Aalto University
School of Science and Technology
Department of Industrial Engineering and Management
Teaching Material 2010/1
Espoo 2010

PROCESS MODELING FOR IMPROVED PERFORMANCE

Miia Martinsuo and Marja Blomqvist

Aalto-yliopisto
Teknillinen korkeakoulu
Aalto-Universitetet
Tekniska Högskolan
Aalto University
School of Science and Technology

Aalto University
School of Science and Technology
Department of Industrial Engineering and Management
P.O. Box 15500
FIN-00076 AALTO
FINLAND
Tel. +358-9-4702 2846
Fax +358-9-4702 3665
Internet: http://tuta.tkk.fi

miia.martinsuo@tut.fi, marja.blomqvist@iki.fi

ISBN 978-952-60-3379-2 (electronic)

ISSN 1797-3627 (electronic)

URL http://lib.tkk.fi/Reports/2010/isbn9789526033792.pdf

Espoo 2010

Process Modeling for Improved Performance

Abstract

Master's theses and other assignments in Industrial Engineering and Management often focus on performance improvement, which implies the need to describe and develop an existing process or possibly to define an entirely new process. Processes are customer value-creating activity chains that require resource investments, effective control and management from the companies in order to fulfill their objectives.

Process modeling is needed to remove factors that negatively affect performance and to allocate resources adequately for value-adding activities. Processes can be described holistically – i.e. through process mapping or architectures – or through their details in terms of value-adding activities within the process. Performance-enhancing process development requires measuring the processes and can imply radical re-engineering or continuous improvement in the process. Besides describing the chain of activities, process modeling and development also includes the identification of core resources and responsibilities and the allocation of resources to activities in the process.

This material shortly describes the key issues associated with process modeling that are beneficial to know when working on process description and/or development, whether relating to thesis work or professional process development. This text does not describe any process in particular, but remains neutral regarding the distinctions between various processes. The text has been kept deliberately concise, and suggestions for additional reading on the main themes in the text are given at the end.

Course readings for:

TETA-4010 Research methodology, Tampere University of Technology, Department of Industrial Management

TU-22.1113/1115 Design of production systems, Aalto University School of Science and Technology, Department of Industrial Engineering and Management

TU-22.1325 Assignment in Industrial Service Operations, Aalto University School of Science and Technology, Department of Industrial Engineering and Management

A Finnish version of this material will be published at Tampere University of Technology in 2010-2011.

Authors

Miia Martinsuo, Professor, Tampere University of Technology, Department of Industrial Management, e-mail miia.martinsuo@tut.fi

Marja Blomqvist, Lecturer, Aalto University, School of Science and Technology, Department of Industrial Engineering and Management, e-mail Marja.Blomqvist@iki.fi

Acknowledgements

We thank prof. Jan Holmström and Sakari Keipi for their work and support in making this translation possible.

Contents

1. Introduction and Rationale

Since the 1970s, process modeling, process improvement and re-engineering have been adopted as key methods for improving organizational performance. Process management has, for several decades, been a core part of the Japanese quality philosophy (among others) and has also greatly affected Western production operations. Process management can be applied nearly everywhere in private companies, public sector organizations, and nonprofit organizations to improve performance. To this end, it is important to recognize how the organization in question perceives and defines “performance” among its own objectives, and to use process modeling and development to promote goal-oriented performance improvement.

The key characteristics of process management are systems thinking, customer focus, goal orientation, focus on value-adding activities, effective use of feedback in modifying operations, and systematic and deliberate process development for performance improvement. Understanding and developing activities as processes is an effective way to implement strategy, achieve customer satisfaction, promote efficiency, and enhance cross-functional and cross-organizational cooperation. Process management is often associated with productivity improvement and elimination of non-value-adding activities. In addition, process management emphasizes the systematic use of tools, documentation and information systems that are integral to sharing good practices and standardizing and automatizing activities. Process modeling often involves the adoption of new information systems, too.

Performance improvement requires adequate data regarding the current performance level and awareness of factors affecting performance positively or negatively. To this end, activities must be monitored and evaluated systematically and their value-creating logic must be stated explicitly. Process modeling is a means to illustrate either the current process or the target (ideal) process and reveal its faults and areas for improvement. Systematic monitoring and evaluation are supported by specific process-related performance indicators.

A process may deal with any part of a company's business or any not-for-profit operations in other types of organizations: the creation of new innovations, designing services, systems, solutions or products, manufacturing capacity implementation, production, service delivery or service events, business finance or financial control, customer relationship management, support functions, etc. This text does not specify the content of the process or task, but focuses on the basic techniques of general process modeling and development. When modeling a process, one should always define a clear scope for the process or the part of process architecture in question; all of the processes of a business can rarely be modeled and re-engineered simultaneously.

The content and purpose of a process to be modeled have some influence on the method of modeling, and on the level of detail. For example, processes with a high level of uncertainty cannot be modeled at a very detailed level, whereas, for example, safety and security-critical processes need to be modeled at a highly detailed level. Therefore, when starting the process modeling, it is important to confirm the content and level of modeling required.

2. Key Phenomena and Concepts

Processes are **customer value-adding chains of activities that utilize resources.** Figure 1 illustrates how a process is connected to the customer.

- Customer: a process always implies a customer-to-customer chain. The customer can be external or internal, known or unknown, but it always sets expectations, needs, and requirements towards the process.
- Added value: a process receives input(s) whose value is increased by the process that results in outputs. Added value is associated with the customer expectations, needs, and requirements, and the output can be in the form of a product, a solution, a service experience, and so on.
- Chain of activities: in a process, value-adding operations consist of several interrelated activities. The chain of activities can be simple or complex, pre-determined or undetermined.

- Resources: a process needs and consumes resources – raw materials, workforce, capacity, capital, tools, knowledge. Resources can be sourced from within the organization or acquired from an outside supplier. They cost money, and their supply is always limited.

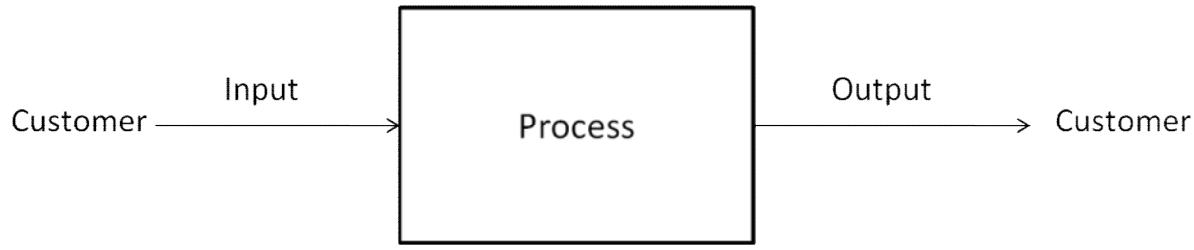


Figure 1. Simplified view of a process.

Particularly in business operations, a distinction can be made between a process and a business process: a business process generates economic profit whereas a process can be any process. However, this text does not distinguish between the two. Also, the following types of different processes can also be identified:

- **Core** vs. **support** processes: core processes are always connected to an external customer, whereas support processes are within the organization and serve the core processes.
- **Main** vs. **sub**-processes (or different process levels): main processes can be divided into several different sub-processes which can be displayed hierarchically, on multiple different levels.
- **Current** vs. **target** processes: this distinction is used when improving processes. Current processes are the ones currently in use, whereas target processes are the processes as they should be, as defined by performance objectives. The differences between the two clarify the practical need for process modification.

A process is linked to a company's **organizational structure** through its objectives and the resources it uses. Figure 2 illustrates the apparent relationship between core processes and organizational structure, i.e., a core process may require resources from all functions or business units of the organization. The role of processes in an organizational structure can vary from very essential to completely secondary because a company can also model its operations using methods that are not process-based. Some organizations may function as

purely process-based organizations, but more often processes are linked to an organization's structure by their objectives, as well as the resources they have access to and use. Such structures are typically called matrix organizations.

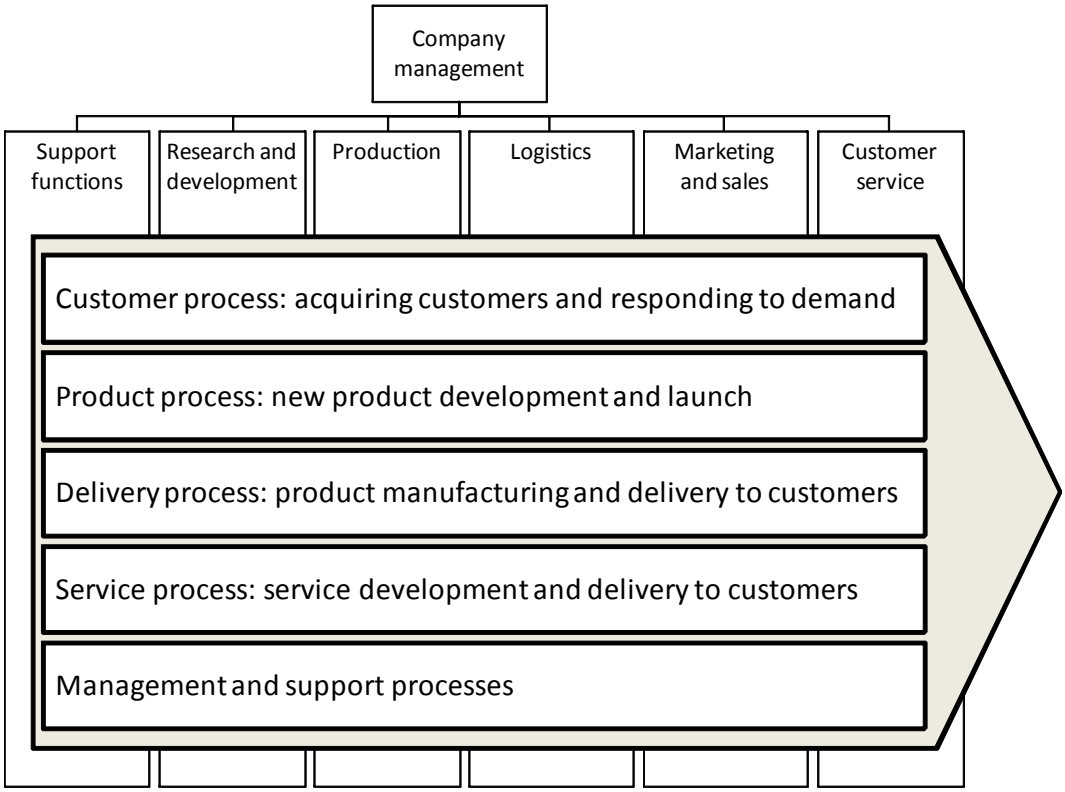


Figure 2.A process architecture and a company's organizational structure (example).

An organization should **manage and control** its processes to achieve its objectives. The key to process management is to set goals for processes based on company objectives, track and understand feedback from the processes, and use the feedback data for process development. Feedback does not refer solely to output-based performance feedback (did we achieve our goals?), but also to functionality and quality-based feedback during the process (did the process function as it should?). Figure 3 illustrates the link between feedback and developing the process and its inputs. Tying incentives and rewards with reaching process goals is a good way to steer the process; however, this requires setting the right goals and appropriate measurement and monitoring. As the saying goes, "You get what you measure." A process and its activities should be managed and controlled throughout its entire course.

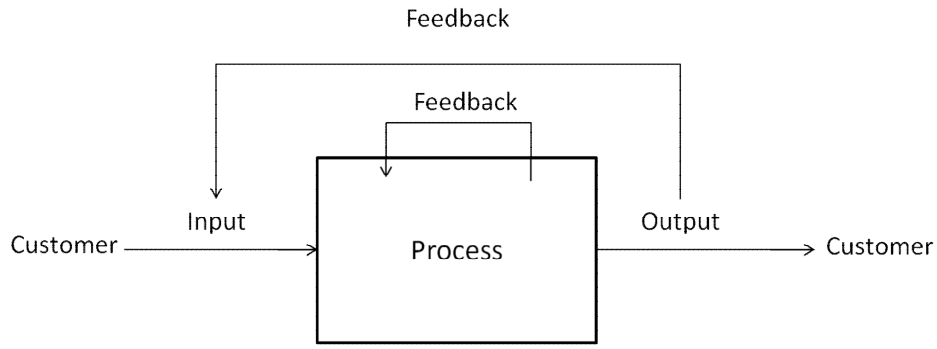


Figure 3. Feedback is an important part of process management.

3. Overview to Process Development

Typical Phases in Process Development

Enhancing the performance of organizations through processes can imply a shift to a process-oriented approach, implementation of a new single process, radical re-engineering of existing processes, or implementing improvements of varying scale into current processes. These different development practices vary in their implementation, but their basic steps can be identified as shown in Figure 4.

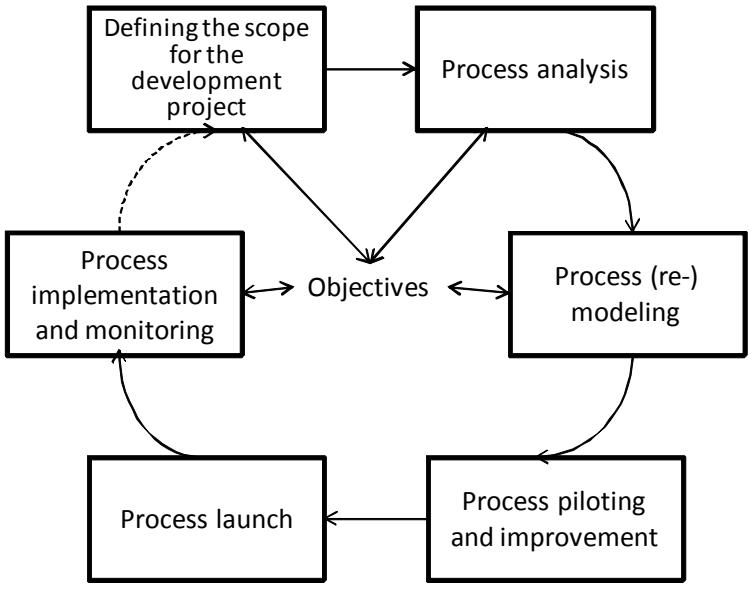


Figure 4. Basic steps in process development.

When starting process development, it is important to specify the scope of the development project in question, and choose which process(es) will be affected. Available data related to current processes can help in delimiting the scope. The company's objectives have an important role in defining the development project scope.

When the development project scope has been defined, it is necessary to obtain as much reliable data regarding the current process as possible. When dealing with a completely new process, the data is concerned with how the value-adding activities of the process have previously been performed, or how some other organizations have implemented this process. It is useful to gather both general measurement data about the process and data that illustrate the functionality of the process. Many kinds of data collection methods can be used in analyzing the process: interviews, group work, data mining on past performance, observation of the process, process simulation, etc. The current state of the process should always be compared to the performance objectives: does the current process produce desirable results, and what types of shortcomings can be observed?

After analyzing the process, it is time to identify areas for process development and model the target process. Sometimes the entire process (or the whole process architecture) is redefined based on customer expectations and needs and the benefits generated to the customers. More often, however, the redefinition deals only with a limited part of a process – sub-processes, interfaces between processes, process organizing or resourcing, etc. The target process is described in such a way that the process can reach its performance objectives.

After modeling the target process, the process is tested (piloted) either in a simulated or actual work environment. In this way, the process can be observed and supported, while making final corrections and adjustments to the process model. Piloting is recommended before the extended implementation of the process model as the model can have a significant impact throughout the organization, and it will be expensive to implement a faulty model. In the piloting stage, good data is obtained on whether the revised process is worthwhile and solves the problems of the earlier ways of operating.

In the extended implementation of the process, old practices, guidelines, and routines are replaced with new ones that conform to the new process. All impacted employees – also the representatives of the customers, subcontractors, and other stakeholders – are trained and

instructed to implement the new process and adopt their new roles, monitoring and control systems are modified to serve the new process, and connections and interfaces to other systems and processes are renewed. It is important that the organization's ways of operating and the entire management system support the effective implementation of the process, and that communication regarding the process is consistent.

Process implementation and monitoring deal with harnessing the entire customer-to-customer chain (Figure 3) to fulfill organizational objectives, and systematically gathering feedback data for continuous improvement. The process is controlled and steered constantly, which implies that someone is always responsible for the resources, implementation conditions, and performance of the process. With constant tracking and monitoring, additional areas for improvement can be identified, and corrections to the process be made.

Different process improvement needs have different characteristics. For example, when creating an entirely new process in an environment where other processes are already in place, the development need may be triggered by a new product, or a new way to deliver the product using subcontractors. In this type of a situation, there may be new players involved and the introduction of the process may generate significant risks and uncertainties, and piloting is likely to be necessary. When developing an old process, perhaps, in the spirit of continuous improvement, the employees working in the process may trigger process improvement through their practical and stepwise development proposals. Improvement can take place in small steps or it may already have occurred spontaneously, which simply implies the need to update the process descriptions to take the improvements into account. In practice, different kinds of development projects can be connected with each other: for example, in a merger, it is necessary to create completely new processes, as well as radically re-engineer and improve old processes gradually.

Special Themes in Process Development

Process development in practise involves many additional perspectives and special cases for which training and additional literatures are available, for example:

- Methods for process development in quality systems and quality management associations
- Process modeling as part of quality standards
- Continuous improvement and its different methods

- Full-scale re-engineering projects
- IT tools for process modeling
- IT tools for process tracking, management, and monitoring
- Process manuals and process training for employees
- Interactive process development methods, such as simulations

4. Process Modeling

Identification of relevant processes should begin from the company's actual operating environment as well as from the broader value chains that the company is involved with. Also when developing single processes, the starting point is knowledge about the position of the process as part of the broader process architecture.

Value Chain, Value Network and the Process Architecture

In order to begin forming the process architecture and identifying essential processes, it is necessary to determine **who the key (business) customers are** and what kind of a chain the customers, the company, and the suppliers form together. Figure 5 illustrates a typical business value chain. Alternatively, one can refer to a value network instead of a value chain, especially if the business actively networks with competitors, legislators, and other partners, in addition to its customers and suppliers.

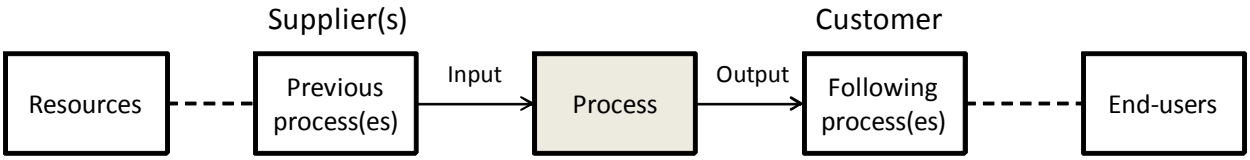


Figure 5. Example of a process as part of an extended value chain.

When the entire customer chains and value chains have been identified, it is possible to determine the **processes that are critical for the company** which add the most value to customers (core processes). For each process, it is important to identify the **direct customers**, all of the **ways that the process connects to the extended value chain** (inputs, outputs, interfaces), and **what added value the process generates** (and how it is generated). Again at

this stage, it is beneficial to determine what resources and support the process needs in order to be effective. Figure 6 shows an example of a company's core process architecture.

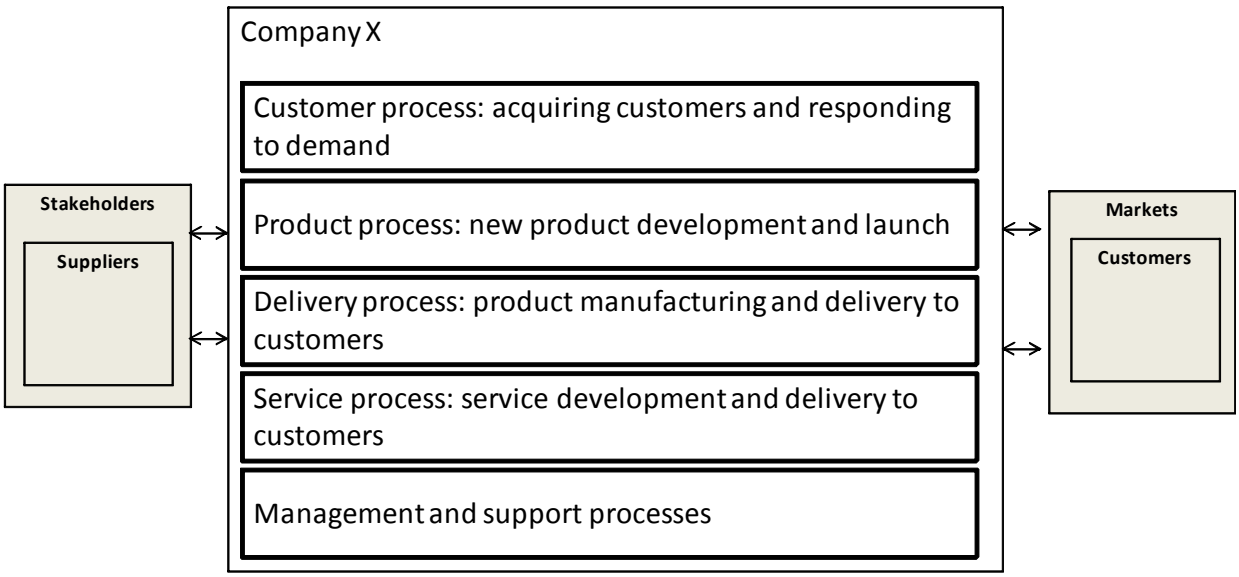


Figure 6. Example of a company's core processes and their value-adding purposes.

When generating the process architecture, one must also consider naming the processes. Generally, process naming may be output-based or task-based. It is ideal that all of the titles in a process map follow the same naming logic, and clearly describe the main purposes of the processes.

Mapping the Process: General Description

Process mapping means the identification and description of value-adding activities and their associated information and material flows. First, the start and end of the entire process are identified (inputs and outputs), clearly linked to the customers and their needs. Also, the process in question can be delimited by outlining the interfaces, added value, main activities, and resources (people, material, systems, support) at a general level. See Figure 7.

Delimiting the core process (level 0)

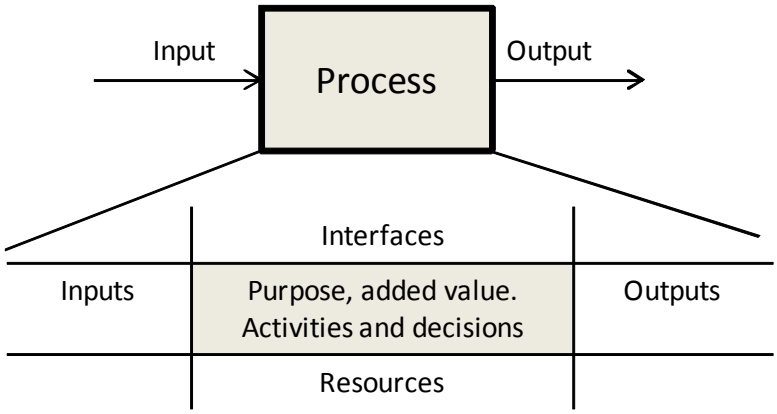


Figure 7. Delimiting the core process, and its rough description.

When describing the current state of a process, it is usually effective to proceed from start to end, tracking value-adding activities as well as information and material flows as they occur. Target process description, in turn, is often best accomplished from end to start. The general description of a process involves identifying the main phases (value-adding activities) and key decision points in the process, identifying activity-specific inputs and outputs, describing the activities and decision points generally, and identifying interfaces, resources and support (including systems). In effect, the process description is specified on the activity or sub-process level. See Figure 8.

Core process, general description (level 1: phases or subprocesses)

Core process, content description (level 2: content of the phases or subprocesses)

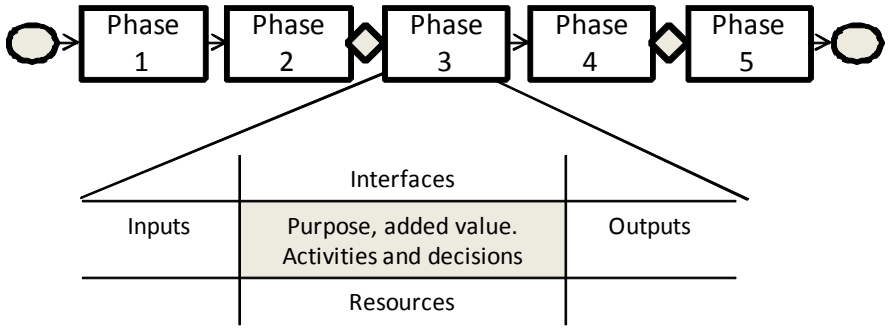


Figure 8. Rough description of the main phases and their content in a core process.

Mapping the Process: Detailed Description

Particularly processes critical to survival or efficiency need to be examined on a more detailed level where required resources are allocated to each task. In such cases, highly detailed flowcharts and practical guidelines may be needed to ensure proper process

implementation. In a detailed description, the following are differentiated: the **tasks** being monitored and controlled, **interdependences between tasks** (including material and information flow), and **roles and responsibilities** in performing the activities. Sometimes it is beneficial to describe the **tools and information** required in the tasks. When making a detailed process description, it is imperative to make a clear distinction between two types of situations:

- If the process is meant to be carried out always in exactly the same way, a detailed description is often necessary, so that all involved persons have consistent information.
- If the process contains uncertainty and it is not necessary to implement it precisely in the same manner each time, the description does not need to be particularly detailed; phase-specific task lists (without a pre-defined order) may be sufficient.

There are many different variations of detailed process descriptions, and no single method has achieved the status of standard practice. The four most commonly used methods are illustrated herein: flowchart, process flow diagram, task matrix, and textual instructions. Each provides a slightly different illustration of the process. Of these, the flowchart and process flow diagrams in particular utilize standard symbols, the most frequently used are shown in Figure 9.

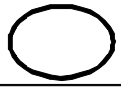
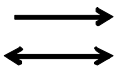
Symbol	Meaning
	Start or finish
	Activity or process
	Material or information flow (can be shown with different line colors/styles)
	Decision point
	Document
	Information system/data storage
	Inventory
	Data
	Delay

Figure 9. Key symbols used in process mapping.

On the following pages, Figure 10 shows an example flowchart, Figure 11 shows a process flow diagram, and Table 1 illustrates a task matrix. Textual guidelines are often used to supplement visual illustrations, and can be an important part of a company's quality management system. **The symbols of a process description generally contain the name of the activity/function/output/system in question.**

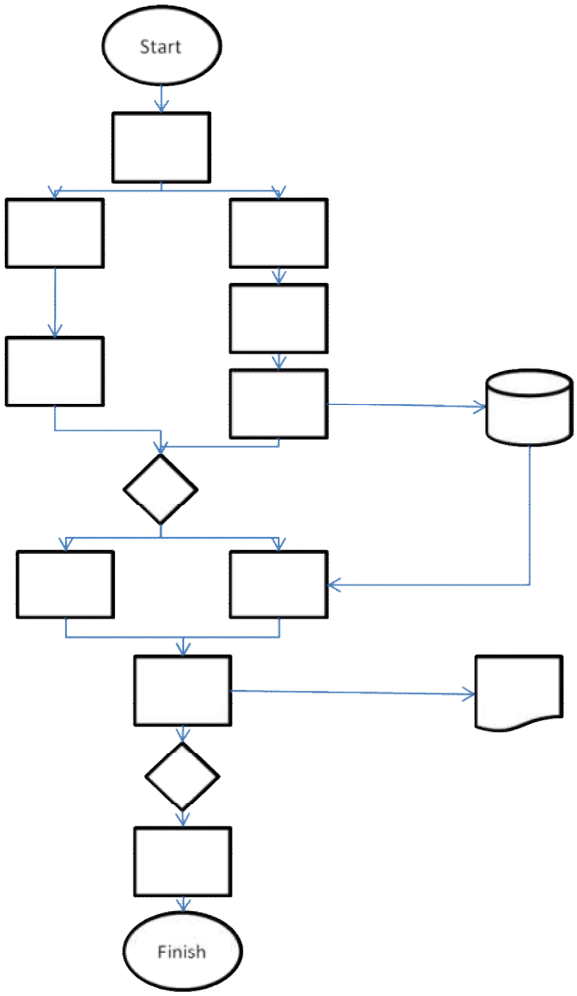


Figure 10. Example of a process or a sub-process in the form of a flowchart.

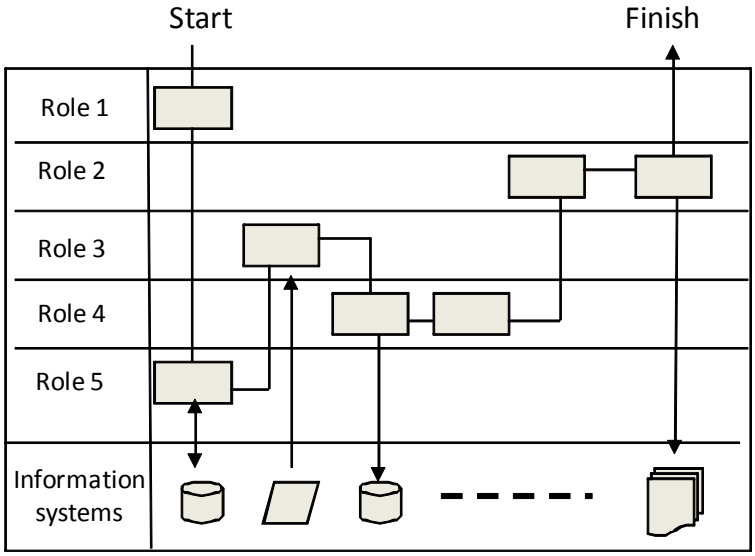


Figure 11. Example of a process or a sub-process in the form of a process flow diagram.

Table 1. Example of a process or a sub-process in the form of a task matrix.

	Phase 1	**Phase 2**	**Phase 3**	**Etc.**
Role 1	Tasks, which Role 1 should complete in this step, OR outputs which must be generated before a certain decision point or milestone			
Role 2				
Role 3				
Role 4				
Etc.				

When mapping the target process, it is typical to map the process from the end to the start. In this way, it is possible to determine what needs to be complete before the customer need is fulfilled (final output), what needs to be done for the output to be generated (activity), what needs to be complete before that (intermediate output), etc. At the same time, it is beneficial to determine what tools and systems are needed for each task, to generate the output for each step.

When mapping the current process, one must accept that all of the current activities and outputs may not meet the ideals, and that the process description may be chaotic, vague, and difficult to follow. Process mapping can help to carry out work more systematically through simply documenting the agreed ways of working. Also, an important goal behind process modeling is to find areas for improvement. For this reason it is important that, when mapping the current process, one does not make the mistake of describing the ideal target process, but that the current and target process models are kept separate. A process review (e.g. carrying out a joint workshop for those involved in the process) is a good way to identify and prioritize the development needs in the process chart and to engage people working in the process in the development work.

When describing the target process, in turn, it is vital to ensure the simplicity and feasibility of the process model. A target process review is performed to ensure that the process has been defined in accordance with good practices and meets its objectives. The review can be used to verify that all of the activities add customer value, there are adequate resources for each activity, and all information and material flows (dependencies) have been taken into account. Activities, resources, and systems that do not add customer value should be removed from the target process.

A variety of IT applications have been developed to aid in drawing process diagrams, and they offer various tools for visualization including but not limited to the aforementioned flowchart and process flow diagrams. In the process development phase, however, it may be more practical to illustrate the current or target process by hand-drawing, by using flash cards and post-it notes on a large wall or bulletin board, or even by performing a functional simulation of the process in a shared space. When the process is outlined together with all of the involved participants, many perspectives can be gained during the event, the problem areas can be identified and instantly structured, and the staff can better commit to their revised roles.

Process Piloting, Improvement and Implementation

The target process should be tested under limited, well-supported conditions before its widespread implementation. The process can be piloted by, for example, implementing the material flow on a smaller-scale experimental batch in the conditions of the target process, or by carrying out an information flow scenario for interpersonal communication in the form of a simulation game. The piloting of especially complicated processes may not be possible, but even then the process model should be tested by asking the process personnel and other experts' opinions regarding the feasibility, defects, and areas for development in the process. The piloting and testing stages often reveal areas for improvement for the entire process, and they should be taken into account prior to its widespread implementation.

Process implementation also involves developing the competences of the people involved in carrying out the process, and adapting the necessary systems to the process. This may require an information campaign, a training program for different employee groups, process guidelines targeted at different stakeholders, changes to IT systems, and even changes to the company's presentation materials and web pages. The interfaces to other processes may also

require modifications – possibly in other processes in addition to the one under development. These process launch measures should be planned and scheduled already in the early stages of the development project. The process has not really been implemented until the organization in question and the customer are fully involved.

Good Practices in Process Modeling

Listed below are things that should be taken into account when modeling processes:

- **The process is a clear, logical entity**
  - it begins and ends with the customer (internal or external)
  - its work steps are taken in their natural order
  - its activities are carried out in the most appropriate place
  - amount of loops in it is minimized
  - unnecessary work is eliminated; lead time of the process and work-in-progress (WIP) are minimized
  - its smoothness, clarity, and speed are maximized
  - its performance is measured
- **The process should be described in a consistent and straightforward manner**
  - Focus on the essentials – everything does not need to be described. What is critical for success?
  - Draw process diagrams from left to right (reading order).
  - Consider: “Are we doing the right things?” as well as “Are we doing things right?”
  - It is beneficial to describe material and information flow separately.
  - If the process branches out, mark whether the diverging process is alternative or parallel.
  - Decision points in the process are clearly described.
  - Participants needed in the process are identified clearly as roles (not individuals’ names).
  - Distinguish between the current and target state process descriptions, and clearly mark necessary changes in the current state description.
  - Ensure that all of the appropriate parties are involved in the process modeling and that the process is reviewed and verified – participation promotes commitment to the new process, and reviewing ensures that the process focuses on the right things.

  - If the organization has adopted a specific notation or technique for modeling processes, utilize it – then the employees know how to 'read' the process models.
- **Once the process is described, everyone follows the process!**
  - The description is illustrative and visual (graphics & diagrams!)
  - The description may be multi-level
  - The level of description (e.g. rough or detailed) is adequate for the purpose
  - The description should include the necessary references to appendices (e.g. work instructions, SOP's: standard operating procedures)
  - The description is available to all, and everyone works according to the process description!
- **The process should be managed so that it achieves its objectives**
  - Fewer things to keep in mind = better controllability
  - A simple measurement system is good
  - Common rules should apply to process management, and the requirements towards the process should be kept clear (e.g. customer requirements specified in writing)

5. Measuring Processes, Setting Objectives and Selecting Areas for Improvement

Measuring Processes

As described above, the feedback information obtained from the process can be used for continuous improvement and radical re-engineering. The outputs and inputs of the process as well as the functionality of the process itself can be measured and monitored. Measuring outputs can be a good starting point for the early stages of process development, as this information is generally easily accessible. When thinking of continuous improvement, however, measuring outcomes – such as production volumes, customer satisfaction, or profit – takes place after the fact, and does not give real-time information to guide the process. On the other hand, particularly in uncertain environments, it is easy to focus on measuring inputs – for example, resources, raw material quantities, or expenses – as any other data may not be easily available. As with measuring outputs, the measurement of inputs does not lend itself to

real-time process optimization. Although real-time process measurement can be difficult, continuous improvement requires the use of process indicators such as throughput time, schedule accuracy, or yield. Input and output measurement, too, certainly have a role in process measurement – for example, they can be important diagnostic indicators used to tackle the root causes of problems.

Table 2 contains examples of conventional indicators used in process measurement. During process development, it is often realized that the process is not being measured or monitored in any way. In this case, the starting point of development could be to experiment with some key process metrics and analyze the data obtained.

Table 2. Examples of process metrics.

Input-related indicators	Process-related indicators	Outcome-related indicators
• Resources: workforce, labor hours, material expenses, capacity • Consistency of the inputs to the process (e.g., raw materials)	• Throughput time, time to market • Schedule and expense accuracy (relative to planning); delivery-on-time • Yield • Efficiency (output in relation to input) • Returns and complaints • Accuracy in resource consumption and costs (relative to planning) • Amount of deviations and changes • Share of new products of total sales • Quality of planning or design	• Output volume • Output-generated income • Quality of output • Product launch timing

A good monitoring system takes into account the process inputs and outputs, as well as the functionality of the process itself in relation to objectives. Good indicators portray the actual performance of the process and can even predict it, take into account the requirements of different stakeholders, provide reliable data, are simple and understandable, are as automated as possible, and give management a clear idea of areas for improvement. A good monitoring system is also effective and low maintenance, i.e. it does not consume too much resources. Furthermore, it is linked to company strategy and objectives, and changes in line with these. Thus, a good measurement system utilizes only a few key indicators – not many more.

The primary role of the measurement system is to promote control and continuous improvement of the process. In this sense, one should be aware of the old saying, "You get what you measure." If the measurement system focuses on production volume or income, the actors involved in implementation are likely to focus their activities to promote these. In turn, if measurement focuses on resources and their minimization, those involved may be more likely to look for shortcuts and compromises in work steps that consume a high amount of resources. Furthermore, if the objective for process development is to cut throughput time in half, double the yield, or finish a task on a certain day, the related indicators are likely to influence employee behavior. The downside of performance measurement is the risk of sub-optimization that can result from utilizing the wrong type of measurement. An important part of process development is the development of appropriate performance indicators to guide operations.

Process Objectives

A process is not an end in itself, but a tool. The objectives of processes – as well as sub-processes – are to be in line with the company strategy and promote its fulfillment. In practice, this requires that the objectives of the process take into account the customer, and customer value creation, and the company's performance goals (including efficient use of resources and quantitative goals for processes). The objectives of sub-processes should be aligned with those of higher-level processes. Process monitoring is supported by tangible, measurable objectives with target levels that can be modified upon need as performance eventually improves.

Determining process objectives:

- Consider what direction the current strategy offers to the process
- Discuss with customers their expectations and requirements towards the process
- Compare your process with similar others, to identify the feasible performance objectives and possibilities for renewal
- Set performance objectives for the process
- Develop the components of the process so that performance objectives can be achieved

Identifying Areas for Development

Performance indicators can be useful in identifying potential areas of process development, by providing information about the process and its current state. However, the identification of specific development areas requires that the process and its components be examined with insight and in relation to objectives. Attention should be paid particularly to value-creating activities and their detection among any operation, and in this, process modeling plays an important role. Directing attention to value-creating activities also reveals potential problem areas in value creation.

Typical areas for development are found mainly in the following three places: lack of investments in value-creating activities, waste, and faulty decisions. Lack of investments can mean an insufficient (or in other ways troubled) resourcing or organizational structure throughout the process, or in a particular process area. A process area with insufficient resourcing constitutes a bottleneck that may weaken the effectiveness of the entire process. Troubled resourcing or organizational structure can come about from resource competition between processes or activities, which in turn problematizes the optimization the entire process or some of its parts. Waste can take the form of excess resources, oversupply, or unnecessary idle time during the process. Whether the question is of excess labor, material, products, components, or time, waste weakens the process performance and its benefit to the entire organization. Faulty decisions can refer to how the process is positioned with regards to company objectives and activities, and they often deal with strategic decisions. The question is whether the process is being utilized appropriately and to the right ends for the entire company.

In the extreme case, process development can be very radical and lead to the elimination of entire processes, or a complete re-organization of sub-processes. In this case, it is more important to consider “are we doing the right things?” than, “are we doing things right?” This requires a fundamental departure from the specific details of a single process and the adoption of a more general “helicopter perspective”, so that the process development can be closely tied with the company’s strategy work. At best, such activities can generate process innovations and genuinely novel approaches.

Literature

Davenport, T. H. (1993) Process innovation. Reengineering work through information technology. Harvard Business School Press.

Davenport, T. H. (2005) The coming commoditization of processes. Harvard Business Review (June) pp. 100-108.

Grover, V. & Malhotra, M. K. (1997) Business process reengineering: a tutorial on the concept, evolution, method, technology and application. Journal of Operations Management 15: 193-213.

Hall, J. M. & Johnson, M. E. (2009) When should a process be art, not science. Harvard Business Review (March) pp. 58-65.

Hammer, M. & Stanton, S. (1999) How process enterprises really work. Harvard Business Review (November-December) pp. 108-118.

Harmon, P. (2007) Business Process Change: A Guide for Business Managers and BPM and Six Sigma Professionals, Second Edition. Morgan Kaufmann.

Harmon, R. L. & Peterson, L. D. (1990) Reinventing the factory. Productivity breakthroughs in manufacturing today. The Free Press.

Harrington, H. (1991) Business Process Improvement: The Breakthrough Strategy for Total Quality, Productivity, and Competitiveness. McGraw Hill.

Jeston, J. and Nelis, J. (2008) Business Process Management: Practical Guidelines to Successful Implementations, Second Edition. Butterworth - Heinemann.

Johansson, H. J., McHugh, P., Pendlebury, A. J. and Wheeler, W. A. (1994) Business Process Reengineering: Breakpoint Strategies for Market Dominance. Wiley.

Pisano, G. P. (1997) The development factory. Unlocking the potential for process innovation. Harvard Business School Press.

Rohleder, T.R. & Silver, E.A. (1997) A tutorial on business process improvement. Journal of Operations Management 15: 139-154.