

In search of well established models and definitions for process management

Klara Palmberg
Division of Quality and Environmental Management
Luleå University of Technology, Sweden
klara.palmberg@ltu.se

Abstract

Purpose: Process management has been around for a long time, but unlike that of many other management trends, the interest in process management has remained high. There is an ongoing discussion among both practitioners and scholars about how to best manage the value creating flows of activities that run through all organizations.

Numerous process definitions have been proposed, most of them fairly similar. Further, there are well established tools, such as process mapping and measurement, to be applied on individual processes. However, when it comes to managing processes on a strategic system level, process management, the notions and definitions used varies widely.

A starting point for this paper is the idea that the lack of well established conceptual models of process management has a role in the difficulties facing organizations when trying to control their processes on a strategic level. A question is whether there really are some existing widespread and common models and definitions for process management in the literature?

Methodology: A structured literature review is used to identify contemporary models and definitions for process management.

Findings: There are several descriptions and definitions of process management presented in the literature, but none that seems to be really widespread and well established. There are similar components in the definitions of the concept of process the included literature which can be condensed into a net process definition.

The result and analysis of the definitions of process management in the included literature shows two different movements, (A) process management for single process improvement and (B) process management for system management.

The varying purposes of working with process management demonstrate a diverse need for both movements. Still, the focus of a majority of the identified tools and approaches for process management is to contribute to the more mechanistic movement (A) of systematically improving single processes.

There is a strong need for process management practitioners and researcher to develop and formulate approaches and tools that have the potential to contribute to process management not only on a single process level but on a strategic system level in the organization.

Value of paper: The paper provides a literature review and an aggregated description of existing models for process management. It also discusses the implications of the findings on process management in organizations and suggests further research.

Keywords: Process management, models, definitions, literature review.

Introduction

Process management has been around for a long time, but unlike that of many other management trends, the interest in process management has remained high (Hellström, 2006). There is an ongoing discussion among both practitioners and scholars about how to best manage the value creating flows of activities that run through all organizations.

Numerous process definitions have been proposed through the years, most of them fairly similar. Still, there many disparate views among practitioners regarding the concept of process (Armistead, Pritchard, & Machin, 1999), (Belmiro, Gardiner, Simmons, & Rentes, 2000) and (Isaksson, 2006). Further, when it comes to managing the processes on a system level, process management, the notions and definitions used varies widely (Garvin, 1995), (Armistead & Machin, 1997), (Pritchard & Armistead, 1999), (Ljungberg, 2002), (Biazzo & Bernardi, 2003) and (Hellström & Eriksson, 2007). In addition, the tools and approaches suggested for process management varies both in the literature and in practice and give few clear-cut directions on how to deploy process management (Hellström & Eriksson, 2007).

In parallel, many organizational quality practitioners seem to have grown frustrated about the senior managers' lack of attention on process management. On the other hand, many senior managers still appear to be quite confused regarding why and how to use process management on a strategic, system level.

The starting point for this paper is the idea that the lack of well established conceptual models and definitions of process management has a role in the challenge and difficulty facing organizations when trying to manage their processes on a strategic level. A question is whether there really are some existing widespread and common models and definitions for process management in the literature?

Method

A structured literature review is used to identify contemporary models and definitions for process management. The phrase "Process management" is commonly used in several fields of research (Armistead, Pritchard, & Machin, 1999). Searching all fields on any combination of the phrase made 2747 hits on Emerald, 2099 on EBSCO and 2276 in Compendex. Based on the number of hits and on convenience Emerald was chosen as the source for the further literature search.

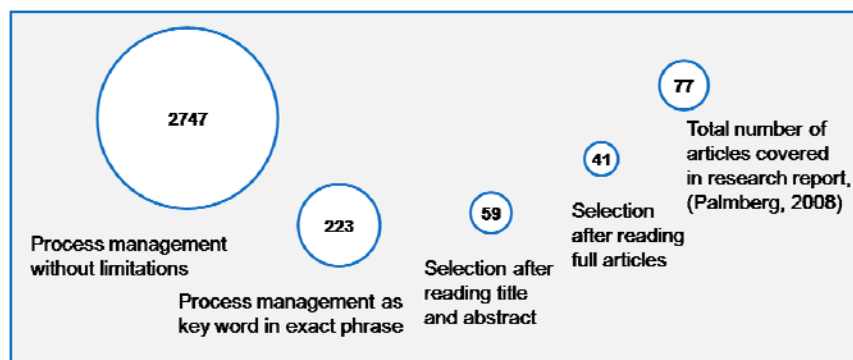


Figure 1 – The number of articles included in the study during different phases.

The search was narrowed down to the *exact phrase of process management* in *keywords* or *title*. This resulted in 223 hits which were sorted on *relevance* and the work of reading titles and abstracts began. Of the first 50 articles 27 were found to be out of scope. A follow-up analysis was performed which showed that these articles covered manufacturing and production (13), IT/computer science (4) and in the area of interest for the review, but not in

scope for the purpose of the study (10). Of the next 173 articles 36 were found to be the most relevant, see Table I.

Articles sorted on relevance	Article 1 to 50	Article 51 to 223	Total no. of articles
Interesting for further review	23	36	59
Out of scope, of which:	27	137	164
<i>Manufacturing & production</i>	13		
<i>IT /computer science</i>	4		
<i>Right field, but out of scope</i>	10		

Table I – Number of articles found in Emerald on exact phrase process management in title and keyword, sorted on relevance.

The studied articles have been published fairly evenly over the period 1993-2007, see Diagram 1. This is in line with (Hellström, 2006) who concludes that the number of published articles on process management in the management journals has been fairly constant since the 1980's.

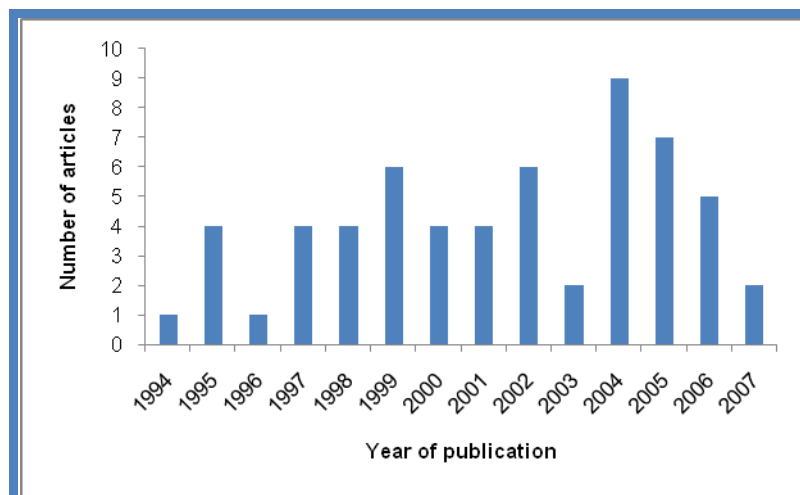


Diagram 1 - Distribution of articles over time in selection after reading title and abstract.

After reading the full articles the selection was narrowed down to 41 items. Additional articles were also identified through references during the reading. In total the review covers 77 full articles, see research report (Palmberg, 2008) and Figure 1.

In order to enable a structure for categorization of the found material four areas of interest were selected based on the purpose of the review:

- Process definitions
- Categorizations of processes
- Definitions of process management
- Approaches and tools within process management

The text was marked and named with headlines. All quotes were gathered in a research report, using the areas of interest as headlines; see (Palmberg, 2008).

The analysis has been based on the assembled marks from the articles. When approaching the identified areas of interest a list of second level labels, hypothesis to be analyzed, was iteratively developed, containing questions and areas for analysis such as:

- *Area of interest:* Process definitions
- *Second level labels:* Input and output, Purpose, Interrelated activities, Cross-functional Repeatability and Use of Resources.

In the area of definitions of process management the RADAR logic from the EFQM excellence model (EFQM, 2003) was used as an inspiration to categorize the material:

- *Area of interest:* Definitions of process management
- *Second level labels:* What is process management? What is the purpose, the result (R) to be achieved by using process management? What are the approaches (A) within process management? How process management is deployed (D)?

The hypotheses were based on a pre-understanding of both the literature and experience from working with processes management in organizations.

Results and analysis

The material in the research report was further analyzed and formulated into the following sections.

Process definitions

Almost all of the studied authors define “process” in their own words. There seems to be no single definition standing out to be the most broadly spread or most widely used. The differences found between the identified definitions have been reduced to six components that can be seen in a majority of the definitions:

- **Input and output** – Articles that, except the early ones from (Davenport & Short, 1990) and (Harrington, 1991), describe the concept of an input that initiates the process and an output which is the result of the process.
- **Purpose or value for customer** – Having a process external perspective, including a wider purpose of the process – i.e. to meet needs of customers, stakeholders or other interested parties. This is mentioned in several articles, such as (Davenport & Short, 1990), (Harrington, 1991), (Hammer & Champy, 1993), (Talwar, 1993), (Jacobson, 1995), (Belmiro, Gardiner, Simmons, & Rentes, 2000), (Ljungberg, 2002) and (Isaksson, 2006).
- **Interrelated activities** – A majority of the authors describe the components of the process as interrelated activities; (Harrington, 1991), (Hammer & Champy, 1993), (Talwar, 1993), (Rentzhog, 1996), (Armistead & Machin, 1997), (Llewellyn & Armistead, 2000), (Ljungberg, 2002) and (Isaksson, 2006).
- **Horizontal: intra-functional or cross-functional** – (Sandhu & Gunasekaran, 2004) are the only authors found that define a process as a series of activities that “involves an independent functional unit”. A dominating view seems to be that processes are horizontal and cross-functional, see for instance (Jacobson, 1995), (Armistead & Machin, 1997), (Lee & Dale, 1998) and (Llewellyn & Armistead, 2000).
- **Repeatability** – Mentioned by a few Swedish authors; (Rentzhog, 1996), (Ljungberg, 2002) and (Isaksson, 2006).

- **The use of resources** – Mentioned by a few authors; (Biazzo & Bernardi, 2003) and (Isaksson, 2006), include the use of resources in their definitions.

A gross process definition should, based on the included articles, include all the components above, see Figure 2. A net process definition can be condensed to: A horizontal sequence of activities that transforms an input (need) to an output (result) aligned with the organization's objectives, see Figure 3.

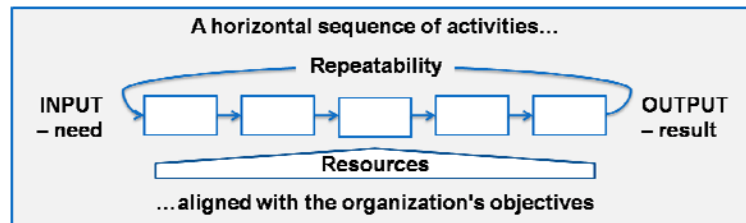


Figure 2 – A gross process definition, including the components; Input and output, Purpose, Interrelated activities, Horizontal Repeatability and Use of Resources.

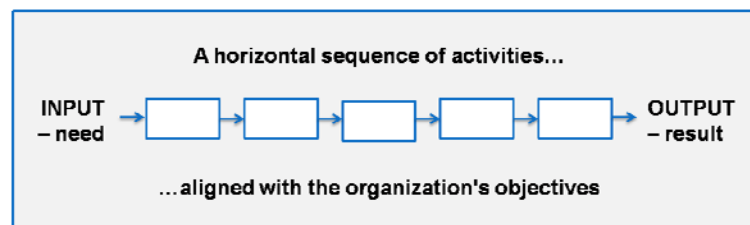


Figure 3 – A net process definition: A horizontal sequence of activities that transforms an input (need) to an output (result) aligned with the organization's objectives. Excluding the components of Repeatability and Use of Resources, only mentioned by a few authors.

Process categorizations

In the reviewed articles both categories of processes and hierarchies within processes are described, see Figure 4.

Categories – The analysis of the reviewed articles has identified three general process categories, see also (Davenport, 1993), (Jones, 1994), (DeToro & McCabe, 1997), (Llewellyn & Armistead, 2000), (Sandhu & Gunasekaran, 2004) and (Isaksson, 2006).

- **Strategic management processes** – covering strategy, planning and control where management oversees and supervises the system (DeToro & McCabe, 1997), (Armistead, Pritchard, & Machin, 1999), (Chapman, 2001), (Sandhu & Gunasekaran, 2004) and (Isaksson, 2006).
- **Operational delivery processes** – produce outputs and results for external stakeholders (Jones, 1994), (DeToro & McCabe, 1997), (Armistead, Pritchard, & Machin, 1999) and (Isaksson, 2006).
- **Supportive administrative processes** – required to sustain and support the delivery processes (Jones, 1994), (Armistead, Pritchard, & Machin, 1999) and (Isaksson, 2006).

Levels/Hierarchies – In a similar way the levels or hierarchy of processes described in the reviewed articles has been summarized into four categories; **process**, **sub process**, **activities** and **tasks**, see also (Harrington, 1991), (Walsh, 1995), (DeToro & McCabe, 1997), (Lillrank & Liukko, 2004).

The perhaps most deviant categorization of processes is the “quality broom” described by (Lillrank & Liukko, 2004) which divides processes into **standard**, **routine** and **non-routine**. The level of uncertainty is described to be larger in the non-routine processes and is better managed with a quality culture. While standard processes with identical repetition and a low level of uncertainty can be managed with quality systems.

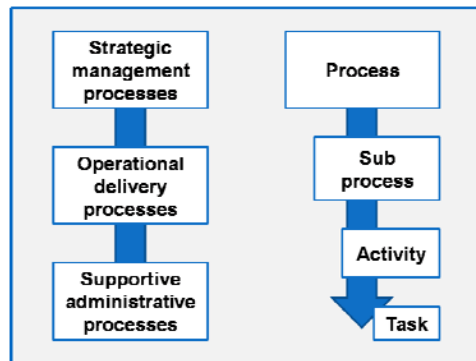


Figure 4 – Two ways to categorize processes.

Definitions of process management

The literature study of definitions of process management gave a large amount of material which was further categorized into a second level of labels.

What is process management?

Very few of the studied authors thoroughly answer this fundamental question. It appears as the answer is implicit but widely agreed upon. Still, there seems to be differences in what the authors consider process management to be. The analysis reveals two distinctly different movements; *process management for single process improvement* and *process management for system management*, see Figure 5.

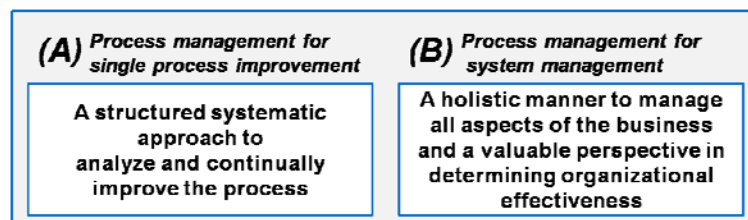


Figure 5 – Two different movements in what the authors consider process management to be.

The first movement, focusing on the management and improvement of single processes, can be summarized into the statement (A): ***A structured systematic approach to analyze and continually improve the process.*** This view is shared by (Elzinga, Horak, Chung-Lee, & Bruner, 1995), (Zairi, 1997), (Lee & Dale, 1998) and (Biazzo & Bernardi, 2003).

A holistic view on process management as a part of managing the whole organization is maintained by (Lee & Dale, 1998), (McAdam & McCormack, 2001) and (Bawden & Zuber-Skerritt, 2002). This is described by Pritchard and Armistead (1999, p. 22) as (B): ***“a more holistic manner to manage all aspects of the business and as a valuable perspective to adopt in determining organizational effectiveness.”***

Lee and Dale (1998, p. 218) somewhat summarize the two views, (A) and (B) above, as: ***“BPM is both a set of tools and techniques for improving processes and a method for integrating the whole organization and it needs to be understood by all employees.”***

What is the purpose of process management?

As was the case with the definition of process management there are also differing opinions regarding the purpose of process management:

- To remove barriers between functional groups and bond the organization together (Jones, 1994), (Llewellyn & Armistead, 2000).
- To control and improve the processes of the organization (Melan, 1989), (Pritchard & Armistead, 1999), (Biazzo & Bernardi, 2003) and (Sandhu & Gunasekaran, 2004).
- To improve the quality of products and services (Melan, 1989), (McAdam & McCormack, 2001) and (Sandhu & Gunasekaran, 2004).
- To identify opportunities for outsourcing and the use of technology to support business (Lindsay, Downs, & Lunn, 2003) and (Lock Lee, 2005).
- To improve the quality of collective learning within the organization and between the organization and its environment (Bawden & Zuber-Skerritt, 2002).
- To align the business process with strategic objectives and customer needs (Lee & Dale, 1998).
- To improve organizational effectiveness and improve business performance (Jones, 1994), (Elzinga, Horak, Chung-Lee, & Bruner, 1995) and (Armistead, Pritchard, & Machin, 1999).

It appears to be few major differences in directions or groupings in the reviewed articles regarding the purpose of process management, just a broad variety of arguments for working with it in one way or the other.

Which tools are suggested?

The tools suggested to be used when working with process management are diverse:

- Process mapping (McKay & Radnor, 1998), (McAdam & McCormack, 2001), (Biazzo, 2002) and (Isaksson, 2006).
- Process measurement (Melan, 1992) and (Lockamy III & McCormack, 2004).
- Process re-engineering or re-design (Lee & Dale, 1998), (DeToro & McCabe, 1997) and (McKay & Radnor, 1998).
- Continuous improvement (DeToro & McCabe, 1997) and (Lee & Dale, 1998).
- Benchmarking (DeToro & McCabe, 1997) and (Lee & Dale, 1998).

Which roles are suggested?

The role of the **process owners** is described as:

- Accountable for all process improvement results with authority to approve process changes (DeToro & McCabe, 1997).
- Responsible, through improvements teams, to optimize efficiency and effectiveness, ensuring external customer's requirements are met (DeToro & McCabe, 1997).
- Overseeing performance control and continuous improvement (Biazzo & Bernardi, 2003).

The other role described in the literature is the one of the cross-functional **process team** (DeToro & McCabe, 1997), (Lee & Dale, 1998) and (McAdam & McCormack, 2001). Their

role is portrayed by (DeToro & McCabe, 1997, p. 58) as: “to map and document the process, assess performance, analyze deficiencies, select an improvement strategy, propose design changes, implement fixes, and assess results.” The process teams are also described as supporting employee empowerment.

Which are the approaches suggested?

Many authors have combined tools and techniques in to methodologies and checklists that are of a consulting character. How to, step by step, work with process management. The analysis of the material shows a divergence in line with the two different movements, (A) and (B), of what process management is, see Figure 5.

The methodology corresponding to the first definition, (A) process management as a structured systematic approach to analyze and continually improve the process, can be summarized as:

- 1. Process selection** – based on analysis of the value chain (Pritchard & Armistead, 1999), identifying customers and suppliers (Sinclair & Zairi, 1995), data collection and process targeting (Armistead, Pritchard, & Machin, 1999) and (Gardner, 2001).
- 2. Process description and mapping** – understanding and defining the process (Melan, 1989) and (Harrington, 1995), key activities (Sinclair & Zairi, 1995) and the process architecture (Pritchard & Armistead, 1999) and (Armistead, Pritchard, & Machin, 1999).
- 3. Organizing for quality** – establishing ownership of the process, defining and appointing process owners (Melan, 1989), (Harrington, 1995), (Armistead, Pritchard, & Machin, 1999) and (Pritchard & Armistead, 1999).
- 4. Process measurements and quantifications** – identifying performance measurements and targets for controlling the process (Melan, 1989), (Jones, 1994), (Harrington, 1995), (Sinclair & Zairi, 1995), (Armistead, Pritchard, & Machin, 1999) and (Pritchard & Armistead, 1999).
- 5. Process improvements** – identifying process improvements, e.g. based on measurements and take corrective actions (Melan, 1989), (Jones, 1994), (Harrington, 1995), (Armistead, Pritchard, & Machin, 1999) and (Pritchard & Armistead, 1999), including management of the improvement process and methodology (Jones, 1994).

In line with definition (A) of process management, but with a strong focus on the purpose of identifying opportunities for outsourcing and the use of technology to support business suggested by (Lock Lee, 2005), (Lindsay, Downs, & Lunn, 2003) Lock Lee (2005) presents a methodology that is focused on the design and implementation of software products supporting business processes.

There were hardly any methodologies found that support definition (B) of process management as a more holistic manner to manage all aspects of the business and as a valuable perspective to adopt in determining organizational effectiveness. In (Biazzo & Bernardi, 2003) a methodology is described by four strategic decision-making areas that form, what the authors call, a process management system:

- **Process architecture** – The constitutive component of a PM system where you describe the processes in the organization in a holistic and systematic manner.
- **Process visibility** – Divided into two dimensions; (1) the relationship between the process architecture and the organizational structure and (2) the formalization of the functioning of the processes which gives them operating visibility.

- **Monitoring mechanisms** – The design of a performance measurement system that will examine and evaluate process performance. With performance indicators that reflects the strategic objectives of the organization.
- **Improvement mechanisms** – The approaches that determine how plans for change will be selected, launched and managed. They should structurally link improvement activities to the daily work and make organizational change systemic and systematic.

The components presented by (Biazzo & Bernardi, 2003) bear a resemblance to the methodologies that supports the definition (A) but with an emphasis on holism and the connection between the work with processes and the strategic objectives of the organization.

Conclusion and discussion

The result and analysis shows, in line with earlier research, that there seems to be no really common definition of the concept of process (Armistead, Pritchard, & Machin, 1999), (Belmiro, Gardiner, Simmons, & Rentes, 2000) and (Isaksson, 2006). Still, there are similar components in the definitions of the included literature. These can be condensed into a net definition, found above in Figure 5 and at the top of Figure 6.

There are several descriptions of process management presented in the literature, but none that seems to be really widespread and well established as a definition. This is in line with what previous research have shown (Garvin, 1995), (Armistead & Machin, 1997), (Pritchard & Armistead, 1999), (Ljungberg, 2002), (Biazzo & Bernardi, 2003) and (Hellström & Eriksson, 2007). Though, the result and analysis of the definitions of process management in the included literature shows two different movements, (A) *process management for single process improvement* and (B) *process management for system management*, see Figure 5 and Figure 6. This is similar to the two models of process management of (Nilsson, 2003) (described in (Hellström, 2006)) described as; (1) a more mechanistic orientation that is characterized by a focus on structural element and (2) an organic orientation that is stronger related to the people in and the flexibility of the process.

The varying purposes of working with process management, described in the covered literature, demonstrate a diverse need for both movements, (A) and (B), of process management. Still, the focus of a majority of the identified tools and approaches for process management is to contribute to the more mechanistic movement (A) of systematically improving single processes. It is a technical and instrumental approach that characterizes the definition of and approach for process management in movement (A).

When it comes to the more holistic movement (B), process management as one of several valuable perspectives in the system management of an organization, hardly any tools and approaches have been found in the literature. Even the identified approaches corresponding to movement (B) can be applied in a linear, mechanistic way – contributing successfully to single process improvements but not as effectively to a strategic and holistic management of the whole organization. This is in correspondence to (Lindsay, Downs, & Lunn, 2003).

The approaches and tools for improving single processes (A) might be mostly suitable for use on an operational level, while the tools and approaches in movement (B) is aiming primarily for the strategic level of an organization. The operational level should be very important for the daily work of process management and improvements throughout the organization, at all levels. As a suggestion, the definition and approaches for movement (B) could be further developed into a model for system management.

It can be discussed whether or not the shortage of approaches and tools for process management on a strategic level is contributing to the often seen confusion and discontent among senior managers regarding the perceived lack of clear results from implementing process management. The lack of a widely recognized model for process management might be a contributing factor to the challenges and difficulties that meet leaders when trying to manage organizational processes on a strategic, system level. It can be argued that many organizations aim at applying process management of both (A) and (B), using the existing tools and approaches that mainly are developed for (A), but largely expect holistic results on a strategic level.

Process definition	A horizontal sequence of activities that transforms an input (need) to an output (result) aligned with the organization's objectives	
Process categorizations	Strategic, Operational, Support Process → Sub-process → Activity → Task	
Process management	(A) A structured systematic approach to analyze and continually improve the process	(B) A holistic manner to manage all aspects of the business and a valuable perspective in determining organizational effectiveness
Purpose	<ul style="list-style-type: none"> • Remove barriers • Control and improve the processes • Improve quality of products & services • Identify opp. for use of technology • Improve collective learning • Align with strategic objectives • Improve organizational effectiveness • Improve business performance 	
Tools	<ul style="list-style-type: none"> • Process mapping • Process measurement • Process re-engineering or re-design • Continuous improvement • Benchmarking 	
Roles	<ul style="list-style-type: none"> • Process owner • Process team 	
Approaches	<ol style="list-style-type: none"> 1. Process selection 2. Process description and mapping 3. Organizing for quality 4. Process measurements 5. Process improvements 	<ul style="list-style-type: none"> • Process architecture • Process visibility • Monitoring mechanisms • Improvement mechanisms

Figure 6 – Summary of the result and analysis of the literature review on definitions of process management.

A wider discussion regarding the interests of practitioners and researchers within the field of process management can be introduced, questioning today's strong focus on the technical and instrumental parts of process management; the definition of a process, the levels and categorizations of processes, and the techniques for mapping and documenting processes on an activity level. Many organizations devote extensive resources to web-based documentation systems, presenting their processes in several levels (lately I have seen up to eight such levels) from main processes down to individual tasks – without having a discussion of how to structurally link the process management work to the strategic objectives and priorities of the organizations. It is hardly surprising that the work with process management does not deliver a more holistic manner to manage all aspects of the business and as a valuable perspective to adopt in determining organizational effectiveness.

There might be a risk in losing the overall business perspective when focusing heavily on maps, tools and checklists aiming for documentation, finding a process structure and

designing the process organization. A lot of energy in quality functions and process development is aimed at building structures with process owners, process teams and a parallel organization to the traditionally functional organization. It might be important to visualize relationships between the process architecture and the organizational structure and to formalize the functioning of the processes. However, the efforts cannot start here without the *strategic* discussion and making a standpoint on how process management should contribute to the business performance.

There is a strong need for process management practitioners and researcher to develop and formulate approaches and tools that have the potential to contribute to process management not only on a single process level but on a strategic system level in the organization.

References

- Armistead, C., & Machin, S. (1997). Implications of business process management for operations management. *International Journal of Operations & Productions Management* , 17 (9), 886-898.
- Armistead, C., Pritchard, J.-P., & Machin, S. (1999). Strategic business process management for organisational effectiveness. *Long Range Planning* , 32 (1), 96-106.
- Bawden, R., & Zuber-Skerritt, O. (2002). The concept of process management. *The Learning organization* , 9 (3), 132-138.
- Belmiro, T., Gardiner, P., Simmons, J., & Rentes, A. (2000). Are BPR practitioners really addressing business processes? *International Journal of Operations & Production Management* , 20 (10), 1183-202.
- Biazzo, S. (2002). Process mapping techniques and organisational analysis: Lessons from sociotechnical system theory. *Business Process Management Journal* , 8 (1), 42-52.
- Biazzo, S., & Bernardi, G. (2003). Process management practises and quality systems standards: Risks and opportunities of the ISO 9001 certification. *Business Process Management Journal* , 9 (2), 149-169.
- Chapman, J. A. (2001). The work of managers in new organisational contexts. *The Journal of Management Development* , 20 (1), 55-68.
- Davenport, T. (1993). *Process Innovation*. Boston, MA: Harvard Business Press.
- Davenport, T., & Short, J. (1990). The new industrial engineering; information technology and business process redesign. *Sloan Management Review* , 31 (4), 11-27.
- DeToro, I., & McCabe, T. (1997). How to Stay Flexible and Elude Fads. *Quality Progress* , 30 (3), 55-60.
- EFQM. (2003). *EFQM Excellence model*. Brussels: European Foundation for Quality Management.
- Elzinga, D., Horak, T., Chung-Lee, L., & Bruner, C. (1995). Business process management: survey and methodology. *IEEE Transactions on Engineering Management* , 24 (2), 119-28.
- Gardner, R. (2001). Resolving the process paradox. *Quality progress* , 34 (3), 51-9.
- Garvin, D. (1995, September-October). Leveraging processes for strategic advantage. *Harvard Business Review* , 77-90.
- Hammer, M., & Champy, J. (1993). *Reengineering the Corporation: A Manifest for Business Revolution*. New York, NY: HarperCollins Publisher.

- Harrington, H. (1991). *Business Process Improvement - The Breakthrough Strategy for Total Quality, Productivity, and Competitiveness*. New York: McGraw-Hill.
- Harrington, H. (1995). *Total Improvement Management - The Next Generation in Performance Improvement*. New York, NY: McGraw-Hill.
- Hellström, A. (2006). Conceptions of Process Management - An Analysis of the Discourse in the Management Literature. *Paper presented at the 9th International QMOD Conference*. Liverpool UK.
- Hellström, A., & Eriksson, H. (2007). Among Fumblers, Talkers, Mappers, and Organizers - Four applications of process orientation. In A. Hellström, *On the Diffusion and Adoption of Management Ideas: Findings from six empirical studies in the quality field*. Göteborg, Sweden: Chalmers University of Technology.
- Isaksson, R. (2006). Total quality management for sustainable development: Process based system models. *Business Process Management Journal* , 12 (5), 632-645.
- Jacobson, I. (1995). *The Object Advantage*. Addison-Wesley.
- Jones, C. (1994). Improving your key business processes. *The TQM Magazine* , 6 (2), 25-9.
- Lee, R., & Dale, B. (1998). Business process management: a review and evaluation. *Business Process Re-engineering & Management Journal* , 4 (3), 214-25.
- Lillrank, P., & Liukko, M. (2004). Standard, routine and non-routine processes in health care. *International Journal of Healthcare Quality Assurance* , 17 (1), 39-46.
- Lindsay, A., Downs, D., & Lunn, K. (2003). Business processes - attempts to find a definition. *Information & Software Technology* , 45 (15), 1015-9.
- Ljungberg, A. (2002). Process measurement. *International Journal of Physical Distribution & Logistics Management* , 32 (4), 254-287.
- Llewellyn, N., & Armistead, C. (2000). Business process management: Exploring social capital within processes. *International Journal of Service Industry Management* , 11 (3), 225-243.
- Lock Lee, L. (2005). Balancing business process with business practice for organizational advantage. *Journal of Knowledge Management* , 9 (1), 29-41.
- Lockamy III, A., & McCormack, K. (2004). The development of a supply chain management process maturity model using the concepts of business process orientation. *Supply Chain Management: An International Journal* , 9 (4), 272-278.
- McAdam, R., & McCormack, D. (2001). Integrating business processes for global alignment and supply chain management. *Business Process Management* , 7 (2), 113-130.
- McKay, A., & Radnor, Z. (1998). A characterization of a business process. *International Journal of Management > Production Management* , 18 (910), 924-36.
- Melan, E. (1992). *Process Management. Methods for Improving Products and Service*. New York: McGraw-Hill.
- Melan, E. (1989). Process Management: A Unifying Framework for improvement. *National Productivity Review* , 8 (4), 395-406.
- Nilsson, G. (2003). *Processorientering och styrning: regler, mål eller värderingar? [Process Orientation and Management Control]*. Stockholm: Handelshögskolan i Stockholm.

- Palmberg, K. (2008). *In search of well established models for process management; Research report 2008:1*. Division of Quality and Environmental Management, Luleå University of Technology.
- Pritchard, J., & Armistead, C. (1999). Business process management: lessons from European business. *Business Process Management Journal* , 5 (1), 10-32.
- Rentzhog, O. (1996). *Core Process Management*. Department of Mechanical Engineering, Division of Quality and Technology. Linköping: Linköping University.
- Sandhu, M., & Gunasekaran, A. (2004). Business process development in project-based industry. *Business Process Management* , 10 (6), 673-690.
- Sinclair, D., & Zairi, M. (1995). Effective process management through performance measurement. Part III: an integrated model of total quality-based performance measurement. *Business Process Re-engineering & Management Journal* , 1 (3), 50-65.
- Talwar, R. (1993). Business re-engineering - a strategy driven approach. *Long Range Planning* , 26 (6), 22-40.
- Walsh, P. (1995). Overcoming chronic TQM fatigue. *The TQM Magazine* , 7 (5), 58-64.
- Zairi, M. (1997). Business process management: a boundaryless approach to modern competitiveness. *Business Process Re-engineering & Management Journal* , 3 (1), 64-80.