or ‘development’ phase, as Carliner calls it. Carliner’s model is the only one which does not include testing as such although he does mention editing and reviewing. The revision phase is included in all the models (‘reworking’ in Haramundanis’ model and ‘maintenance’ in Carliner’s model). The last task in Haramundanis’ model, receiving the results, stands out from the other two.

Neither of the models by Carliner and Hayhoe is as thorough as the model presented by Haramundanis, but they all serve to show that there are differences in how a documentation process can be conceived. Even if Haramundanis’ model is the only one which explicitly differentiates researching and understanding as two individual tasks, I am sure that Carliner and Hayhoe would agree with her that there has to be researching and understanding before a document can be written.

As mentioned before, these models will be the basis for presenting the new documentation process model for RWN in chapter 4. Once an effective and a functional process is in place it will ensure consistent high-quality documents to be delivered to customers as scheduled. In the following section, the focus will be on quality, how it is defined and how customer satisfaction can be achieved consistently.

2.5 Quality and Customer Satisfaction

Quality and customer satisfaction are very closely intertwined. Quality can be defined in many different ways and it means different things to different people.
Hackos provides us with a broad definition of quality which nevertheless suits the purposes of this study. She defines quality as “meeting the needs of the customer” (Hackos 1994: 12). In other words, when defining quality, the customer of the product should be kept in mind and quality should be looked at from his point of view.

In the annual report of 1999, Risto Mäkitalo, the president of Raute Group, states that the company will focus its efforts “on proactive R&D, consultative selling and high-quality products and services” (Raute Group 1999). In addition, RWN has a policy for the company’s operations, and one of the four key elements of that policy is high customer satisfaction. All employees, including the company management, have committed themselves to acting according to the company policy. It is important for RWN to maintain good customer relationships since the number of potential customers worldwide is rather small, about 1,000. The quality of the operations, including the quality of the technical customer documents, is controlled via feedback forms. They provide RWN with valuable information about the customers’ opinions about the quality of RWN’s products and services.

Although I said earlier that this study does not deal with the technical customer documents as such, I will include them in this discussion on quality, because they are the result of a documentation process. Also, it is usually thought that it is the documents where the quality is most visible and where it can be most easily evaluated.

When developing the documentation process at RWN, one of the goals is that the outcome of that process is high-quality documentation. Hackos emphasizes the importance of a sound documentation process with regard to quality. Hackos says that

Standards and good people, although useful, are simply not enough to sustain quality through many years and many different people and projects. Only with a sound process in place and people trained in
managing the process can quality be consistently produced. (Hackos 1994: xiii.)

Hackos also lists characteristics of high-quality publications that benefit the producer as well as the user of the publications. According to Hackos, high-quality publications:

- make information more accessible.
- make customers more productive more quickly.
- reduce training costs.
- lower the barriers for discretionary and infrequent users.
- foster use by diverse user communities.
- reduce the cost of customer support.
- can reduce the cost of field maintenance.
- can increase sales of a product. (Hackos 1994: 12-14.)

These reasons for producing high-quality publications amount to reducing costs and saving time on several areas, for example, in customer support and field maintenance, which usually require a lot of resources. The fact that high-quality publications can increase the sales of a product is a good argument to improve the quality of publications which usually interests the management of a company.

Others have studied the effects of the increase in demand for quality technical manuals. M. Jimmie Killingsworth and Kimberly Eiland did a survey on industrial companies and contractors. The survey revealed that “organizations are developing new techniques of management and are shifting old priorities in order to integrate production, technical writing, and marketing in an effort to produce better manuals.” (Killingsworth & Eiland 1995: 118.) According to their study, there are three functional groups that influence manual production in most companies. These groups are product development, technical communication and marketing. At the same time, some of these groups can be seen as customers of documents.
Nagle says that there are three simple steps to assure quality of documents and those three steps are editing, critical reading and proofreading (1996: 200). Here editing, according to Nagle, means light editing, that is an overall check for consistency and a check for gross errors, such as missing parts or word substitutions (for example, *now* for *not*). It can be a critical error in an operation instruction, for example. The spell-checker in the text-processing system is a good tool to do this kind if editing, but it should not be trusted blindly since it will not catch word substitutions as the one mentioned above. (Nagle 1996: 200-202.)

The second step to assure document quality according to Nagle is critical reading. Critical reading is reading from the audience’s point of view. The document is checked for order, significant content and logic. It is easier to read someone else’s document critically since we become blind to the oddities in the way we have presented information in a document. When we read our own documents critically, we should let them cool down and read them with a fresh set of eyes. Last and, in this case, least is proofreading, which is the least important step in assuring quality documents. If the first two steps have been done thoroughly there is no need to do the third step; the first two steps in other words include proofreading. If there is no time for editing and critical reading, then a document should at least be proofread. Proofreading consists of looking for wrong words, format inconsistencies and problems with data presentation. (Nagle 1996: 206-212.) These three steps can be included in a documentation process to assure high-quality technical customer documents and they will be taken into account when designing the new documentation process model for RWN.

One more aspect to quality can be added to this discussion. Annette D. Reilly argues that “the only way to achieve quality is through professional communicators” (1995: 293). According to Reilly, quality in the product, in the process or in the users’ perceptions is not as important as quality in the professional communicators (1995: 293). The importance of a professional communicator seems to be a recurring issue if Reilly’s opinion is compared with
Hackos’ maturity model. It was Hackos who said that stepping from level 0 to level 1 is achieved simply by hiring a professional communicator (1994: 52). This issue about technical communicators will be discussed further in chapter 4 (see subsection 4.3.4).

2.6 Publishing

The choice of the medium in which project documents are delivered to the customer will be discussed next. It is an issue which is in the state of transition at RWN and it will be developed further in the near future. Up until now, project documents have been delivered in paper format, but recently, there have been some deliveries in electronic format. Publishing is an essential part of the process which is undergoing changes at RWN and will continue to do so, and thus, it is included in this study.

Marlana Coe discusses the choice between different media, and says that a medium has two components, namely type and subtype. The type is either hardcopy or online. The subtype is a more specific classification and subtypes of hardcopy include brochures and data sheets. The subtypes of online are, for example, online manuals and context-sensitive help. As Coe points out “Users’ needs and expectations should drive the choice of media type and subtype.” (1996: 207.) These needs and expectations can be mapped through customer surveys and site visits. It is important to find out how the users use the documents and what is the medium that serves them best in performing the tasks that they need to perform with the help of the documents. (Coe 1996: 207-208.)

Coe lists many advantages and disadvantages of both of the media types. She wants to emphasize that there is no one right answer when choosing the medium but that the choice is always a compromise. (Coe 1996: 210-212.) The following figure presents the central points that Coe makes:
Keeping these advantages and disadvantages in mind, if the decision is made that a company will move to delivering information in online format, the information itself needs to be designed in a way that it is still usable in electronic format. It is not necessarily an improvement if a document is simply sent “through a black box“ as Coe puts it (1996: 204). The information has to be restructured so that the user can take advantage of the new medium. For example, there has to be more white space in order to preserve the readability of information in electronic format and this can be achieved by using lists, tables and graphics to present information. (Coe 1996: 220-222.)

From the user’s point of view, a change in the medium will also change the way information is and can be used. The user no longer flips from one page to another.
to find information but he can use hyperlinks and search engines for the same purpose. Users can get lost when they use hyperlinks to navigate in the text and it is more difficult to see the online information as a whole entity of information. Users usually have less patience when reading online information, since it is more tiresome, and this has to be taken into account when online information is designed. (Coe 1996: 220-223.)

The transfer from publishing documents in paper format to delivering them electronically has also been studied in Finland. In the research notes published by the Technical Research Centre of Finland (VTT) concerning the electronic use of documents, researchers Immo Heino and Teppo Kurki list reasons why companies are developing their documentation toward electronic publishing and delivery:

• pressure from the customers to deliver documents in electronic format.
• companies aim at saving expenses that are caused by delivery and updating the documents.
• electronic documents also add value to the product, which in turn increases the market value of a product and helps the company compete in the international market.
• additional advantages are enhanced usability and the correct and updated contents of the documents. (Heino & Kurki 1995: 82, my translation.)

As has become evident, the choice of the medium is a complex issue and it will require careful consideration. There are many advantages and disadvantages to delivering documents in electronic format, and usability is the main concern that has to be taken into account when the decision on the medium is made. This subject will be discussed further in the following chapters when I will present the medium that is used at the moment at RWN and the possibilities in this field in the future.
This chapter sets out to describe the current state of the documentation process at RWN so that it could be assessed in the light of the theoretical framework presented earlier. It is interesting to see how the mostly American models of managing a documentation process fit the traditional Raute way of writing and delivering documents to the customer. The contents of this chapter are divided into two main sections, namely document management and documentation process.

### 3.1 Document Management

The technical customer documents have to be very precise and thorough because the production lines are complex entities and their operation requires comprehensive guidance. The customer also handles the basic maintenance work on the production line and the information in the maintenance instructions as well as in the safety instructions must be very carefully presented so that there is no chance that the instructions are interpreted in a wrong way.

As was mentioned in the first chapter (section 1.1), the technical customer documents produced at RWN can be divided in two main classes: model documents and project documents. These two types of documents are presented in more detail below.

### 3.1.1 Model Documents

The practice of creating model documents is not yet firmly established at RWN. There are some model documents which are used as the basis for project documents, but there is no comprehensive collection of model documents for each production line. The model documents that do exist are created by designers and, in most cases, they are written in Finnish and translated into other languages when necessary. The development work on the model documents will be discussed in more detail in chapter 4 (see subsection 4.3.3).
### 3.1.2 Project Documents

Project documents are written by designers assigned to different customer projects. If there are suitable model documents that they can use as the basis for project documents, the designers take the model documents and tailor them according to the individual project and customer. The designers also sometimes use documents written for previous projects when producing project documents for a project they are working on. The project documents are usually written in Finnish and then they are translated into English or other languages depending on the customer. Some designers write documents in English, too.

The project documents that are delivered to external customers are divided into eight groups, which are presented in the following figure. The installation manual, which was mentioned in the first chapter, is not included in this presentation, since it is delivered to the internal customers, that is mechanics and electricians.

**Figure 3.** Project Documents Produced at RWN.
In the following, I will briefly describe each of these document classes to give a holistic view of the types of documents that are produced at RWN.

**Customer Project File**
A customer project file contains information that is collected in the course of the project from the kick-off meeting all through to the installation of the machinery and signing of the Certificate of Acceptance. A customer project file is delivered to all customers – domestic and foreign. The file contains the following documents:

- technical data, machine list, scope of delivery
- drawing symbols, line drawing
- connection information (electricity, water, steam, compressed air, sawdust removal)
- foundation drawing
- maintenance and operation platforms
- installation plan, hauling info, installation instructions
- hydraulic oil and lubricant specification
- recommended spare parts
- certificates
- training material
- other information: motor list, list of cable, cabinets
- customer survey, feedback form.

**Operating Instructions**
Operating instructions guide the user into operating the machine in a safe way all through the lifespan of the machine. One basic requirement of operating instructions is that they can be used to train future operators for a given line. Operating instructions cover the operation of the whole production line, unlike, for example, a maintenance instruction which is more specific (for example, a maintenance instruction for a moisture meter). Operating instructions include the following sections: safety instructions, a description of operation, operator’s instructions, instructions for clearing a jam, alarms, troubleshooting, and other
information. The extent and content of operating instructions depend on the production line and its complexity.

**Maintenance Instruction**
The purpose of a maintenance instruction is to guide the customer to maintain and repair individual machines and other parts of a production line. The maintenance instruction includes some sections that are similar to those in the operating instructions. There are five main sections in a maintenance instruction: safety instructions, diagrams, maintenance and repair procedures, troubleshooting and other information.

**Electrical Documents**
The set of electrical documents delivered to the customer in each project varies according to the production line and whether it includes a Programmable Logic Center, a Motor Control Center, or both. The electrical documents consist mostly of electrical drawings.

**Hydraulic Documents**
The suppliers of hydraulic units also supply the hydraulic documents which RWN delivers to the customers in most cases without further editing or formatting. Hydraulic documents include diagrams, a Bill of Material and brochures of the hydraulic components.

**Brochures**
There are some components, such as, motors, pneumatic cylinders and valves which are used in the production lines and which are bought from other companies. These components come with brochures that the customer will need when maintaining the component or when he needs to order spare parts for the component. These brochures are often in paper format and thus they are copied and compiled in a separate folder with a table of contents.
Documents Produced by Subcontractors
Besides brochures there are also other kinds of documents produced by subcontractors. Some of the components produced by subcontractors come with thorough documentation which includes documents that cover everything from maintenance to the Bill of Material. Like brochures, many of the documents are in paper format. The quality of the documents varies as does the layout which are factors that add to the inconsistency of the project documents as a whole. However, the large amount of documents produced by subcontractors makes it impossible for producers of project documents at RWN to reformat those documents. Also, some of the documents are delivered directly to the customer by the subcontractor.

Spare Parts Book
A spare parts book consists of two parts: a Bill of Material and drawings. Up until now, both the Bill of Material and the drawings have been printed on paper and delivered as such to the customer. As an answer to the many customer requests and problems in the customer service department concerning the orders of spare parts, an electronic spare parts book has been developed at RWN. The many levels of a Bill of Material and the great amount of paper were two reasons why there was a need to develop the electronic spare parts book. It also serves the customer to identify and specify a particular spare part more easily. The customer service department benefits from the electronic spare parts book, too, since they can serve the customer faster, and there are no mix-ups in the orders or the deliveries.

The electronic spare parts book is delivered to the customer on a CD-ROM. The possibility of delivering the rest of the project documents along with the electronic spare parts book will be studied in the future at RWN.

3.1.3 Naming Documents
Managing a great number of documents at RWN in each project alone has caused some problems in the past. In her thesis, Pehkonen proposed a system of naming the model documents in the following manner. The name would consist of a
series of numbers that would indicate several facts about the document. In other words, the name of a document would consist of the following:

- **xx** numbers indicating the production line in question (for example, 11 stands for a jointing line)
- **y** a number indicating the main class the document belongs to (1 = customer project file, 2 = operating manual, 3 = service manual, 4 = electrical documents)
- **zz** numbers indicating the first level of the table of contents
- **w** a number indicating the second or the third level of the table of contents
- **a** a letter indicating the language of the document

An example document could be named as 112034e.doc which would stand for a composing line’s operating manual and more specifically a document called *Operation of the Line* which is in the third level of the table of contents. The document is written in English. Once the practice is fully adopted at RWN, a list of numbers and what they stand for will be compiled so that it will serve all employees in naming and locating a specific document.

### 3.1.4 Version Management

It is the unfortunate reality of a designer who writes technical customer documents that there will be some changes to the production line or some parts of it in the installation phase, for example. The document has to be updated to correspond to the actual product the customer is left with and the updated document must be delivered to the customer. It may be the case that another designer, who is assigned to a new project much like the one the first designer was working on, wants to use the documents produced during the previous project. It is important in cases like this that the designers can trace the history of the documents and find out who has done changes to the document and when those changes were done.

Up until now, changes have been made to the documents by different designers and there is no systematic practice of managing the different versions of
documents. This can easily cause confusion and it is possible that the same mistakes occur in the new project if the documents are not properly updated and if the different versions of the documents get mixed up. There is a need for a version management system that would keep track of the different versions of documents. This subject will be discussed further in chapter 4 (subsection 4.3.6).

3.1.5 Filing System
At the moment, the archiving system for the model documents is still being developed and there is no practice for how and where they should be saved. The proposed filing system for the model documents will be discussed in more detail in chapter 4 (subsection 4.3.3). The project documents, on the other hand, are all saved in a directory which is named according to the project number. Thus, the specific documents are easy to find according to the project number. The documents in the project folder are saved in specific subfolders according to the type of the document. Paths become long but the system is quite simple and documents can be found rather easily.

3.1.6 Document Layout
There is a template especially made for writing manuals. When everyone uses the same template, all the documents will have the same kind of settings; for example, the headings as well as the information about the document in the header and the footer will be similar in all documents. The template is easy to use and even the fact that a different paper size is used in Europe and in North America is taken into consideration. It is easy to alter the settings so that the text area looks similar on both paper sizes.

3.2 Documentation Process at RWN
As mentioned earlier, the technical customer documents of RWN’s products are written by designers who are assigned to specific customer projects and who are in charge of producing the documentation for that specific project. The documents are written with the MS Word text-processing system. The designers have no special training for writing customer documents besides the training courses on using the text-processing system. As mentioned before, the documents
are written in Finnish and then they are translated into English or other languages depending on the customer. They are translated by RWN’s own translator or by outside translation companies and freelancers.

3.2.1 Typical Project

Projects range from delivering one production line to delivering complete production facilities which contain several production lines. A typical project lasts about a year and it consists of the delivery of one production line. Customer projects differ from each other; all the production lines are in one way or another unique.

A project begins when the sales department notifies the project coordinator of a closed deal with a customer. The head of the project department designates the project to a project manager, who handles the project from that point forward. Together with the technology and the production management, the head of the project department also designates other persons on the project team. The project begins with a kick-off meeting where all the members of the project team are present. The schedules are set according to the sales contract.

In the course of the project, the production line is designed and once the drawings are ready, they are delivered to the production facility which begins the production of the components of the production line. Most of the machines of a production line are test run before they are shipped to the customer's location. There the production line is fully installed usually by RWN’s own personnel. The mechanics and electricians train the customer’s personnel to operate the production line and they also report to designers in Nastola of possible changes that have been made in the installation phase. The updates to the drawings and project documents are completed by designers and the updated material is sent to the customer once the project is completed.

The project manager keeps track of the progress of the project, and he is also in touch with the customer. He makes sure that deadlines are met and everything is done as planned and stated in the sales contract.
The project documents are usually produced once the drawings are ready and the production work has begun. In other words, the designers tend to write the documents toward the end of the project. The time used to write the project documents depends on the project, but usually there is a period of a couple of months during which time the project documents should be prepared. There is an average of 50 to 150 hours budgeted for producing project documents in the mechanical engineering department in each project. The same amount of time is used for producing electrical documents. There is a work number under which the time used to prepare project documents is reported. Thus, the amount of time used to produce project documents can be calculated for each project.

Once the project documents are ready they are translated if necessary, printed and compiled in folders. In most cases, the head designer compiles a model set of documents and the office assistants in the engineering department compile the rest of the folders. The folders are then shipped to the customer.

The deadlines for delivering the project documents are set according to the sales contract, which states that the project documents are delivered to the customer at the same time when the components of the production line are delivered. The deadlines for delivering the updated documents to the customer are not stated in the contract.

The amount of customer documents delivered in each project varies according to the project, but the minimum amount is four to five folders full of drawings and other project documents. Some of the largest production line deliveries consist of as many as ten folders of project documents. A delivery usually consists of three to seven sets of folders. In addition, one set of project documents for each project is archived for the customer service department at RWN and one set is sent to the local Raute Wood office nearest to the customer’s location.

3.2.2 Translation

Since about 70% of Raute Wood’s sales go into the foreign market, a majority of the project documents must be translated from Finnish into some other language.
Within the European Union, project documents must be translated into the customer’s native language and in case of deliveries to Russia, project documents are translated into Russian. Customers in other countries usually receive their project documents in English unless it has been stated otherwise in the sales contract.

There is currently one person who translates and coordinates translations at RWN. Project documents make up a small part of her work and there is a decreasing number of project documents to be translated. Designers use once translated project documents and make their own additions to them which can cause problems. These documents are not checked by anyone before they are sent to the customer and thus there is variation in the quality of the project documents.

The lack of standards causes problems which affect translation. The quality of the documents that designers produce varies to a great extent. Reasons for this are that designers use several terms in place of one and there is no standard for presenting and organizing information in a document. There are also designers who do not use the template designed for writing technical customer documents, and some of them seem to have problems with using the MS Word text-processing system. Tight schedules and the fact that translations are usually done in a hurry affect the quality of the translations, too.

3.2.3 Publication and Delivery of Documents

As mentioned before, the amount of documentation that RWN delivers to customers in each project varies from four or five folders to as many as ten folders in a project document set and there are several sets that are delivered to the customer. Printing the documents and compiling them in folders is troublesome and it takes a lot of time. Several sets of folders take up a lot of space and delivering them to the customer can be expensive. Customers have also started to ask for project documents to be delivered in electronic format, as became evident from the survey Pehkonen did on both external and internal customers. Therefore, delivering project documents in electronic format has
become a serious consideration. This is an issue that will be discussed further in the following chapter.
4 DEVELOPING THE DOCUMENTATION PROCESS AT RWN

In the previous chapters I have presented the theoretical background to managing a documentation process as well as one instance of how it is managed in practice. The aim of this chapter is to present the results of the interviews and to put forward a set of standards that can be adopted at RWN in order to manage the documentation process so that it runs smoothly. First, I will present the study material and methods after which the results of the interviews will be analyzed. The third section of this chapter deals with the documentation process and suggestions for improving it at RWN.

4.1 Material and Methods

The qualitative method is used in this study. As I mentioned earlier, I used interviews in gathering material for this study. The main informants were the people who participate in the process of producing technical customer documents, in this case the designers and the translator, and those internal customers who use the project documents, in other words, the mechanics and electricians.

Irving Seidman says that “The primary way a researcher can investigate an educational organization, institution, or process is through the experience of the individual people, the ‘others’ who make up the organization or carry out the process” (1998: 4). Although Seidman is mainly discussing research in education and the social sciences, his instructions and thoughts on interviewing can be applied in other fields of qualitative research. My opinion is similar to his in that I think a functional documentation process cannot be developed without asking the opinions of people who participate in that process. They are the primary informants in surveying the current state of the documentation process.

There were also other reasons for choosing to interview people at RWN. I needed to find out practical issues about the documentation process because such information is not available elsewhere. I also wanted to learn about the project cycle of which the documentation process is a part. In order to develop the
installation manual I also needed to find out about the installation of a production line. The opinions of the interviewees were valuable in that they gave me the insight to these processes since little written information about them is available. The interviewees also had an opportunity to present their ideas on improving the documentation process at RWN. The interviews and the analysis of the material will be discussed further in subsection 4.1.2 and section 4.2.

This study can be defined as being a case study because the case is a specific one: the documentation process as it is at the moment at RWN. The installation manual can be defined as a subcase in this study since it is part of the main case. Here is a definition of *case study* by Robert K. Yin:

> A case study is an empirical inquiry that:
> • investigates a contemporary phenomenon within its real-life context; when
> • the boundaries between phenomenon and context are not clearly evident; and in which
> • multiple sources of evidence are used (Yin 1989: 23).

By doing a case study a researcher tries to find answers to questions beginning with ‘how’ and ‘when’. Yin also says that “the case study allows an investigation to retain the holistic and meaningful characteristics of real-life events – such as individual life cycles, organizational and managerial processes, neighborhood change, international relations, and the maturation of industries” (1989: 14).

Sirkka Hirsjärvi, Pirkko Remes and Paula Sajavaara say that by doing a case study the researcher can gain detailed and intensive information of an individual case or a small number of interrelated cases (2000: 123). They also list some typical features of a case study:

• an individual case, a situation or a number of cases is chosen as the subject of the study (the subject can be an individual, a group or a community, in many cases the subject is a single process which is studied in the natural environment).
• material is collected from several different sources (for example, by observing, interviewing and by studying different kinds of documents).
• a typical goal of a case study is to describe phenomena. (Hirsjärvi, Remes & Sajavaara 2000: 123, my translation.)

The empirical material for this study was gathered by using different kinds of interviews. I chose different types of interview methods and experimented with them. I chose the type of interview based on the type of information I was after and the best way that I thought was to get that information. The three types of interviews and the three groups of interviewees are shown in Table 1.

Table 1. Interview Types and Interviewees in This Study.

<table>
<thead>
<tr>
<th>INTERVIEW TYPE</th>
<th>INTERVIEWEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>structured interview</td>
<td>mechanics and electricians</td>
</tr>
<tr>
<td>pair interview</td>
<td>project managers</td>
</tr>
<tr>
<td>(semi-structured interview)</td>
<td></td>
</tr>
<tr>
<td>open interview</td>
<td>designers, translator</td>
</tr>
<tr>
<td>(non-structured interview)</td>
<td></td>
</tr>
</tbody>
</table>

For the interviews with the mechanics and electricians, I chose the structured interview because I was unfamiliar with the subject and I needed to find out facts about the process of installation. I chose pair interviews for the project managers in order to bring about more discussion. In the case of the designers and the translator, I chose to discuss the documentation process and the technical customer documents with them in an open interview without a structured set of questions in order to reveal as much information as possible. I will discuss the background as well as the strengths and weaknesses of these approaches in the following sections before presenting the results of the interviews.
As I had a clearly structured set of questions and it was possible to write down the answers, I decided not to record the interviews of the mechanics and electricians. The speech situation or some features of the spoken language were not important, but simply the facts and opinions. In addition, I suspect recording might have increased the formality of the interviews. I wanted the answers to be as honest and open as possible and therefore, I wanted to keep the situation as casual as possible. Looking back at the pair interviews, it might have been useful to record them, but since I chose not to record the structured interviews and it was possible to take notes, I decided that I would not record any of them.

4.1.1 Structured Interviews

The starting point for setting up an installation manual was to find answers to two questions: What should the manual contain?, and How should it be directed in the course of a project? The first question was mainly directed at the mechanics and electricians, and the second question was of concern to the project managers. Up until now, the contents of the installation manual have varied a great deal from one project to another depending on the project manager and the head designer that compile the manual, and there has been no clear practice for producing it.

Before I prepared the set of questions, I studied several documents to attain information on the material that the mechanics and electricians had had with them at installation sites in the past. I compiled a list of information that I thought might be included in the manual. I divided the contents into three sections: general information, installation information and project documents. The section under general information contained on my list information that the mechanic or electrician needed if he went abroad to an installation site, for example information about the company’s traveling policy. The installation section contained information that was needed at the actual installation site, for example drawings. The third section that is included in the installation manual, even though it is a separate set of folders, is the set of project documents that is delivered to the mechanics and electricians on site for training purposes.
Based on the information that I found and analyzed, I prepared a set of structured questions which I discussed with Sari Pehkonen. The questions can be seen in Appendix 1. The questionnaire included questions that can be divided into five sections (see Appendix 1):

- the background of the interviewee
- the general information folder
- the installation information folder
- the project documents
- some practical issues.

The background questions and the questions on the general information folder were aimed at both the mechanics and electricians. In the third section, the questions on the installation information folder, there were some questions that are only for the electricians. These questions were in italics, so that they could be distinguished from the other questions. The questions that were especially directed at the project managers had the word proi (a shortening for projekti-insinööri) in brackets after them. There were also some personal notes in brackets after some of the questions.

The interviewees were not given the set of questions beforehand. They were not given the written questionnaire in the interview either, because I used it as the basis for the interviews and I wrote the answers on it. I also used the list of information that I had prepared in the interviews. The interviewees could comment on the list that was organized along the same lines as the structured questions. I took notes on the questionnaire and wrote a more thorough report on the results of each interview. The reports were later compiled into a comprehensive summary. One example of the notes I wrote on the questionnaire is shown in Appendix 2. Based on the notes and the summary of all the interviews with the mechanics and electricians, I prepared a table containing the documents included in the installation manual. The table is shown as Appendix 3. That table was to be used in the following pair interviews.
A structured interview was easy to perform and it proved to be an appropriate method to get the kind of information I needed in order to develop the installation manual from the users’ point of view. Most of the questions dealt with facts, and the short and simple questions were aimed at receiving those facts. A slight disadvantage was that the structured interview seemed to make some of the interviewees feel that the situation was a formal one and some of them belittled their opinions and answers. In my opinion, some of them were more careful about what they said than the interviewees in the open interviews.

4.1.2 Pair Interviews

The project managers were interviewed in pairs. I decided to interview the project managers in pairs in order to bring about more discussion. I had a few questions for them that were included in the set of structured questions which were used in the interviews with the mechanics and electricians. I used the table mentioned above (see Appendix 3) to direct the discussion with the project managers. During the interview I made notes on the table and after the interview I wrote out a more specific report about the results of each interview.

I found that interviewing in pairs is more difficult to control than a personal interview, if the interviewees know each other and discussion may sidetrack. Another disadvantage of a pair interview is the fact that documenting the results is more difficult than those of a personal interview if the interview is not recorded. On the other hand, a pair interview may prove to be more productive in that the interviewees may end up discussing a subject matter more thoroughly and this can bring up valuable information and opinions.

4.1.3 Open Interviews

I used open interviews when interviewing the designers and the translator in order to leave room for issues to come up which I might not have thought of when preparing the questions. I also thought that an open interview would result in an open conversation about the documentation process where the interviewer might discuss the process more openly than in a structured interview.
In the open interviews, I only had a few questions on paper to help me remember to ask them. The most important questions in the open interviews were:

- How is the documentation process managed at RWN at the moment from your point of view?
- Are there any problems with the documentation process or the documents?
- How could those problems be solved?

In the course of each interview, I made notes about what was discussed, and after the interview was over, I made more comprehensive notes about what was said.

The requirement of a successful open interview is that the interviewer is familiar with the subject so that he can think of questions in the course of the interview. Since I was more familiar with the documentation process than the installation of a production line, an open interview was possible in the case of the designers and the translator but not with the mechanics and electricians. On the other hand, an open interview is in a way more difficult than a structured interview where the interviewer does not participate in the interview in the same way.

All of the three types of interviews have some advantages and some disadvantages, but I think they served well in discovering the kind of information that was relevant in this study. Next, I will present the results of the interviews and analyze them.

### 4.2 Results of the Interviews

The results will be presented in the order that the interviews were done. Thus, I will first present the results of the interviews with the mechanics and electricians. Then I will shortly sum up the most important issues that came up in the interviews with the project managers. Finally, I will deal with the results of the interviews with the designers and the translator.
4.2.1 Interviews with Mechanics and Electricians

Five mechanics and three electricians were interviewed. The interviews were carried out during two weeks in October, 2000. The interviewees were selected randomly of those that were in Finland at the time. The 5:3 ratio roughly corresponds to the number of mechanics in relation to electricians employed at RWN. Another reason for interviewing more mechanics than electricians was that the practice of producing installation information seems to be more established in the electronic engineering department than in the mechanical engineering department. I will refer to the interviewees as M1 to M5 (mechanics) and E1 to E3 (electricians). In the following, I will briefly present the main results of the interviews.

Background

The questions in the first section were of general nature and the main aim was to get the interviewees’ opinion on the installation manual as it has been up until now. I also gathered some background information about the interviewees.

All of the mechanics and electricians were men, they had many years of experience and they had all been working in domestic and foreign installation sites. All of them felt that the installation manual was important, for example, for the following reasons:

- It improves the relationship between the mechanic and the customer. (M2)
- It contains valuable background information. (M2)
- It is indispensable for completing the job as planned. (E3)

They also gave some examples of what they had had with them on the installation sites: different kinds of drawings, a sales contract, and a list of tools. The contents of the manual had varied depending on the project manager. As a conclusion, the answers to the first section clearly showed that there was a need for a comprehensive installation manual and that the current manner in which the manual was managed and its contents could be greatly improved.
Before the specific questions on the general information folder, there were a few questions on the contents in general and the delivery of the folders to the mechanic or electrician. All of the interviewees were pleased with the presentation although one was skeptical about the whole study. Many interviewees also seemed pleased that their opinions were heard and that they could influence the development work on the installation manual.

There was no consensus on how the manual should be delivered to the mechanic or electrician and thus the decision was left to the project manager. The decision also depends on the project. All of the mechanics and electricians were in favor of handling documents in electronic format, in other words, they liked the idea of having a laptop computer which they could carry with them. In some projects there are several folders that the mechanic or electrician carries with him. Most of those documents could be in electronic format and that would result in advantages like these mentioned by the interviewees:

- There would be less paper to carry. (E2)
- Backup copies of documents in electronic format. (M1)
- Documents could be printed at the location. (M4)
- Pictures in digital format could be sent back and forth and stored in the computer. (M1)
- Reporting would be easier. (all)
- Changes could be reported faster which would speed up the whole updating process. (M1)
- Corresponding and keeping in touch with the project manager would be easier via electronic mail. (all)
- Electronic dictionaries could be used, if mechanics had laptop computers with them. (M5)

The General Information Folder

The contents of the general information folder were regarded as useful for most part, but there are some documents that are only needed in exotic locations, for example, in Indonesia or Chile. An example of this is information on the target
country. A couple of the mechanics and electricians pointed out that information on insurances has been almost non-existent, although they would need that kind of information, especially abroad. The general opinion was that the contents seemed versatile. On the whole, the interviewees made only a few additions to the section on general information (for example, a CD-ROM about different countries and cultures, a first aid kit, and brochures on Raute and Lahti).

The Installation Information Folder

Most of the questions for the mechanics and electricians dealt with the installation information. The installation information is different in mechanical and in electronic installation. The contents also depend on the status of the mechanic or electrician (supervising or not) and their number at the installation site. For example, a supervising mechanic is the only one who has the certificates for acceptance. On the list used in the interviews, the installation information was divided into five sections:

- documents needed at the installation site
- other information needed for installation
- reporting
- test run and other testing
- certificates for the completion of the installation and for acceptance of the production line.

The documents that are needed at the installation site most of the time include different kinds of drawings, a Bill of Material and other supportive material, such as brochures. They are all considered very important and that is why there were many questions dealing with them. The goal was to find a consensus, for example, about the drawings that could be used as a guideline when producing the set of guidelines for project managers and head designers for compiling the folders. However, there were as many variations on the kinds of drawings, their sizes and their number as there were interviewees. Since drawings are so important for the mechanics and electricians and they are project dependent, it is
reasonable to let the mechanics and electricians discuss them with the head
designer in each project.

The Bill of Material could be taken as an example of the kind of variation that
occurred in the interviews. Four out of five mechanics said that one Bill of
Material is enough, whereas one mechanic said that there should be two of them
in case parts of it get lost. The most common wish concerning the language of the
Bill of Material was Finnish but there was again one mechanic who definitely
wanted it in English. Combinations of Finnish and Russian, for example, were
also suggested. There was variation even among the three electricians. One of
them said that he has never needed the Bill of Material, while the other two said
that they were useful. It became evident that these matters are not simply facts
about the work at an installation site but they are also matters of opinion and of
the level of experience and skill of the mechanics and electricians.

Other information that is needed for installation but which is not necessarily
always needed at the installation site was included in section two on the list of
information. The documents in this section included the sales contract,
installation schedules and the list of tools. The sales contract was the only one
that the mechanics unanimously said that they need. It has been the custom in
most projects that the mechanics have had one copy of the sales contract with
them and the electricians have borrowed it, if they have needed it. Two of the
electricians thought that they too should have a copy of the sales contract. One
electrician, on the other hand, pointed out that there should not be too many sales
contracts at the installation site since the information in them is confidential. The
conclusion is that at least one sales contract is needed and, it is the responsibility
of the project manager to ensure that the mechanics and electricians have one.
The prices and other confidential information will be hidden.

Reporting the progress of the installation to the project manager resulted in a lot
of discussion and opinions were presented both in favor of it and against it.
Reporting includes several different types of forms which are used for different
purposes. Some interviewees said that they use all the forms for reporting the
progress of the installation and the changes that occur during the installation. Some admitted that they have not used all of the forms. Many were in favor of reporting electronically, that is via electronic mail.

Test run and testing reports are obvious parts of the installation manual and they did not cause much discussion among the interviewees. Similarly, certificates for the completion of the installation and for acceptance of the production line on the customer’s behalf are documents that the supervising mechanic is usually responsible of and they are important documents in the installation manual.

**The Project Documents**

At the moment, one set of project documents is sent to the mechanics and electricians in each project. The documents should be used for training the operators at the customer’s location. However, the majority of the interviewees said that they do not need the project documents. Reasons for this included:

- The operators do not want to look at paper documents, if they do not know how to read. (M2)
- They are not needed if there is a comprehensive installation manual. (M4)
- They can be borrowed from the customer if they are needed. (E3)

**Practical Issues**

The practical issues mainly dealt with the ending of the installation process at the customer’s location and the responsibilities of the mechanic or electrician at that point. The interviewees were asked what they usually do with the installation material once they leave the installation site. Up until now, there has not been a clear practice on what should be done with the material. As a result if this study, the installation manual will contain a document that lists the responsibilities of the mechanic and electrician at the completion of an installation. This is an important issue that the project managers emphasized in the interviews which will be discussed next.
4.2.2 Interviews with Project Managers

Based on the interviews with the mechanics and electricians I compiled the table shown in Appendix 3 that had all the documents, which had come up in the earlier interviews. It was important to find out who are responsible for producing the documents and who in the end attaches the documents to the installation manual. The answers to these questions were received in the two interviews, which took place at the end of October and the beginning of November in 2000. Four project managers were interviewed in pairs about the contents of the manual and the role that they have in compiling the installation manual. The project managers were selected randomly of those who were available. The most important questions that were answered by the four interviewees were: where does a specific document, for example, information on insurances, come from and whose responsibility is it to make sure that the mechanic or electrician receives that information?

In the course of the interviews I made notes on the table that was used to direct the conversation. The individual documents were discussed in the order they were presented in the table as well as the source of the documents and the person responsible for including the document into the installation manual. The goal was to clarify the roles of project managers and the head designers and to find out the project managers’ opinion on the contents of the installation manual. After both of the interviews I wrote out the comments in the form of a report.

Both of the interviews were similar in that there seemed to be genuine interest in improving the installation manual, and the project managers were content with the kind of development work that was done on the installation manual. The interviewees suggested some additions to the table, for example, information on currencies and on the contact person in the target country. No documents were removed from the table.

The Meeting
After interviewing the four project managers, the information was gathered and analyzed and a proposal for the contents and for the process of compiling the
installation manual was prepared. The proposal was presented in a meeting, which took place on November 23, 2000. There were eight people present at the meeting, all of whom were in one way or another connected with the installation manual. A few additions and changes were made to the proposal and it was decided that some new documents would be added to the manual (for example, an accepted document on the company’s traveling policy in stead of an unofficial one). Besides those minor changes to the proposal, it was accepted as such.

The following figure shows the material of the installation manual after the interviews and the meeting as it was agreed upon. The contents are divided into three sections: general information, installation information and the project documents. The main documents in each section are listed below in Figure 4:

![Figure 4. The Contents of the Installation Manual.](image)

**Internal Instructions and Training**

Once the interviews and the meeting were held I wrote a set of guidelines on the installation manual. The guidelines are not strict in that project managers and
head designers can make alterations to the contents of the installation manual as they see fit in each project. As became evident from analyzing the results of the interviews, there were many opinions and it was impossible to set up a definite guideline that would satisfy all, and one that would fit all projects.

There will be training on the installation manual for mechanics, electricians, project managers, product managers and head designers. The contents of the manual as well as the responsibilities will be discussed in the training sessions, in other words, who is responsible for preparing documents to the folder and who will compile the folder. At the same time, mechanics and electricians will become familiar with some new documents that are included in the manual. After the training, the manual will be taken into use.

4.2.3 Interviews with Designers and the Translator

The designers and the translator were interviewed in order to find out their opinions on the documentation process at RWN. I interviewed three designers and a translator. The sample was rather small but I interviewed the people who deal with the technical customer documents the most at RWN. It was important to find out their opinion about the documentation process because they have valuable knowledge and opinions about the documentation process as it is at the moment. The interviews were carried out in February and March of 2001.

The results of the open interviews showed that there are some problems with the documentation process. The problems that came up in the interviews included the following:

- Documents are written in a hurry.
- There is no editing.
- There is inconsistency in layout and the order in which information is presented in a document.
- Documents produced by subcontractors are often received late.
- Some designers seem to have trouble using the MS Word text-processing system.
• Finding the latest version of a document can be difficult.

Solutions to these and other problems which came up in the interviews will be presented in the following section where I will discuss some suggestions for improving the documentation process at RWN. The results of the open interviews will be discussed in more detail in the following sections as well.

4.3 Managing the Documentation Process

As I said before, it is important to find out the current state of the documentation process at RWN before thorough development work can be started on it. The interviews with the designers and the translator were valuable sources for information about the documentation process. In the course of the analysis of the data from the interviews, it has become evident that there is room for improvement in the documentation process. In the following sections, I will first deal with some problems that have occurred in the documentation process and then I will present some suggestions for solving those problems.

Inconsistency was one characteristic of the technical customer documents produced at RWN that came up in several occasions. Inconsistency does not give a good impression of a company and it does not improve the quality of the documents. The varied use of terminology and the way information is organized in a document add to this problem. In cases when documents are written in a hurry, it is not uncommon that some grammatical or other kinds of errors end up in the text along with typos. These are not solely problems at RWN and they have been recognized elsewhere, too.

In defining quality of technical publications, Hackos describes “manufacturing problems” being, for example, spelling, grammatical and formatting errors (1994: 10). These kinds of errors are relatively easy to fix. One solution to this problem is making sure that all designers who write customer documents run a spell check before they consider the document ready to be delivered to the customer. As was mentioned in section 2.5, a spell checker should not, however, be trusted blindly since it will not recognize the difference between two correctly spelled words
(for example, *tukki* and *tuki*), even though they would change the meaning of a Finnish sentence completely. Carefully checked and formatted text seems more trustworthy and builds up the company image.

Documentation seems to have an unfavorable status and producing documents is not the most desirable task in an engineer’s task list. Hayhoe says that “Engineers are essentially problem-solvers by inclination and training, and few probably think of time spent on reports and technical presentations as productive” (2000: 3). This is a fundamental issue that should be taken into account because it will affect the development of the documentation process. Documentation is sometimes seen as a low priority task at RWN and thus it does not have the status it should have.

One reason for the low status of documentation is that documents are not seen as part of the product. The management should emphasize this issue and it should be discussed with the designers in possible training sessions and other meetings. Management can demand high-quality products but documents are not valued as much as the physical product. As a consequence, people who produce documents do not take as much pride in producing quality documentation and they are not as critical and conscientious as they should be. Changes in attitudes will not happen overnight but slow progress can be achieved with persistence and patience.

The low priority of documentation affects another issue that has come up in the interviews, and that is scheduling the production of project documents at RWN. It was my initial thought that the cause for delivering project documents late to the customers of RWN was poor or complete lack of scheduling. This is not the case in most projects, however. There seems to be enough time budgeted in each project to produce the documents. There is also a deadline when the project documents should be ready, but the problem is sticking to the deadlines. This problem does not have an easy solution and it cannot be solved overnight. One possible solution could be rewarding those people who do keep the deadlines in one way or another. Finding a good solution to these kinds of problems should be left to the management of the company since they are the ones who make
decisions about such matters in the end. As the instruction booklet on developing documentation stated (see section 2.2), a company should state the importance and goals of manuals and make the organization realize these goals (Pohjolayhtiöt 1991: 41).

The documents delivered by subcontractors should also be scheduled. RWN does not look good if documents created by subcontractors arrive late or if they are not of high quality. Another issue concerning the documents produced by subcontractors is the format in which they are in. If the documents were delivered in electronic format, it would ease the processing at RWN, and they could possibly be compiled on the same CD-ROM with the rest of the project documents. The specific format in which the documents would be delivered would have to discussed with RWN.

There is one more issue that I would like to discuss before the solutions are presented. Designers are not necessarily good at producing documents. There are designers who do not take into consideration the user of the documents, and this is an essential issue when operating and maintenance instructions are produced, as one interviewee pointed out. The information in operating instructions has to be presented in a way that, for example, a summer trainee at a veneer plant can operate the production line by using the operating instructions. Maintenance instructions, on the other hand, are used by professional maintenance workers whose knowledge about the production line is much higher than the average operator’s knowledge.

From these problems in the current documentation process it is time to present the suggestions for improving the process. First, I will present the model for managing the documentation process at RWN which is followed by several other suggestions that deal with more specific aspects of documentation, such as standards, for example.
4.3.1 Suggested Model for a Documentation Process

This is the model designed for the documentation process at RWN. The three models presented in chapter 2 (see subsections 2.4.3, 2.4.4 and 2.4.5) form the basis for it. The phases of this model have been compiled and slightly adapted from the theoretical models to best suit the current situation at RWN. The model created for RWN includes five phases:

1. Planning
   • for each project, a documentation plan is created which includes:
     - a list of documents included in the delivery
     - a schedule
     - a list of existing model documents that can be used
     - a list of people responsible for the model documents and for producing the project documents

2. Writing and revising
   • new project documents are written and existing model documents are revised according to the specific project

3. Editing and publishing
   • project documents are edited and checked, and translated if necessary
   • publishing (project documents are printed and compiled in folders, or they are prepared for electronic delivery)
   • project documents are delivered to the customer

4. Updating
   • specific project documents are updated according to the changes made in the installation phase, for example.
   • updated documents are delivered to the customer

5. Maintenance
   • feedback from customers is gathered and analyzed
• people responsible for model documents keep them up to date, maintain
them
• development work on the documentation process and the documents (for
example, customer surveys, user and task analysis, usability testing).

Documentation plan, which is the document produced in the first phase of the
documentation process, is adopted from Haramundanis’ model for a quality
documentation process (1998: 87), which was presented in chapter 2 (see section
2.4.3). According to this model for a documentation process, it is one of the tasks
of a technical communicator at RWN to produce a documentation plan for each
project (the role and the other tasks of a technical communicator will be
discussed in section 4.3.4). It would save the designers time if they did not have
to look for individual model and project documents and their different versions.
The documentation plan would also clearly show who is responsible for creating
the specific model and project documents. Hopefully, the plan would also
improve scheduling and keeping the deadlines for producing project documents.

In the second phase, the designers either write completely new project documents
or use existing model documents to produce the custom-made project documents.
Then, in the third phase the project documents are edited by a technical
communicator. The responsibility of the correctness of the information in the
documents is left to the designers, who are the best experts on those kinds of
facts. It is then their responsibility to check the documents for their information
content. The project documents are also translated if necessary. In the third
phase, the technical communicator compiles the project documents and prepares
them for electronic delivery, if that is the medium chosen in the company. He
also makes sure that the project documents are delivered to the customer as
scheduled.

Updating is the fourth phase of the documentation process model. It includes
updating the project documents according to the changes made to the production
line at the installation site. It is important that the project documents correspond
to the final product that is delivered to the customer. Mechanics and electricians
are responsible for reporting any changes that were made at the installation site, and designers who produced the original project documents are responsible for updating the specific project documents. The technical communicator keeps track of the updating process and makes sure that all updated project documents are delivered to the customer.

The last phase of the documentation process model is the maintenance phase. Designers who are responsible for specific model documents keep them up to date. Feedback from customers is gathered and analyzed and possible changes are made accordingly. The development work on the documentation process and the documents is included in this phase since it is an ongoing task that should not be forgotten. The development work includes testing project documents and trying out new tools for producing documents.

Last year, 150-200 feedback forms were sent out by RWN and 21 of them were received back from the customer. Most of the customers who answered the questions and gave feedback were pleased with the product and service. The average grade was 4,8 (6 being the best grade). The average grade for the usability of the operating instructions was also 4,8. It might be that the dissatisfied customers are less eager to give feedback, since the rate at which customers return feedback forms is rather low. Feedback could be gathered through other methods, such as surveys or personal interviews.

In addition to this model for managing a documentation process, there are other suggestions for improving the documentation process that I would like to discuss. The four main issues, which I will discuss further in the following subsections, are listed here:

- standards
- model documents
- the role of a technical communicator
- training.
I will also touch upon other issues, such as tools for producing documents and publishing, which will likely undergo changes in the future at RWN.

4.3.2 Standards

Going back to Chisholm’s study (presented in subsection 2.4.2), there seemed to be similarities between the results of his study and the current situation at RWN. To be more precise, some of the problems that Chisholm listed seemed familiar when considering the documentation process at RWN. It seems that the lack of policies and routines and inconsistent terminology are problems that need attention in the documentation process at RWN. These are also other issues that came up in the interviews with the designers and the translator and which were presented earlier.

A set of standards is one solution to these problems. By adopting standards, the quality of RWN’s customer documentation can be improved. One concrete example of setting standards for an organization is a style guide that would help designers write and format their documents in a consistent way. Having style guides and possibly also checklists would save designers from having to make the same decisions over and over again. Using a style guide would also be one way to make sure that all designers use the model documents and the template that should be used when writing project documents. But, as Hackos points out, “Standards alone are not sufficient to ensure quality” (1994: 15). A company aiming at quality documentation also needs good employees and effective tools.

Standards can be created and adopted in a company but they also have to be enforced. It is then the responsibility of the management of a company that standards and policies are given enough attention and that they will be firmly adopted. One possibility would be to apply the standards first to a set of model documents. Through the creation of model documents according to the standards, the practice might be adopted more effectively when the designers use the model documents to write project documents.
4.3.3 Model Documents

The development work on model documents is a good place to start developing the documentation process as a whole at RWN. There has to be a demand for high-quality model documents, which will ensure that the quality of the project documents will also improve. Once there is a comprehensive set of model documents for each production line, designers will save a lot of time in producing project documents, and project documents can be delivered to the customer on time. This will be a considerable improvement to the documentation process and to the quality of the documents.

An indexed organization will be developed for all model documents which will ensure that a specific model document will be easy to find. The directories are organized in a way that all general documents, such as general safety instructions that apply to all production lines, are in one directory and the other directories will cover one production line each. All model documents for a composing line, for example, are found under a specific directory.

4.3.4 Technical Communicator as a Part of the Process

In chapter 2, I presented Hackos’ process-maturity model (see subsection 2.4.1), which classified publications organizations on six levels according to the maturity of their documentation process. In my opinion, the documentation process at RWN could be placed between levels 0 and 1. According to Hackos, stepping from level 0 to level 1 is simple: she says that it can be achieved simply by hiring a technical communicator or a group of technical communicators depending on the size of the company (1994: 52). However, the role of the technical communicator at RWN would differ from that of Hackos’ as becomes evident from the following description of the tasks of a technical communicator.

In the light of the current situation at RWN, it seems sensible that designers continue to write the documents. They have the best knowledge of the production lines and the special features that make the lines unique. As has been shown in the previous chapters, there is a need to improve the quality of the technical customer documents. One answer to this need for improvement is the addition of
a technical communicator to the documentation process at RWN. The technical communicator would in his part ensure the constant high quality of technical customer documents.

When the model for a documentation process was presented in subsection 4.3.1, the role of a technical communicator was slightly touched upon and some of his tasks were presented. The complete list of the tasks of a technical communicator is put forward here:

- producing a documentation plan for each project
- editing both model and project documents
- publishing (for example, preparing CD-ROMs)
- training and assisting
- developing the documentation process and the documents.

Since there are so many project documents delivered in each project, the development work on the technical customer documents should be started on the model documents. Once designers write model documents, they should be edited by someone who ensures that all the documents look alike and that there are no typos or other grammatical errors. These model documents would ensure that the quality of the project documents is as high as that of the model documents. Through editing the documentation process can reach level 2 of Hackos’ model.

The technical communicator could also participate in managing the documentation process by making sure that all the necessary documents are produced and delivered on time. He would prepare the CD-ROMs if that was the medium the customer wanted to receive the project documents in.

The technical communicator would help the designers with writing and offer assistance in using the text-processing system. He would organize training on documentation if that was regarded necessary and create a style guide for designers that would be used when writing documents. In addition, one of the most important tasks of a technical communicator would be the constant
development work on the documentation process since it can never be completed. As was mentioned in chapter 2 (see section 2.2) when the instructions booklet on documentation (Pohjola-yhtiöt 1991) was discussed, the development of a documentation process includes keeping track of results in the development work as well as setting new goals. These are important tasks for continuous improvement.

One of the problems with project documents has been updating them after the installation has been completed. In the end, it is the responsibility of the designers who wrote the project documents that they update the documents and that the revised documents are delivered to the customer. The technical communicator could participate in this part of the process to make sure that all documents that need updating will be revised and that they are delivered to the customer after the completion of the installation.

4.3.5 Training

One interviewee pointed out that there is need for further training but it should be carefully considered what kind of training is most useful. According to one interviewee, training should be based on practical issues, such as producing real documents for a project. It was also suggested that designers should read each other’s writing. That might be a useful way of paying more attention to their own way of writing and presenting information.

There will be further training on writing and using the MS Word text-processing system if there seems to be need for it. There will certainly be information given out on the new arrangements on the documentation process so that it can be adopted as smoothly as possible. Version management and the naming system for both the model and the project documents will be two important issues that the designers need to be informed about as soon as they are officially adopted at RWN.
4.3.6 Tools of the Trade

Currently, the documents are written with the MS Word text-processing system at RWN. Many other companies with similar project deliveries which require tailored project documents use other formats such as SGML (Standard Generalized Markup Language) to write documentation. The change from using, for example, the MS Word text-processing system into using SGML is not easy and it will require training, but there are many advantages that can be achieved by it. Haramundanis describes the wide use of SGML:

Initially SGML was designed for the publication of books; it has evolved to support the publication of technical documents and today it is used in many industries: financial, defense, automotive, commercial aerospace, pharmaceutical, electronics, telecommunications, transportation, news services, and by the government (1998: 255).

SGML is one solution to some of the problems mentioned earlier. Designers would not have to worry about the layout or the order in which they present information since a DTD (Document Type Definition)\(^3\), which is used to produce documents, solves those problems. In the case of RWN, there would be different DTDs for different types of documents and this would ensure that all maintenance manuals, for example, would be organized consistently. SGML enables the modular text writing and the documents are tightly organized. The version management of SGML documents is also secure.

There are also other benefits of using SGML which are listed here:

- Documents can be linked together.
- Search features can be used.
- Figures and tables can be linked to documents.
- Indexes can be created more easily.
- Updating and versioning is easy.

\(^3\) Haramundanis’ description of a DTD: “A DTD is similar to a template used in a text processing system but is more detailed and contains more specific structural elements than the typical template” (1998: 226).
It will be seen in the future whether SGML is used in the long run or whether it will be replaced by XML (Extensible Markup Language) or XHTML (Extensible Hypertext Markup Language). These are just a few possibilities and it is not an easy decision to choose the type of language that will be used to write documents a few of years from now.

However, since the MS Word text-processing system is used at the moment, it is necessary to explore the possibilities that it offers. One of them is the versioning feature. It enables the author to save different versions of the same document which can be retrieved for further use later. The date and author’s comments can be saved and viewed later. The version management is a feature that works well if everyone knows how to use it and if everyone uses it consistently. The version management should be further studied and if it proves to be a stable system, it could be adopted at RWN for managing the different versions of model documents.

4.3.7 Translation
Translation is an essential part of the documentation process at RWN since the majority of customers are foreign. The translation process can be made easier and faster by making sure that the Finnish documents are consistent in style and terminology. This can be achieved by adopting a set of standards and by creating a set of high-quality model documents as was presented earlier.

There are also other issues that can affect the smoothness of a process as in this following example. Here is a matter that Hackos points out when she talks about translation and localization; the use of callouts on illustrations. Since different languages express matters by using different amounts of words, direct callouts on illustrations can cause problems when they are translated. (Hackos 1994: 502.) English is a compact language and this might not be such a severe problem when translating texts from Finnish into other languages since Finnish words are generally rather long. But it helps translators to do their work easier when this is taken into account. The following illustration from a composing line’s operation description manual is a model example of good use of callouts:
Another example illustration of the same production line is the following figure which has text in it. It slows down the translation process when the translator has to make changes in the original drawing and especially if there is a great difference with the length of the words used in the source language and the target language. This illustration describes the controls of a composing line.

**Figure 5.** Composing Line with Callouts (Raute Oyj 1998).

**Figure 6.** Controls of a Composing Line (Raute Oyj 1998).
After all the language versions are ready, it is time to actually prepare the folders for the customers.

4.3.8 Production and Publishing

The actual production of documents, that is, printing hundreds of pages of information and filing them in the right order in several sets of folders, takes a lot of time and it can be seen as a boring task. Traditionally, customer documents have been delivered to the customer in paper format in a series of folders. There are some problems caused by this:

- large quantity of documentation
- finding information can be difficult
- updating documents is slow and expensive if the whole set has to be redelivered to the customer.

As was mentioned before, the amount of documentation that RWN delivers to customers in each project varies from five folders to as many as ten folders. The number of sets of folders varies from three to as many as seven. So, the cost of sending several sets of folders to, for example, Chile or New Zealand is substantial as compared to sending a couple of CD-ROMs to Chile or New Zealand. There is also a difference in the expenses of printing compared to the price of producing a CD-ROM disc. These savings in expenses can amount to considerable amounts of money on a yearly basis.

In chapter 2 (see section 2.6), the advantages and disadvantages of the two medium types, hardcopy and online, were presented as they were seen by Coe (1996: 210-212). As was pointed out, the choice of the medium is always a compromise and when making a decision on the medium, the users of the documents should be heard (Coe 1996: 207). These are issues that have to be kept in mind when choosing the medium for project documents produced at RWN.
Project documents produced by RWN will be delivered more and more in the Portable Document Format (PDF) in the near future. The advantages of this are that a CD-ROM is much easier and cheaper to send to the customer than a set of folders. Individual files can also be sent through the electronic mail system and the software that is used to view the documents, Acrobat Reader, is free and can easily be downloaded from the Web. There are several benefits form using the Acrobat Reader. Simple searches for words can be done. The table of contents is helpful in finding a particular section or chapter of a document and the reader can quickly glance through the contents of a maintenance instruction, for example. It is also easy to jump from one section to another. (Adobe Acrobat 4.0 2001.)

There are also other benefits of using the PDF format which are listed here:

- Documents created in any application, even Web pages and scanned documents, can easily be converted into PDF files.
- Compact PDF files are smaller than their source files.
- The original fonts, formatting, images and colors are preserved.
- PDF files always print correctly.
- Security features, links, thumbnails and bookmarks can be used.
- There is the possibility to review documents (text formatting, sticky notes, handwritten marks with the pencil tool).
- PDF files on the Web are downloaded a page at a time for faster display.
- Web links, sound and video can be added to PDF files. (Adobe Acrobat 4.0 and Adobe PDF 2001.)

Up until now, many of the features of Adobe PDF have not been used when converting documents into PDF and delivering them in a CD-ROM to the customer. These features, such as creating links and using the review functions, will increase the usability of project documents. Another benefit from using PDF files is the fact that documents created by subcontractors can be scanned and converted into PDF files and thus, they can be delivered in the same package in electronic format as other customer documents.
A thought for future developers of documentation at RWN is the possibility of linking some specific documents, for example, operating instructions, to a PC on those production lines where there is one. The possibility of doing this depends on the type of display the PC has, whether or not it has a CD-ROM drive and a printer. Many mechanics and electricians also have laptop computers in the future and that would enable them to take some project documents with them in electronic format. These possibilities have to be studied and tested thoroughly and the documents have to be adapted accordingly for best possible usability.

4.3.9 Continuous Learning

In order to keep improving the documentation process, it is necessary that the progress is evaluated at the end of each project. Mistakes happen and delays and changes in the schedule occur every now and then, but it is important that the same mistakes do not repeat themselves in every project.

The development could be evaluated by the project manager or the technical communicator in each project by comparing the planned schedules to the amount of time used to complete the project, and to be more precise, to produce the project documents. The quality of the project documents is difficult to evaluate unless they are edited by a technical communicator. Learning from mistakes is the key to continuous development and progress since only then can high-quality documents be produced consistently in each project.
5 CONCLUSION

This study has explored the documentation process in theory and in practice at Raute Wood Nastola. The goal of this study was to set up a documentation process that would solve at least some of the problems that came up in the course of this study. Improving the quality of the technical customer documents produced at RWN by improving their production process was one of those goals.

The starting point for this study was to analyze the current state of the documentation process at RWN. The material for the analysis was collected by interviews. It became evident that there is room for improvement in the way the documentation process is managed at RWN. In addition, there are other issues that have to be considered when developing the process. Raute Wood is a traditional company with a set of values. Their products are well-known in the field of wood processing industry to be of high quality. Since documents are a part of a product it would be an easy conclusion that the documents should be at the same level as the rest of the product. However, this is not the conclusion that everyone automatically arrives at.

The theoretical background to this study relied mainly on the five models dealing with the documentation process that were presented in chapter 2. They were used as the basis for the process model, which was presented in the previous chapter. The theory also included issues related to quality, which is the goal of a well-managed documentation process.

This study continued the research which Sari Pehkonen begun when she studied the documentation at RWN in 1998. She carried out a customer survey to find out the quality of the project documents. She also defined the contents of the project documents and their division into eight groups. She developed a template which is used for writing manuals and which is an important factor in achieving consistency in document layout.
The main result of this study is the model for a documentation process, which includes five phases:

1. Planning
2. Writing and revising
3. Editing and publishing
4. Updating
5. Maintenance

I also presented other suggestions for improving the documentation process which are solutions for the problems that came up in the interviews with the designers and the translator. The suggestions presented dealt with:

- adopting standards
- producing model documents
- adding a technical communicator to the process
- training designers.

Installation manual was an independent subcase of this study which will mostly benefit the mechanics and electricians at RWN. The goal was to compile an installation manual which will help mechanics and electricians in their work at installation sites both in Finland and abroad. The problem had been up until now that the contents of the manual varied a great deal according to the project manager. In order to find out exactly what was needed in an installation manual I interviewed mechanics, electricians and project managers. As a result I wrote a set of guidelines which will be used to direct the course of the production and compiling of the installation manual. The guidelines state who is responsible for which document and how the manual is compiled and delivered to the mechanic or electrician who needs it. In addition to the guidelines, there will be training on the new manual for mechanics, electricians, project managers, head designers and product managers in the near future. The installation manual will then be taken into use.
Before a thorough development work can be adopted in a company the following questions have to be asked and answers to them have to be found: Is there willingness to invest in developing documentation and to maintain the high quality of products and the good reputation that they have around the world? Is everyone willing to take responsibility of the quality of his work?

At the moment, documentation at RWN does not have the status it should have. In my opinion, the low status of documentation can be seen in the documents that are delivered to the customers. One of the most serious problems is keeping the delivery deadlines. The documents are also not always consistent as to their layout and the presentation of information. Documents are written toward the end of the project cycle and the pressure to get them ready in a hurry can be seen in the final documents. Through firm scheduling and emphasizing the fact of keeping deadlines, it is possible to deliver project documents on time.

A well-planned and well-managed documentation process does not function by itself. Everyone who is connected to customer documentation has to know the common rules of documentation and the quality required of the documents. The demand for quality in all the areas of services has to come from the upper management but it should also be rewarded in some way and the current bonus system is one step in the right direction. Much effort has to be put into educating and training designers to pay attention to the quality of documents, and courses on producing documents should be organized if there seems to be need for such courses.

Once the high level of technical customer documents has been reached, it is time to ask for customer feedback on the project documents and test how they are used at the actual production sites. Only then can their usability and user-friendliness be achieved. The feedback can be gathered through surveys, interviews and usability testing. It is important to ask customers’ opinions to improve the company’s image and to ensure the customers that there is concrete development work being done to improve the technical customer documents.
Documentation is a field which is changing rapidly. The tools that are used for writing documents change as well as the products that the documents are written about. Keeping up with the changing trends and tools is a busy job in itself and the pressure from harsh competition in the market the company is competing in does not make that job any easier. Documentation is a part of a process in a company which easily suffers from tight deadlines and product development work done at the last minute. Once the product is ready, it needs to be rushed to the market or to a customer and there is a tendency not to pay attention to the documents and their level of quality. It is the product that is important. A well-managed documentation process is one solution to this problem. If the rules of the game are clear to everyone, playing the game is much easier and better results can be achieved. Yet, there are other factors that can ease the solving of the problem.

One solution is adopting a process where a key player is a technical communicator. A machine cannot be designed by someone who does not have training in designing machines. Writing usable documents, where the information is clearly presented and well-organized, is not an easy task that everyone is capable of doing successfully. Every job has its special requirements that people who have training in that area are capable of handling. A professional technical communicator is an essential part of the documentation process in many companies.

The possibility of delivering documents electronically will certainly change the scheduling in a way profitable to the customer and also to RWN. Updating the documents alone will become much easier and new versions of the documents can be delivered to the customer fresh from the press in electronic format. Delivering documents in electronic format will also save expenses which can amount to quite great amounts of money at a year level. There are many features in the currently used delivery format which have not yet been taken advantage of and which will make the documents more usable.
The format in which the documents will be written in five years from now, for example, will be different than the one that is used now at RWN, and changes like that will be a challenge that employees have to be prepared for well in advance. Major changes will not happen overnight but they still demand a lot of effort and patience from all employees. The demand for continuous training will increase and there has to be willingness to meet that challenge.

The future of documentation at RWN seems still a little uncertain but there is light at the end of the tunnel. The study carried out by Pehkonen and this study are concrete proof of the will to improve the current documentation process and the quality of the technical customer documents. The guidelines have now been set and it is up to the management and everyone who participates in the production of documents to follow those guidelines. It will not be an easy transfer from old habits and ways of producing documents into the new model but change is inevitable in everything and if there is a genuine interest in developing the process, then the change will be easier.

This study is not in any way the end of possible research of documentation at RWN. One main area that was not touched upon at all is user analysis which is a growing and important field of study in the documentation arena. Once the documentation process runs smoothly, the documents and their usability can be tested at the customer locations. It is easier to improve their contents and styles once the process is firmly in place.
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ASENTAJANMAPPI-HAASTATTELU

HAASTATELTAVA:_____________________________________________________________

PVM:_______________________________________________________________________

ASENTAJA/ASENNUSVALVOJA:___________________________________________________

TYÖKOKEMUS ALALTA:________________________________________________________

KOTIMAAN/ULKOMAAAN KOMENNUKSIA:___________________________________________

ARVIO ASENTAJANMAPIN TARPEELLISUUDESTA:

___________________________________________________________________________

ASENTAJANMAPIN SISÄLTÖ TÄHÄN ASTI (KOTIMAA/ULKOMAA):

___________________________________________________________________________

___________________________________________________________________________

MITÄ HYVÄÄ JA TARPEELLISTA MAPISSA ON OLLUT TÄHÄN ASTI?

___________________________________________________________________________

___________________________________________________________________________

ONKO MAPISSA OLLUT JOTAIN TURHAA TAI ONKO SIELTÄ PUUTTUNUT JOTAIN?

___________________________________________________________________________

___________________________________________________________________________

KOMMENTIT EHDOTUKSESTA ASENTAJANMAPIN SISÄLLÖKSI eli mitä mukaan asentajanmappiin?

ASENTAJANMAPIN SISÄLTÖ VOITAISSIIN JAKAA KOLMEEN OSAAN ELI YLEISINFOON, ASENNUKseen liittyvään infoon ja asiakasdokumentteihin. JÄOTTELU PERUSTUU SIHIN OLETUKSEEN ETTEI ASENTAJA TARVITSE KAIKKEA TIETOA AINA ASENNUSPAIKALLA. MYÖS ERI OSIOIDEN TUOTTAJA VAIKUTTAA TÄHÄN JAOTTELUUN.
MILTÄ SISÄLTÖ VAIKUTTAA?

___________________________________________________________________________
___________________________________________________________________________

ONKO SISÄLLÖSSÄ POISTETTAVIA, TURHIA OSIA?

___________________________________________________________________________
___________________________________________________________________________

PUUTTUUKO JOTAIN?

___________________________________________________________________________
___________________________________________________________________________

MITEN HALUAISIT, ETTÄ ERI OSIOT TOIMITETTAISIIN SINULLE? MILLOIN?

___________________________________________________________________________
___________________________________________________________________________

MITEN KOTIMAAN JA ULKOMAAAN KOMENNUKSET EROAVAT ASENTAJANMAPIN SISÄLLÖN
KANNALTA?

___________________________________________________________________________
___________________________________________________________________________

YLEISINFO-OSA

ONKO LISTASSA JOITAKIN PAPEREITA, JOITA ASENTAJA TARVITSEE ASENNUSPAIKALLA?

___________________________________________________________________________

KÄYTÄNNÖN TIETO - MITÄ TARVITAAN? (kotimaa/ulkomaa)

TIETOA KOHDEMAAN OLOSUHTEISTA?

MATKUSTAMINEN (LENNOT, YM)
MAJOITUS ________________________________________________________________

VAKUUTUSASIAIT, VAHINKOJEN RAPORTINTI ______________________________________

TYÖSUOJELU ______________________________________________________________

TYÖTERVEYS (KOTIMAA/ULKOMAA, ENNEN LÄHTÖÄ) ______________________________________

TYÖTURVALLISUUSOHJEET ASIAKASDOKUMENTTIEN KANSSA (YLEISOHJE, SUUNNITTELIJALTA KONELINJAN TURVAOHJEET) - OK?

___________________________________________________________________________

ERILLINEN OHJE ASENNUSVALVOJILLE? ERILLiset VELVOLLISUUDENT?

___________________________________________________________________________

___________________________________________________________________________

MUUTA KÄYTÄNNÖN TIETOA?

___________________________________________________________________________

___________________________________________________________________________

MATKATYÖ JA MATKALASKUT - YLEISET OHJEET (kotimaan/ulkomaan)

MATKATYÖILMOITUSKAAVAKKEITA ______________________________________________

SAMA OHJE KOTIMAASSA JA ULKOMAILLA? (PROI)

___________________________________________________________________________

___________________________________________________________________________

PÄTEEKÖ AINA SAMA OHJE? (PROI)

___________________________________________________________________________

___________________________________________________________________________

ASENNUSINFO-OSA
ONKO LISTASSA JOTAIN, JOTA EI AINA VÄLTTÄMÄTTÄ TARVITA ASENNUSPAIKALLA?

________________________

________________________

MIKÄ ON SÄHKÖPUOLEN KÄYTÄNTÖ? MITEN ESIM. MUUTOKSET RAPORTOIDAAN?

________________________

________________________

TARVITAanko MUUTOSTA NYKYKÄYTäNTÖÖn?

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ASENNUSINFO ON JAETTU VIITEEN OSAAN:

OSA 1 - KONEEN LUONA TARVITTAVAT PAPERIT

PIIRUSTUKSET

SÄHKÖPIIRUSTUKSET - MONTAKO SARJAA?

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MITÄ PIIRUSTUKSIA TARVITAAN? (LINJAKUVAT, LAYOUT, PERUSTUS, PKP/OKP/OSAT)

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MONTAKO TASOA?

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RIITTÄÄKÖ AINA SAMA TASOJEN MÄÄRÄ?

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KOKO (A3)?

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MONTAKO KAPPALETta? (+1 MUUTOSKUVIKSI)

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OSALUETTELOT

Onko sähköasentajilla yleensä mukana osaluetteloit?

Montako kappaletta?

Milloä kielellä?

Montako tasoa tarvitsee olla ’täydellisinä’? (täydellinen/asiakas)

Muu materiaali (esitteet (esim. sahoista), valokuvat, TMS) - tarvitaanko?

Pakkalistat ja niiden toimitus

Koeajopöytäkirja (koeajo nastolassa) - tarvitseeko asentaja? Missä toimitetaan?

OSA 2 - Muu asennukseen liittyvä informaatio

Asiakkaan erityisvaatimukset/myyntisopimus (proi kokoaa sopimuksesta)

Aseunnusaikataulut (koko projekti/oma projekti)
LISTA TYÖNUMEROISTA - MIHIN KAIKKEEN KÄYTETÄÄN JA MILLOIN TARVITAAN? TARVITAANKO KOTIMAAN PROJEKTEISSA?

LISTA KONEASENTAJAN/SÄHKÖASENTAJAN TYÖKALUISTA - ONKO AINA SAMA? MISSÄ TARVITAAN?

OSA 3 - RAPORTINTI

ASENNUSRAPORTIT
KUINKA USEIN TÄYTETÄÄN? (PROI)

KUKA TÄYTTÄÄ? ALLEKIRJOITTA? (PROI)

ASENNUSSPÄIVÄKIRJA
MITÄ SISÄLTÄÄ? (PROI)
MITÄ MIELTÄ?

PALAUTEKAAVAKKEET

OSA 4 - KOEKÄYTTÖ JA TESTAUS

TESTAUSSUUNNITELMA
TARVITAANKO?
KOEKÄYTTÖPÖYTÄKIRJA
KUKA TÄYTTÄÄ/VASTAA ASIAKKAAN LUONA, ONKO LOMAKE?

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TOIMIKO SÄHKÖASEN TAJA MYÖS KÄYTTÖÖNOTTAJANA?

___________________________________________________________________________

TURVALAITTEIDEN TARKASTUSPÖYTÄKIRJA _______________________________________

KAPASITEETTIJOPOYTÄKIRJA ___________________________________________________

OHJE SÄHKÖASENNUKSEN TARKASTAMISESTA - ONKO AINA SAMA? TARVITAANKO AINA VAI OVAKO PROJEKTIKOHTAISIA?

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SÄHKÖASENNUKSEN TARKASTUSPÖYTÄKIRJA - ONKO AINA SAMA?

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OSA 5 - LUOVUTUS JA HYVÄKSYMINEN

HYVÄKSYNNÄT

KUKA ALLEKIRJOITTA?
ONKO VAKIOT?
MISSÄ POHJAT?
TARVITAANKO LINJAKOHTAISIA?

ASENNUSVALMISDOKUMENTIT _________________________________________________

LUOVUTUS- JA/TAI HYVÄKSYNTÄDOKUMENTIT ___________________________________

ONKO MUITA HYVÄKSYMISEEN LIITTYVÄ PIAPEREITA? (VIRANOMAIISTARKASTURAPORTIT)

___________________________________________________________________________

LISÄKSI:

ASIAKASPROJEKTIKANSIO SISÄLTÄÄ MM. TEHDAS LAYOUTIN, TIEDOT SÄHKÖN, PAINEILMAN JA LÄMMÖN TUONNISTA. MITÄ OSIA ASIAKASPROJEKTIKANSIOISTA ASENTAJA TARVTSEE? (LISTA)
ASIAKASDOKUMENTIT

Tarvitsetko sähköasentaajat asiakasdokumentteja, esim. koulutukseen?

Millä kielellä? (asiakaskieli/SU, EN)

Montako sarjaa?

Asetajanmapin joidenkin paperien toimitus sähköisessä muodossa? Suurin osa yleisohjeen sisällöstä, jos asentajalla kannettava tietokone mukana keikalla.

Mitä mieltä joidenkin kaavakkeiden palauttamisesta sähköpostin välityksellä? (esim. asennuspäiväkirjat)

KYTÄNNÖN JÄRJESTELYT

Montako asentajanmapia/komennus?

Kuka kasaa? (PROI)

Läpiäynti pääsuunnittelijan/proin kanssa

Miten palautetaan työmaalta?

Kuka hävittää ja miten?
VOIDAANKO TESTATA VALMIIN MAPIN TOIMIVUUTTA JOSSAKIN ALKAVASSA PROJEKTISSA? (PROI)

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MUUTA KOMMENTOITAVAA?

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ASENTAJANMAPPI-HAASTATTELU

HAASTATELTAVA: 

PVM: 12.10.2000

ASENTAJA/ASENNUSVALVOJA: MOLEMAA

TYÖKOKEMUS ALALTA: 15 V

KOTIMAAN/ULKOMAAAN KOMENNUKSIA: U ENIMMÄKSEEN

ARVIO ASENTAJANMAPIN TARPEELLISUUDESTA:

TÄRKEÄ, PAROIMA ASIAKASSUOHE, KUVA ASENTAJASTA,
HYVÄ TANSTATTEDEA

ASENTAJANMAPIN SISÄLTÖ TÄHÄN ASTI (KOTIMAA/ULKOMAA):

ENG. SOPIMUS, ONKIA TIEDEJÄ PROJ, OMA
AKTIVIUS

Mitä hyvää ja tarpeellista mapissa on ollut tähän asti?

KAikki TARPEELLISTA

Onko mapissa ollut jotain turhaa tai onko sieltä puuttunut jotain?

EVI TUEHAA

KOMMENTIT EHDOTUKSESTA ASENTAJANMAPIN SISÄLLÖKSI eli mitä mukaan asentajanmappiin?

ASENTAJANMAPIN SISÄLTÖ VOITAISIIN JAKAA KOLMEESEIN OSAAN ELI YLEISINFOON, ASENNUKSEEN LIITTYVÄÄN INFOON JA ASIAKASDOKUMENTTEIHIN. JAOITTELU PERUSTUU SIIHEN OLETUKSEEN ETTEI ASENTAJA TARVITSE KAIKKEA TIETOA AINA ASENNUSPAIKALLA. MYÖS ERI OSIOIDEN TUOTTAJA VAIKUTTAA TÄHÄN JAOTTELUUN.
Miltä sisältö vaikuttaa?

DK, Jackoon vaihtaa - asiaikahalle ei voi

Nayttää kaukaa

Onko sisällössä poistettavia, turhia osia?

Turhat näkemäkätäkynnostä, vaikea snnoa vievä

Puuttuuko jotain?

Ei, sähköessä muddossa matkatyöilmoitus

Mitä haluaisit, että eri osiot toimitettaisiin sinulle? Milloin?

'Salaset' absentaajan mukana, muut kannetkavassa

Koneitten mukana

Mitä kotimaan ja ulkomaan komennukset eroavat absentaajanmapin sisällön kannalta?

Kotimaassa ei konditiömä, as. info sana

Yleisinfo-osa

Onko listassa joitakin paperia, joita absentaaja tarvitsee asennuspäikällä?

Ei

Käytännön tiedo - mitä tarvitaan? (kotimaa/ulkomaa)

Sähköompongaa maksimien tiedo, Bitmichilla

Tietoa kohtamaan olosuhteista? kaupunki/maaseutu erät, yö, luoto, ja

Matkustaminen (lennot, ym) liput, ajat
MÄJÖITUS TIETO PROIHTA

VAKUUTUSASIAT, VAHINKOJEN RAPORTointI KORTI ON

TYÖSUJOJELU

TYÖTERVEYS (KOTIMA/ULKOMAA, ENNEN LÄHTOÄ) IRMAAtt LEHDElAAN TIElOA,

ROKOTUKSET, TOO TIEtO PAlAATBlAS IA AtLAkku

TYÖTURVALLISUUOSOHJEET ASIAKAASDOKUMENTTIEN KANSSA (YLEISOHJE, SUUNNITTELIJALTA KONELINJAN TURVAOHJEET) - OK?

ÅSAAlUS ILMOTTAu

ERILLINEN OHJE ASENNUSVALVOJILLE? ERILLISET VELOVALLISUUDET?

E1

MUUTA KÄYTÄNNÖN TIElOA?

CD-ROM MALASTA

MATKARYÖ JA MATKALASKU - YLEISET OHJEET (kotima/ulkomaa)

MATKARYÖILMOITUSKAAVAKEIITA JOD, MAISSA

SAMA OHJE KOTIMAASSA JA ULKOMAILLA? (PROI)

PÄTEEKO AINA SAMA OHJE? (PROI)

ASENNUSINFO-OsA
ONKO LISTASSA JOTAKIN, JOTA EI AINA VÄLTTÄMÄTTÄ TARVITA ASENNUSPAIKALLA?

KATKUSA EI TÄRTE AINA

MIKÄ ON SÄHKÖPUOLEN KÄYTTÖ? MITEN ESIM. MUUTOKSET RAPORTOIDAAN?

TARVITAAanko MUUTOSTA NYKYKÄYTTÖÖN?

ASENNUSINFO ON JAETTU VIITEEN OSAAN:

OSA 1 - KONEEN LUONA TARVITTAVAT PAPERIT

PIIRUSTUKSET

SÄHKÖPIIRUSTUKSET - MONTAKO SARJAA?

MITÄ PIIRUSTUKSIA TARVITAAN? (LINJAKUVAT, LAYOUT, PERUSTUS, PKP/OKP/OSAT)

EI OKP ALENPIA, TÄKILLÄ / POSTITTEE SAA, JOS TÄRTEE

MONTAKO TASOA?

OKP PÄÄ KONEESTA (SORVI - RAUTEN MERSU)

RIITTÄÄKÖ AINA SAMA TASOJEN MÄÄRÄ?

KOKO (A3)?

A1 150

MONTAKO KAPPALETTA? (+1 MUUTOSKUVIKSI)

RIIPPUU LÄÄKIJÄJÄSTÄ, JOS ISOJA LINNOJA - USEITA LINJAA / LAYOUT 1/ASENNA
OSALUETTELOT

Onko sähköasentajilla yleensä mukana osaluetteita?

Montako kappaletta?

Sama kon kuvat (jos tähän)

Millä kielellä?

Su (TURVAISEMPI)

Montako tasoa tarvitsee olla 'täydellisinä'? (täydellinen/asiakas)

Aiiasas Kuntaa

Muu materiaali (esitteet (esim. sahoista), valokuvat, TMS) - tarvitaanko?

Valokuvat, esitteet + asennuskuvat tuntuu nähden

Pakkalistoja ja niiden toimitus

TARPEEN

Koeajopöytäkirja (koeajo Nastolassa) - tarvitseeko asentaja? Missä toimitetaan?

Huom Olla

OSA 2 - Muu asennukseen liittyvä informaatio

Asiakkaan erityisvaatimuksen myyntisopimust (proi kokoaa sopimuksesta)

On ollu, hintojen musten, huom olla mukana

Asennusaikataulut (koko projekti/oma projekti)
ON MUKANA, KETÄ TYÖMAALLA, KUKA VARSTA,

\[4\]N\ [4\] OLLA

LISTA TYÖNUMEROISTA - MIHIN KAIKKEEEN KÄYTETÄÄN JA MILLOIN TARVITAAN? TARVITAANKO KOTIMAAN PROJEKTEISSA?

\[6\]O, \[6\] RAPORTOINTI, \[6\] TILAOS

LISTA KONEASENTAJAN/SÄHKÖASENTAJAN TYÖKALUISTA - ONKO AINA SAMA? MISSÄ TARVITAAN?

\[4\]N\ [4\] OLLA, \[4\] PERUSPAIKAT + LISÄYKSIÄ

OSA 3 - RAPORTOINTI

ASENNUSRAPORTIT \[4\]S\ [4\] KÖSENN

KUINCA USEIN TÄYTETÄÄN? (PROI)

KUKA TÄYTTÄÄ? ALLEKIRJOITTA? (PROI)

ASENNESTOPÄIVÄKIRJA
MITÄ SISÄLTÄÄ? (PROI)
MITÄ MIELTÄ?

KAikki \[4\]VALTIINA \[4\]NAPISSA, \[4\]TOISET \[4\]TREES, \[4\]TOISET \[4\]B

PALAUTTEKAAVAKKEET

\[4\]N\ [4\]N\ [4\]N

OSA 4 - KOEKÄYTTÖ JA TESTAUS

TESTAUSUUUNITELMA \[4\]N\[14\]STOLAHSSA \[4\]EA \[4\]ASENTHIJILLE

TARVITAANKO?
KOEKÄYTTÖPÖYTÄKIRJA
KUKA TÄYTTÄÄ/VASTAA ASIAKKAAN LUONA, ONKO LOMAKE?
NASTOLA | HUUT OLLA

TOIMIIKKO SÄHKÖASENTAJA MYÖS KÄYTTÖÖNOTTAJANA?

TURVALAITTEIDEN TARKASTUSPÖYTÄKIRJA

KAPASITEETTIJOHTOPÖYTÄKIRJA

OHIJE SÄHKÖASENNUKSEN TARKASTAMISESTA - ONKO AINA SAMA? TARVITAanko AINA VAI OVATKO PROJEKTIKOHTAISIA?

SÄHKÖASENNUKSEN TARKASTUSPÖYTÄKIRJA - ONKO AINA SAMA?

OSA 5 - LUOVUTUS JA HYVÄKSYMINEN

HYVÄKSYNNÄT

KUKA ALLEKIRJOITTAÄ? ONKO VAKIOT?
MISSÄ POHJAT?
TARVITAANKO LINJAKOHTAISIA?

ASENNUS-VALMISDOKUMENTIT

LUOVUTUS- JA/TAI HYVÄKSYNTÄDOKUMENTIT

ONKO MUITA HYVÄKSYMISEN LIITTYVIÄ PAPEREITA? (VIRANOMAIJASTARKASTURAPORTTI)

LISÄKSI:

ASIAKASPROJEKTIKANSIO SISÄLTÄÄ MM. TEHDAS LAYOUTIN, TIEDOT SÄHKÖN, PAINEILMAN JA LÄMMÖNJUONNISTA. MITÄ OSIA ASIAKASPROJEKTIKANSIOSTA ASENTAJA TARVITSEE? (LISTA)

6, 5( KUVAT + MUIAT ) > HUUT OLLA 8 HUUT 9 ( EU )

HUUT OLLA

LISÄÄ

ASIAKAS HOITAA,

ASSENTAJAT
ASIAKASDOKUMENTIT

TARVITSEvatko sähköasentajat asiakasdokumentteja, esim. koulutukseen?

Amalleemolem tärkeätkä korostetava

Millä kielellä? (asiakaskieli/su, en)

su

Montako sarjaa?

1 ASENTAJILLE, E MULTEDRA

ASENTAJANMAPIN JOIDENKIN PAPEREIDEN TOIMITUS SÄHKÖISESSÄ MUODOSSA? SUURIN OSA YLEISOHJEEN SISÄLLÖSTÄ, JOS ASENTAJALLA KANNELTAVA TIEKONEEN MUKANA KEIKALLA.

OK, KANNANÄMÄ HYVÄ

Mitä mieltä joidenkin kaavakkeiden palauttamisesta sähköpostin välttyksellä? (esim. asennuspäiväkirjat)

Hyvä

KÄYTÄNNÖN JÄRJESTELYT

Montako asentajanmappia/komennus? 1 ASENTAJA

Kuka kasaa? (proi)

Läpiäntä pääsuunnittelijan/proin kanssa

OK

Miten palautetaan työmaalta? OSA HÄVITETY

KUVAT UTJANNA, KAH. SONEEN (SPAIHUKSET)

Kuka häävittää ja miten?

POITETU
VOIDAANKO TESTATA VALMIIN MAPIN TOIMIVUUTTA JOSSAKIN ALKAVASSA PROJEKTISSA?
(Proi)

MUUTA KOMMENTOITAVAA?
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<td>X</td>
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<td>asiakas/sopimus/myynti</td>
<td>proi</td>
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<td>assistentit/proi</td>
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<tr>
<td>Matkustustieto, liikkuminen, kuljetus</td>
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<td>X</td>
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<td>Tuija/proi</td>
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<td>vakuutusyhtiö/henkilostopällikkö</td>
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<td>vakuutusyhtiö</td>
<td>Tuija</td>
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<td>Osaluettelot</td>
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<td>pääsuunnittelija/(proi kokonaispositioissa mukana)</td>
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<td>Hävittäminen</td>
<td>Mistä?</td>
<td>Mitä asentaja tekee?</td>
<td>Kuka muokkaa/ sitten mappiin?</td>
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SUOMENKIELINEN LYHENNELMÄ


Tutkimuksen tuloksena on tarkoitus synnyttää dokumentointiprosessimalli, joka soveltuu tutkittavaan yritykseen ja jonka avulla voidaan ratkaista yrityksen nykyisessä dokumentointiprosessissa havaittuja puutteita. Mallin lisäksi esitellään muita suosituksia, jotka käyttöönottamalla kyseisessä yrityksessä voitaisiin tuottaa laadukkaampia asiakasdokumentteja entistä tehokkaammin ja sujuvammin.


Tämä on kvalitatiivinen tutkimus, jossa tutkimusmateriaali on kerätty haastattelemalla asentajia, projektipäälliköitä, suunnittelijoita ja yhtä kääntäjää. Haastatteluilla pyrittiin keräämään tietoa sekä dokumentointiprosessista että asennukseen liittyvistä faktoista ja toimintatavoista. Tämä tutkimus on myös tapaustutkimus, jossa keskitytään tutkimaan dokumentointiprosessia juuri Raute Woodin Nastolan yksikössä.

Tämän tutkimuksen kohdeyleisönä on ajateltu olevan toisaalta tiedeyhteisö ja varsinkin käännöstkönteen ja kielen opiskelijat, opettajat ja tutkijat sekä toisaalta Raute Woodin henkilökunta ja erityisesti dokumentoinnista ja sen kehittämisestä kiinnostuneet. Jäkimmäistä kohdeyleisöä silmällä pitäen tutkimuksessa on selostettu myös teknisen dokumentoinnin taustaa mm. historian ja koulutuksen osalta.

1.1 Teoreettinen viitekehys


Chisholmin tutkimuksen tulokset sisällytettiin tähän tutkimukseen myös siksi, että hänen tutkimuksensa tulokset ovat joiltakin osin hyvin samanlaisia kuin tässä


Tutkimuksen teoriaosuudessa käsitellään lisäksi dokumentointia lain näkökulmasta sekä esittelään erään suomalaisen vakuutusyhtiön dokumentointia käsittelevän julkaisun tämän tutkimuksen kannalta tärkeitä asioita. Dokumentointiprosessin teoreettista käsitteilyä tuetaan myös laatun liittyvillä seikoilla.
1.2 **Dokumentointiprosessi RWN:llä**

Tutkimuksessa esitettään dokumentointiprosessi RWN:llä käytännön näkökulmasta. Tutkimuksessa kuvataan tekniset asiakasdokumentit, jotka on RWN:llä jaettu kahteen pääaluokkaan: mallidokumentteihin ja projektdokumentteihin. Projektdokumentit on edelleen jaettu Pehkosen mallin mukaan kahdeksaan alaluokkaan, jotka ovat:

- asiakasprojektikansio
- käyttöohje
- huolto-ohje
- sähködokumentit
- hydraulikkadokumentit
- esitteet
- alihankkijoiden toimittamat dokumentit
- varaosakirja.

Tutkimuksen käytäntöä esittelevässä luvussa kuvattaan lyhyesti myös asiakasdokumenttien nimeämistä, versionhallintaa, arkistointia sekä niiden tuottamiseen käytettävää dokumenttipohjaa. Dokumentointiprosessin osalta tutkimuksessa kuvattaan tyyppilisen projektin eri vaiheet. Käytäntöön liittyen esitellään myös asiakasdokumenttien kääntämiseen ja julkaisemiseen sekä toimitusmuotoon liittyviä asioita.

1.3 **Tutkimusmetodi ja -materiaali**


Tutkimuksen asentajanmappia koskevaa osuutta varten haastateltiin myös neljää projektipäällikköä. Projektipäällikköiden haastattelut tehtiin pareittain, jotta asentajanmappin sisällöstä syntyisi enemmän keskustelua ja jotta keskusteluihin saataisiin enemmän syvyyttä. Projektipäällikköiden haastatteluja varten kasattiin taulukko, joka sisälsi asentajanmappin sisällön hieman muutettuna asentajien haastattelujen perusteella. Taulukkoa käytettiin haastattelujen pohjana ja siihen merkittiin haastatteluvien vastauksia ja kommentteja. Tämän tutkimuksen liite 3 on haastatteluissa käytetty taulukko.

1.4 Dokumentointiprosessin kehittäminen RWN:llä

Tutkimuksen yksi tärkeimmistä tehtävistä oli kartoittaa nykyisen dokumentointiprosessin tila ja epäkohdat, jotta ne voitaisiin ottaa huomioon ratkaisumalleja suunniteltaessa. Suunnittelijoiden ja kääntäjän haastatteluissa tuli esiin joitakin ongelmia, joita olivat:

- Dokumentit kirjoitetaan usein kiireessä.
- Dokumentit kirjavia sekä ulkoasultaan että sisällöltään.
- Dokumentteja ei editoida.
- Alihankkijoiden tuottamat dokumentit saapuvat usein myöhässä.
- Joillakin suunnittelijoilla on ongelmia MS Word -tekstinkäsittelyohjelman käytön kanssa.
- Dokumenttien viimeisimmän version löytäminen joskus hankalaa.


Tutkimuksessa on esitetty ehdotuksia, joiden avulla päästään ainakin alkuun näiden edellä mainittujen ongelmien ratkaisemisessa. Tutkimuksen tärkein tulos on RWN:lle suunniteltu dokumentointiprosessimalli, joka koostuu viidestä eri vaiheesta. Nämä vaiheet ovat:

1. suunnittelu
2. kirjoittaminen ja muokkaus
3. editointi ja julkaiseminen
4. päivitys
5. ylläpito.
Ensimmäisessä vaiheessa luodaan dokumentointisuunnitelma, joka sisältää seuraavat asiat: listan toimitettavista projektidokumenteista, aikataulun, listan olemassa olevista mallidokumenteista, joita voidaan käyttää kyseissä projektissa, listan henkilöistä, jotka ovat vastuussa listattujen mallidokumenttien ylläpitämisestä sekä kyseisen projektin projektidokumenttien tuottamisesta.

Toisessa vaiheessa suunnittelijat tuottavat tarvittavat uudenten projektidokumentit tai muokkaavat mallidokumentteista kyseistä toimitusta vastaavat projektidokumentit. Kolmosvaiheessa yrityksen tekninen viestijä editoi dokumentit sekä ne tarpeen mukaan käännötään. Suunnittelijat vastaavat asiasisällön oikeellisuudesta. Projektidokumentit muokataan tarpeen mukaan joko paperi- tai sähköistä toimitusta varten, jonka jälkeen ne toimitetaan asiakkaalle.

Neljännessä vaiheessa suunnittelijat tekevät tarvittaessa päivityksiä projektidokumentteihin. Muutokset tehdään asentajien raportoinnin mukaan, jos tuotantolinjaan on asennuksen aikana tehty muutoksia. Päivitetty projektidokumentit toimitetaan asiakkaalle.

Viimeisen vaiheen sisältää asiakaspalautteen keräämistä ja analysoimista. Mallidokumenteista vastaavat henkilöt puolestaan pitävät mallidokumentit ajan tasalla ja dokumentointiprosessissa ja dokumenttien kehittämistä jatketaan esimerkiksi tekemällä dokumenttien käyttöönotto ja tutkimusvastuuta.

Edellä esitetyä dokumentointiprosessimallin lisäksi tutkimuksessa kuvattiin myös muita suosituksia RWN:n dokumentointiprosessin kehittämistä varten. Näitä suosituksia olivat:

- standardien luominen ja käyttöönotto
- mallidokumenttiarkiston luominen
- teknisen viestijän rooli dokumentointiprosessissä
- suunnittelijoiden koulutus.
Standardien avulla voidaan asiakkaalle toimitettavien dokumenttien ulkoasua yhtenäistää. Suunnittelijoiden teknisten asiakasdokumenttien tuottamisprosessin tueksi voitaisiin esimerkiksi laatia tyylioppaita ja tarkistuslistoja. Niissä voitaisiin mm. muistuttaa mallidokumenttien ja dokumenttipohjan käytöstä. Standardien käyttöönottoon täytyy kuitenkin kiinnittää huomiota laajemminkin yrityksessä, sillä muuten niillä ei saavuteta haluttuja tuloksia.


RWN:n valmistamien tuotantolinjojen monimutkaisuus edellyttää projektidokumenttien tuottajilta asiantuntemusta, joten on järkevää, että suunnittelijat tuottavat edelleenkin asiakasdocumenttit RWN:llä. Tekninen viestijä lisäisi kuitenkin omaralta osaltaan laatua dokumentointiprosessiin. Teknisen viestijän rooli painottuisi enemmän dokumentointia tukeviin ja kehittäviin tehtäviin. Hänen tehtäviensä kuuluisivat:

- editoiminen
- dokumenttien valmisteleminen julkaisuvalon varten (esimerkiksi dokumenttien muokkaaminen julkaistaviksi CD-ROM muodossa)
- koulutus ja avustaminen
- dokumentointiprosessin ja dokumenttien jatkuva kehittäminen.

Suuunnittelijoita kouluttamalla voidaan myös merkittävästi vaikuttaa teknisten asiakasdokumenttien laatuun. Koulutusta tulisi erityisesti järjestää muutoksista dokumentointia koskien (esimerkiksi standardeista), jotta sen käyttöönotto olisi

Dokumentointiprosessin kehittämistä käsiteltäässä esiteltiin myös tulevaisuuden näkymiä teknisten asiakasdokumenttien tuottamiseen käytettäviin työkaluihin ja julkaisuun liittyen. Esille otettiin myös tähtääminen jatkuvaan oppimiseen ja kehittymiseen tällä saralla.

1.5 Dokumentoinnin tulevaisuus RWN:llä


Dokumentointiprosessin tutkimus RWN:llä ei suinkaan lopu tämän tutkimuksen myötä. Kun dokumentointiprosessi on toimiva, voidaan dokumentoinnin kehittämisessä keskittyä esimerkiksi dokumenttien sisältöön ja niiden tuottamiseen käytettäviin työkaluihin. Dokumenttien käytettävyys tarjoaisi myös mielenkiintoisen tutkimuskohteen, joka voitaisiin toteuttaa yhteistyössä asiakkaiden kanssa.