Implications of business process management for operations management

The Authors

Colin Armistead, The Business School at Bournemouth University, Bournemouth, UK

Simon Machin, The Business School at Bournemouth University, Bournemouth, UK

Abstract

Addresses how organizations are approaching Business process management. Following interviews in “leading edge” organizations, qualitative analysis has revealed key themes which may help inform others at an earlier stage in developing their approach to business process management. Presents research propositions, based on these themes, and on a categorization of business processes into operational, support, direction setting and managerial processes. There are implications for operations management in both the probable order of addressing these process categories and in the applicability of techniques and concepts from operations management.

Article Type: Research paper
Keyword(s): BPR; Operations management; TQM.
Volume: 17
Number: 9
Year: 1997
pp: 886-898
Copyright © MCB UP Ltd
ISSN: 0144-3577

Introduction

Operations management is concerned with the management of people, processes, technology and other resources in order to produce goods and services. There is a resonance from operations management into business process re-engineering (BPR) of the process paradigm and of the concepts and techniques of designing, managing and improving operational processes. Doubtless much can be learned from operations management for the application of BPR[1].

But business process management is more than just BPR applied to operational processes. What are the implications of the wider consideration of business processes for operations management and can the concepts and techniques from operations management be directly applied to all types of business processes? This paper introduces the concepts of business processes and business process management, and reports findings from interviews in four organizations which are continuing to develop their approaches to managing processes. These findings are then positioned within a categorization of business processes, by way of research propositions. Finally, implications for operations management are discussed.

What are business processes?

Business processes can be thought of as a series of interrelated activities, crossing functional boundaries with inputs and outputs. Why are they important and why are organizations moving to adopt approaches to explicitly manage by business processes? Reasons include[2] that the process view:

- allows increasing flexibility in organizations to meet changing external demands;
- addresses the speed to market of new products and services and the responsiveness to the demands of customers;
- facilitates the reduction of costs;
- facilitates increased delivery reliability; and
- helps address the quality of products and services in terms of their consistency and capability.
Processes are part of the philosophy of total quality management (TQM)[3]. Both the Malcolm Baldrige National Quality Award[4] and the European Foundation for Quality Management (EFQM) model[5], on which the European Quality Award is based, have at their heart the consideration of business processes. Such models require the identification of processes, the management of these processes with review and targetary, innovation and creativity applied to processes and the management of process change.

A second route that leads organizations to consider their business processes is BPR[6, 7, 8, 9] which promotes the radical change of business processes. Some have illustrated the complementary nature of BPR and TQM[10], others the conflict[11]. Regardless of this, the fact is that organizations come to consider their business processes through TQM, or through BPR, or potentially through both avenues.

**What is business process management?**

There is considerable debate about what business process management means and how organizations interpret the business process paradigm[2, 12]. Business process management cannot be considered simply as BPR. Rather it is concerned with how to manage processes on an ongoing basis, and not just with the one-off radical changes associated with BPR. But how are organizations actually managing their business processes? What approaches have they developed? What lessons have they learned and what can be drawn from their experiences? The aim of the research reported in this paper is to address such questions by considering organizations at the leading edge of process management.

**Methodology**

A qualitative methodology was adopted in conducting the research. During a pilot phase interviews were conducted in four organizations: TSB; Rank Xerox; Kodak; and Birds Eye Walls. This, coupled with knowledge of the approach within Royal Mail, led to an initial understanding of the approaches being adopted by organizations[13]. This was followed by further interviews in four organizations (including within a different part of Rank Xerox), and it is these that form the basis of the findings reported in this paper.

The four organizations, in this second phase of interviews, were:

- Rank Xerox - European Quality Award (EQA) winners in 1992;
- Nortel - Netas, a subsidiary of Nortel, were EQA winners in 1996;
- Texas Instruments - EQA winners in 1995;
- Hewlett-Packard - who do not use the EFQM model, but have been using their own “Quality Maturity System” for several years, with many similarities to the EFQM model, including the central role of processes.

While these organizations are at varying stages of their approach to business process management they can be considered “excellent” against many criteria (including process management), as shown above, and the findings and lessons derived from the research should inform other organizations which are just starting their approach to process management.

In two cases the quality director of the UK operation was interviewed; in one case the participant was the business process manager; in another the participant was a direct report to a service director. We consider that the roles and experience of the participants make possible sensible comparison between the organizations, based on the interviews.

Semi-structured open-ended interviews (typically of between two and three hours), based on the ideas emerging from the pilot interviews, were carried out in each organization. The interviews were supported by other documentation from each organization which included process maps, planning frameworks and organizational structures. Interviews were transcribed and the transcriptions used as the basis for analysis. Each interview transcription was read and examined several times and lists of concepts developed[14]. A cognitive map[15] of all four interviews was then constructed showing the concepts emerging from the data and how the concepts informed on each other (based on the perception of the authors). Concepts were then clustered, with six clusters, or themes, readily appearing. The clusters were then checked against the transcripts from the pilot interviews and documentary material from the case organizations to ensure consistency of findings.

**Findings**
The six clusters emerging from the research we have labelled: organization co-ordination; process definition; organization structuring; cultural fit; improvement; measurement. While some of these might not be novel in themselves we discuss them first individually and then as a set.

**Organization co-ordination**

One property associated with business processes is their “end-to-end” nature. They start with input at the business boundary and finish with outputs from the business boundary. Hence their cross-functional nature and, implicit in this, is their ability to integrate and co-ordinate activity. For example, “a better way to think about process is that it is an organizing concept that pulls together absolutely everything necessary to deliver some important component of strategic value”[16]. It is perhaps not surprising therefore that a strong theme emerging from the interviews was that the process paradigm provides an approach for co-ordination across the whole organization. This integration through the use of business processes is perhaps most simply illustrated by the fact that participants, in describing their approaches to business process management, described how they run and organize their entire business.

The co-ordination took a number of forms. For example, business process management was strongly positioned in the overall approaches to business planning adopted by the organizations. This was illustrated in one organization with their long- and medium-term plans explicitly linked to annual plans for their key processes. Business process management also provided an approach for integration through increased knowledge within the organizations (for example, about strategic direction), without the need for bureaucratic procedures or hierarchical control:

but what we were trying to do was create a very free environment, a very innovative environment, but an environment where we knew exactly where we were going.

The concepts of business processes emerged as providing a link between the top of the organization and activity at the lower levels: “the bit in the middle”. Central to this is the concept of different levels of processes and typically the organizations reported having identified three or four levels of process from the top-level architecture through to the individual or task level.

In providing the co-ordination across the organization, the importance of managing the boundaries of processes was strongly emphasized. One organization, for example, was addressing these boundary issues between their processes through the use of networks of individuals representing the interests of their process. They used networks around each process to formulate and implement strategy, and identified which processes have boundary issues with other processes. Individuals from one process network then attend meetings of the other process networks on this boundary to address the potential issues. Without some form of co-ordination between processes, changes in one process could also lead to changes in performance of other processes such that strategic goals would be compromised, typically in the areas of quality and costs.

**Process definition**

Much of the literature on managing processes is concerned with process improvement[17, 18] and this is typically directed at how to improve the actual operation of processes. However, a view expressed during the interviews was that the real value derived from the process approach is through the understanding and development of an approach at higher levels within the organizations, rather than simply process improvement activity at the task or team level.

Nevertheless, these organizations recognized that they struggled with this and acknowledged that, in reality, the understanding of processes was often still at the task level, with a natural tendency for procedure writing. Approaches to help overcome this included communication across the different levels of the organization to develop common understanding (and, in particular, to develop better understanding between process owners and process operatives) and a focus within process flowcharts on value steps and decision points, together with the definition and management of process boundaries.

Process flowcharting is often presented as a panacea for understanding and managing processes, but some organizations reported problems with applying the methodology to all processes:

the methodology of flowcharting … is OK for consistent, regularly operated, reliable processes - it is not that useful for processes that are very iterative and processes that run infrequently, the more complex processes.
Certainly the organizations were coming to realize that such process maps in themselves were not sufficient:

people talked a lot about process re-engineering and all they ever did was diddle around with process maps, and they didn’t really get the big picture.

and

we have used a flow-charting methodology widely deployed across the company...we have still got a lot of problems though in terms of processes gathering dust on the shelf.

Also, while the organizations recognized the need to specify processes beneath their high level processes, the need certainly did not emerge to map all processes to the same level or detail.

It would be unusual to go to an entity and show all the processes in detail to all depths.

In general, the drive appeared to be to use business process management more as a long-term and living tool than just a remedial tool for short-term, tactical issues. Long-term plans were needed for processes to enable the process owners to focus on the future requirements of their processes. Also there was the need to develop methodologies other than flowcharting to support a more holistic approach to business process management, and to directly consider the “process of managing processes”.

**Organizational structuring**

Much has been written about the role of processes in structuring organizations and, in particular, the development of horizontal organizations structured purely around processes[2, 19, 20].

In general, the organizations interviewed in this research appeared to be taking a less radical view. Instead they had developed matrix-based organizations between functions and processes, and tended to adjust their functional structure to align with their identified processes. They thus saw processes as simply another dimension of the organization structure[21]. Indeed they seemed to have implicitly balanced the dimensions of autonomy/co-ordination, motivation/ control and efficiency/learning[22] and in doing so derived the matrix structure. This perhaps also reflects other organizational paradoxes[23].

Their reasoning was influenced by a view that personal relationships were the key to effective organizations, as much as the formal, imposed structure. Processes were seen to provide a framework for these relationships in terms of building understanding and common approach across the organization. This framework was reported to help establish empowerment in a structured way, matching level of empowerment with control and support. Hence the entering of the process dimension into their structure. However, they were unwilling to do away with the functional dimension, due to the perception that functions better supported the actual personal relationships within the framework of processes and better supported specialist expertise:

people don’t necessarily align with processes, they align with other people, and entities and organizations. People don’t go to parties on processes!

and

if you start bashing on about process organizations, and “you’ve got to do away with the silos, and the function” and so on...you’re denying it in a way - something to do with that relationship side of things.

This has a resonance with reports that moves to process-based organizations can be ineffective if the personal relationship and cultural aspects are overlooked[24].

These matrix structures were regarded as relatively unstable[13] with a tendency to drift back to a functional structure, or to move too far towards a process focus, but the organizations saw the role of their “quality professionals” as the catalyst to ensure balance between functions and processes.

More interesting is that, in these matrix-based organizations, there appeared to be no desire to move towards a
purely process-based structure, with the matrix recognized as a desirable state, enabling constant and efficient reorganization through its flexibility. Inevitably the matrix adds complexity, but it seems that these organizations are willing to trade this complexity against the flexibility and personal relationship aspects supported by the matrix structure.

One organization did, however, report a totally process-based structure, and this did appear to support a high degree of simplicity against the complexity of the matrix approach. There may therefore be value for organizations in explicitly considering the trade-offs between processes and functions in forming their approach.

Regardless of the process/function structure, the approach of process groups and process owners at different levels of the processes was common.

**Cultural fit**

Culture is an ambiguous concept which is difficult to define[25]. However, most organizations have some notion of their culture, and this was the case in all four organizations, where culture had an implicit meaning. It is an important concept in thinking about organizations since people and processes must combine to produce output. However, within the organizations, processes were not seen as a constraint, rather, as reported above, as providing a framework for empowerment.

There emerged a general view that the overall approach to business process management needed to fit initially with the culture of the organization, and allow that culture to be maintained, at least in the short term. This is not to say that there was not a longer-term objective to address culture, but culture drove the appropriate initial approach:

that’s why it works well, because we’re a highly empowered organization, and a team of people are comfortable working as a team, so bringing them together for a process team is perfectly easy - all we had to do was teach them the tools to do it and a bit of flowcharting and away they go. But that fits well with the culture.

This is in stark contrast to some business process re-engineering approaches which may often be insensitive to culture or may have an immediate objective of changing culture[26]. Where BPR was deployed in the organizations it tended to be positioned as part of the overall approach to business process management, for example, alongside process stabilization and continuous improvement, rather than instead of. When used in this context, there were examples of culture change for smaller organization groupings. There were also examples where the failure of BPR initiatives was directly attributed to a culture within the organization which so strongly supported constant, but incremental, change that radical change, as proposed by BPR was rejected.

All four of the organizations embraced TQM and, in particular, continuous improvement. The concept and language of teams and “teams of teams”[27] featured strongly, with rewards and recognition often linked to team performance. The formation of cross-functional teams in improving processes happened naturally in these organizations, and appeared critical to the success of their approach in managing processes.

**Improvement through business process management**

Unsurprisingly the interviews supported a drive within the organizations to constantly improve processes and this is reflected in the above discussions of culture. Examples of specific approaches included the use of benchmarking to understand and set best practices and the development of compendiums and databases of best practices and the linkage of improvements to assessments against European Foundation for Quality Management (EFQM), Baldrige and other quality models.

While BPR was clearly used in some of the organizations (indeed Texas Instruments and Rank Xerox are well known for their re-engineering work) this tended to be talked about more at the process simplification or process improvement end of the spectrum of definitions placed on BPR[28, 29, 30]:

you would not change the overall process radically in a short space of time, but for people (in the process) I think it is a drastic step.

and
I would not anticipate the total process radically changing over a short space of time because one could not manage it, so you have to move forward in sizeful steps at each part of the process.

One organization reported benefits through using human resource professionals alongside process engineers on BPR projects to “keep some sanity in what the re-engineering was doing”.

**Measurement and business process management**

Measurement is a key principle to managing processes\cite{18} with the need to identify trends, assess stability, determine whether customer requirements are actually met and drive improvement. This was confirmed by the interviews and measurement emerged as central to successful approaches to business process management. There seemed to be a genuine attitude of “living and breathing” measurement within the organizations:

if you can’t actually get good metrics you won’t manage a process, so it’s absolutely fundamental to managing a process.

and

if we don’t define the metrics we’ve had it.

Increasing importance was being given to customer satisfaction and customer loyalty measures and there was a recognition of the importance of developing efficiency measures for the processes as opposed to just measuring whether processes actually delivered. There was also a drive towards examining the tails of distributions of the measures (process variation) not just average values, consistent with the view of statistical process control\cite{31, 32}.

One danger that was reported is related to the “level” issues discussed above: detailed measures were implemented into lower-level process maps, directly related to processes, as one would hope - however, this resulted in a large number of measures that it was then difficult to prioritize, because, at a higher level, measures had not been (or had not been properly) defined.

A particularly interesting approach to measurement was in one organization where they had established “business fundamentals” as performance measures on key processes, deployed worldwide and at all levels. All professional staff in the organization have business fundamentals which are deliverable, cost, customer or people measures, but self-driven measurements rather than management-driven measurements. These business fundamentals are linked to the key processes, and individuals self-assess their progress against these, using a simple rating scale. Every quarter there is then a formal review across the organization against the business fundamentals. The same approach is used to track individual performance, performance against plans, and process performance, providing an integrated approach to measurement across the organization, and a strong illustration of integrating process measures with other organizational measures.

**Process categorization**

Different categorizations of processes have been proposed in the literature\cite{28}. For example the CIM-OSA Standards\cite{33} use the categorization of manage, operate and support. In describing processes we have found a categorization into operational, support, direction setting and managerial processes to be useful (see Figure 1). The separation of direction setting and managerial processes is driven by two considerations:

- on a practical level models, such as the EFQM model, adopted by organizations, separately identify leadership from policy and strategy formulation; and
- the strategy literature regards development of strategy as a process in its own right\cite{34, 35}.

Operational processes are the way in which work gets done within an organization, to produce goods and services. These processes are the ones which have been the subject of much of the focus to date in TQM and BPR. They run across the organization and are associated with outcomes such as product development or order fulfilment. They are recognized in the ideas of integrated supply chains and logistics and in simultaneous engineering and are part of just-in-time approaches. The same ideas for improvement in flow and reduction in cycle times come through into service organizations in the practices of BPR.
Support processes are those which enable the operational processes. They are concerned with the provision of support technology, or systems, with personnel and human resource management, and with accounting management.

Direction-setting processes are concerned with setting strategy for the organization, its markets and the location of resources as well as managing change within the organization. Direction-setting processes involve a mix of the prescribed steps within a formal planning process and also less well-defined frameworks.

Managerial processes are to some extent superordinate to the other categories and contain the decision-making and communication activities. For example, the entrepreneurial, competence-building and renewal processes proposed by Ghoshal and Bartlett[20] are managerial processes. Some organizations have tried to formalize these processes and have adopted a structured approach to, for example, decision making and communication.

This categorization, like any other, does not necessarily fit with the view taken by all organizations (for example, some organizations would position the direction setting processes as part of their operational processes) but it provides a useful framework for discussion of the research findings, and for describing propositions for further research.

Discussion and propositions arising from the research

The six clusters identified in the findings of organization co-ordination - process definition, organization structuring, cultural fit, improvement and measurement can be considered in the light of these process definitions. The issue of process definition at a top level is a view of how organizations work to satisfy strategic intents. The translation of top-level architecture into an operational reality is influenced by aspects of organizational culture which affect both organizational co-ordination and organizational structure. In no cases is the disappearance of functions apparent; rather the functional organization is replaced by a matrix structure. This form of organizational structure derives its coordinating strength from the formation of cross-functional teams. The issues of measurement and improvement reflected in the findings reinforce the need for effective measurement which drives process improvement in a form which co-ordinates and prioritizes activity; something which many organizations find difficult. The findings suggest that taking a business process management approach is one way to overcome some of the difficulties.

It is our observation that organizations in approaching business process management tend to initially address their operational processes, then move to focus on support processes, while continuing to improve their operational processes, and next to focus on direction setting processes while continuing to improve operational and support processes. Thus there is a similarity to the operations management sandcone model, as proposed by Ferdows and De Meyer[36], used to show that cost reduction relies on the cumulative foundation of improvement in objectives. We propose that an organization’s approach to process management is similarly constituted by its approach across process categories, and that to build a stable sandcone the approach to, first, operational processes must be created (see Figure 2).

This proposal has practical value, since it is the operational processes that directly impact on customers and so can yield quick benefits. Thus attention to the operational processes ensures capability of delivery; attention then moves to encompass support processes, since these in turn ensure the capability of the operational processes; attention to the direction setting processes recognizes that capability can only be maintained with good direction setting. The superordinate nature of managerial processes positions them outside the sandcone, with influences from the other categories.

This sandcone model for business processes implies further propositions based on our findings.

- \( P1: \) As organizations develop their approach to business process management, moving through the sandcone, the appropriateness of techniques will change.

Flowcharting methods are well tested in understanding operational and some support processes. However, the organizations in this phase of our research were discovering that such methods were inflexible for other types of process. The appropriate methodology for understanding the managerial and direction-setting processes may lie in the fields of systems thinking[37] and business dynamics[38] and the shape of a process for managing such processes needs further attention. Thus the appropriateness of “soft mapping” techniques increases as an organization moves through the sandcone.
P2: As organizations move through the sandcone there is an increasing impact on organization structure, with the need to address structural changes to reap the benefits from the process approach.

Increasingly organizations will need to consider organization design as an explicit, rather than implicit, activity to ensure organizational effectiveness. This need not necessitate a move towards a complete process-based structure, but may mean a trade-off between process and functional structures[39]. This trade-off includes the need to consider factors such as personal relationships and cultural aspects. For example, in some organizations a purely process-based structure will be appropriate while in others the process-function matrix approach will be best utilized.

P3: We propose that there is an increasing need for maturity in TQM throughout the organization to ensure a successful process paradigm, as the organization moves through the sandcone.

This raises the immediate question as to whether TQM is a necessity before a process-based approach can be effectively initiated. Certainly all organizations in this phase of our research had developed a TQM-based culture. It also raises questions as to whether the continual application of the radical end of the BPR spectrum[28, 29, 30] makes it impossible to address all process categories, with the associated lack of care for the human dimension and resulting demoralized workforce.

P4: We propose that the degree of co-ordination across the organization increases with moves through the sandcone. As the process approach spreads through the sandcone it forces the question of what integration actually means for an organization and clarifies the requirements for co-ordination. This is readily understood for operational processes, with a key element being the elimination of barriers to flow. The co-ordination includes the need for a co-ordinated approach to measurement (an example is illustrated in the measurement section above).

Further implications for operations management

There is a clear message emerging from this research of the need to manage the boundaries between the categories of processes and between the processes themselves. The appropriate approach will be determined by the category of process being addressed and organizations may find the sandcone logic useful in placing their current position. There are different requirements at different points in the sandcone: knowledge and understanding of process flowcharting techniques at one end of the spectrum through to knowledge and understanding of “softer” mapping techniques; the need to consider the appropriate organization structure and trade-offs between process- and function-based structures; the degree of maturity in TQM; the degree of co-ordination desirable and possible and, in particular, the need for a co-ordinated approach to measurement.

The research supports a view that there is a need to consider performance improvement methods and concepts such as TQM, lean production and supply and “agile” manufacturing in a wider context, as applied to all business processes, and not just operational processes with the associated need to manage the interfaces between operations management and other disciplines.
Figure 2A sandcone model for developing approaches to business process management

References


Mumford, E., Hendricks, R. (2), "Business process re-engineering RIP", *People Management*.


Wheeler, D.J. (1993), Understanding Variation - The Key to Managing Chaos, SPC Press, Knoxville, TN.

CIM-OSA Standards (1989), CIM-OSA Reference Architecture, AMICE ESPRIT.


