Business processes—attempts to find a definition — Source link ↗

Ann Lindsay, Denise Downs, Ken Lunn

Institutions: University of Huddersfield

Published on: 01 Dec 2003 - Information & Software Technology (Elsevier)

Topics: Business process modeling, Artifact-centric business process model, Business rule, Business Process Model and Notation and Business process discovery

Related papers:

- Reengineering the corporation: a manifesto for business revolution

- A conceptual framework for understanding business processes and business process modelling

- Business process management: a survey

- Business process modelling: Review and framework

- Process Innovation: Reengineering Work Through Information Technology

Business Processes – Attempts to Find a Definition

Ann Lindsay, Ken Lunn
School of Computing and Engineering, University of Huddersfield, UK

Abstract

This paper proposes that definitions of business process given in much of the literature on Business Process Management are limited in depth and their related models of business processes are correspondingly constrained. After giving a brief history of the progress of business process modeling techniques from production systems to the office environment this paper proposes that most definitions are based on machine metaphor type explorations of a process. While these techniques are often rich and illuminating it is suggested that they are too limited to express the true nature of business processes that need to develop and adapt to today's challenging environment.

Introduction

In the 21st century we are lead to believe that the most valuable characteristic of an organization is its ability to adapt to the dynamic environment in which it operates. Much of the literature produced by the business process re-engineering and management (BPM/R) community would suggest that implementing process orientated structures will help organizations to be more responsive to an increasingly changing environment. It is essential then that those utilizing such techniques understand adequately the nature of business processes. This paper suggests that not only are there few attempts to define process adequately, but those definitions and corresponding models most widely used are confined to a mechanistic viewpoint of process. After briefly discussing business process definitions and models the paper will propose why these models are inadequate and where research should be focused to enhance BPM techniques.

Definitions of process are usually short and succinct. Ould's book Business Processes(1995) had still not attempted to define the term 'business process' by the end of the first chapter but instead lists a few key features: it contains purposeful activity, it is carried out collaboratively by a group, it often crosses functional boundaries, it is invariably driven by outside agents or customers. The rest of his book expands on these features. Jacobson (1995) on the other hand quickly describes a business process as; 'The set of internal activities performed to serve a customer', and Bider(2002) suggests that the BPR community feels there is no great mystery about what a process is, it is a 'Set of partially ordered activities intended to reach a goal'.

So if a business process is so easily defined that it can be described in a simple sentence and most businesses understand what a business process is, why do we need so many different expertise to illustrate and model them? Why the shift towards BPR/M of the 90's? Jacobson though admitting processes are nothing new to companies explains the confusion surrounding them by their invisible nature, that they are neither named nor described.

A Brief History

The business world has been evolving;

- in the '60s industry concentrated on how to produce more (quantity),
- in the '70s how to produce it cheaper (cost)
- in the '80s how to produce it better (quality)
- in the '90s how to produce it quicker (lead time)
- in the 21st century how to offer more (service)

Except for the last shift with its emphasis on service, the above chronology is about improvements to aspects of production. From the start of the industrial revolution the onus had been on automating and improving production efficiency and costs. Definitions roughly describing business processes along the

lines of, 'A sequence of activities which transform inputs into outputs' and their corresponding models have their routes in the scientific management techniques of the early twentieth century. They are possibly more suited to descriptions of production processes than a generic description of a business process. This is not to say they do not have value and their 'limited' view of a process is a substantial area of research in itself. These techniques have been used in many fields from work study and operations management, process control, business modelling and systems engineering to name but a few and are central to the business process reengineering (BPR) and business process management (BPM). The advent of automation in the office meant that the spotlight in search for efficiency and cost reduction was to encompass not only the shop floor but the office too with the same principles applied to office work.

Shifting the Emphasis to Office Environments

The principle separating office process from production process is often based on the hypothesis that production workflow is traditionally analysed by attention to the activities being performed whereas office systems are more goal based and people do whatever is necessary to attain a goal. The Workflow Management Coalition (1994) proposed classifing processes as manual process activities and workflow process activities. The work of Gulla and Lindland (1994) distinguishes between production processes and coordination processes, with traditional approaches of modeling, input – process – output, suited to modelling the chain of production processes but lacking concepts for modelling coordination activities which involve actors, information exchange and coordination structures. Ellis and Wainer (1994), Bussler and Jablonski (1994), Yu and Mylopoulos (1995) have all suggested that analysis of activities is not appropriate for modelling office workflows or management decision making. Yu (1996) separates office processes from processes executed by machines. The latter being simply a progression of tasks whereas office workflows are about actors in social systems collaborating to achieve a goal. Joosten(1994) extends this for workflow to 'a system whose elements are activities, related to one another by a trigger relation, and triggered by external events, which represents a business process starting with a commitment and ending with the termination of that commitment'.

Action Workflow(1993) divide process into material process, information process and business process. Informational models include ERM (Entity Relationship Model) and OO (Object Orientated) models, material modelling is dataflow and process models, business models are viewed as networks referred to as workflow with interactions the main focus of attention. ActionWorkflow (Flores 1995) have worked on merging these three types of process definition into one workflow architecture. Continuing in the workflow arena other dimensions which have been analysed are methods to help organisations specify, execute, monitor and coordinate flows of work. Finally Yu's paper distinguishes between process as executed by machine and process as performed by humans. Curtis et al (1993) also made this distinction, noting that mathematically structured process programs could be used to described machine based processes whereas more flexible process scripts are used for manual tasks performed by humans who are able to interpret and enact ambiguous process descriptions. They looked at the processes employed in the software development industry and their interest was to extend traditional software modelling of data flows and transformations to the challenge of process representations which incorporated communication and coordination. Looking at a software development environment extends our enquiry of process structures into another discipline where the nature of processes is a creative problem solving environment. This still omits a great deal of the activities that go on within organisations to do with creative problem solving and decision making, to mention just two.

BPM & BPR Additions to Business Process Definitions

The fields of BPM/R strive to better understand a business's key mechanisms in order to improve, and in some cases radically change, the business performance by identifying opportunities for new business opportunities, for outsourcing, for improving business efficiency and for areas within the business where technology can be used to support business processes.

BPM/R methods have developed over the last 20 years from a variety of disciplines and as with software modelling techniques before them, have suffered from a lack of standard techniques and notations, with every BPM method using its own notation. The argument of this paper is that this lack of standardization

in representing a business process is in part caused by the absence of an adequate definition of a business process.

Champions of BPR, Hammer & Champy (1993) state, 'A business process is a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer. A business process has a goal and is affected by events occurring in the external world or in other processes'. This contradicts slightly a later definition given by Eriksson and Penker (2000) who say that a business process emphasises how work is performed rather than describing products or services that are a result of a process. The confusion here is whether a description of a process includes any information about the end product or service; surely in the customer focused ethos ascertaining whether a customer's requirements have been served needs repeated reference back to what is required in the first place. Another founder of the BPR movement, Davenport (1993) seems to support Eriksson and Penker's view when he describes a process as; 'simply a structured set of activities designed to produce a specified output for a particular customer or market'. It implies a strong emphasis on how work is done within an organization, in contrast to a products focus on what. A process is thus a specific ordering of work activities across time and place with a beginning, an end and clearly identified inputs and outputs: a structure for action.

Jacobson (1995) describes processes as cutting across traditional hierarchies and in order for them to succeed they involve collaboration between individuals or groups to achieve a goal. Jacobson says a customer-orientated process is expressed in terms of meeting an individual customer's needs, by concentrating on processes that provide value to customers and not merely to other parts of the business we arrive at what the organisation should be doing.

When Taylor developed his theories of scientific management and refined the work activities in order to simplify, deskill and specialize, workers still carried out a process to achieve a goal. That goal was just a subgoal of BPR/M movements customer-oriented goal. What was lost was the holistic view of the process from commencing with a customer and returning to the same customer when complete with someone responsible for achieving that goal for a specific individual. Thus we lost the person or group responsible for delivering the objectives of the process. Scientific management techniques segmented the process into the functional departments in the call for economies of scale and work standardization.

Perhaps here we can stop briefly to point out what the BPR/M movement adds to the scientific management view of a process. The characteristics of a process in a traditionally structured organization share many of the same attributes, but BPR/M by always keeping explicit the customer focus supports changing the organizational structure to cross functional working practices or team structure. What is reflected here is that in the modern business world some organizations find that functional structure impedes their efficiency. This may be caused by the operators of the system, or the parts of the machine, illustrating the inadequacy of the machine metaphor when related to them– ie they don't work efficiently when treated as machine parts. Alternatively it may be that the rapidly changing environment that modern companies find themselves in cannot respond adequately with a functionally structured organization.

To continue, Jacobson's(1995) discussion of process explains the need for the different structure for a customer-focused process to deliver to a customer, the various players operating parts of the process collaborate to achieve the goal. Jacobson maintains traditionally structured organisations are not conducive to this way of working, and that issues such as internal politics and personal goals hamper the smooth running of the horizontal nature of a customer orientated process. Jacobson's description concentrates on the interface between the internal business process and the customer. This gives an external view of the business, how the external actors use the business.

BPM additions to the definition of process attempt to recognize the involvement of humans in the execution of processes but they assume the existence of crucial notions such as perfect knowledge, action taken by the humans involved as rational decision makers, cooperating together to achieve agreed and clearly defined goals. These methods concentrate on the internal structure of the process and organization and although they often mention the need for a holistic approach the models used often don't reflect this. These models are concerned with past knowledge and promoting best practice.

Further Dimensions to Process

Melao & Pidd(2000) recognise these limitations of these viewpoints and give four perspectives on business process, relying strongly on metaphors to develop a conceptual framework with which to understand business processes more fully. The four categories:

- Business processes as deterministic machines
- Business processes as complex dynamic systems
- Business processes as interacting feedback loops
- Business processes as social constructs.

Most of the techniques mentioned in this paper fall into the first categories given by Melao & Pidd. . The second two concepts deal with a process's interaction with its environment and ways to capture the variable or unpredictable nature of these interactions. Finally Melao & Pidd cover the human aspects of business processes offered from soft systems methods. While some of the above techniques often mention human factors of perceptions and motivation they are rarely illustrated in the corresponding models.

So far we have travelled from the production process to the office process, and we've briefly touched on the more complicated nature of processes shown in Melao and Pidd's classification. Ould tries to show that processes cover the whole spectrum of business with his core, support and management processes and his area of interest is the interactions between the people operating the process, but he fails to make the leap needed for the true complexity of what business processes could entail.

The analysis so far has shown that the classifications of process have been fairly limited. Modelling methods have tended to concentrate on production and office systems. These could be viewed as the more simplistic types of process. Mintzberg's(1973) early work on the nature of managerial practices does not fit easily into the structure of a process which has been described so far. Davenport(1993) spoke of a process having start and end points, Mintzberg's discussion of management practices speaks of the open ended nature of management. Management processes according to Mintzberg are never ending tasks without clear milestones at which a goal could be said to have been reached or concluded. It would be a mistake to assume that management processes alone suffered from this issue. The process structures of software development have long been realized to not fit well to the linear structure often attributed to them by software development practices. Similarly Sixsmith et al(2002) in the area of community care for the elderly has shown that caring for the elderly in their own homes for as long as possible is not a process with a start and an end point. It could be that the nature of the goals of these types of process, i.e. a maintenance goal as opposed to an achievement goal, alters the structure of process and illustrates that it may not always be appropriate to look at process in terms of clearly defined start and end points or that a goal can be achieved.

Conclusion

Meloa and Pidd's conceptualizations of process were efforts to deal with some of its other aspects that restrict the effectiveness of current modeling techniques. Models are simplifications in order to bring clarity and understanding to some aspect of a problem where there is complexity, uncertainty, change or assumptions. The problem in reality is complex and more variability exists than can be modeled. Both the environment the process must operate in and the process itself are not static, and changes in either one could affect changes in the other. Underlying the mechanistic view of process is also a number of assumptions, such as perfect knowledge of the human actors involved, that humans work in a rational and logical way and that problems have a solution. Melao and Pidd's conceptualization recognizes that whilst the mechanistic/deterministic view of process gives a rich opportunity to model its tangible aspects failure to appreciate the limitations of these models can be dangerous.

Modelling gives a snapshot of what is perceived at a point in time. Sustainable business processes carried out by human operators are a balancing act between learning from the past and experimenting with and adapting to the future, rules and constraints versus freedom and flexibility. BPM definitions and models

described here have all depended on past knowledge, what is already known, and the attempt to impart this knowledge through best practice. Process models are currently best used to represent the internal elements of business processes; for example the activities needed and their dependencies, the dataflow, the roles and actors involved, and the goals. None of the techniques described above can incorporate what Senge(1990) refers to as 'The learning organization' but if organizations are to survive in the long term their processes have to be responsive and adaptable.

References

[Bider 2000] Business Process Modelling - Concepts (PBPM'00)

[Bussler, C and Jablonski, S. 1994] An Approach to Integrate Workflow Modelling and Organization Modelling in an Enterprise. Proceedings of third Workshop on Enabling Technologies. Morgantown West Virginia 81-95

[Curtis et al 1992] Curtis B., Kellner, Marc I., Over J., Process Modelling, Communication of the ACM, Vol 35 No. 9 September 1992

[Davenport T. 1993] Process Innovation. Harvard Business School Press, Cambridge, MA.

[Ellis, C.A. and Wainer, J. 1994] Goal-based models of collaboration, Collaborative Computing 1(1), 61-86

[Eriksson-Penker 2000] Eriksson Hans-Erik, Penker Magnus, Business Modeling with UML
ISBN 0-471-29551-5

[Flores, R.F. 1995] The Value of a Methodology for Workflow,
http://www.actiontech.com/market/paers/method5.html

[Gulla, J.A. and Lindland, O>I. 1994] Modelling Cooperative Work for Workflow Management, CaiSE'94, Utrecht, TheNetherlands.

[Hammer, M. & Champy, J. (1993) Re-engineering the Corporation; A Manifesto for Business Revolution. Harper Business, New York.

[Jacobson 1995] Jacobson, I., The Object Advantage,,1995 ISBN 0 201 42289 1

[Joosten, S. 1994] Trigger Modelling for Workflow Analysis : Workflow Management – Challenges, Paradigms and Products Con'94 Linz, Austria

[Melao 2000] Melao, N., Pidd, M., A Conceptual Framework for Understanding Business Processes and Business Process Modelling, Info Systems J(2000) 10,105-129

Mintzberg, H. (1979). *The Structuring of Organizations.* Englewood Cliffs, NJ: Prentice-Hall.

[Ould 1995] Ould, Martyn A., Business Processes ISBN 0-471-95352-0

[Workflow Management Coalition 1994] Glossary – A Workflow Management Coalition Specification, Brussels Belgium.

[Yu, e. and Mylopoulos J. 1994] From E-r to A-R Modelling Strategic Actor Relationships for Business Process Reengineering. Proceedings of Conference on Entity Relationship Approaches ER'94 548-565

[Senge, P.M. 1990] The Fifth Discipline : The Art & Practice of the Learning Organisation. Century Business ISBN 0-7126-5687-1