

**Documentation Process Development:
A Case Study at Metso Automation**

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Tässä tutkimuksessa käsitellään dokumentointiprosessia teorian ja käytännön näkökulmasta. Tämä on luonteeltaan tapaustutkimus, jossa tarkasteltavana kohteena on Metso Automationin Process Automation Systems-liiketoimialan Pulp and Paper Systems-osaston asiakasdokumenttien eli tuotteiden käyttöohjeiden tuottamiseen liittyvät käytännöt ja prosessi. Tutkimuksen tavoitteena on kehittää dokumentointiprosessimallia, joka soveltuu tutkittavaan yritysympäristöön niin, että se mahdollistaa korkealaatuisten asiakasdokumenttien valmistumisen ajallaan.

Tutkimuksessa lähestytään tutkimustapausta kolmella tavalla. Ensin kartoitetaan kyseessä olevan osaston tuotekehitykseen liittyvät prosessit. Tällä katsauksella on tarkoitus näyttää, mihin tapahtumaketjuun dokumentointiprosessin pitäisi täsmätä ja sopia. Seuraavaksi teoriaosuudessa esitellään kahta dokumentointiprosessimallia. Näiden yhteydessä pohditaan yhtäältä millä tavalla nykyiset käytännöt vastaavat näitä teoreettisia malleja ja toisaalta miten nykyisiä käytäntöjä voitaisiin kehittää niin, että ne vastaisivat malleja paremmin. Samalla arvioidaan, mikä on tutkittavan osaston prosessikypsyyden nykyinen aste dokumentointiprosessien osalta ja kerrotaan, millä tavalla voisi parantaa kypsyyssastetta. Teoriaa soveltaen luodaan runko dokumentointiprosessille, jossa on huomioitu prosessin nykytilanne ja lähtökohdat sen kehittämiseksi. Tutkimuksen empiirinen osuus muodostuu haastatteluista. Haastateltavina olivat tuotekehityksessä mukana olevia ja siten myös dokumentointiprosessin kanssa kosketuksessa olevia henkilöitä. Haastattelut toteutettiin teemahaastattelumenetelmällä.

Tutkimuksesta käy ilmi, että dokumentointiprosessi voidaan jakaa kahteen päävaiheeseen: suunnitteluun ja toteutukseen. Nämä päävaiheet täsmäävät myös tuotekehityksen päävaiheiden kanssa. Dokumentointiprosessia tulisi siten soveltaa ja nivouttaa kauttaltaan tuotekehitysvaiheisiin. Dokumentointiprosessia voidaan parantaa paremmalla suunnittelulla ja aloittamalla suunnittelu tuotekehitysprosessin alkuvaiheessa. Asiakasdokumentoinnin tarkoitusta ja merkitystä kirkastamalla saataisiin myös parempia asiakasdokumentteja aikaan. Osaston johto voisi vaikuttaa dokumentointiprosessien sujumiseen varmistamalla projektiin riittävästi työvoimaa ja resursseja sekä seuraamalla prosessin etenemistä. Seuraaminen helpottuu, kun ratkaisumallissa sovelletaan ns. virstanpylväs -menetelmää, jossa joka vaiheen jälkeen tarkistetaan, että dokumentointiprosessi etenee toivotulla tavalla. Lopuksi tutkimuksessa pohditaan laajemmin seikkoja, jotka vaikuttavat dokumentointiprosessin onnistuneeseen uudistamiseen ja kehittämiseen.

Avainsanat: dokumentointi, dokumentointiprosessi, viestintätuote, informaatiotuote, asiakasdokumentointi, käyttäjädokumentit

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1. Introduction

The aim of this thesis is to investigate the process by which technical documentation is produced in one department at Metso Automation and to identify means of improving the process. My goal is to form a model of the documentation process that, when followed, will enable department personnel to consistently create high-quality user documentation.

The American Heritage Dictionary of the English Language, 4th Edition (2006, 1398) defines “process” as “a series of actions, changes or functions bringing about a result” and “a series of operations performed in the making of a product”. The same tome defines “model” as “a preliminary work [...] that serves as a plan from which a final product is to be made” and “a schematic description of a system [...] that accounts for its known or inferred properties” and “one serving as an example to be imitated” (2006, 1130).

Process

A process is a chain of events that leads toward a certain goal or end. Processes provide a framework for approaching situations and a list of issues to consider when doing so. Saul Carliner (2002) states that with a pre-described process as the basis of a given project, the likelihood of success increases greatly because appropriate tasks will be performed in the appropriate order and at the appropriate time. JoAnn Hackos (1994, 20) says that a process is a “set of procedures, standards, and management methods you use to produce consistently high-quality [products].” Procedures indicate the tasks and the order in which they must be performed.

Model

A model is a tool or a set of tools for the management of complex development activities. A model of the life cycle of a development effort provides a means for

planning and controlling actions, thereby granting a better chance of guaranteeing success. A model provides a way to organize the activity of a publications or documentation team, establishes common definitions of the activities, and is a point of reference when communicating about publication products with others in an organization (Hackos 1994, 26).

A model, when followed, teaches people a basic set of behaviors for performing and completing various tasks. It simultaneously teaches them how to approach tasks and familiarity with it gives them the confidence to make informed decisions when the need arises to deviate from the model (Carliner 2002).

Process Model

From the descriptions above, it can be deduced that a process model is a preliminary, schematic description of a series of actions performed in making a product, and that this series of actions can be imitated or repeated as necessary. A model consists of descriptions and specifications of the activities that must be performed at different phases of a process. It indicates where to start, which path to choose, and when the end of the path is reached. If a process is a series of actions or a chain of events, then a model of the process provides a way to organize that series of actions and a means of describing the steps in a way that they can be repeated when necessary. The model makes it easier to understand and follow a process, and an established, well-described process makes it easier to perform appropriate tasks at appropriate times when working to reach a specific goal.

1.1 Purpose of this Study

As indicated above, it is my goal in this thesis to arrive at a model of the documentation process that will serve the specific needs of the Pulp and Paper Systems department at Metso Automation. This study began in cooperation with Metso Automation in

Tampere, Finland. I was employed there in the Paper and Pulp Systems (PPS) research and development department in the Process Automation Systems division from April 2001 to June 2002 as a Technical Writer. During this time, I heard that the department in which I worked was interested in improving its user documentation processes. It seemed that the process of producing documentation was problematic, characterized by delay and lack of clarity on how the document writing process should proceed. These impressions were confirmed in my own ensuing work as a technical writer. I began this research in the fall of 2001. After the aforementioned period of being on Metso's payroll, I have worked for the department in question as a subcontractor. Consequently, I am aware that the documentation process is still largely the same as it was in 2001-2002. Therefore I am confident that this topic is still timely and relevant, and that the company and, specifically, the department can benefit from the findings of this study. I also believe that scholars and practitioners in the field of technical communication may learn something from this case study in the technical documentation process.

In this study, I will investigate the user documentation process in the PPS department and try to determine how exactly user documentation is currently created, what guidelines exist to guide or govern the process, and how the creation of user documentation aligns with product creation. To this end, I will interview employees of the PPS department to gain empirical knowledge on existing documentation processes. I will compare these findings to documentation process models constructed by scholars in the field of technical communication. Ultimately, I aim to suggest a model of a documentation process that will allow high-quality user documents to be created in a timely fashion.

This study and its approach to the research problem draw upon previous pro gradu research done by Jenni Tuominen (2000) in German Translation and Maaria

Tarnanen (2001) in English Translation. Jenni Tuominen conducted a descriptive survey of documentation processes at her place of employment. She gathered her data via focused interviews. Maaria Tarnanen analyzed the documentation process at a certain company and suggested improvements in the process based on theoretical models of the documentation process and based on interviews of employees of the company.

1.2 Terminology Used in this Study

This study uses a variety of terminology for referring to core concepts and does not make a particular effort to adhere exclusively to certain lexical items. The reason for this is that different scholars use different terms to describe the same phenomena. For instance, Saul Carliner (2002) uses the term “technical communication product” or just “communication product” to refer to the results of a technical documentation effort. Joann Hackos (1994) uses the term “publication product”. However, in her newer work (2007) on managing documentation processes, she switches to using the term “information product”.

I personally, over the course of my professional career, am used to using the terms “customer documentation” or “user documentation”, and I do so in this study. I also use the terms mentioned in the previous paragraph; I believe it is prudent to use the terms used by the scholar when discussing and analyzing their viewpoints and theories. Furthermore, the different terms serve to highlight different aspects of the phenomenon they all refer to. For example, what I think of generically as “documentation”, they call a “product”. I can see the wisdom in doing so; it emphasizes to e.g. those involved in a documentation project that the “product” is the result of a production process, i.e. work must be done to achieve it. The qualifiers added to the word “product” not only serve to differentiate it from the consumer product that the user documentation describes, but they also enhance and emphasize the *function* of the product: it communicates

something, it is a publication, and it provides information. Even in light of this reasoning, though, I still think there is a place for the terms “customer documentation” or “user documentation”. These also can serve to emphasize important aspects of the concept at hand: that the documentation is for users or for those who have purchased the product, i.e. the customer. In summary, all the terms mentioned in this section are used interchangeably in this study. It would have felt artificial to me to use one, sole term throughout. The guiding principle is merely that the terms are used as deemed appropriate, to emphasize or underscore the point being made at any given point in the study. After all, that is how we practitioners of technical communication function in our working life as well: as the Finnish saying goes, translated here into English, a beloved child has many names.

1.3 How this Study is Organized

Chapter 2 introduces Metso Automation as a company, the Process Automation Systems business line, and the Pulp and Paper Systems research and technology development department. This information illustrates the business environment in which the study at hand is being conducted. Chapter 2 then describes in varying amount of detail the Application Development process, the Innovation Process, and the Product Research and Creation process in use in the PPS department. These descriptions serve to convey to the reader a sense of the product-development process alongside which user documentation should presumably be created or developed as well.

In Chapter 3, two documentation models are described and analyzed. These are simultaneously evaluated in terms of the current documentation practices and processes in the PPS department. Chapter 3 also contains an evaluation of the process-maturity level of the user documentation process in the PPS department. This evaluation is coupled with recommendations how to advance to a higher level of process maturity.

Chapter 4 contains the empirical portion of this research project. There the interview background, methods, and themes are presented. The chapter also summarizes and discusses at length the outcome of the interviews. Chapter 5 revisits and summarizes the results of the various strands of research. Chapter 6 provides discussion on the research results and ponders issues that may arise when a new documentation process is implemented and therefore deserve attention. Chapter 6 also contains a suggestion for a documentation model that I believe will serve the needs of the PPS department at Metso Automation.

2. Application Product Development at Metso Automation

The aim of this chapter is to introduce Metso Automation, its business line called Process Automation Systems, and a department within that business line called the Pulp and Paper Research and Technology Development department. This chapter then describes the application development process and introduces the innovation process at Metso Automation. Finally, the produce creation process is discussed. This information is intended to make the reader familiar with the corporate environment in which the processes that are under scrutiny in this study take place. The main focus is on the product creation process, as this is the process parallel to which user documentation must presumably be created.

Metso Automation specializes in automation and information management application networks and systems, field control technology and life cycle performance services. Its main customers are the pulp and paper industry as well as power, energy and oil and gas industries. Metso Automation operates worldwide and has sales and customer support units in 34 countries in Europe, North and South America, Asia and Australia, and Africa. In 2006, Metso Automation's net sales were EUR 613 million. The number of employees totals approximately 3,300. (www.metsoautomation.com, 21 November 2007)

Process Automation Systems (PAS) business line develops, produces and supplies process industry analyzers and sensors and automation and information management application networks to all customer industries. (<http://www.metsoautomation.com/automation/info.nsf/WebWID/WTB-041109-2256F-229E7?opendocument> 15 April 2008) One area of focus in the PAS business line is

automation solutions for pulp and paper. The aim is to create automation products that stabilize and optimize pulp and paper quality and mill productivity.

The Pulp and Paper Research and Technological Development (RTD) department aims to study and develop control applications for the pulp and paper industry. These applications include process measurement and control solutions from the wood yard to paper finishing, in other words, total capabilities for all pulp and paper mill processes. Flow control devices, consistency management tools, special process analyzers and process optimization packages provide solutions for customer needs. As Metso Automation's website notes, the Pulp and Paper RTD personnel "are the source of constant new innovations to meet the pulp-making challenges now and in the future." (http://www.metsoautomation.com/automation/pp_prod.nsf/WebWID/WTB-041103-2256F-F8ADA?opendocument 14 April 2008). In this thesis I shall refer to Pulp and Paper RTD as PPS department, which means Pulp and Paper Systems. This is the practice in place within the company as well.

2.1 Application Development Process

The application development process is part of a longer process via which an application progresses to a marketable product. It is included in the innovation process along with a so-called "customer project". Application development yields a generic application product, i.e. one without the specific mill or machine or process information that is integral in an actually functioning product. The customer project begins when Metso Automation products are sold. In the case of the PPS department, this would typically include both metsoDNA and paperIQ. The former is Metso's automation system. The latter is a package of hardware and software that allows automated control of a paper machine. After these are sold, Software Logistics compiles the software components included in the package that has been sold. The Project department (so

named because it handles these customer projects) customizes the software. Then the software is tested and sent to the customer. In this section I shall list and briefly describe phases the process entails.

The following figure illustrates the progression of phases, which are explained below. In addition, the figure indicates the phases in which internal documentation is used and the phases in which documentation available to the user is used.

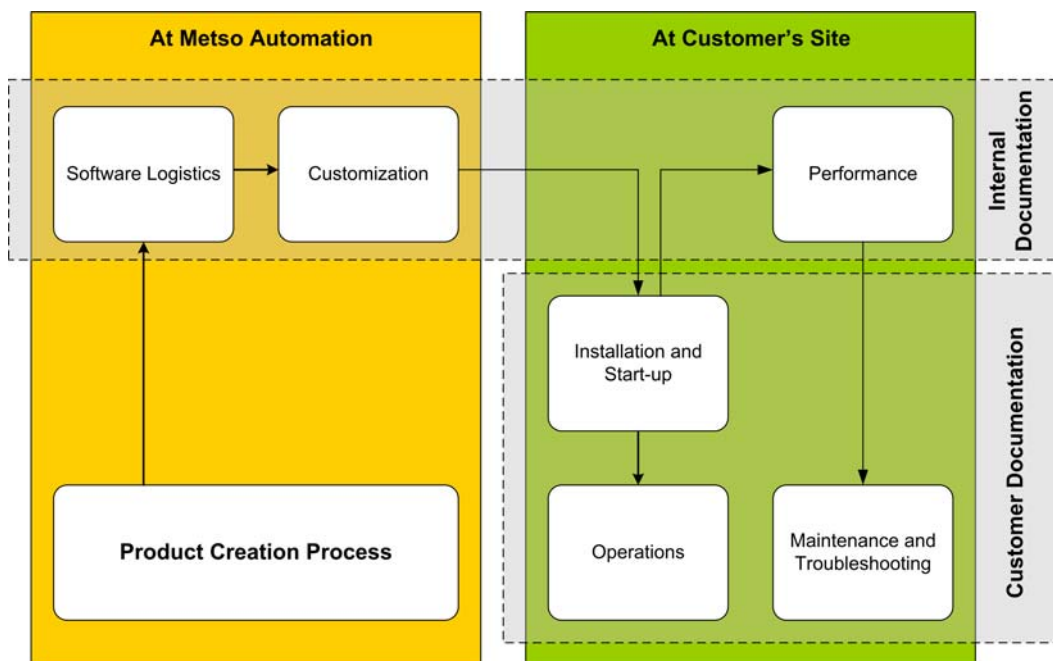


Figure 1. The Application Development process in the Pulp and Paper Research and Technology Development department at Metso Automation

The Application Development process yields a product that can be tailored to suit the needs of individual customers. As Figure 1 indicates, after that process, the product still goes through many phases. The product innovation process is explained in more detail below.

Software Logistics

Software Logistics involves generating code to create an application product that functions fully according to the specifications. Customer project engineers use version descriptions and testing guidelines to complete the software.

Customization

Customer project engineers customize the application product according to customers' needs. For example, they incorporate customers' process station identification codes, control room identification codes and control identification codes into the product. Version descriptions and testing guidelines may also be used in this phase as well.

Installation and Start-up

When the application product meets customer specifications, it can be installed and started up. In this phase, installation engineers install the software at the customer site and start it up. Engineers use installation guides and tuning guides to start up the application product successfully.

Performance

In the Performance phase, engineers gather performance data from the newly installed application product to ensure that it is functioning according to specifications. In this phase, the engineer uses performance tool data gathering lists.

Operation

In the Operation phase, machine operators operate the software. They refer to the Operator Manual for operating instructions.

Maintenance and Troubleshooting

Once the application product is in normal, constant use, it must be tuned periodically. Also, when e.g. paper machine parts are serviced and maintained, adjustments may need to be made to the software as well. Also, problems may arise that require troubleshooting expertise. In this long-term phase, maintenance engineers use the technical manual to keep the software functioning properly.

2.2 Innovation Process Implementation in PPS Business Unit

The objectives of the innovation process in the PPS department include making informed decisions based on business issues with an emphasis on customer values and cost-efficiency. The innovation process links product creation and research with company strategy and provides a framework for these processes in which cross-functional activities are enabled. The outcome of the innovation process should then be improved process quality and lifetime product management with a well-defined and manageable way of operating. The following figure illustrates the innovation process.

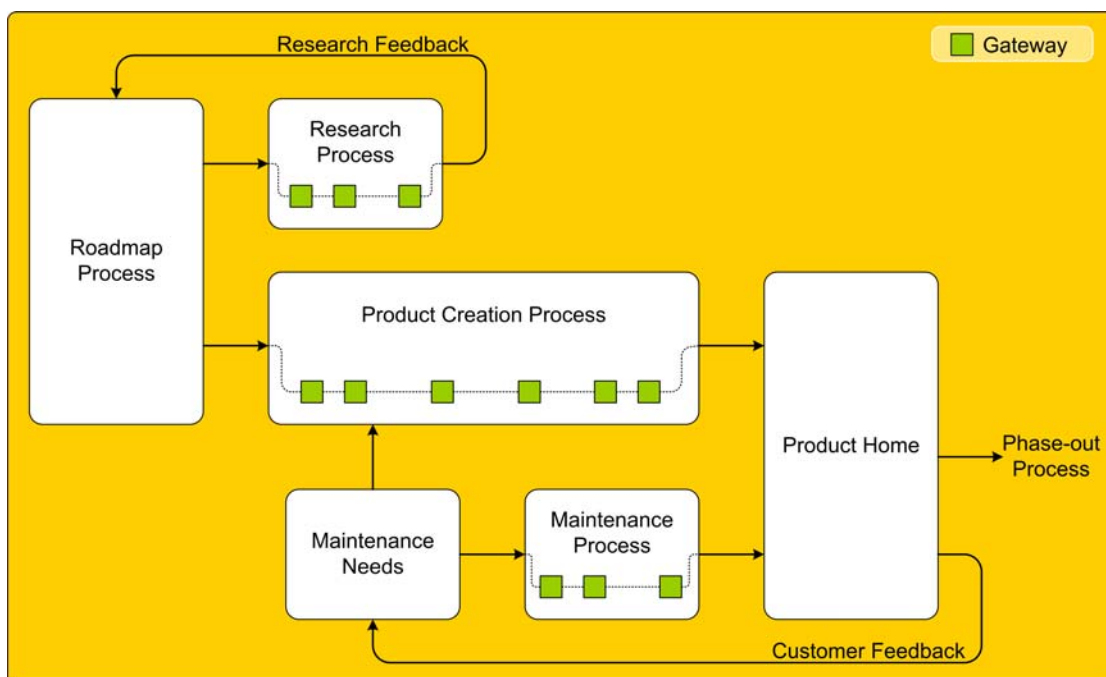


Figure 2. Innovation Process

(Based on PowerPoint presentation by J. Kauppila 25.2.2003)

The Innovation process describes the functions that turn business and technology strategy into new products. It is a balanced combination of strategies related to marketing, sales, product development, logistics and the service department. The innovation process is designed to aid these in getting new products to market as efficiently as possible.

Riihilahti (2005) maintains that the innovation process must be measured and undergo internal evaluation, on such points as schedule, budget, and goals. Also the

closing report must be evaluated. In addition, each project is evaluated and the overall process itself is audited. Riihilahti also states that the process itself is not essential, but rather how it is managed.

2.1.1 Roadmap Process

In the roadmap process, RTD personnel map out the path the company is on and steer it in various directions. Personnel take into account many factors in the process of arriving at viable strategic development programs, i.e. projects that may lead to a marketable product. They consider the core competencies of the company and weigh this against current market conditions and forecasts for future market conditions. They also consider technology trends and emerging technologies and processes. As ideas solidify into potential development projects, the personnel must also consider the resources currently available and how well the prospective project fits into the company's overall vision and strategy.

In the Pulp and Paper RTD department, a new product usually arises when RTD personnel brainstorm new ideas and a business manager determines an idea worthy of developing. The idea or concept is then researched, and after the research phase, the feasibility of the product idea is evaluated. In short, the research project is a sort of feasibility study of sorts.

2.1.2 Research Process

According to Riihilahti (2004), the RTD Research Process illustrates the phases involved and describes how research activities are managed. The process includes roadmaps and business strategy. Researching and developing new products is an important part of doing customer-oriented business. The aim of the research process is to produce technology or a concept that can potentially be utilized in future products. Thus, the research process is part of the Product Creation Process and the Roadmap

Process. After research is performed, products can be developed faster and roadmaps are easier to implement.

What is a Gateway?

A gateway is a set of goals that project personnel meet. A gateway is used for managing risks in a development project. At each gateway, the project is evaluated and resources are allotted to reach the next gateway. This way the company can commit itself to a project one step at a time rather than tie a larger share of resources to an entire development project.

2.1.3 Product Creation Process

The Pulp and Paper RTD department has a process by which projects proceed and progress from phase to phase. Between phases there are gateway meetings. At these meetings, project milestones are discussed, and project participants ensure that certain key milestones have been reached so that the next phase can commence.

The aim of the product creation process is to produce a product that satisfies customers' needs and expectations. The process defines the phases of the project. The output of the process should be a product that sells and generates profit flow for a period of time. A product in and of itself is not enough to guarantee sales. Rather, the customer must know about the product or service and be able to order it, and the product must be produced, delivered, installed, and supported over its life cycle.

The following figure illustrates the gateways and the phases between them. It also shows how the process through Gateway 3 can be thought of as the phase when the product is being conceptualized, whereas after Gateway 3 the product plans are realized and the product is actually produced. According to Riihilahti (2006), concentrating on the concept phase enables efficient and quick product realization. The phases at the end

are more disciplined than the phases at the beginning: this helps ensure high-quality products and processes.

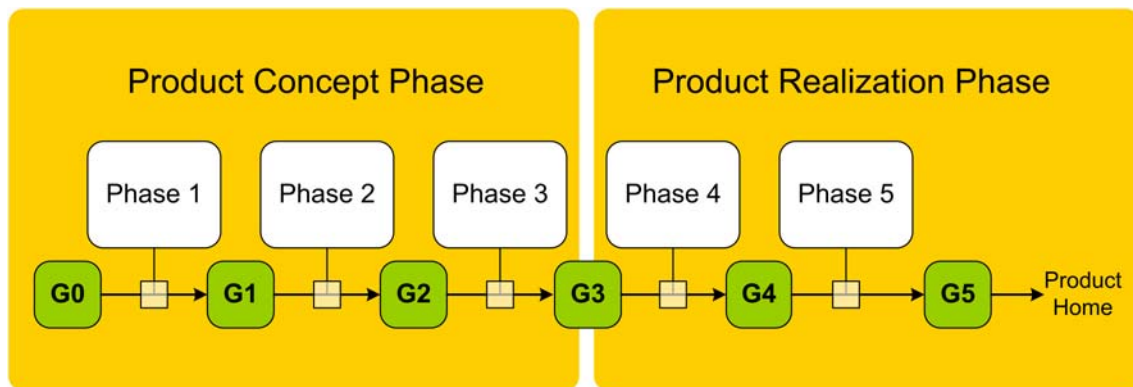


Figure 3. Product Creation Process

Riihilahti (2006) indicates that the success factors in the product creation process are a customer-oriented approach, sufficient business planning, keeping customer value in mind, and sufficient resources.

Other Features of the Innovation Process

As shown in Figure 3, the innovation process also includes such components as Product Home, the Phase-out process, and the Maintenance Process. These concepts are outside of the scope of this thesis, so only the following brief explanations will be provided.

The Product Home is the entity that manages the product over the course of its life cycle. The Phase-out process indicates the end of the product's life cycle, i.e. when it is no longer sold and/or no longer supported. The aim of the Product Maintenance Process is to take maintenance needs or requests for maintenance into account and determine their impact on development and future production of the product.

3. Documentation Process Models and Theory

Many models exist of the documentation process. These models share a common goal of attempting to identify the steps involved in creating a technical communication product and, further, to describe and define what each step entails. The presumable purpose of these models is that they would be applicable to any number of real-life scenarios in which technical communication products are being produced. The models vary in the number, breadth and depth of the steps they present, but I believe that they together show that the documentation process can be examined and dissected and subsequently divided into distinctly identifiable steps.

In this chapter I shall present two models of the documentation process. I chose Saul Carliner's Process for Developing Technical Communication Products and Joanne Hackos' Model of the Publications-Development Life Cycle because they both are modelled on product or software development life cycles, which is what is practiced in the PPS department. In this way, both models seem very applicable to the subject matter at hand. Furthermore, they both seem very practical in nature; they are designed to be applicable, and I believe that a practical, applicable model is just what is needed in the Metso Automation department in question. Finally, while the two models share many similarities, they also have differences, and the varying nuances in the two models complement each other very well. I believe that the interplay between the aforementioned models will provide a solid foundation on which to build a documentation model for Metso Automation.

There are many ways in which a model aids in carrying a process through to its end. Specifications and descriptions of tasks are designed to ensure that participants in a process do the right tasks in the correct order. By dividing a process into phases, the

participants are able to schedule opportunities to review the activities and how well they were performed.

Carliner (2002), however, points out that models have their limitations. They are, after all, only representations of what occur in the real world, they are not real themselves. The process described in the model can reflect what happens during the design and development of technical communication products, or it may prescribe to some extent how the activities occur (Carliner 2002). In other words, merely having a model in place does not guarantee success. One can deduce, however, that a model is still good to have in place, as indicated in the following paragraph.

Hackos (1994, 26) paints a bleak picture of what can happen when no model is used. The lack of a model means, for instance, that publications people fail to plan and control their working activities, and, as a result, others in the organization believe that the aforementioned publications people are working aimlessly. Furthermore, if the publications people fail to plan and communicate their processes to the rest of the organization, then it is easy for management to deduce that it takes no particular skills to produce technical publications (Hackos 1994, 26).

In other words, one can assume that having a model, which includes good planning and making known what the planning and development processes are, increases publications people's credibility as responsible professionals. A model also illustrates interdependencies, i.e. that a publications project is a common, mutual effort in which different factions have an impact on one another's schedules.

Toward a Process Model

The question that logically follows the previous discussion of analysis of user needs and goals and designing communication products for users is how technical communicators go about all this. How do they achieve goals and determine resources and constraints

and other factors? The simple answer to this question is that technical communicators follow a process.

By following a process, technical communicators can make appropriate decisions at appropriate points in the development of a communication product. A process also guides in asking the right questions at the right junctures. Carliner (2002) says it is important to design and develop communication products in the context of a process. He has adapted the phases of his process from the realm of instructional design and software development.

Carliner (2002) reminds readers that due to the varying nature of technical communication projects, the phases may differ in order from what follows. The phases may have to be adjusted in order to better suit a given project. After all, the purpose of a model is to help structure the technical communicator's work, not to constrain it.

3.1 Saul Carliner's Model

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

1. **Design:** 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.
 2. **Development:** 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.
 3. **Production:** the document is printed, duplicated and delivered to the customer
-

4. **Maintenance:** updating the document, but Carliner also includes tracking user satisfaction and document usability in this phase.

(Carliner 2001).

In an article titled “The Process for Developing Technical Communication Products”, Carliner (2002) expounds upon and expands the four phases listed above. In addition to writing, he explains, the preparation of a technical documentation product also involves other tasks, including analysis of the problem, design, development, and implementation.

Before beginning writing, analysis is necessary in order to determine how users will apply the technical information in their lives or jobs. Analysis also aids in clarifying goals that users achieve using the communication product. After these goals are clarified and approved, then technical communicators determine the most effective means of presenting the information to users. This can be called “design”. (Carliner 2002).

3.1.1 Assessment Phases

In the Assessment Phases, technical communicators work to identify the needs that underlie the communication product: why is such a product going to be produced? Who needs it? What do they aim to do with it? After the needs are identified, communicators set goals that must be achieved via the product.(Carliner 2002).

In these early phases, technical communicators should not consider the final form, because the final form of the communication product is part of the solution. In these phases the aim is to fully understand the need for the communication product and its goals, so it is not time to seek a solution yet. If the communicators jump to a conclusion, they may overlook important issues that could greatly affect the ultimate solution to the needs (Carliner 2002). Assessment consists of two phases.

Phase 1: Define the Problem

In Phase 1, technical communicators identify a great deal of information. They must determine the client's goal, i.e. how the communication product affects the client. In this case "client" refers to the organization for which the communication product is being produced. Whether the aim of the communication product is to generate revenue, reduce expenses, or comply with regulations is, according to Carliner (2002), the ultimate need behind the effort to create the communication product. The communication product must meet this ultimate or "bottom line" need in order to be a success. In the same vein, the technical communicator must link the process of producing the communication product to the same bottom line need (Carliner 2002).

With the bottom line need in mind, the communicator must define who will use the product and what tasks they will perform with it. To whom is the information directed? Will users perform main tasks, i.e. tasks they do to complete their work, or will users perform supporting tasks, i.e. tasks they do to complete their main tasks? (Carliner 2002).

As the technical communicator defines the problem in this phase, he or she must also analyze the corporate culture and project group dynamics in order to identify factors that may affect success of the communication product. Carliner (2002) maintains that it is important to observe the behaviours that will be necessary in order to succeed within the organization (Carliner 2002).

When documentation projects are begun at PPS department, it would be important to determine Metso Automation's goal in creating customer documentation. I am not aware that such a goal is explicitly stated anywhere. I assume they do have a goal of obtaining customer documentation to satisfy regulations and presumably to add value to their product by aiding the user. However, if this were stated explicitly

somewhere, it might help to raise the profile of customer documentation, i.e. emphasize the importance of high-quality documentation.

When the problem is defined, it would also be important for PPS department personnel to discuss who will use the product and what will customers use the product for. Furthermore, they should analyze whether the tasks that users will presumably perform with the product are main tasks or supporting tasks. I do not believe that these have been explicitly discussed at least in connection with planning user documentation.

Phase 2: Set the Goals

In Phase 1, Define the Problem, communicators identified the goals and needs underlying a project and profiled the users. After this is complete, it is time to perform Phase 2, Set the Goals. This phase has two main components: Defining Objectives and Developing a Plan for Evaluating Results (Carliner 2002).

Defining Objectives

In this phase, technical communicators must define business objectives underlying a project. They also define content objectives, which describe what content users need to master in order for clients to achieve business goals. These objectives must be presented in measurable form (Carliner 2002).

In the PPS department, business objectives are identified and analyzed in the product creation process, so it seems it would be easy enough to incorporate user documentation-related business objectives as well. The business objectives of user documentation could define e.g. what content users must master in order to achieve their own business goals using Metso's products. In this case, users need to be able to operate automation controls successfully in order for PPS to have succeeded and met their bottom line, which is complying with regulations and satisfying—and thereby keeping—their customers.

When these business objectives are being written, they must be made to be in measurable form. This means that one should be able to review the process afterward and gauge how well e.g. the user documentation met its business objectives. I believe that if objectives are expressed clearly and concisely, then it should be easy to refer to them later and review their validity. Such review could be added to a gateway review or checklist in order to ensure that evaluation of business objectives occurs.

Developing a plan for evaluating results

Carliner (2002) says that before deciding how to structure and present the required information, tools must be designed for assessing the effectiveness of a communication product. This gives the technical communicator a view of how the end product should look. With this view, the communicator can design and construct a communication product that will fare well in ensuing evaluations (Carliner 2002).

The evaluation should assess the satisfaction of users, users' ability to achieve content objectives, the ability of the communication product to achieve business objectives, and the satisfaction of the organization for which the product is being created. When Phases 1 and 2 are complete, the technical communicators should then present a report of needs assessment and goals to the client organization for approval (Carliner 2002).

I feel that it would be essential for PPS department to design its own tools for assessing the effectiveness of its communication products, i.e. user manuals. Also, if one knows this is going to be reviewed at a gateway further in the product creation process, then it makes one pay closer attention to what one is doing at the given moment. The aforementioned assessment or evaluation tool should assess users' satisfaction, how well users are able to achieve content objectives, how well the

communication product achieves business objectives, and how satisfied the organization itself (PPS department) is with the communication product.

This leads me to ponder how important feedback actually is. I am not aware of any official channels of gathering and processing feedback. Perhaps I myself should instate a feedback gathering mechanism. Merely gathering it, though, is not enough; one must also decide how to process feedback, i.e. how to transfer feedback to constructive actions. I would have to analyze how best to solicit feedback from peers, colleagues, and customers.

3.1.2 Design Phases

In the Assessment Phases, technical communicators defined the underlying need for the communication product, set goals for the project, defined project objectives and decided how to evaluate the success of the product. Once this information is amassed, it is time to plan, or design, the actual communication product. During this process, the communicators must describe how to present the information. Then guidelines are prepared to make sure all parts of the project are related and to ensure the completion of the project in an effective way (Carliner 2002). Design consists of three phases.

Phase 3: Choose the Form of the Communication Product

In this phase, the technical communicator must select the type of communication product that best meets the needs of users and of the client organization. In doing so, the communicator must identify or keep in mind the expectations that users bring to the product in question in order to meet said expectations. The communication medium, i.e. print or online, etc., must be selected in this phase as well (Carliner 2002).

Currently, customers who use products produced in the PPS department receive user documentation in print format or in a PDF file that is printable and also viewable online. Hypertextual possibilities are not exploited at all. In order to determine whether

the current practice is sufficient or whether another form of communication product would be better, I would first have to survey the users. The survey should identify what expectations they have of the communication product, and how they use it to meet their goals. When such a survey is conducted, one could also gather valuable data on the amount of information that the customer truly needs.

Phase 4: Structure the Content and Plan its Presentation

In this phase, the technical communicator plans the functions of the content. This includes outlining the structure and identifying what book elements, such as table of contents, index, etc., to include. The content must be selected and sequenced. In short, the communicator must decide what information will be included, in what order, and how users gain access to the information.

Once the content and its order or sequence is determined, the communicator can plan how to present each major piece of information: through visuals, with the help of charts, suitable amount of text, examples, case studies, or step-by-step instructions. At this juncture it is important to prepare a sample section of each communication product to show how the goals of the product will be achieved. Carliner (2002) reminds that it is essential to gain approval for your approach to presenting the information (Carliner 2002).

In projects in which I have been involved at PPS department, the order of the information in a manual, for example, is often predetermined. Among a set of controls, the structure of each control's manual is very similar if not identical. The Documentation department decides how the user will gain access to the information; they determine the Table of Contents and whether there is an index or not.

In structuring the contents of a given document, I use visuals, charts, case studies, and step-by-step information as is appropriate. One area, though, to which I

could pay closer attention is including examples. For example, it would serve installation engineers if the screenshots in the manual had actual, real-life values or default values for the various parameters.

In this phase, the technical communicator is exhorted to prepare a sample section of the communication product in order to show the produce developing organization how the various goals described above will be met. I think this would be a valuable step in developing the document because in my experience not all engineers in key roles are able to articulate what kind of communication product they want until they have something to hold in their hands or otherwise look at. When such a point of comparison exists, it is easier for them to state their opinions, which in turn leads more directly to a satisfactory end result.

Phase 5: Establish Editorial and Project Guidelines

In this phase, the technical communicator completes plans for the proposed design of the information. The communicator also develops guidelines by which the project will operate and against which the drafts of the communication product can be assessed for quality (Carliner 2002).

Editorial guidelines must be established. These include a style guide, which ensures that information will be presented in a consistent manner to the user. The guidelines also specify what software tool(s) will be used. Technical specifications must be made; these include, for example, the type of paper and number of inks to be used in a print product (Carliner 2002).

Project guidelines must also be established. These include budget, schedule, and members of the project team. In short, all the steps in this phase simplify the development process by removing the question, “What next?” and ensuring consistency across the project (Carliner 2002).

After the Design Phases are over, the technical communicator or communication team must present final design plans to stakeholders for formal approval. Carliner (2002) also advises to take special care in presenting the plans as this presentation affects how the plans are received. The communicator must distribute regular reports on the status of the project to stakeholders in order to keep them informed about the progress of the project and to keep them feeling actively involved (Carliner 2002).

In the PPS product creation process, the project documentation must be completed by a certain gateway. That means that the editorial and other guidelines must be established well before that. Currently there are no guidelines for the documentation established at all. It seems that in the overall project scope, it would make sense to have the time and expense of creating the documentation scheduled and allotted ahead of time. The budget, schedule, and members of the project team are decided for the product creation process, so it would be straightforward to select or assign simultaneously the same items for the documentation creation process. I must also say that currently we have nonexistent editorial guidelines in the PPS department. It would be helpful to all to have a style guide and a list of preferred software tools. The design plans and editorial guides should be reviewed by other PPS employees. This would be easy to accomplish in a gateway meeting at the earlier stages of the project. Gateway meetings would also be a place to inform others on the progress of the communication product project.

3.1.3 Development Phases

After the project needs and goals are established and a communication product is designed to meet these needs and reach these goals, it is time to actually create the communication product. In the Development phases, the technical communicator writes

drafts and submits them for review, seeks feedback, and revises to reflect feedback received (Carliner 2002).

Phase 6: Draft the product

In this phase, the technical communicator collates all the plans made in the previous phases and creates a draft of the communication product. This draft employs elements of visual communication and an effective use of language. The aim is to write such that others can revise and reuse the draft. Carliner (2002) finds it important to test the draft before distributing it for review. In the PPS department, we do write drafts of the communication products, but sometimes there is little or no time to review them before publishing dates arrive.

Phase 7: Receive feedback on product

In this phase, the technical communicator seeks feedback by arranging a variety of reviews. In technical reviews, subject matter experts review the communication product for technical accuracy. In editing reviews, issues concerning presentation of the content, grammar and writing style are addressed. In usability reviews, people representing the end users try to perform the main tasks using the communication product (Carliner 2002). In the PPS department, it is easy to get good technical reviews of the document drafts. Editorial reviews are harder to come by; I decide on presentation of content, grammar, and writing styles, though sometimes others comment on these and occasionally state an opinion. Usability reviews are nonexistent; I have never been involved in one in the PPS department.

Phase 8: Revise product

In this phase, the technical communicator responds to feedback from the reviews in the previous phase by editing and changing the communication product. In theory there may be any number of review-feedback-revision cycles. As the product nears its final

draft, the communicator can add access aids, such as table of contents and index (Carliner 2002).

Throughout this process, the technical communicator maintains close communication with the organization for which the communication product is being produced. Close communication is necessary in order to reach a satisfactory balance between editing demands and limiting the amount of rewriting in order to meet requirements of schedule and budget (Carliner 2002). In the PPS department, I respond to feedback I receive by revising the product. At times, though, it is difficult to justify making extensive changes if budget or schedule demands do not allow. This might be avoided in the future, though, if we were to have a better established means of scheduling and budgeting.

3.1.4 Production Phases

After the final draft is completed, it is time to make the communication product available to users. Production consists of three phases.

Phase 9: Produce a communication product

In this phase, the technical communicator prepares and finalizes all components of the communication product, such as text, graphics, audio-visual elements, or software code. Next, all these components are combined into a cohesive whole—a master copy—that can be printed or duplicated. Finally, the communication product is printed or duplicated into a distributable form (Carliner 2002). At Metso Automation, there is a Documentation department that handles formatting, printing and distributing of user documentation. They, in other words, would perform the tasks listed in this phase after we submit them a document that shows correct information and how it is to be laid out.

Phase 10: Distribute a communication product

In this phase, the technical communicator makes sure that the product reaches its intended users (Carliner 2002). In the PPS department, this is not in my jurisdiction;

rather the company has a logistics department that ensures that all pertinent documentation is delivered to customers with the products they ordered.

Phase 11: Maintain the communication product

This phase begins with a post-mortem, which is a closing meeting with the members of the project team to determine what was done successfully and what will be handled differently in future projects (Carliner 2002).

In this final phase, the technical communicator monitors how users use the communication product and how its use affects the business performance of the organization for which the communication product was produced. Users' response to the communication product can be tracked or even elicited by various means. Carliner (2002) says it is important to maintain contact with the organization for which the communication product was created in order to assess their ongoing satisfaction with the results of the project.

Meanwhile, the technical communicator should turn his or her eye toward future versions of the communication product by tracking technical changes in the product and changes to knowledge content. Future revisions and their availability to users should be planned (Carliner 2002).

In the PPS department, we do not have a formally established forum in which to discuss the project as a whole and evaluate its success or lack thereof. We do discuss such topics informally at times, but it would most likely be more fruitful to have an official "post-mortem". This would allow for continuity as project members would affirm and reaffirm their goals in attaining high-quality documentation. Furthermore, it would be useful to monitor how users use communication products and how their usage of it affects business performance. I am not sure how we would accomplish these tasks, but it would be interesting to try.

3.2 JoAnne Hackos' Model for the Publications-Development Life Cycle

Hackos bases her five-phase model on several well-accepted models of the product-development life cycle (Hackos 1994, 25). One could therefore deduce that product-development engineers should be able to comprehend the publication-development model since its phases and their order should presumably appear familiar.

If there is a phased development model in place for products, then the publication-development model will fit in easily. If there is not, then potential conflicts may occur, in which case one must anticipate and plan for challenges in getting the plan through (Hackos 1994, 25).

3.2.1 Phase 1: Information Planning

In the Information Planning phase, information about the product or subject matter and the development project is gathered. This includes a description of the product, its intended audience, and a plan that indicates how the intended publication product will be produced. The Information Planning phase contains two deliverable reports, the Information Plan and the Project Plan (Hackos 1994, 29)

Information Plan

The Information Plan contains information about the nature of the product or subject matter, the market for the product, and the audience for the product. Specifically, it clearly states what goals the audience has when using the product, in what environment the product is used, and what are the major tasks that a user performs with the product (Hackos 1994, 29).

The Information Plan also fulfills aims related to project management and communicating among members of the organization for which the publication product is being written. The plan provides direction for the publication staff as they produce the publication product. It is also a way to communicate with others in the organization

about the publication project and to communicate with those involved in other parts of development projects (Hackos 1994, 33).

An Information Plan summarizes all the information collected thus far and, through review of the plan, ensures that consensus is reached on the contents of the plan. Furthermore, it serves to convince the project stakeholders that the publication team understands the total project and will produce a publication product that serves the intended and necessary purpose. The Information Plan persuades its readers or reviewers that the technical communicator(s) have completed thorough research on the aforementioned pertinent elements and have carefully weighed alternatives to the present plan (Hackos 1994, 110).

Hackos seems to place great emphasis on planning. I recognize that in the PPS department, there is much room for improvement in how the documentation projects are planned. I think an Information Plan in the way Hackos outlines it would be a useful tool in the documentation process at the PPS department. It would inform others what plans exist for the documentation project at hand, and it would aid project members in reaching consensus on how to proceed in the documentation project.

Project Plan

If an Information Plan indicates what is to be done in the publication process, then the Project Plan indicates how. In effect, it takes the ideas presented in the Information Plan and charts a course for putting them into effect and developing them (Hackos 1994,145).

The Project Plan is an early estimate of the resources that will be necessary in order to implement the Information Plan. It predicts the hours needed to complete the project, a schedule of milestones, and a list of deliverables at each milestone. It includes

a plan for how many people are necessary and an assessment of possible risk factors (Hackos 1994, 146).

Hackos (1994, 146) says that a thorough Project Plan allows those in charge of the project to carefully prepare for the development effort and to maintain control of the project as it proceeds. It seems to me that the Project Plan would be quite like a map: it shows you how to arrive at your destination without taking wrong turns, having to double back, or taking time-consuming detours. It also helps you estimate accurately when you will arrive.

As mentioned in connection with discussion of Carliner's documentation process, a project plan would be absolutely essential. It would give a time frame and sketch out the resources available and set milestones over the course of completing the project. These are both important aspects of completing a documentation project successfully. The project plan for the documentation project can be drawn up simultaneously with the project plan for the product development project.

Phase Review

Phase 1, Information Planning, ends with a phase review. In the phase review, interested parties and stakeholders review and approve the plan or request modifications to content, schedule, cost, or required resources. Hackos says that it is a good opportunity to solidify plans, listen to others' input and concerns, and negotiate tradeoffs in e.g. quality and scope versus schedules and resources (Hackos 1994, 214). If there are not enough resources, then either quality or scope must be reduced.

3.2.2 Phase 2: Content Specification

Once the Information Plan and Project Plan are written, reviewed and approved, it is time to craft the Content Specification. The Content Specification is a detailed map of the rest of the publication-development life cycle. Whereas the Information Plan and

Project Plan define the project as a whole, the Content Specification comprises a detailed design of the individual parts of the project. This detailed design leads to a necessary re-evaluation of the scope projected in Phase 1. As a result, the Project Plan may need to be re-evaluated as well. Thus phase 2, Content Specification, contains two deliverables: the eponymous Content Specification and a revised Project Plan.

Content Specification

Hackos (1994, 228) says that a good Content Specification should teach the reader about the product. It contains detailed results of research into the product, the audience, and the environment in which the users use the product. It analyzes the tasks the users wish to perform with the product. The most important function of the Content Specification is a detailed analysis of the information needed by the audience. This means that the Content Specification should indicate how often tasks are performed, how difficult they are for the audience, and how critical the task is.

Once a detailed task analysis has been completed, the organization pattern of the information should be determined. This amounts to a detailed, annotated outline of topics or a preliminary table of contents. Planners should organize the information into a pattern that best serves the needs of the audience and is easy to understand. Structural devices, such as headers, footnotes, icons, and graphics, etc., help reveal the organizational strategy the planners have chosen (Hackos 1994, 241).

In Phase 1, one Information Plan and one Project Plan were written. These encompass the whole project. In Phase 2, however, a separate Content Specification must be produced for each communication product. Each Content Specification, then, lists the goals and objectives for the publication. Furthermore, it organizes the information into the order that it will appear in the publication. A Content Specification

also includes a rationale for why the publications team has arrived at the publication plan in question (Hackos 1994, 229).

A Content Specification is, in effect, an annotated outline of the publications product that is to be produced. Its organizational strategy is transparent to management. If stakeholders agree on the presented organization of information, they are less likely to suggest major changes later. Hackos points out (1994, 229) that a thorough Content Specification might even reveal organization flaws in product design. She also says (1994, 311) that the Content Specification should include and organize only that information which the audience truly needs; it does not need to be a compendium of all available data on the product.

Hackos places great importance on sufficient planning. She admonishes (1994, 227) that a publications team cannot afford to start writing before they know what they are going to write. The Content Specification is what shows the writer what to write. It should act as a solid knowledge base to draw on as you write. In fact, Hackos says (1994, 228), writing from a Content Specification should ideally be like filling in blanks on a form.

The content specification, as outlined by Hackos, contains detailed results of research into the product. At the PPS department, such research is not utilized in creating user documentation, but I imagine that some applicable research exists or is created over the course of the product creation process. I think the most important aspect of the content specification is a detailed analysis of the information needed by the audience. I am not aware that any such analysis has ever been performed at the PPS department. It would be very useful and valuable to know what tasks customers perform, how often they perform them, how critical each task is, and how difficult or challenging the tasks are for customers.

In the PPS department, we have a sort of template according to which we arrange data for users. However, to my knowledge, we have never tested or questioned whether this order and structure of information is one that serves users. So, if we analyzed what users truly need to know, this could potentially change the information structure currently used. I also think it would be useful to write an annotated outline of the information product. That would make it clear to management and other project members what the strategy of each user document is. Overall, a content specification would give all involved a better idea of the scope of the documentation project.

Revised Project Plan

When Content Specification is complete, planners will have a more complete idea of the scope of the project. This allows them to make more exact estimates of time and resources needed. As a result, the Project Plan must be revised as necessary. Hackos warns (1994, 269) that projects have a tendency to grow, so it is good to review the Project Plan in light of the Content Specification even if the latter does not clearly dictate different requirements than what were outlined in the original Project Plan.

Phase Review

Phase 2, Content Specification, ends with phase review. Interested parties and stakeholders review and approve the plan or request modifications to content, schedule, cost, or required resources. Hackos reminds (1994, 311) that the point of a review is to serve the needs of the audience, not the needs of the development team or publications team.

3.2.3 Phase 3: Implementation

As mentioned in the previous section, Hackos stresses (1994, 227) that writers must know what they are going to write before they begin writing. Since the Content Specification provides answers to the implied question, once it is finished, then the

writing phase, or Implementation Phase can begin. Implementation means the actual design and development of technical publications. Simply put, Implementation involves creating drafts of the publication product(s), submitting them for review, and then revising them as necessary. The cycle of review and revision may repeat several times.

Hackos (1994, 29) says that the Implementation Phase takes fifty percent of the publication-development process. One can deduce from this that it is a large effort with many factors to be taken into account.

Implementation Phase involves tracking progress and keeping progress running smoothly. Changes must be anticipated and managed. Writers develop prototypes of publication types and styles. In addition, the usability of the publication products is ideally tested. The Implementation Phase is characterized by a need for the publication team to communicate thoroughly and regularly. This helps avoid doing needless work, and it means that team members will receive feedback from each other on their own progress in reaching project goals. Hackos also emphasizes (1994, 319) the importance of skillful project management. After all, projects do not manage themselves.

Possible deliveries in this phase include designs for style of publications, prototypes demonstrating the style, informal drafts, formal drafts, and final approval drafts. In addition the project manager regularly files time sheets and progress reports and other project-related items (Hackos 1994, 35).

Implementation Phase includes planning meaningful and measurable milestones. Milestones help ensure success, because, as Hackos cautions (1994, 323), what is not tracked does not get done. Project progress must be compared to the milestones set in the original project plan to ensure that the project is on schedule and within budget.

One final important component of the Implementation Phase is review. Hackos states (1994, 336) that technical communicators must inform or even educate

stakeholders how to review publication product drafts. This includes educating reviewers on what the writer wants them to do, what to look for, what not to review, and what criteria to base the review on. It may even include an estimation of how much time the review should take so that the reviewers devote enough time to the review effort.

In the PPS department, prototypes of documents are produced, but the process of implementing the plans into actual documents is not documented anywhere. I think it should be; after all, measurable milestones help ensure success. These milestones could be incorporated into the gateways that already exist in the product creation process. We also currently have document review meetings, but they focus mostly on the accuracy of technical information, and not so much on e.g. whether the existing documentation product meets the needs of users or not. We could review the documents in a more well-rounded manner.

3.2.4 Phase 4: Production

When the final drafts are reviewed and approved in the Implementation Phase, the publication product is ready to be reproduced and distributed. Phase 4, Production involves these activities.

In the Production phase, the publications team prepares final, camera-ready copy of text and graphics. The text and graphics are localized and translated into required languages. Print publications are printed, bound and packaged. Other forms of publications, such as recordings, videos, DVDs or CD-ROMs are manufactured and reproduced. A means of distributing the publication products is implemented. Hackos points (1994, 36) out that even if a writer or technical communicator is not personally involved in performing these tasks, the person in question should still understand what needs to be done and how much time and effort it takes.

The Production Phase also plays an important role in project scheduling and planning. Hackos maintains (1994, 36) that publications managers learn early in their careers that they must always plan the production cycle first and estimate all other activities in relationship to the needs of manufacturing the publication products.

At Metso Automation, the tasks listed in this phase are largely performed in the Documentation department. They prepare the final copy, print and produce it, and distribute it via established channels.

3.2.5 Phase 5: Evaluation

After the publication product is published and distributed, then project members must evaluate the complete product and also possible plan for the next version. Evaluation phase includes writing a wrap-up report. As the name of the phase indicates, many facets of the project, the product, and project participants are evaluated: the publications team and its cooperative efforts, the project itself, each publication product individually are all evaluated. Additionally, each participant performs self-evaluation. Evaluation phase records successes and opportunities for improvement (Hackos 1994, 37).

Evaluation Phase links to Phase 3, Implementation, in that in Implementation, project members must often make tradeoffs between quality and scope, time and resources. In Evaluation Phase, project members can reflect on these and make informed decisions concerning future revisions or versions of the publication product under evaluation. Topics or publication types that were left out in the current iteration can perhaps be reinstated in future versions (Hackos 1994, 37).

In the PPS department, we do not write a wrap-up report. I think it would be very beneficial if we did evaluate the project, the information product, the participants and their cooperative efforts. The goal of such an undertaking should be to record successes and best practices and, above all, to learn from them. This reflection would be

a good basis on which to begin planning and producing the next version of the documentation product. At the present moment, experiential knowledge in e.g. project practices and routines is not sufficiently passed from one project to the next or from one project member to another. There is a wealth of experience that could be passed on; a solid wrap-up report would be one way to preserve a record of these experiences, but other means of relaying and spreading knowledge could be examined as well.

3.3 Comparison of Hackos' Model and Carliner's Model

In comparing Hackos' model for the publications-development life cycle and Carliner's model for producing communication products, I began by considering the names that the two scholars assign to the intended outcome of the processes. Carliner writes about "communication product", while Hackos uses the term "publication product". I feel that these two terms compliment each other. The former indicates the function of the product, i.e. to communicate information to the user of the communication product. The latter term describes the process by which the product ultimately comes into existence, i.e. by being published. Both terms, I feel, are named as they are for two reasons. Firstly, calling them a product emphasizes that fact that the customer documentation in question is indeed the product or result of a process. This indirectly points out that effort must be put into its production in order to be successful. Secondly the describing word, "communication" or "publication", differentiates the item of customer documentation from the product that is the subject of aforementioned documentation.

When considering the names for the documentation process models, it is worthwhile to mention JoAnn Hackos' new name for her model. In a new book (2007), she renames the publication development process as the "information development process". In the preface (2007, xxi), she provides an explanation of changes in the documentation field over the last few decades. This explanation implies that the

changed name is intended to shift attention from “documenting” products, i.e. lists of features and details, to providing customers with the “information” they need. Furthermore, I glean from the preface that the name “publication” sounds like information on paper, whereas nowadays the required information may be delivered in any number of formats, few of which are on paper (Hackos 2007, xix). It is necessary to mention this new tome because I shall continue to use the one published in 1994 as the main source of my information regarding Hackos’ thoughts on the documentation process. The reason is that the steps are explained in more detail and, at the same time, more succinctly in the 1994 work. Also, as Hackos herself notes (2007, xix), “except for some of the information associated with print product, little about the basics of documentation plans, project estimates and schedules, project tracking, and project completion has changed.

The discussion in the two previous paragraphs leads me to consider which of the terms I shall use in the ensuing comparison of Hackos’ and Carliner’s models. I have decided that I shall use the term “information product”. After all, in communicating knowledge to the user and in publishing it—whatever the format—the underlying need is for information: information about the product and how to use it to reach one’s goals.

When the process models of Hackos and Carliner are placed side by side, it is immediately apparent that both can be divided into two overall phases: planning and producing. Carliner’s Assessment Phases and Design Phases and Hackos’ Information Planning and Content Specification comprise the planning phases. Likewise, Carliner’s Development Phases and Production Phases and Hackos’ Implementation and Production comprise the phase when the plans are implemented and an information product is born. Figure 4 juxtaposes the two documentation process models. The arrows

link phases in which identical or highly similar actions are taken. An arrow does not mean that the phases in entirety match exactly.

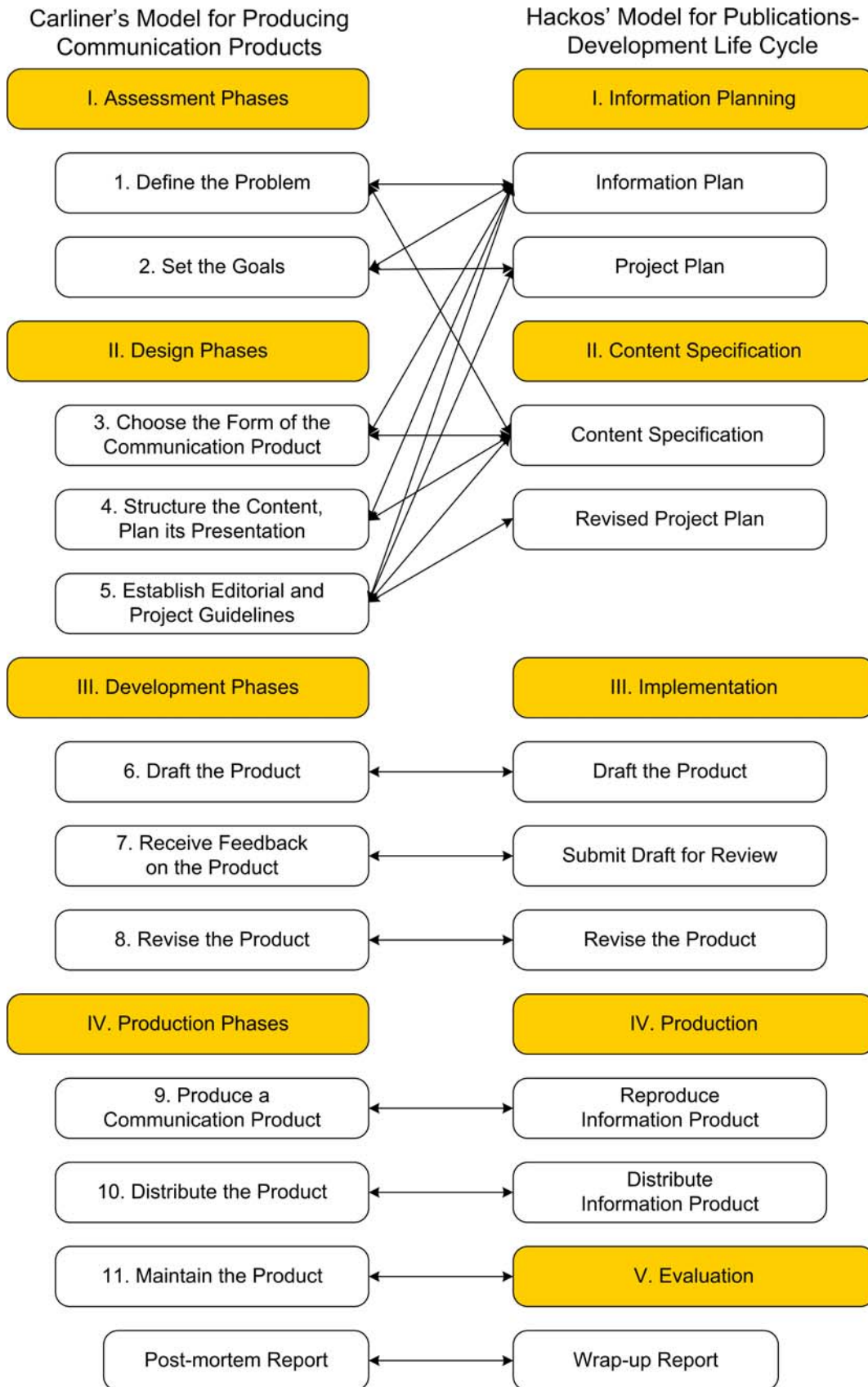


Figure 4. A Comparison of Phases in Carliner's and Hackos' respective documentation models

3.3.1 Planning Phases

Hackos and Carliner stress both explicitly and implicitly the importance of thorough planning before actually implementing the information product. Carliner (2002) explicitly states that analysis of the problem (that the information product is to address) and the design of the information product are necessary in addition to actual writing tasks. He says that analysis is necessary to determine how users will use the information. After this the technical communicator determines effective means of presenting this information. Only then does the technical communicator begin actually implementing the information product (Carliner, 2002). Hackos (1994, 227) states that technical communicators cannot afford to begin the writing process before they know what they are going to write. These explicit statements are also relayed implicitly in the structure of the two process models: of Carliner's four phase groupings, two of these are devoted to planning, and Hackos' first two of five phases also describe the planning phases.

A comparison of these planning phases reveals that they contain identical elements. One area of planning deals with the information product and the product about which it is informing: defining the product, the audience, the audience's goals and tasks to perform with the product, how to structure the information, and how to deliver the information. The other overall area of planning focuses on the process of producing the information product, i.e. activities that fall within the realm of project management: budget, schedules, project participants, other resources, and project milestones. To be precise, these factors arise in different orders in the two process models. For instance, Hackos' phase 2, Content Specification comprises elements that arise in e.g. Carliner's phases 1, 3, and 4 (Define the Problem, Choose the Form of the Communication Product, and Structure the Content and Plan its Presentation respectively). However, I feel that the fact that largely identical factors are included in both models is more

relevant than the order in which they appear. Perhaps the differences in how Hackos and Carliner conceptualize the planning phases are due to their varying backgrounds and professional interests. For instance, it seems to me that Hackos is more business-oriented, by which I refer to her meticulous attention to budgets, resources, business objectives, etc., while Carliner pays attention in a “textbook” sense to creating a solid communication product and only perfunctorily nods in the direction of requirements and constraints imposed on the project by business realities. Nonetheless, I feel that each process, when faithfully followed, should yield a sound information product created in a sound project.

3.3.2 Production Phases

A comparison of the Hackos’ and Carliner’s production phases shows them to be quite identical, both in content and order. They both proceed from writing drafts and receiving feedback to producing a final draft and escorting the information product into distributable form. One difference that exists is the fact that Carliner proposes one phase for the production phase and what follows that whereas Hackos has a separate phase for that which follows production. At any rate, whether as one phase or two, this part of the project is quite similar. Both models contain a project follow-up report, in which the project and lessons learned are reviewed. Both contain elements of preparing for future revisions of the publications product. Hackos, after all, indicates that her process model is for the publications product life-cycle, which in my opinion implies the possibility of a following cycle. Carliner is more specific, naming his final phase “Maintaining the Product”. In summary, both the models end with a look back at the accomplished project and a look forward at future revisions made with wisdom accrued in the recently completed project.

3.4 Information Process Maturity Model

In the previous sections of this chapter, I presented two models of how a communication product-development process can proceed. I believe that it would also be beneficial to judge the quality of current practices at the PPS department. To that end I will use Joanne Hackos' Process-Maturity model to analyze the documentation process at Metso Automation. The model is designed to divide organizations into categories based on how mature--or how well-managed and well-functioning--their documentation process is. (Hackos 2007, 33).

Hackos says that the model is based on her work with publication managers and studies of how various organizations work. In other words, it is based on actual people and their work in real organizations (Hackos, 1994, 46). The theoretical background for her Maturity Model is in the realm of process maturity in organizations in general and more specifically in software-development firms (Hackos 1994, 46).

The model attempts to take into account changing and evolving demands on the field. For instance, Hackos (2007, 53) lists mergers and acquisitions, offshore information development, and demands for more productivity with less people. When companies are merged, people coming from different organizations may distrust one another, and there may be wildly varying practices in information production. Modern corporations may wish to save expenses by outsourcing their information production tasks, and often the new doers are found overseas in places where labor costs are low. Changes in the corporate climate over the intervening decade have forced information developers to seek ways to reduce the work of developing technical information.

There are five actual levels of maturity. To these Hackos has added a sixth level, Level 0. An organization at Level 0 is at a level of process maturity lower than Level 1 (Hackos 2007, 38). Table 1 shows the six levels of process maturity as follows:

Level	Description
Level 0: Oblivious	<ul style="list-style-type: none"> ▪ No knowledge that a process even exists ▪ Usually an organization at this level does not have technical writers ▪ Documents written by product-development experts ▪ No standards for document written <p>(Hackos 2007, 38)</p>
Level 1: Ad hoc	<ul style="list-style-type: none"> ▪ Lack of a process ▪ Little planning for publication projects ▪ Projects begin late in product-development life-cycle ▪ Technical communicators work as independent contributors ▪ Little or no teamwork ▪ No editing ▪ No project management to maintain control of budgets and schedules <p>(Hackos 1994, 47)</p> <ul style="list-style-type: none"> ▪ Technical communicators rarely have any degree of support to get their jobs done ▪ Technical communicators are expected to handle all project activities: editing, publishing, illustrating, transferring to electronic sources <p>(Hackos 1994, 54)</p> <ul style="list-style-type: none"> ▪ The quality of the final product is highly dependent on the professionalism and expertise of the technical communicator. <p>(Hackos 2007, 35)</p>
Level 2: Rudimentary	<ul style="list-style-type: none"> ▪ Rudiments of a process in place ▪ Enforcement of style standards is lax or impossible ▪ Some copy-editing ▪ May have information plans ▪ Project management frequently absent, and therefore projects are overwhelmed by change ▪ Direction for project provided by technical or marketing specialists <p>(Hackos 1994, 48)</p> <ul style="list-style-type: none"> ▪ A documentation plan exists that contains a description and outline of the project ▪ Documentation plan usually lacks business case for publication, assessment of audience requirements, and estimate of size of the job <p>(Hackos 1994, 59)</p>

Level	Description
Level 3: Organized and repeatable	<ul style="list-style-type: none"> ▪ Becoming a fully developed process ▪ Information plans are standard ▪ Plans implemented at an early stage ▪ Estimates made based on copious prior experience ▪ Editing done by experienced editors ▪ Change is controlled via the development process ▪ Technical communicators recognize that all projects must be planned ▪ Project managers recognize that communication product will fail to meet quality requirements without a process to guide team members toward common goals <p>(Hackos 1994, 48)</p> <ul style="list-style-type: none"> ▪ They have a sound publications-development process and they always use it ▪ Work in teams ▪ Team members are dedicated to the development process because they are convinced it guarantees quality in publications products <p>(Hackos 1994, 63)</p>
Level 4: Managed and sustainable	<ul style="list-style-type: none"> ▪ Well defined process that is always followed ▪ Technical communicators can modify the process when there is a need for innovation and experimentation, e.g. under rapid development ▪ Technical communicators are regular members of the product-development team from the beginning of the development life cycle ▪ Well developed project management techniques ▪ Specialists handle different areas, such as production, translation, editing, usability <p>(Hackos 1994, 49)</p>
Level 5: Optimizing	<p>Has the same characteristics as Level 4: Managed and sustainable, and in addition,</p> <ul style="list-style-type: none"> ▪ Technical communicators review their own functions and processes and results ▪ Based on review, they implement means of improvement ▪ Team members use quality control measures ▪ Open to use of innovative techniques <p>(Hackos 1994, 49)</p>

Table 1. Joanne Hackos' six levels of Publications-Process Maturity Model

Hackos maintains that many companies are at the first few levels, with a smaller number of companies reaching level 3. Levels 4 and 5 are theoretically possible if an organization has a sound and functioning documentation process (Hackos 1994, 46).

All publications efforts in various organizations exhibit many varying characteristics. Some projects go better, some worse. However, one instance of a perfectly managed project does not put a given organization at Level 4 any more than a nightmare project puts the organization at Level 1 or 0. The main thing when analyzing the publications-process maturity in an organization is to ferret out what Hackos calls "steady-state behavior" (Hackos 1994, 49).

If, as Hackos maintains, most companies are at the first few levels of process maturity, let us examine the qualities ascribed to levels 0-2 and attempt to find the one that suits the PPS department best.

Level 2: Rudimentary

In Level 2, there is usually some sort of a process in place. Style standards may exist but are rarely or never enforced. (Hackos 1994, 48). In the PPS department, there may be a vague process in place, but I have never seen one explicitly stated. Neither have I ever seen nor heard mention of style standards. If there are any, they are never enforced to my knowledge. Hackos states that in Level 2, there is a documentation plan that contains a description and outline of the project. At PPS department, however, I have never encountered such a plan. Therefore, I must deduce that in the maturity of its publication process, PPS department is not at Level 2.

Level 1: Ad Hoc

Organizations at Level 1 lack an established publications process. Furthermore there is little planning for publication projects and they begin late in the product-development life-cycle. Technical communicators in such an organization typically work as independent contributors with little or no teamwork. (Hackos 1994, 47). I am not aware of how much projects are managed in terms of budgets and schedules. Documentation projects are not scheduled in advance. They are done when the need for a document

arises or has long since arisen. Finally, in a Level 1 organization, technical communicators are expected to handle all project activities, and the quality of the final product is highly dependent on the professionalism and expertise of the technical communicator. A perusal of these qualities leads me to believe that the maturity of the PPS department's publication process is at Level 1: Ad Hoc.

Level 0: Oblivious

For comparison's sake, let us recall what characteristics are shared by Level 0 organizations. These are ones in which there is no publications process in place, nor do product-development personnel seem aware that such a process should or could exist.

Rather, documents are written by product-development experts. (Hackos 1994, 51)

While it is true that in PPS department, documents are often written or drafted by product-development experts, nonetheless there is an awareness in the department that a process could exist, as is evidenced by e.g. the fact that I was asked to do my thesis on this very topic. As a result, it can be safely stated that the PPS department at Metso Automation has matured past Level O and is therefore not oblivious to the publications process.

3.4.1 Key Characteristics of the Information Process Maturity Model

The maturity model identifies eight key characteristics on which the maturity is based.

A chart lists the eight characteristics and a brief description of the extent to which each level of maturity reflects or carries out the characteristics in question (Hackos 2004, 5-6). Such a chart would be a useful and efficient tool in analyzing the maturity of an organization's information-development maturity. An analysis of the contents of the table yields the following observations.

Organizational Structure

A mature organizational structure is one that allows information developers to produce consistently high-quality information products (Hackos 2007, 56). In the PPS department, there is no organizational structure for information production. Information developers work for technical managers and make very independent decisions concerning information development. Therefore, in terms of organizational structure, the PPS department at Metso Automation is at a maturity level 1.

Quality Assurance

A mature quality assurance process is a series of activities designed to promote high standards of quality via such activities as copyediting, developmental editing, peer reviews, and technical reviews of draft information products. Quality assurance also includes usability testing and customer studies to ensure that the quality of the information products meets customer needs (Hackos 2007, 56). I as an information developer am responsible for the quality of language, layout, and editing. Technical personnel are responsible for proofreading the technical information for accuracy. There are no explicit guidelines in place and therefore no one maintains any specifically stated standards. In terms of quality assurance, the PPS department at Metso Automation is at maturity level 1.

Planning

Mature planning infers activities that ensure that every information product meets customer needs while fulfilling demands of schedule and budget. Planning includes the development of adequate resources and budget to ensure that required quality standards are reached (Hackos 2007, 56).

To my knowledge, Information Plans are never written specifically to further user documentation. There may be a plan of sorts for the product as a whole that happens to mention documentation, but that is not the sort of information plan Hackos

means. Refer to Chapter 3.2.1 for more information on Hackos' Information Plan. In terms of Planning, the PPS department at Metso Automation is at maturity level 0.

Estimating and Scheduling

A mature level of estimating and scheduling includes activities to ensure that the information-development process is being followed to remain within requirements of schedule and budget. It also includes tracking a project to assess and accommodate the impact of changes in the project and changes in customer requirements throughout the course of the project. A mature estimating process also establishes project histories to allow better planning for future projects (Hackos 2007, 57).

The documentation efforts in the PPS department at Metso Automation department usually begin much too late in the application development process. As a result, the projects most often have no particular deadline stated other than "as soon as possible". Also, since little planning has been done ahead of time, it is usually difficult to make an informed estimate of the amount of work to complete the task. Therefore, guesswork does no good. Rather, we rarely know if we can accomplish anything on time while maintaining quality. In terms of estimating and scheduling, the PPS department at Metso Automation is at maturity level 1.

Hiring and Training

In a mature hiring and training process, information developers are hired by knowledgeable professionals in the field of technical communication, and hiring is based on a wide array of clearly defined professional requirements. Furthermore, once information developers are hired, they are provided with internal and external opportunities for training on a continuous basis so that best practices in the field are understood, followed and maintained (Hackos 2007, 57).

In the PPS department, I am the only information developer that I am aware of. I was hired by a technical manager, though indeed I was hired for my technical writing knowledge. On the other hand, I was hired as a trainee, rather than as a full-fledged professional. No regular training is provided. In searching for even a technical writer trainee, though, it seems the technical manager in question was attempting to take proactive steps to remedy a backlog of user documentation work. While this is a very positive attribute in my opinion, I still feel that in terms of hiring and training, the PPS department at Metso Automation is at maturity level 1.

Publication Design

A mature publication design process includes activities to ensure that the organization is following the best practices in the information design industry. Design innovations are regularly introduced based upon research in the field, usability testing, studies of customer needs, and practices learned through exposure to the output and ideas of industry leaders (Hackos 2007, 58).

In the PPS department at Metso Automation, there are no explicit design standards to comply to. I am free to design my own publications. However, Metso Automation has a department that stylizes user documents for publication, so my design efforts are limited to how the information is arranged visually and spatially. I am not sure who influences the look and feel of these official publications. I am also unaware of how this process is updated. However, in my estimation, this department represents specialization in publishing and, to an extent, design. This suggests a maturity level of 2. On the other hand, as was stated, there are no explicit publication design standards. Therefore, in terms of publication design, the PPS department at Metso Automation is at maturity level between 1 and 2.

Cost Control

In a mature cost control process, a publications organization has controls its own budget for its activities and carefully tracks the costs of its development projects. The organization understands costs well and regularly evaluates them in terms of added value and return on investment. Budgets are defined by the need to achieve a pre-determined level of quality in information products (Hackos 2007, 58).

I am not involved in making budgets. I do the work assigned to me and count up the hours afterwards. Therefore, I am reluctant to make too definitive a statement concerning cost control. I suspect, though, that since user documentation is poorly planned in advance, it is most likely also poorly budgeted. Moreover, the mechanisms of successfully estimating costs of information design may also be lacking. Therefore, in terms of cost control, the PPS department at Metso Automation is, in my limited estimation, at maturity level 0 or 1.

Quality Management

In a mature quality management process, there is a series of activities that strive to attain complete and well-informed definitions of quality, including regular studies of customer needs, regular usability assessments, regular assessment of customer satisfaction with products, and regular assessment of the impact of poor quality on training, support, sales, and others factions. The process is characterized by strong communication of goals and strategies to senior management and peer managers. Finally, in such a process the larger organization recognizes the value added by technical communication activities (Hackos 2007, 59).

In the PPS department at Metso Automation, no mechanisms exist to measure customer satisfaction in user documentation. I am not aware of how customer complaints are addressed. Quality is equated with completing a user document period

whether by the deadline or past it. Therefore, in terms of quality management, the PPS department at Metso Automation is at maturity level 1.

3.4.2 Moving from One Level of Maturity to the Next

In the preceding discussion of the maturity level characteristics and the key characteristics on which maturity is judged, the PPS department appears to be quite soundly situated at maturity level 1. There were a few characteristics on the basis of which level 0 seemed to describe the PPS department best and one on the basis of which level 2 may have come into the question, but by and large level 1 describes the current state of affairs the best.

Hackos provides advice for how to proceed to the next level. She mentions (1994, 56) that catalyst for change often comes from outside the organization. That is partially true in this case. I work in the organization, but in the context of conducting this thesis study, I have tried to cast a more impartial look on current process and practices. I shall now briefly list the steps necessary to move from process maturity level 1 to maturity level 2.

Transition from Level 1 to Level 2

In order to move from a maturity level 1 to maturity level 2, a company should develop publication standards and appoint someone to be responsible for making sure the standards are followed. The company should begin using an Information Plan or Content Specification or some similar document. Furthermore, team members should be educated in these new practices. Also, the changes instated must have the support of management and staff members alike (Hackos 1994: 56). In other words, both personnel at the managerial level and department members must understand the need for common processes and design standards for the information products. If there are individual

communicators working separately, they should be organized into some sort of a department with someone to oversee and coordinate their efforts. (Hackos 2007, 35)

Further steps to developing the company's process maturity level include conducting preliminary user studies to discover how customers use information, how they judge existing information, what would provide them with increased value. It would also be important to define standard information types, i.e. procedures, concepts, and reference materials. These are things that all information developers will be able to use in their work. The information designers or their managers should begin implementing information-development processes with distinct planning and production phases. This process should also include quality assurance procedures, such as peer review, etc. (Hackos 2007, 35)

Transition from Level 2 to Level 3 and beyond

At this juncture, I feel it would also be prudent to consider what actions need to be taken to continue the company's development in process maturity past level 2 into level 3 and beyond. Hackos (1994, 58) stresses that the information-design personnel will most likely have to overcome opposition to imposing a process with lots of planning in the form of e.g. the Information Plan, etc. Nonetheless, there should be an increasing realization of the importance of publication-development process alongside (and not after) the product-development process. Instating new processes and lobbying for change requires strong leadership. Commitment to process and planning must be encouraged and facilitated. Hackos (1994, 61) says that it is this commitment that distinguishes Level 3 from Level 2. Information managers must make their standards known and enforce them. Likewise, all project members must be educated in the use of planning documents. In this way, all employees in the organization will begin to realize the value of planning (Hackos, 1994: 61).

Hackos (2007, 45) states that transition from level 1 to level 3 usually takes at least two years. When level 3 is close to being attained, the process begins to work so well that there is room for innovation when necessary. The team understands the nature of business decisions—a balance of sorts—that keep a company profitable and customers satisfied. Information designers take responsibility for usability of publications, and the publications are targeted carefully to give just the amount of information the user needs. (Hackos 1994, 66)

4. Research Methods

In previous chapters of this study, I have described the theoretical process by which products are created at Metso Automation. Furthermore, I have presented and discussed two theoretical models of how the customer documentation-creation process could proceed. These approaches to the research problem at hand stand to be complemented by evidence on the current customer-documentation practices in the PPS department. In order to gain insight into the customer documentation process and procedures in PPS department at Metso Automation, I chose to conduct a focused interview.

An interview is a basic way of gathering information. By interviewing various informants, the interviewer can gain deep knowledge and insight on the topic of the interview.

4.1. Focused Interview

A focused interview is by nature a semi-structured interview. According to Case et al in their toolbox of methods of assessment in community forestry (1990), a semi-structured interview is an open framework that allows for conversational, two-way communication. Not all questions are designed or phrased ahead of time. This allows the interviewer and interviewee flexibility to probe details and discuss issues that arise. The term "semi-structured" infers that some guidelines are established ahead of time, and these guidelines form a sort of framework for the interview.

(<http://www.fao.org/docrep/x5307e/x5307e08.htm>, viewed 13 March 2008)

In the study at hand, a conversational approach to gathering information and experiences seems best. I am not measuring anything quantitatively nor am I seeking statistical data. Rather, I wish to gain general knowledge on how people view the documentation process, what documents they use, and how they feel about

documentation in general. As such, the flexibility and two-way nature in a semi-structured interview seem suitable for my aforementioned goals.

A focused interview is used to collect qualitative data by creating a situation in which the interviewee has the time and scope to talk about his or her opinions on a particular subject. According to Chris Livesey (2008), the focus of the interview is decided by the researcher according to the areas the researcher is interested in exploring. The objective is to understand the interviewee's point of view. The questions may be prepared or they may arise spontaneously during the course of the interview. Wording of the questions is not rigid, i.e. wording is not necessarily the same for all respondents. I feel that it is very important to hear what my interviewees have to say about the customer documentation process in their department. After all, this documentation process is what I am studying, and I feel the actual participants in said process are the absolute best source of information on how things actually work on a day-to-day basis. Hirsijärvi and Hurme confirm this. They state (2001, 47) that the focused interview allows the interviewees' voices to be heard. Furthermore, it acknowledges that people's interpretations of phenomena in the world around them and the meaning they give these things are of central importance.

A focused interview has several distinguishing characteristics when compared to other interview types. In discussing distinguishing characteristics of the focused interview, Merton et al (1990, 3) point out that all interviewees have been involved in a particular situation. In the context of this study, all the interviewees work for Metso Automation in similar jobs in product development. They therefore have all been confronted with situations in which they must produce, edit, use, or at least ponder customer documentation.

Merton et al (1990, 3) continue their discussion of the focused interview by stating that the significant elements, processes and the overall structure of the aforementioned situation have been analyzed by the researcher. This is true in my case. In the course of preparing for and conducting this study I have analyzed the environment and conditions under which customer documentation is produced. I have heard people discuss customer documentation and thus gained insight into peoples' attitudes toward it. According to Merton et al (1990, 4) the analysis of the situation is a prerequisite to performing focused interviews. Only through pre-analysis of the situation can I gauge the importance of what is being said and what is not being said in the interviews. After all, I am not just gathering data for interpretation, I am specifically interested in how the *interviewee* interprets the phenomena at hand.

The next distinguishing characteristic of the focused interview is an interview guide (Merton et al 1990, 3). This is a collection of the major areas of inquiry and the hypotheses that set forth items of relevance on which the researcher wishes to gain information in the interview. Hirsijärvi and Hurme (2001, 47) explain that researcher has studied the topic and the situation and determined the essential factors, structures, processes and, in effect, the overall whole. Based on this analysis, the researcher has formed certain assumptions about the effects of the research topic on the interviewees. The researcher turns these assumptions into themes for the interview. The themes form a loose outline for the interview. Hirsijärvi and Hurme's loose outline seems identical in nature to the "interview guide" discussed by Merton et al. Via my observations and work in the PPS department, I have arrived at various assumptions about coworkers' attitudes and knowledge of the customer documentation process. These shall form the basis of my interview guide; these are the topics of discussion I wish to pursue in my interviews.

According to Hirsijärvi and Hurme (2001, 102), the interviewer should have a clear picture of the topics areas to be studied. The themes and questions should be thought through carefully beforehand in order to ensure information gathering. The list of themes and questions keeps the interview on track so that the essential topics are touched upon. On the other hand, the interviewer should leave room for improvisation if the course of the conversation dictates such.

The final distinguishing characteristic of focused interviews, according to Merton et al (1990, 4) is that the interview centers around the interviewees' subjective experiences related to the themes in the interview guide. In other words, I wish to ascertain their definitions of the situations under discussion in the interviews. Merton et al point out that it is also possible that there may be unanticipated responses that can give rise to fresh hypotheses and provide unforeseen or unpredicted insight. As Hirsijärvi and Hurme (2001, 103) point out, an adept interviewer quickly recognizes the meaning of an answer and the new conversation topics or directions that it opens.

In summary, as I see it, a focused interview is one in which I, the researcher, choose the themes that are discussed in the interview, but it is the interviewee who chooses the words to explain and the length and depth of the answer. Thus I hope to learn about the interviewees' viewpoints, knowledge and understanding of the topics at hand.

4.2 Themes of the Interview

I believe the focused interview method is a suitable approach to finding solutions to the question of how to improve and enhance the documentation process in the PPS department at Metso Automation. The people I interviewed all work in the same department with the same or at least similar products. They share a similar educational background and, as employees of the same organization, share common professional

goals. I am interested in determining what they think documentation is, how it figures in to their working life, i.e. what role documentation plays in their professional activities, and what sort of documentation process or processes they perceive to exist. In effect, I wish not only to glean factual information about the workings of the company at hand but also to know how the employees thereof feel about the aforementioned processes and what beliefs and notions they harbor toward the ephemeral phenomenon of technical documentation and customer documentation products.

Then the thematic areas: how they interpret “documentation”, how they use documentation in their work, what documentation they use/create, documentation process at Metso, when and how has process succeeded/failed, how to change the process or develop your own skills, is documentation part of any product. A complete list of the themes is provided in Appendix 1 of this thesis.

4.3 Interview Methods

Exact questions are not necessary but not forbidden either. The themes and questions should be thought through carefully beforehand in order to ensure information gathering. The list of themes and questions keeps the interview on track so that the essential topics are touched upon. Questions can play an important role, as by forming and posing questions, the interviewer guides the course of the discussion. Flexibility is called for in adjusting the overall language use and tone to the level of expression of the interviewee (Hirsijärvi and Hurme 2001, 103)

Size of the Sample

Chris Livesey (2008) points out that due to the time-consuming nature of the focused interview, samples tend to be small. In cooperation with my boss at Metso, I identified a number of people who could be interviewees. We chose people from the R&D department, from the Project department, and attempted to contact people in the

Customer Service department as well. The interviewees were selected based on what work they do, not on other personal characteristics. I sent these people email, in which I outlined the topic of my thesis, why I was conducting an interview, and the sorts of topics I would like to discuss in said interview.

In the end, I was successful in arranging meetings with seven people, four from the R&D department and three from the project department. The fact that some are development engineers and some are project engineers represents the different phases in the product-development process. I felt that this sample would provide a wider array of viewpoints on the topics at hand.

Conducting the Interviews

The interviews were conducted individually between June 5 and June 13, 2002. Each interview lasted approximately one hour. I recorded the interviews after receiving permission to do so individually from each interviewee. I had paper and a pen and made rudimentary notes during the interview. I proceeded through all the questions or topics on my list, but not all were addressed by all interviewees. In addition, some topics arose that I did not specifically ask. The interviewees all seemed willing to discuss the topic.

Handling the Data

After each interview, I listened to the recording one or two times and made detailed notes of all points I felt to be pertinent. In other words, I began my interpretation at this point by choosing what I felt was relevant rather than slavishly recording every utterance. I did not transcribe the interviews, as I felt the aforementioned method of careful listening and notetaking was sufficient.

Analysis Method

My analysis of the interviews began when I listened to the recordings following each interview. I chose the points that I felt were relevant and made note of them. After I had

made notes of each interview, I gathered all the items related to one theme or question. I numbered the items according to which interviewee had said them. Then I attempted to synthesize or generalize the interview results. I summarized in paragraph form the information that the interviewees shared. I marked the individual thoughts and pieces of information with an indicator between I1 and I7, where “I” stands for interviewee and the numeral represents the number of the interviewee.

In the following section, I will summarize and analyze the main points learned in the interviews.

4.4. Interview Results

The following sections contain summaries of the data gathered in the interviews. They also contain my interpretation of the data as well as suggestions that the interviewees make either implicitly or explicitly on how the documentation process in the PPS department could or should be conducted.

4.4.1 What does the term documentation mean to you?

The interviewees identify documentation as a source of information (I1, I3, I4, I7) and as a vehicle to relay (I3) or store information (I3, I4). There is awareness of the differentiation between internal documentation and external, or customer, documentation (I1). One interviewee says the term “documentation” has a negative connotation (I2). Some comment on specific aspects or contents of documentation, such as parameters (I4) or installation guides and spare parts information (I7). Another says it is a broad concept (I3); this observation is corroborated by the breadth of comments made on this topic.

I expected to receive a variety of comments on this theme. In my work at Metso Automation, I have encountered a variety of opinions on what exactly documentation is. I have also encountered a range of attitudes towards whatever documentation is. At first

the lack of consensus on the meaning of documentation confused me. I, having just completed a university program in the field of technical communication, had a clear picture of what “documentation” is. It was indeed a large realm of information-laden entities, of which customer or user documentation was only one small part. The interviewees confirmed my perception that to them the term “documentation” is a broad one. Therefore, when speaking of documentation that specifically serves the user in his or her attempts to use the automation products, a more exact term must be employed.

4.4.2 What is the aim of documentation in general?

A partial response to this theme already arose in the previous discussion on what documentation is. The interviewees identify documentation as a source of information (I1, I3, I4, I7) and as a vehicle to relay (I3) or store information (I3, I4). When the **aim** of documentation is specifically discussed, the interviewees largely agree that the aim of documentation is to enable or aid others in their efforts to use Metso’s products (I1, I3, I4, I6, I7). Documentation makes it easier to understand how to perform a specific task (I1). In using the product, one does not always remember how things work, so one can turn to documentation in such a case (I4, I7). Documentation should tell what a product does and how to use it (I6). In short, the topic of **user** documentation comes out very strongly.

The fact that “documentation” is seen as serving a user’s needs is interesting to me because my personal experiences in the PPS department indicate that customer documentation per se does not have a clearly defined role. Rather, all product-related documentation, be it business plans, project plans, product specifications or something else, seems to belong to a collective pool of “documentation”. When one discusses documentation and means user guides and installation manuals, etc., one has to make it verbally clear that one is strictly referring to customer documentation. Here, though, we

see clear evidence that documentation exists for the assistance of users. Perhaps the specific concept of customer documentation, then, needs to be made clearer as an entity unto itself. This should not be too difficult given the solid conviction that documentation should serve its user. Furthermore, the reason for the vagueness is in the fact that engineers I interviewed not only create or contribute to documentation, but they also use it in their own work. This topic is addressed below.

4.4.3 How is documentation part of your work/working life?

Documentation has a multifaceted role in the lives of the people I interviewed. They read manuals written by others to gain new information (I2, I3, I5). They write product specifications (I2, I7) and report on product performance (I5, I6). They also write reports on various work-related processes and events, such as project progress reports (I6), working processes for other workers (I4), and reports of mill visits (I5). Several of the interviewees produce documentation for end users (I2, I7, I3). Regarding customer documentation, they are of the opinion that they should approach the product from the user's standpoint (I2) and they should ponder the actual conditions in which and under which the product can be and is used (I7). In summary, the interviewees use documentation in many ways and also produce a wide variety of documentation.

The comments made on this theme confirm my assumption that documentation figures in to the interviewees' working life in many ways. They use various documents for a variety of purposes, which in my opinion is only natural in a research and development environment. The next questions will perhaps clarify further the ways documentation figures into interviewees' working lives.

4.4.4 What documentation do you use? Who creates the documents you use?

The interviewees gain knowledge from manuals for Metso's automation system (I3), Metso application manuals (I1, I3, I4, I5, I6), function block descriptions and drawings

of modules (I1, I6), and databases in Lotus Notes, in which employees can record technical notes and information on faults that have been encountered in various products (I3, I5). They refer to product specifications for various products (I3, I5, I6) and also mention specific Metso manuals, such as IQSensor manual (I4) and CD and MD manuals (I4, I5). Interviewees use training information as well (I4, I5, I6). They feel that training information is the most important documentation that they use: it summarizes information well and it provides practical tips and hints that are not in the user manuals. In addition, it uses concrete examples that represent a simpler, more understandable way of presenting information. They also mention that it is easy to remember what information is in the training material because they have spent time in training sessions poring over it.

Two interviewees explicitly stated that they prefer electronic documentation to documentation in paper format (I2, I6). This is due to the fact that search mechanisms in electronic documentation is more efficient than in paper documentation, and electronic documents do not take up space on one's shelves (I2). Also, there are those that read competitors' manuals and websites (I3)

The documentation that interviewees use is largely created within the company. For example, product owners write the texts (I1) or the training department distributes product-related material that is useful (I4, I6). Some documents are self-made; screenshots from previous projects are useful as user manuals do not always contain sensible or actual parameter values (I4). For Metso documentation, the Documentation department is responsible for the layout and style (I1).

The interviewees discuss many kinds of documentation that they use. In my opinion, in a research and development environment, it is only natural to draw on a wide number of resources to gain knowledge about the technology and controls one is

developing. The discussion regarding this topic was, as I expected, a listing of specific documents (the various manuals) as well as general sources of documentation (Technical Notes,). It was interesting to note that the documentation that interviewees use should preferably be in electronic format than in paper format.

This discussion revealed three factions involved in creating documentation that interviewees use: the training department, product owners, and the documentation department. These three factions and their interaction, while not a specific topic of discussion in the interview, could be an area to examine further in developing the documentation process in the PPS department. The interviewees provided valuable clues to what kind of information (screen shots with real values, general summaries of product features, etc.) they require from user manuals when they discussed what advantages the training material possesses compared to user manuals. Perhaps the product owners could coordinate with the training department to create material that can be used for training and in the user manual as well. The documentation department deals with laying out information to make various manuals. They also compile, manage, coordinate translation and localization, and distribute the manuals. They rarely provide actual content, however.

4.4.5 What is the function or aim of documents you use? What information do you wish to get out of these documents?

In the interviews I brought out two themes that turned out to yield rather identical responses. I asked what the aim or function of the documents they use is and what information the interviewees wish to get out of the documents they use. In retrospect, these questions are quite similar, though not identical in my opinion. At any rate, interviewees use documentation to learn something new (I2, I3), out of interest (I3), and to find information on how to complete various tasks. For example, they seek information on communication protocol (i.e. how information is relayed from one

system to another) (I1), specific bits of coding (I1, I2, I3), installing and starting up products (I6), and parameters (I4, I5, I6). In fact, there were many comments on the need to find information on parameters, such as what real parameter values are (I4, I5, I6), tuning parameters (I6), what function block parameters exist and what values are valid for them (I1), and where parameters are located on the screen (I4, I6). In addition to this more specific detail on what information they wish to find in the documentation, interviewees also gave more general descriptions of what they are looking for. They mentioned succinct summaries of product information and features (I6), product descriptions (I5, I6) and product specifications (I3)

The discussions on this topic also yielded interesting observations on items not specifically related to the topic at hand. For example, one interviewee explained how he tries to look at a new product from a customer viewpoint (I3). This remark is noteworthy because it shows that those involved in the product-development process at least at times try to place themselves in the role of a user and approach the product from this standpoint. Another interviewee explained how he uses the documentation in paper format that he has printed from a CD-ROM (I5) and another explained how PDF is a better format than HTML (I6). I think these are important observations to note, because it shows that the employees who use Metso documentation in their own work definitely have an opinion on what format is most usable in various situations. In other words, if these employees are among the target audience of the documentation, then their needs and wants should be taken into account as well.

4.4.6 What documentation do you create? Who uses your documents?

The people I interviewed create documentation for internal users (I1, I2, I3, I5, I6) and external users (I2, I3, I4, I6, I7). Here, “internal” refers to Metso Automation personnel and “external” refers to customers, who were also referred to as “end users”. Most of

the interviewees made this division between internal and external users. I think this is a noteworthy fact; if the division already exists clearly in Metso employees' minds, then said dichotomy should be reflected in the documentation model suggested in this study. One interviewee, however, observed that there is not much difference in the kinds of manuals for internal users and customers (I3).

Documentation for internal users includes product descriptions (I1), specifications (I2, I3), lists of new features in the current version of a product (I1), and reports on system performance and other system data (I6). The internal audience includes Training, SMG (Software Manufacturing Group), Logistics, and those who generate QCS (Quality Control System) products (I1). Other internal users of documentation produced by the interviewees are the Project department (I2, I3), product managers (I2, I5), the Service department (I3, I6), Sales (I6), and Research and Development personnel (I3, I5). Due to the fact that all these parts of Metso Automation were mentioned, it seems to me that they should be taken into account in the documentation model to be suggested on the basis of this study. In addition, it emphasizes the notion that to my interviewees, end users or customers comprise only one of a large number of target groups. Furthermore, it leads me to wonder whether the fact that customer documentation has been sometimes neglected is indeed due to the fact that there are so many audiences vying for the information-producers attention. If this is the case, then the customer documentation, i.e. the target audience of end users, has to be emphasized; its profile should be raised and special attention should be paid to it. Perhaps the documentation model to be suggested in this study can help meet such goals.

Documentation for external users includes user manuals (I2, I3) or parts thereof (I6), diagrams (I6), or instructions for one specific workflow (I3). I was surprised by

one form of documentation that is produced. In other words it was not an expected outcome of the discussions on this topic. This form comprises descriptions of items that were either explained incorrectly in the user documentation (I2, I5) or were missing altogether (I4, I7). Apparently this information flows to both internal documentation users, in which case the repository for it is Fault Notes or Tech Notes databases, and external users or customers.

4.4.7 What is the function or aim of the documents you create? What types of information do you wish to convey to the users of the documents you create?

When the interviewees discussed the function or aim of the documents they create and the types of information they wish to convey to users of the documents, they came up with similar observations. In short, the aim of the documentation is to serve customers, both internal and external (I1, I2, I3, I7). They want to help users use the product (I1, I3) or even offer recommendations on the best way to use it (I1). The interviewees wish to relay general product descriptions and product knowledge (I1, I2, I3), for example what is in the product and what you can do with it (I1) or how to operate the product (I1, I2). They want to convey installation and maintenance information (I3), instructions on how to tune controls (I2, I3), or troubleshooting information (I2, I3).

The interviewees brought the end user's viewpoint into the discussion in a number of ways. For instance, one aims to construct manuals in a way that leads customers to perceive the product in the desired way (I1). This same interviewee also wishes to cooperate with the project department in order to tailor the product for customers (I1). One interviewee expressed the need to work with the customer service department in order to receive feedback on customer documentation so that the customer documentation could be made better (I2). This interviewee stated that if user

manuals were begun when the product development starts, then it might result in a better manual (I2).

4.4.8 When have you felt that the documentation process has succeeded in its aims?

The previous topics have dealt with documents and documentation as part of an employee's workload. This and the following few topics discuss documentation as a process.

Interviewees feel that the documentation process is successful, first of all, when it is finished (I1, I3). Furthermore, a successful documentation process results in a manual that is completed when the product is complete (I3). Other measures of success include producing manuals in both paper and electronic format (I2), explaining new features and changes to the product (I4), and whether or not the document adheres to the principle of answering what, how and why about the product (I7). The interviewees provided a few examples of successful and unsuccessful documentation (I4, I5). The customer's viewpoint was also brought out in one discussion; a successful documentation process involves writing about a product according to what users truly use the product for and what the users need (I7). One interviewee pointed out that in the PPS department, the process only involves gathering and writing the information into a rough draft; the documentation department makes a final version and prints and distributes it (I1).

On the whole, the results of this discussion provide quite an all-encompassing description of a successful documentation process: the documentation should thoroughly explain the product, the process should be completed and preferably on time, there should be a variety of output formats, user needs should be taken into account, and the manual should be updated when the product is updated. Furthermore, the part of the process that PPS department is directly responsible for was more clearly

defined. It is good to note that the interviewees are able to identify their areas of responsibility and the criteria of success. This implies that they may be willing to make extra effort to achieve said success, which bodes well for the documentation process improvements and changes to be suggested in this study.

4.4.9 When have you felt that the documentation process has not succeeded in its aims?

The documentation process is unsuccessful, according to the interviewees, when the necessary documentation is not ready when the product is ready (I1, I5). This, apparently, is a great weakness in the PPS department (I1). The process has also failed to be successful when the quality of the language is poor (I7) or when the author does not ponder what the users need the documentation for and therefore do not make the documentation based on users' needs (I7). In addition, interviewees provided examples of specific manuals they thought were unsuccessful (I4).

Reasons were given for why the documentation process may at times be unsuccessful. For example, work piles up and there is not enough time to create manuals (I1, I3). One interviewee questions whether it is even sensible for research and development personnel to even write manuals, opining instead that technical writers would do the job better (I3). This interviewee maintains that there is no tangible reason why engineers should create manuals (I3). Another interviewee points to the documentation department as one factor for lack of success. This interviewee says that the documentation department should design and write documentation and not just be concerned with layout, translation, and printing (I2).

The interviewees had no trouble listing characteristics of an unsuccessful documentation product. Among these, the main characteristics dealt with schedule and the audience. These are the same criteria that arose when the interviewees discussed a successful documentation product. Critique was aimed at the documentation

department. In my opinion, the critique is unfounded because the documentation department, despite its name, has a clearly defined duty and role in the documentation process. The name, it seems, could be changed to something that more specifically states what its functions are. At any rate, the documentation department is not a creator of user documentation, only a processor and distributor thereof. In addition to the aforementioned critique, in which it was conjectured that the documentation department could create and design user documentation, there was other speculation as well on just who should be the creator of user manuals and other documentation. Some interviewees thought that it was not sensible for engineers to be performing this task. The implied assumption is that engineers could use their time better in other tasks and let documentation professionals handle the documentation-related tasks and processes. I think the role of the documentation department, and perhaps its name, could be made clearer to the engineers in question. As to their role in creating user documentation, that is something that must be addressed when suggesting a new documentation process model in this study.

4.4.10 What changes would you make in how documentation is handled at Metso Automation?

In the discussions on how they would change the way documentation is handled at Metso Automation, the interviewees made it clear what the current state of affairs is. One interviewee in particular expounded at length on this topic. The interviewee feels that people in a product-development project should think more about the manual, because documentation is often forgotten or ignored at the beginning of the project. This means that there is not enough time to complete the documentation before the product is ready. Furthermore, maintains this interviewee, when documentation is being written or created, it is looked down upon as something that can routinely be done as it has always been done. People consider documentation less important than their other,

“real” work (I3). These attitudes, in my opinion, contribute to the state that the documentation is in at the present moment. These attitudes must be addressed and efforts must be made to counteract them. If they continue to exist, then they will have a negative impact on improvements to the documentation process that I intend to suggest in this study.

The group of people working on a project, i.e. the project team, should have a writer as one of its members from the beginning of the project (I1, I3, I7). That way, the user documentation can be ready when the product is ready (I6). The documentation process should begin at the start of the project and even have its own project number (I3). I think this project number idea is good. If a project number exists, then presumably someone somewhere is in charge of the project and in charge of keeping track of it. Such a mechanism would force at least some sort of attention to be paid to customer documentation regardless of the project team’s attitudes toward documentation. One interviewee tells how difficult it is to get materials together at the beginning of the document-creation phase (I1). I think that by means of the project process, this information could be systematically compiled, in which case less effort would have to be made in finding it and thus the threshold to begin writing would lower considerably.

In discussing what changes they would make or like to see in the documentation process at Metso Automation, the interviewees again pondered the role and duties of the documentation department. One interviewee said that the documentation department should be spread among different divisions and departments, because each department has its own sorts of products, all of which need user documentation (I1). Some people mentioned that the PPS department (or perhaps all of Metso Automation) would benefit if the company subcontracted for or outsourced such routine steps as printing,

distributing, and formatting user documentation (I1, I7). This would mean, I presume, that Metso's resources, perhaps even those of the Documentation department, would be freed up and devoted to actually creating documentation.

Possible changes to the handling of documentation at Metso would also include introducing customer needs analysis (I2). We should attempt to deduce what customers truly need, and these needs should be taken into account in formatting and structuring the documentation. We should also ponder how to provide information that can support users with a variety of prior experience (I2).

Overall, I feel that the interviewees touched on matters that are very central to a successful documentation process. First of all, they feel that people should have the correct attitude toward documentation and the work involved in producing it. Secondly, they feel the project should be structured to ensure that information is gathered and documentation is created in a timely fashion. Thirdly, they are of the opinion that the actual documentation creation should be performed by a technical writer, i.e. a professional information designer. Fourthly they ponder how best to allocate Metso's resources in order to enable and ensure the success of the documentation process, and whether some steps in the documentation process could be outsourced. Finally, interviewees touch on what I feel should be the starting point of any customer documentation endeavor: an analysis of customer's needs. If all these factors are taken into account, then one can say that much has already been done to ensure the success of the documentation process. I think it is a very reassuring sign that PPS employees are aware of these factors already.

4.4.11 How do you feel about this statement: “Documentation is an integral part of any product.”

All the interviewees that commented on this topic agree that documentation is an integral part of a product. After all, without a user manual, customers may not be able to use the product (I1, I3), whereas documentation makes the product much easier to use (I1, I6). It can help structure the product in a way that helps the user conceptualize and comprehend the product better (I2). It can help the user find the necessary information at the moment when it is needed (I2). The quality of the manual is also important. If there is a bad manual, then it means it is a bad product. On the other hand, if there is a usability problem in the product, then a good manual can help overcome the problem (I2). Documentation can, in that way, make a product better (I1, I2, I6).

I am pleased to note that the interviewees that discussed this topic know very valid reasons for why documentation is part of a product. If these opinions already exist among PPS employees, it means that they should be willing to change the documentation process to enable the good effects of documentation they brought up, as listed in the previous paragraph. These provide good reasons for improving the documentation process and the foundation for worthwhile documentation goals toward which to strive.

4.4.12 What kind of documentation process are you aware of at Metso Automation? How have you gained this knowledge?

The interviewees agree that the user documentation is usually written based on product specifications (I2, I3, I6). The technology owner, i.e. the product creator, is responsible for documentation (I1, I7). Usually, this product creator, a R&D engineer, writes the manual (I6). The product creator creates and lays out information so that the manual serves the product and matches the product. The product creator’s boss and colleagues may also participate in the project. The Training, Customer Service, and Project

departments may also comment on what the product and, in turn, its manual should contain (I1).

Some interviewees mentioned that it would be better if there were people whose job it was to create user documentation from information available and illustrate it and add captions and so on (I1, I2). If these people, i.e. technical writers or information designers, focused on writing the documentation and editing its content, language and style, then the engineers could focus and comment more on actual content (I1).

When the manual is ready, it is often not even reviewed (I3), but rather submitted straight to the Documentation department (I7). The Documentation department formats the documents and makes them into PDF files (I3). They also translate and manage the documents (I2). They are not able to edit for content or change information because they are so far removed from the actual product and its development processes (I1). The Documentation department then sends a formatted draft back to the department that produced it for review. After it is reviewed, they publish and distribute the document (I3). They produce both paper and electronic documentation, which one interviewee says is a good thing (I2). In fact, electronic publishing methods and possibilities and opportunities could be investigated and utilized even more than they are now (I2).

The interviewees have gained this knowledge through practice (I2, I3). None of the interviewees inferred in any way that there would exist an explicitly stated or outlined documentation process. Rather, the process described here is the one that exists in practice, for lack of one specifically implemented. Perhaps that is the reason why documents are always late; they are written after the product is ready (I4).

I feel that the discussions on the topic of existing *de facto* documentation processes were particularly fruitful. I had my own preconceived notions of how the

process usually proceeds in the PPS department, but due to the fact that there is no official process or no process was ever explained to me, I could not be sure whether my notions held true only in the projects I had been involved in, or whether they encompassed more widespread practice. Therefore, it was good to hear that other employees shared my views on the chain of events in the existing documentation process. It seems to contain many elements of established, explicit documentation processes, but the lack of a process leaves the department without means of enforcing and monitoring its progress.

The explanations of the Documentation department's role in the process confirm or are confirmed by the previous discussion about it in this analysis of the interviews. In short, they play a rather mechanical role in formatting, stylizing, printing, and distributing the product created by the R&D engineers. It appears the interviewees wish of the Documentation department a larger role in the documentation-creation process, one that would diminish the interviewees' own workload and responsibilities, but on the other hand, there is also mention of having information designers or technical writers handle those chores. In other words, engineers would rather concentrate on what they perceive to be their core tasks and let appropriate professionals create the necessary documentation. This is a viewpoint that must be taken into account when suggesting an improved documentation process in this study.

4.4.13 Is there anything you think could help you and others develop your documentation skills, i.e. some sort of training?

Interviewees had many ideas for training that could assist them to become better creators of user documentation. They suggested courses on arranging or laying out information and structuring manuals (I1, I5). They wish to be able to write concise, readable text (I2) and in general improve their language skills (I6). They could stand to become better users of software tools used in creating customer documentation (I5, I6).

One interviewee would like to learn more about why customer documentation is even necessary (I3). The interviewee was doubtful about the usefulness to users of warmed-over product specifications served in the guise of product documentation. This thought was corroborated by another interviewee's comment in another context. When discussing the aim of documentation this interviewee maintained that customer documents should not be mere specifications. Sometimes the final document looks like a report of what has been done in the product development department, not a guide to what people actually use the product for (I2).

I think that all the training topics that the interviewees suggested could be useful. If it seems likely, over the course of time, that product developers continue to create product documentation, then training on any or all of these topics should be offered to the PPS personnel. The discussion on this topic also reveals that the interviewees are well aware of some things that make good documentation: good, clear language, readable text, and a good layout.

4.4.14 Feedback

One topic that arose, although it was not one of the focuses of the interview, was feedback that interviewees give or receive concerning documentation. Some interviewees both give and receive feedback (I1, I3). They report feedback via FaultNotes (I1) or Technical Notes (I7) e.g. on things that should be in the current version of a user manual but are missing (I7). They also utilize email to relay feedback (I1, I3). They receive feedback from users. For example one interviewee has heard that manuals contain too much, too exact technical knowledge (I3).

It is good to know that some channels of giving and receiving feedback exist. Feedback is very important in improving user documentation and in tailoring the

documentation to users' needs. These channels or methods of giving and soliciting feedback should be officially established and their use should be encouraged.

5. Summary of Research Results

In conducting this research, I have approached the topics of the documentation process in PPS department at Metso Automation and of documentation processes in general in a total of four different ways: I investigated the product development process in the PPS department, I studied and compared two documentation process models, I analyzed PPS documentation practices for process maturity, and I conducted interviews of PPS employees on topics related to documentation and the documentation process. In this chapter, I shall revisit the highlights of my findings and the discussion of them in the previous chapters and attempt to coagulate them into coherent entities.

5.1. Opportunities to Produce Customer Documentation in the Application Development Process

Opportunities to Produce Customer Documentation in GR0-GR2

According to the Research Process description by Riihilahti (2004), the research process should yield a Project Plan and a Project Report. There is also mention of feasibility reports and a research report. Perhaps these two are part of the aforementioned project plan and project report. At any rate, it seems to me that these would contain descriptions of functionality, processes and benefits to the customer with which the participants in the process could begin forming technical documents with eventual customers in mind. Perhaps there could be some sort of template into which the project team members could write e.g. the following:

- What is the aim of the application product (or family of products) being researched?
 - Assuming the product is going to be sold one day, who will use it?
 - What will users use the product for? What goals will users have when using the program?
 - What must users do to meet their goals? In other words, how does the product work?
-

- What all features or functions are provided? Which features and functions are primary and which are secondary?

Answers to these and other such questions could serve as a starting point when planning customer documentation in the Product Creation Process.

Opportunities to Produce Customer Documentation in G0-G5

Customer documentation is a vital, integral part of any product. Therefore, when a product is produced, the planning and production of customer documentation should be allotted equal attention and effort. In other words, the customer documentation process should be monitored throughout the gateways. I feel that if project members are aware of the necessity of allotting resources and attention to customer documentation from the very beginning, then there is a greater likelihood that it will be ready for delivery concurrently with the product.

At gateway meetings, project milestones are discussed, and project participants ensure that certain key milestones have been reached so that the next phase can commence. I think it would be very essential to add user documentation-related items to this list. That way, project participants would have to ensure that the documentation is being produced along with the application. Ideally the documentation would be ready to deliver to the customer when the application product is delivered.

When human and monetary resources are discussed and a business plan is made, then human and monetary resources should be allotted for the customer documentation process. When a project plan is drawn up, project personnel should also plan for the customer documentation process. It should be integrated into the project plan, in which case resources would be allotted and the steps in the documentation process would be scheduled as well. If customer needs and wants are studied in this phase, then these

factors should indeed form the very core or foundation not only for the product under development, but for the customer documentation also.

The freezing of product specifications is an important juncture in time for the customer documentation process. It is the perfect opportunity to begin producing customer documentation, since it is likely that there will be only minor changes to specifications in the ensuing phases. If the product has been lab-tested, then information gained that way can also be incorporated into customer documentation.

When the product is tested and verified, then solid knowledge and experiential information on how the product functions can be collected. This in turn means that customer documentation preparation can proceed on sure footing. If there are drafts of the operator and tuning displays, then this means that explanations of these and relevant workflows can be added to customer documentation. It is very important that at least rudimentary documentation be completed before a customer pilot project is done. The final customer documentation can be updated and edited based on the experiences of the customer pilot project.

At one point in the product creation process, all product documentation, including manuals and installation guides, must be ready. The statement in process descriptions that the documentation must be ready at a certain point is, as far as I can tell, the first mention of manuals and installation guides in the sources I have used. It is very surprising to me that they were not mentioned previously, especially considering that most other facets of the product are taken into account in great detail at many phases of the project. In a project in which the goal is to produce something according to carefully predetermined specifications, using certain resources and according to a set schedule, how is customer documentation to come into existence if it is not mentioned until well into the process?

In my experience, a project is usually nearing its end before project participants begin talking about the need for a manual or the need to update a manual. This is too late. If there is a pilot project or a prototype of the project, then usually there is no documentation for it. This means people outside the project have no idea how the prototype or pilot product is supposed to work. The product documentation process, therefore, should begin before the project actually begins, because the prototype is actually used by customers in the customer setting. At a mill where project engineers e.g. must add the new application prototype to the automation system, it is obviously expected that the customers will use the prototype and judge its feasibility. Customers need user guides to be able to operate, tune and perform maintenance on the application prototype. Specifically, a technical manual for automation engineers and maintenance engineers and an operator manual for operators are needed.

There are many cases, however, in which no user manuals are provided, and customers thus have difficulties using prototypes. In fact, there have even been cases in which the mill management has forbidden mill personnel from using a prototype until they receive documentation on how the product works. This in turn means that project engineers must try to create some user documentation ad hoc. I think that such a document, produced under stress, on top of other work, and in a great hurry, would not necessarily be of the same quality as one that is planned and scheduled ahead of time. Obviously the production of a prototype product involves planning of specifications and functions. Therefore it seems possible that with the proper recording and documenting of such details, a preliminary, rudimentary document could be produced with little extra effort. This would only require that this task be written into the project milestones. All the things that are necessarily recorded somewhere anyway could be a good starting point for a technical manual.

5.2 Steps to Achieve a Higher Information-Process Maturity Level

This research indicates that on a scale of 0 to 5, with 5 the highest, the PPS department has an information-process maturity level of 1. Since Hackos maintains that the majority of companies are at levels 1-3, I think it is feasible to gradually takes steps to achieve a process maturity level of 2 or 3. As discussed in Chapter 3.4.2, Moving from One Level of Maturity to the Next, there are indeed many steps an organization can and must pursue in order to achieve a higher information-process maturity level. Obviously these steps involve change in the way people work. It is therefore good to recall that any changes instated must have the support of management and staff members alike.

Furthermore, personnel at the managerial level and department members must understand the need for common processes and design standards for the information products.

The company that is trying to achieve the higher maturity level should create a centralized information-development organization. This department should be overseen by a manager who is knowledgeable about information development and can coordinate the work of employees working in that field. Information developers or technical writers should be hired by managers who are knowledgeable in the demands of the field. They should be hired for their expertise in information development and for technical and tools skills. Training should be available to them on a regular basis to keep abreast of changes and developments in the field.

In order to ensure uniform, high quality in information products, the company should develop publication standards and appoint someone to be responsible for making sure the standards are followed. Quality can be further assured by regular usability testing and customer studies; these help ensure that the quality level in the information products meets customer demands and needs. Publications are designed to follow pre-

determined best practices. They are based on research, usability testing, and customer studies. The design of the information products should be evaluated by peers and by customers in order to determine how well it meets its goals.

Planning, estimating and scheduling are activities that take high priority in a company that is aiming for a higher documentation-process maturity level. A successful, high-quality information product, in my opinion, is the result of a fine balance between meeting customer needs and demands, fulfilling the goals of the organization making the information product, meeting budget demands and staying on schedule. To this end, a company must ensure adequate resources for information product projects. Funding should allow for training, printing, localization and translation expenses. The projects must be tracked to ensure that the product is produced on schedule. Also, this information forms—after the fact—a history that can be used in future estimating efforts. Communication among all parties involved is essential, as it allows possible changes in any of the above elements to be accommodated. The initial plan for the information product itself should be an Information Plan or Content Specification or some similar document. Team members should be educated in the practices and procedures of planning and scheduling in order to guarantee a higher rate of success in performing these duties.

The topics discussed in the previous paragraphs are all aspects that need to be considered when aiming to increase a company or department's process-maturity level. All of these are linked to quality management, which is one of the main determiners of process maturity. Quality management means activities that are geared toward actually defining what quality means to or in the organization. Quality in this instance can be assessed and maintained by regular studies of customers' needs, usability assessments, customer satisfaction questionnaires, and working to ensure high quality in training,

sales, and support services. Instead of merely meeting headlines and publishing whatever document was the result of a hurried effort, information designers should begin implementing information development processes with distinct planning and production phases. Quality has a much greater chance of being managed well if there is strong communication of goals and strategies amongst peers and with management as well. Communication aids in making the value added by technical communication efforts more widely known, which increases management's recognition of aforementioned efforts (Hackos 2007, 35). This recognition and respect work to empower employees in their tasks which, once again, has a positive impact on increasing the level of all-around quality in the project. To these ends, I think it is prudent if information designers or their managers begin implementing information-development processes with distinct planning and production phases. Also, the information designers should conduct preliminary user studies to discover how customers use the information and what exactly would provide them with the most extra value.

5.3 Observations from within the Process Models

Hackos bases her model of the publications-development life cycle on models of the product-development process. Therefore, it is presumable that a publications-development life cycle like hers would fit together well with the actual product-development life cycle. Due to the close relation between these two developmental efforts, it is clear to me that the two efforts should occur simultaneously or in close dialog with one another. There is no need to wait until the product is nearly complete before beginning a publication or documentation project. Rather, the publication process can be managed more easily if it is not delayed; the later it begins in relation to

the product life cycle, the more difficult it will be to plan and produce high-quality publications (Hackos 1994, 28)

As mentioned in the discussion of Phase 2, Content Specification, Hackos warns against too much writing in the planning phases (Phases 1 and 2) because it will most likely have to be rewritten anyway. In other words, just as a product is planned carefully before it is produced, so should the publication product and the publication process be planned. Writers may feel they should be writing, but actually they should be planning in these planning phases. Hackos reminds readers (1994, 228) that planning activities are not keeping writers away from the perceived real work of producing pages. Rather, they are laying important groundwork for the writing to come.

Overall, in surveying the documentation process models presented in Chapter 3, the main point that arises is the great emphasis on planning; both Carliner and Hackos explain in detail how to plan and what to plan for. When I contrast this with the fact that, in the PPS department at Metso Automation, very little planning for customer documentation projects is conducted, it seems clear to me that this lack of planning would be the first issue to tackle in attempts to improve the documentation process. In my experience, there are no guidelines in the PPS department for the documentation process. Creating guidelines would be an important step in the planning process, because I think that guidelines provide a visible framework or structure to plans and projected outcomes. The guidelines could describe both the process itself (project guidelines) as well as the intended outcome of the process, i.e. customer documentation (editorial guidelines, documentation guidelines).

Another step that the PPS department must undergo is to determine and explicitly state what the goals of customer documentation and the documentation process are: why does Metso Automation need or wish to create customer

documentation? What business goals does the existence of customer documentation fulfil? At the present moment, business objectives are written for the products themselves, so it seems to me that it would not be too great a leap to record simultaneously the business objectives of the customer documentation. Metso Automation's goal in creating customer documentation and the resulting business objectives should be put into measurable form. That would allow project members to measure or evaluate later how well the objectives have been met.

With the business objectives underlying the project firmly in mind, the next area of planning to be addressed is the product itself and, just as important, its users. Any user documentation should be crafted to meet the needs of users. In order to know what these needs are, research is necessary. The information designers should conduct detailed research into the product to understand how it can be used and what it will be potentially used for. Next they must survey users to gain a thorough understanding of what information the audience of users needs. The ensuing user documentation should then reflect the knowledge of who uses the product and what tasks they perform with it as well as the criticality and frequency at which the various tasks are performed.

When the areas of knowledge, goals, and other information described in the previous paragraphs are in place, then there is sufficient information to form an actual project plan for the documentation project. A project plan is like a roadmap that shows the starting point, finish point and the route between them. Furthermore, it gives a time frame for reaching the finish point and sketches out the resources necessary to reach it. To ensure progress, the plan should contain milestones at which to check that plans have been followed and necessary steps taken. A project plan, in other words, is at the core of planning for a documentation project, but it can not stand alone without the other information discussed in this section. Rather, it ties them all together and provides

a step-by-step guide for advancing. The documentation project plan should be drawn up at the same time as the project plan for the product is being drawn up. This helps to ensure that the user documentation is ready when the product is ready to be released. Likewise, resources for the documentation project should be allocated in conjunction with resource allocation for the product creation process.

When the documentation process is advancing according to the aforementioned project plan, the documentation products themselves must be planned and drafts must be designed and written. In this task, too, is planning important. I think that an Information Plan as described in section 3.2.1 of this thesis could be an effective way of planning the documentation product. This plan would also inform others what plans exist, and it would allow all those involved in the project to reach a consensus on documentation-related issues. The Information plan would identify the strategy of each user document and outline the information each one contains. The outlines should order the information in a way that serves users best. In other words, this plan should be based on user surveys or other such studies of users' needs. An information plan coupled with specification of the information product's contents would give product creation project members a firm grasp of the scope of the documentation project. Based on these plans, the information designers could prepare a sample of the communication product, thus easing in my opinion the review and commentary process.

In planning documentation products, information designers should also plan and implement tools to assess the effectiveness of the documentation. Such tools should assess first and foremost users' satisfaction. I feel that feedback of any kind is important, so feedback should be solicited, and there must be mechanisms in place that dictate how feedback is dealt with and that correct action is taken to enforce things that elicit positive feedback and adjust things that cause negative feedback. In all phases of

the project, there must be measurable milestones; milestones are one way of ensuring quality results.

Plans for the documentation process should include a clear description of the responsibilities and duties of Metso Automation's Documentation Department. Furthermore, these duties and responsibilities must be incorporated into the overall project plan, of which the Documentation Department must also be informed. Open channels of communication between departments will ensure timely processing of PPS documentation.

The documentation process must end with a formally established forum for discussing and evaluating completed projects and the success or lack thereof that was experienced. In addition to the project per se, the information product, the project participants, and their cooperative efforts must also be evaluated. Project members should record best practices and learn from them, as well as from practices that did not produce desired results. A completed project yields very much experiential knowledge about project practices and routines. A post-project discussion would ensure that this knowledge can be recorded and benefited from in future projects. This reflection and knowledge sharing and recording also lay a solid foundation for future versions of the newly-produced information product.

In reviewing the documentation process models and the comparison between the two, it is evident that both process models can be divided into two major parts: planning phases and implementation/writing phases. I cannot help drawing a comparison between these and the Product Creation Process mentioned in Chapter 2.1.3. That process is also divided into the conceptualization process and realization process. In the planning as well as in the conceptualization phases, the details of the product as well as details of the project are hammered out. In the implementation/ realization phases, these

aforementioned plans are put into action and the product or information product is produced. This parallelism is a factor that I believe could be utilized and capitalized upon to great benefit. Bluntly stated, if the documentation process model to be instated in PPS department is anything like Hackos or Carliner's models, i.e. based on product-development processes, then the documentation-development process and the product-development process should progress in parallel tandem, closely linked at all applicable points. Finally, if the documentation process is thought of in two overall phases, i.e. planning and implementation, then in my opinion, the bulk of efforts in improving the documentation process should be focused on the planning phase. This study seems to indicate that the importance of thorough planning cannot be emphasized enough.

5.4 Interview Results

The interviews revealed a variety of insights that should be taken into account in improving the documentation process in PPS department. I think these are important insights to note, because the interviews show that not only do PPS employees produce documentation, they also use documentation to a great extent in their own work. These employees, i.e. the interviewees, definitely have an opinion on what documentation format is most usable in various situations. Since they are among the target audience of the documentation, then their needs and wants should be taken into account as well.

The interviews confirmed my perception that interviewees consider the term "documentation" a broad one. Therefore, when speaking of documentation that specifically serves the user in his or her attempts to use the automation products, a more exact term must be employed. Perhaps the specific concept of customer documentation, then, needs to be made clearer as an entity unto itself. This should not be too difficult given the interviewees' solid conviction that documentation should serve its user.

Nonetheless, the interviews reveal that there are many audiences vying for information-producers attention, both internal and external audiences. This leads me to wonder whether this causes customer documentation to become neglected. To counteract this, the customer documentation, i.e. the target audience of end users, has to be emphasized; its profile should be raised and special attention should be paid to it. This does not mean, though, that the needs of the other audiences should be entirely forgotten.

Despite the fact that “documentation” as a term proved to seem rather broad a term to the interviewees, the interviews show that they are able to provide quite an all-encompassing description of a successful documentation process: the documentation should thoroughly explain the product, the process should be completed and preferably on time, there should be a variety of output formats, user needs should be taken into account, and the manual should be updated when the product is updated. Furthermore, the part of the process that PPS department is directly responsible for was more clearly defined. It is good to note that the interviewees are able to identify their areas of responsibility and the criteria of success. This implies that they may be willing to make extra effort to achieve said success, which bodes well for the documentation process improvements and changes to be suggested in this study. All of these factors must be closely studied and implemented in the new documentation process model.

Even though the interviewees have a clear picture of what elements a sound documentation process includes, they were not all convinced that they themselves should play a direct role in this process. Some interviewees thought, for example, that it was not sensible for engineers to be creating documentation. The implied assumption is that engineers could use their time better in other tasks and let documentation professionals handle the documentation-related tasks and processes. I think the role of

the documentation department, and perhaps its name, could be made clearer to the engineers in question. Their role in creating user documentation is something that must be addressed when creating a new documentation process. The interviews indicate that engineers would rather concentrate on what they perceive to be their core tasks and let appropriate professionals create the necessary documentation. This is another viewpoint that must be taken into account in creating a new documentation process.

When documentation is being written or created, it is looked down upon as something that can routinely be done as it has always been done. People consider documentation less important than their other, “real” work. These attitudes, in my opinion, contribute to the state that the documentation is in at the present moment. These attitudes must be addressed and efforts must be made to counteract them. If they continue to exist, then they will have a negative impact on improvements to the documentation process that I intend to suggest in this study. One way to counteract negative attitudes toward documentation is to plan the process and instate a project plan. In a carefully controlled project, the necessary information for the information product would be systematically compiled, in which case less effort would have to be made in finding it and thus the threshold to begin writing would lower considerably.

Overall, I feel that the interviewees touched on matters that are very central to a successful documentation process. First of all, they feel that people should have the correct attitude toward documentation and the work involved in producing it. Secondly, they feel the project should be structured to ensure that information is gathered and documentation is created in a timely fashion. Thirdly, they are of the opinion that the actual documentation creation should be performed by a technical writer, i.e. a professional information designer. Fourthly they ponder how best to allocate Metso’s resources in order to enable and ensure the success of the documentation process, and

whether some steps in the documentation process could be outsourced. Finally, interviewees touch on what I feel should be the starting point of any customer documentation endeavor: an analysis of customer's needs and not just warmed-over product specifications. If all these factors are taken into account, then one can say that much has already been done to ensure the success of the documentation process. I think it is a very reassuring sign that PPS employees are aware of these factors already.

6. Discussion and Conclusion

When I began this research, my aim was to find or design or construct a customer-documentation process that would suit the needs of the PPS department at Metso Automation. To that end, I reviewed and analyzed the product-creation process in that department. I studied two documentation-process models crafted by well-known scholars and practitioners in the field of information design. Furthermore, I subjected current documentation-process practices, as I know them, to a process-maturity test described by one of the aforementioned scholars. I also interviewed seven Metso Automation employees involved in the product-creation process to gain insight into their perceptions of customer documentation and related practices and processes, their role in creating documentation, and their usage of documentation.

At first, the results of the research processes listed in the previous paragraph seemed quite straightforward. Due to the fact that the documentation-development processes I reviewed are based on product-development processes, either of them or an amalgam of the two would suit well the PPS department's documentation-development needs. However, upon further analysis, it appears that there are a multitude of other factors that have to be considered as well. These factors are not all directly linked to the documentation-development process themselves; rather, they are factors that must be addressed or dealt with or analyzed further in order for the implementation of a documentation-development process to be successful. Just as a seed can only take root in the proper kind of soil and under proper conditions of light, moisture and nutrients, so also must a new process be implemented in an environment that is prepared to accept, embrace, and nurture it. Now I shall list and briefly describe some of the observations I made regarding the factors at the periphery of a sound, thriving documentation-development process.

6.1 Research

The documentation-development process could benefit greatly from research. By this, I mean research on the product: its functionality, processes, and benefits to the customer.

Project members could gather information on who would potentially use the product and what their aims or goals would be in using the product. Research into the features and functions of the product could reveal information that can be utilized in producing drafts of the communication products. The research could be begun when research into the actual product is being conducted. Knowledge thus gained would form a solid foundation for building the communication product during the product creation process.

The second main focus of research is users. The experts cited in this thesis agree that any user documentation should stem from the needs of users and serve these needs by supporting the user in the way he or she actually uses a product. Furthermore, the people I interviewed were of the opinion that the user documentation should be more user-friendly and that the user's needs must be taken into account. Any research performed must be shown or listed in the tasks of the documentation-development process and progress milestones must exist to gauge progress.

6.2 Managing Change

When a new process or new ways of working are introduced and implemented, it means change, not only in the way certain tasks are done, but also in planning, in people's job descriptions, in training, in budgeting, in business objectives and in areas of strategic emphasis. Hackos (1994, 51) discusses how moving to the next level of process maturity involves changes in the way people work. All changes must have the support of management and staff. Management and department members must grow to understand the reasoning behind and the need for whatever procedures and standards are new.

Along with change comes the need to train employees how to follow new practices and, on a practical level, how to write e.g. an information plan. Training would be necessary when, for example, the information designers or information managers begin implementing information-development processes. Employees must be made very aware of their roles and duties concerning the new practices and procedures. The Metso Automation employees I interviewed seem to have a good idea of their area of responsibilities and also of the criteria for success. If other employees also share this knowledge, then this bodes well for change in the PPS department.

One particular change that must occur in the PPS department is that customer documentation must be more clearly defined. The interviews I conducted revealed that documentation is a broad concept that people use to refer to a variety of things. Therefore, I believe that sharing a common perception of what customer documentation is would enable constructive and concise discussion on the topic of customer documentation and related tasks and processes. In other words, employees should have a clear idea of what is meant by customer documentation as opposed to other kinds of documentation that are used and produced in the department.

The fact that myriad documentation exists and the concept of user documentation is not clearly defined leads me to think that the profile or image of the “customer” should be cast in sharper relief in the minds of employees. This, I feel, would be corrected if research were conducted into what users need and want out of user documentation. However, as the interviews indicate, there are many kinds of documents that are also used by other Metso employees. Are the users of this internal documentation also customers? If so, how should their needs and wants be taken into account? A carefully designed and properly carried out documentation-development

process would most likely result in information products that meet the needs of these users as well.

Another change that should be effected is a shift in attitudes toward creating user documentation. My personal experience in the PPS department and the information shared with me by the interviewees collectively indicate that PPS employees consider documentation less important than their other, “real” work. To be blunt, it sometimes feels that creating user documentation is a “necessary evil”. I think this is the result of a vicious cycle involving poor or nonexistent planning, which causes delays and a late, sometimes sub-par product, which causes complaints from customers, which causes employees to receive negative feedback from superiors, which increases stress and antipathy toward future customer documentation projects, which leads back around to a job poorly done and so on.

In short, efforts must be made to counteract these negative attitudes. I think that sufficient planning would be one way to begin correcting attitudes. If the user documentation is well planned with an information plan and content specification completed, then the writing process would be easier and not so time-consuming and poorly defined and stressful. Another way to counteract negative attitudes is through education. If department employees and especially project members are taught to recognize the fact that user documentation adds value to the product and is in line with company goals, then their attitudes toward being involved in the documentation-development process will most likely change. I also feel that attitudes can be influenced by judicious use of naming. By this I mean that “documentation”, as indicated above, is a term that is vague and therefore hard to grasp and digest. If, instead, the results of documentation efforts were officially called e.g. “communication products”, it may help people to conceptualize more easily what is in question. In a product-development

environment, “product” is certainly a familiar and core concept. The qualifier “communication” (or some other similar qualifier) specifies the function of the product in question further. A name like this might aid in turning employees’ attitudes from hostility to matter-of-fact acceptance of the communication product as an essential part of their working lives.

6.3 Organizational Issues

As discussed in the previous section, change is necessary in implementing new practices and procedures. In addition to effecting change on the level of knowledge, perceptions, and attitudes, changes may also be necessary on the organizational level. For instance, the discussion in this study on process maturity indicates that to move to a higher level of process maturity, the PPS department should have an information-development organization within it (Hackos 2007, 56). This would allow engineers to concentrate on their core tasks while allowing the company to benefit from the services of employees who are trained and experienced in producing user documentation and other information products. Such an organization should be headed by a manager who is knowledgeable about information development and thus can deftly coordinate employees’ work. This organization should create publication standards and monitor that the standards are upheld and followed. They should instate a system of peer review to ensure a high level of quality in publication products produced by the department.

One important responsibility of an information design department and the person or people in charge would be to create and manage a system of eliciting feedback from users of information products. There should be a system of dealing with negative feedback as well as with positive feedback.

It is easy to speculate that the PPS department or any other department would feel the need to have a solid reason to create a new organization within the department

or alter an existing organization. Perhaps one way to justify the need for organizational change is to approach it from the business standpoint. For instance, decision-makers could ponder what Metso Automation's goal is: why does the company exist? Why and how are long-term customers important to the company? What are ways to keep these customers? How can Metso Automation serve the customers in the best way possible? What is the image of Metso Automation among customers, or among potential customers who ultimately purchase rivals' products? I believe that in pondering such questions, many important issues would arise, and among these issues one topic of discussion might be customer documentation and the value it can add to or subtract from products and the way in which customer documentation can affect a company's image.

One final area where organizational issues come into question are where the company's bottom line is involved. Changes to the documentation-development process would surely mean changes in the way resources are allocated, in the budget for staff resources, and in a reorganization of the number of hours to be spent doing various tasks. In the PPS department, resources for staff and for hours spent developing and designing documentation would have to increase. Some of these decisions would be made easier with careful and sufficient planning, which would presumably yield fairly accurate estimates of budget requirements for documentation-development projects. Furthermore, as time passes and experience accrues, these estimates would become more accurate, which would in turn make budgeting and forecasting an even more exact science.

6.4 Communication among Stakeholders

In my opinion, in an environment where change is imminent or underway or freshly completed, communication is of utmost importance among all stakeholders. They must

all be informed of what is happening in the business areas subjected to change and the must also inform others of their actions and how these actions will affect other stakeholders. Communication is necessary to inform employees how new procedures and processes will work and what their role in the processes will be. Communication is necessary when the process is underway in order to keep the process flowing smoothly. Communication among stakeholders helps them reach and maintain a consensus on the intended outcome of documentation projects. Succinctly put, communication of the nature described here must be encouraged, aided, and nurtured with clearly identified forums for communication and by communicating to all involved that they must indeed communicate.

One particular channel of communication that has arisen and been addressed directly and indirectly in this research is communication between PPS department and Metso Automation's Documentation Department. The responsibilities, duties and roles of each of these departments in crafting communication products should be clearly defined, and each should communicate clearly their expectations of the other in order to ensure seamless cooperation in serving customers, which, after all, is the two departments' common goal.

Finally, it would be important to understand the decision-making processes of the people who will approve a proposal for information products and who will allot sufficient resources. The better a technical communicator communicates with these people, the better chance he or she has of persuading them to approve the proposal.

6.5 The Information Products

One of the most substantial results of this research, in my opinion, is the clear indication on many research fronts that the information products—user documentation—must stem from the needs of users. The value of any information product that serves as user

documentation lies solely in how well it meets the users' needs. The textual and visual contents of the information product, the extent or amount of information, the format(s) in which it is published, and the means of gaining access to the information (Table of Contents, index, titles) must all be designed to aid and enhance the users' experience with the product for which the information product provides information.

In order to ensure that the information products do indeed meet the requirements listed above, tools must exist to evaluate the effectiveness of the information products. I think these evaluation tools should measure the success of information products in three ways:

- 1) **Customer feedback** is the most important form of review. With this we can measure user satisfaction and gauge how well the information product meets the immediate needs of the user concerning the product in question.
- 2) **Peer review** by other information designers or technical communicators provides insight into how well the information product adheres to identified best practices in the field and ensures high-quality products in the future as well.
- 3) **Business objectives review** by e.g. management indicates yields information on how well the information product adheres to the company's business objectives or how well the business objectives are fulfilled in the information product in question.

These evaluation tools must also provide means of addressing and processing feedback.

6.6 The Documentation Process: A Model to Follow

Earlier in this thesis, I have shown that Hackos' model for the publications-development life cycle and Carliner's model for producing communication products are quite similar. I have also maintained that either of the two or a combination thereof would be suitable models for the PPS department's documentation-development needs. Furthermore, I have stated that the phases of whatever model is adapted must be closely tied to the

phases of the product creation process at Metso Automation. Because of confidentiality reasons, I am unable to list the exact phases of the product creation process here.

Therefore, the following presentation of a model to follow is somewhat vague.

However, I believe that the employees of Metso Automation that can potentially benefit from this research will be able to deduce which documentation-development phase should occur in conjunction with which phase of the product creation process.

During the course of the following process, it may be assumed that there is a gateway check after each phase. Let it be said that documentation *must* be discussed and reviewed and its progress monitored at every gateway meeting. This will aid in reaching the abiding goal of producing a high-quality communication product in a timely fashion.

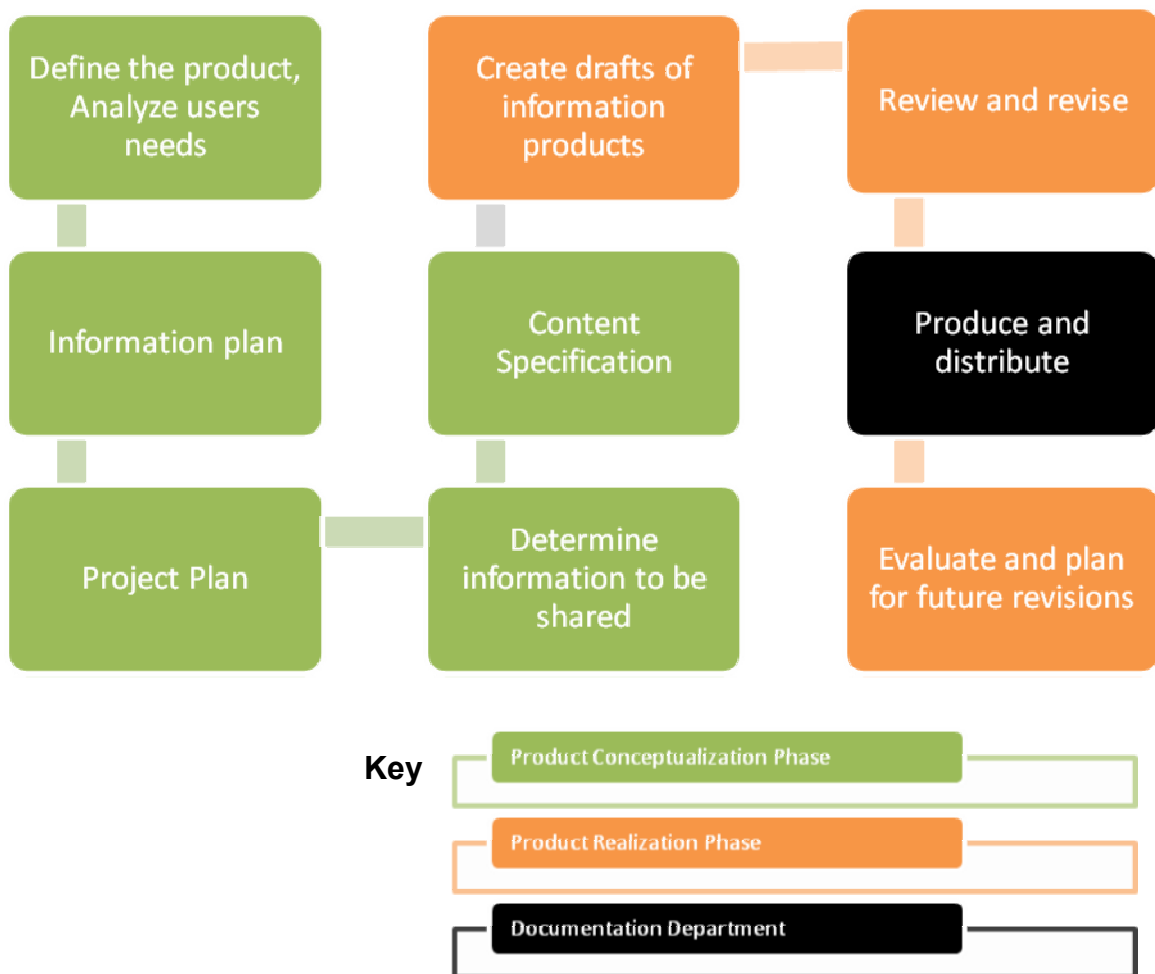


Figure 5. A documentation process for PPS department to follow

Of the nine sections in the figure above, the first five occur during the product conceptualization phase in the product creation process. My research seems to indicate that these first five phases are the most important ones. If they are handled well and carried out in an appropriate manner, then the rest of the phases should proceed without difficulty and result in a high-quality product that is ready on time. If, on the other hand, the first phases are neglected and poorly handled, then efforts to create a high-quality documentation product are doomed. These first phases aim to carry out the threefold purpose of planning (these tenets are collectively gleaned from an overall reading of Hackos 1994):

- 1) To get to know the product and its purpose and its audience better
- 2) To create an outline of the communication product
- 3) To establish yourself as part of the product-development process while simultaneously establishing ties of communication with stakeholders in the organization.

The remaining four phases, beginning with **Create drafts**, occur during the project realization phase. The PPS department is responsible for all phases except **Produce and distribute**, which is handled by Metso Automation's Documentation Department. More detailed information on the phases shown above may be found in previous chapters of this thesis.

6.7 Further Research Opportunities

The research question, processes, and results at hand all provide ample impetus for future research. For example, one could undertake a historical study of the development of user documentation in the PPS department or at Metso Automation in general. This would provide insight into why the current practices and attitudes and business objectives concerning user documentation exist. One could perform usability studies on

the current user documentation and search for ways of improving the documentation—and most likely the process as well—based on those findings. One could survey the users of PPS department products and apply potential feedback to efforts to improve the documentation process and documentation products.

In terms of the research processes used here, it turned out that Carliner and Hackos had quite similar models, albeit with slight differences and emphases. One could seek different kinds of models for comparison's sake and appraise them for possible applicability to product-development processes in the PPS department. The focused interview was a very rewarding way of gathering data. One could expand upon it, or at least use it again. Since all the interviewees are still employees of Metso Automation, one could survey them again, perhaps on even the same themes, and see if their attitudes, thoughts, and perceptions have changed significantly in the nearly six years since the original interviews were conducted.

The research results give rise to many interesting possible venues of research. My research indicates that implementing a new documentation-development process may be a more complicated process than I originally imagined it might be. I think it would be very fascinating to research in theory and practice the effects that changes have in a corporate environment and how these changes can be managed in order to ensure a smooth transition from the old way of doing things to the new. I deduce in this thesis that the documentation process can be mapped to the product creation process. I would like to do this in practice in at least one product creation project and observe whether my hypothesis holds true or not. Then I would conduct interviews or surveys of project personnel to gauge their reactions to and opinions on the new way of working and their thoughts on the new system compared to the old way of doing things. I hope

that I can observe these things in practice and perform at least “on-the-job” research if not actual academic research.

6.8 Conclusions

In this study, my goal was to be able to suggest a documentation-development process model for the PPS department at Metso Automation. The aim of the new documentation process model is, on the one hand, to address problems that have been experienced in the process of creating the user documentation and, on the other hand, to create documents that serve their purpose adequately and are ready when the products they describe are sent to customers.

My personal experience working in the PPS department confirms the need that gives rise to the aforementioned research “problem”. First of all, I have encountered many kinds of problems in my attempts to create or edit or update user documentation. I will not list them here in great detail, but suffice it to say that said problems are attitudinal in nature and linked to other employees’ desire—or lack thereof—to be involved in and take any responsibility for creating and maintaining user documentation. The problems are also institutional in nature, resulting from managerial staff’s own perceptions of what tasks are worthwhile and deserving of support and emphasis. For the record, I absolve my immediate superiors of culpability in this regard. Secondly, I have edited and updated many documents that, while full of sound technical data, are not, in my professional opinion, in line with my ideals of how to serve users, i.e. customers. Furthermore, some of these documents are for products that have already been on the market for several years before the user documentation is ready to be released to customers. In summary, there is a myriad of reasons why implementing a new documentation process is a worthwhile pursuit, and, as a participant in the documentation process, I was eager to undertake this study. In connection with this

statement, I must state the obvious fact that I am biased by fact of working for Metso Automation. However, in this study, I have attempted to maintain an objective viewpoint on the subject matter at hand.

I began the research by studying the innovation process and product creation process at Metso Automation and how these processes are specifically implemented in practice in the PPS department. The process turned out to alternate between distinct phases in which various tasks are undertaken and accomplished and gateways in which the progress was monitored and reviewed and decisions made. This information created a backdrop against which to evaluate the characteristics of different documentation process models and their potential suitability. Unfortunately, for confidentiality reasons I was not able to describe the product creation process in any detail in this study. Given the nature of the outcome of this study, it would have been very illuminating to be able to describe the phases of the product creation process and match them to phases in the documentation process.

Next I selected two existing documentation models and described them in detail, all the while comparing the steps and phases they contain to the current de facto process at Metso Automation. After a survey of literature, I chose Saul Carliner's model for producing technical communication products and Joann Hackos' model for the publications-development life cycle as the target of my analysis. Their selection was influenced by the fact that both are widely read and well-known figures in the field of technical communication and information design. Furthermore, both base their models on product-development processes. Since the PPS department is a product-development department, I thought models based on common practices in that field would be suitable. I found that both models are applicable to the documentation process in the PPS department. The models differ from each other somewhat, as this study shows, but

in the end they seem to contain the same elements structured differently. Reading and analyzing these documentation process models proved to be very useful, not only in terms of this academic research, but also in my every-day working life. I especially gained valuable insight in how to view the steps in a documentation project as part of a single entity, i.e. I no longer focus on one step at a time, but rather gauge continuously how decisions and actions made at this phase will affect future phases and future projects.

In connection with analyzing and reviewing Joann Hackos' documentation process model, I discovered her discussion on process maturity (Hackos 1994, 44). She has developed a system of evaluating companies' process maturity in documentation development. She lists characteristics of documentation processes at different levels of process maturity and describes the criteria on which process maturity is measured. In addition she suggests ways to advance to the next level of maturity. I applied these criteria and characteristics to the documentation process as I know it in the PPS department.

In order to give this study an empirical aspect, I conducted a focused interview of seven employees of Metso Automation. I conversed with interviewees on a list of topics rather than asking a list of preset questions. This allowed the interviewee and me room to pursue those areas and topics that seemed most relevant to the interviewee. My aim was to gain general knowledge on how people view the documentation process, what documents they use, and how they feel about documentation in general. As such, the flexibility and two-way nature in a focused interview seemed suitable for my aforementioned goals. The interviews revealed a variety of insights that should be taken into account in improving the documentation process in PPS department. I think these are important insights to note, because the interviews show that not only do PPS

employees produce documentation, they also use documentation to a great extent in their own work. The highlights of the interview results are summarized in the next few sentences. Interviewees touched on attitudes towards documentation and the work involved in producing it. They stressed how important it is to complete a documentation project on time. My informants further pondered their own role and tasks and concluded that documentation creation should be performed by people who have the proper training and professional experience in technical documentation. Resource allocation and its potential enabling effects in documentation projects was another topic of discussion that arose in the interviews. Most importantly, interviewees discussed at length and in many different contexts what I feel should be the starting point of any customer documentation endeavor: an analysis of customer's needs and not just warmed-over product specifications. If all these factors are taken into account, then one can say that much has already been done to ensure the success of the documentation process. I feel that the results of the interviews form a very core part of this study. They are the starting point that puts other research results into perspective and grounds them in the physical and experiential environment in which products and product-related user documentation are created.

Summarizing, condensing and coalescing the findings of these various lines of research resulted in surprising observations. It seems that a potential documentation process will be quite straightforward after all to construct, because the documentation models presented here match well to Metso Automation's product creation process. If these processes are followed conscientiously, then success is all but guaranteed, especially if great emphasis is placed on the planning phases, i.e. those that occur during the product conceptualization phase of Metso Automation's product creation process. However, in the course of arriving at these conclusions, I discovered that there were a

great many factors connected to and surrounding the documentation process that must be considered and addressed in order to ensure success in implementing a documentation process. These factors are discussed earlier in this chapter, but I shall recap some of the main points here. For instance, implementing a new process causes changes on many levels, both on the personal level of each individual involved and on an organizational level as well. These changes in people's way of working and within the organization must be forecasted, prepared for, and micromanaged carefully in order to ensure a smooth transition to following a new documentation process model. Another such factor is the documentation products or information products or communication products (as they are variously called). The documents per se were not the subject of this study and, furthermore, one could assume they would turn out okay if a sound process is followed closely. However, it appears that the structure and contents and function and role of user documentation and business objectives surrounding it might deserve some attention in the form of a study of some sort. If these issues are clarified, they in connection with this study of the documentation process would provide a solid stepping stone off of which to set toward better user documentation.

Overall, I am satisfied with how the study went. I feel the various strands of research, including the description of the product creation process, the theoretical information, and the empirical data collected via interview, tied nicely together to provide a comprehensive picture of what all is necessary in order to instate and conduct an improved customer documentation process.

In summary, I feel that this study has fulfilled its aims and met its goals. A new documentation process model is suggested here and outlined in various ways at varying levels of detail. PPS department employees have been able to have their say on documentation in general and thus have provided valuable insight into the role and

position of documentation in the PPS department. There are concrete suggestions on how to implement, follow, and upkeep the documentation process. Furthermore, this study outlines a path to a more mature, sustainable and predictable documentation process. Conducting this research has been a very rewarding and extremely educational experience. These research findings and the path I followed to arrive at them will serve me well no matter what kind of documentation process model the PPS department at Metso Automation decides to adapt.

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Appendices

Appendix 1: Interview Topics

What does the term documentation mean to you?

- What is the aim of documentation in general?

How is documentation a part of your work/working life?

What documentation do you use, if any?

- What do you use documentation for, and what do you hope to get out of it?
- What is the function or aim of the documents you use?
- Who creates the documents you use?
- What types of information do you wish to get out of those documents? Give concrete examples.

What documentation do you create, if any?

- What is the function or aim of the documents you create?
- Who uses your documents?
- What types of information do you wish to convey to the users of those documents? Give concrete examples.

When have you felt that the documentation process has succeeded in its aims? Give concrete examples.

When have you felt that the documentation process has not succeeded in its aims? Give concrete examples.

What changes would you make in how documentation is handled at Metso Automation?

How do you feel about this statement: "Documentation is an integral part of any product."

What kinds of documentation process are you aware of at Metso Automation?

- How have you gained this knowledge, i.e. via practice or through formal channels?

Is there anything you think might help you and others develop your documentation skills, i.e. something to be offered as training?

- Is there something you'd like to know about documentation?
 - How would these facts or skills help you in your job?
-

Appendix 2. Characteristics and their level traits in the Information-Process Maturity Model by Joanne Hackos

Characteristic	Level 1	Level 2	Level 3	Level 4	Level 5
<p>Organizational Structure</p> <p>An organizational structure that enables information developers to produce consistently high-quality work.</p>	<p>Information developers work for technical managers.</p> <p>Information developers usually work alone or in small groups.</p>	<p>A centralized information development organization is in place.</p> <p>The organization manager is knowledgeable about information development.</p>	<p>A senior manager designates leads for individual projects.</p> <p>Specialized job functions have been developed.</p>	<p>Information developers are in a matrixed organization, reporting to a central group but working closely with cross-functional project teams.</p>	<p>Information developers have leadership roles on cross-functional project teams and with peer organizations.</p>
<p>Quality Assurance</p> <p>A series of activities specifically designed to promote uniform high standards of quality, including copyediting, developmental editing, peer reviews, and technical reviews of draft information products. Includes usability testing and customer studies to ensure that the quality achieved meets customer needs.</p>	<p>Information developers are responsible for their own quality assurance.</p> <p>Few or no corporate-wide standards and best practices are in place.</p>	<p>Standards are in place and designated individuals have begun to be responsible for maintaining the standards.</p>	<p>Designated individuals (editors) are responsible for maintaining standards.</p> <p>Developmental editing is in place to assist in developing consistent information design and architecture.</p>	<p>Usability assessments are a standard part of the information-development process.</p>	<p>The outcomes of quality assurance activities are measured as part of a continuous improvement process.</p>
<p>Planning</p> <p>Activities to ensure that every information product meets customer needs as well as the demands of schedule and budget. Includes the development of adequate resources and budget to ensure that required quality standards are met.</p>	<p>Individuals sometimes create Information Plans.</p>	<p>A standard Information Plan is in place and followed for many projects.</p>	<p>All projects begin with Information Plans.</p> <p>A standard information-development process is followed by staff.</p>	<p>Plans are regularly reviewed to encourage innovation and cost control.</p>	<p>The planning process is measured to ensure that productivity and performance goals are achieved.</p>
<p>Estimating and Scheduling</p> <p>Activities to ensure that the information-development process is being followed to meet schedule and budget requirements. Includes project tracking to assess and accommodate the impact of project changes and changes to customer requirements through the course of the project. Establishes project histories to better inform planning for future projects.</p>	<p>Assignments are made without knowing if they can be accomplished by the deadline while maintaining quality.</p>	<p>Information developers apply guesses to determine if they can complete projects by the deadline while maintaining quality.</p>	<p>Projects are carefully estimated according to data on previous projects.</p> <p>Projects are carefully tracked to ensure they will be successful.</p>	<p>Projects are estimated and tracked so that adjustments can be made to resources, schedules, and scope of work in response to requirements changes.</p>	<p>Complete development projects are scheduled and tracked, and they include the requirements to meet quality goals in information development.</p>

Characteristic	Level 1	Level 2	Level 3	Level 4	Level 5
<p>Hiring and Training</p> <p>Information developers are hired by knowledgeable professionals in the field, and hiring is based on a wide range of clearly defined professional requirements.</p> <p>Once hired, information developers are provided with internal and external opportunities for continuing training so that best practices in the field are understood and maintained.</p>	<p>Information developers are hired by technical and other managers. They are typically hired for technical and tools expertise rather than information-development skills and training.</p> <p>No regular training is provided.</p>	<p>Information developers are hired by knowledgeable managers and peers for technical and tools skills and sometimes for expertise in information development.</p> <p>Training is provided occasionally by request.</p>	<p>Information developers are hired for their expertise in specific specializations.</p> <p>Training is considered a required part of each person's professional development.</p>	<p>The skills of senior information developers are leveraged through hiring of entry-level staff.</p> <p>Training and mentoring are provided internally, and external opportunities for growth are regularly provided in specialized areas.</p>	<p>Information-development managers are provided with management training and development opportunities to increase their understanding of business objectives.</p>
<p>Publications Design</p> <p>Activities to ensure that the organization is following the best practices in the industry. Design innovations are regularly introduced based upon research in the field, usability testing, customer studies, and practices learned through exposure to the work and ideas of industry leaders.</p>	<p>Information developers may design the publications they produce. However, the designs are often heavily influenced by others in the organization, including non-experts in engineering, programming, and marketing.</p> <p>Few or no information design standards are in place.</p>	<p>Information developers are fully responsible for the design of their publications, although outside influence may still be a factor.</p> <p>Standards are being developed with incomplete compliance.</p> <p>Some specialization in design and publishing functions may be in place.</p>	<p>Information developers are fully responsible for the design of publications, following departmental or corporate standards they have established.</p> <p>Compliance with standards is complete.</p> <p>Specialized functions for design, graphics, editing, production, and others are in place.</p>	<p>Information developers, working with teams of specialists, are actively pursuing design innovations and testing these with users. They are aware of industry standards and best practices and compare their work with best-in-class designs.</p> <p>Information developers actively contribute to the design of product interfaces.</p>	<p>Information developers are actively engaged in sharing their design expertise with others in the industry and developing and disseminating industry best practices.</p>
<p>Cost Control</p> <p>The publications organization has budget authority for its activities and carefully tracks the costs of its development projects. Costs are well understood and regularly evaluated in terms of return on investment and value added. Budgets are defined by the need to achieve a stated level of quality in information products.</p>	<p>Costs are determined by headcount assigned. Total costs may include printing, distribution, and localization and translation.</p>	<p>Publications organizations have assigned headcount. Departmental budget allocations for training, printing, and localization and translation are beginning to be the responsibility of the manager.</p>	<p>The publications organization has a budget controlled by the manager, who submits budget requests.</p> <p>The organization is active in cost-reduction activities and reports on these activities to senior management.</p>	<p>Senior management is well aware of the quality cost associated with publications, through the communication efforts of publication management.</p> <p>Efforts to reduce costs and increase productivity are well received by senior management.</p>	<p>Publications managers have instituted a continuous improvement process to reduce costs while maintaining or improving customer quality.</p>

Characteristic	Level 1	Level 2	Level 3	Level 4	Level 5
<p>Quality Management</p> <p>A series of activities directed toward complete and well-informed definitions of quality, including regular studies of customers' needs, regular usability assessments, regular assessment of customer satisfaction with products, regular assessment of the impact of poor quality on training, support, sales, and others. Strong communication of goals and strategies to senior management and peer managers.</p> <p>Recognition by the larger organization of the value added by technical communication activities.</p>	<p>No mechanism exists to measure quality of output. Quality is often equated with making deadlines.</p>	<p>The publications manager and staff are beginning to investigate ways to measure quality besides meeting deadlines.</p> <p>Customer complaints are addressed.</p>	<p>The organization is active in defining, measuring, and managing customer-driven quality.</p> <p>Customers are regularly polled and their issues addressed.</p> <p>Benchmark studies are pursued for the first time.</p> <p>Competitors' information is evaluated.</p>	<p>All aspects of customer-driven quality are regularly assessed, including satisfaction with information, calls to support, and complaints.</p> <p>Benchmarking is a regular part of the process.</p>	<p>Staff members have acknowledged expertise in the field at defining quality in publications.</p> <p>The organization is actively engaged in developing quality standards in the larger organization.</p> <p>An understanding has been established between the quality of information and the success and profitability of products and services.</p>

Table 2. Joanne Hackos' eight key characteristics by which information-process maturity is judged
(Hackos 2007, 56)