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In this issue:

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An Investigation of the Methodologies of Business Process Reengineering

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Abstract

Companies continue to reexamine and fundamentally change the way they do business. Intense competitive pressures and a sluggish economy provide the motivation for continued efforts to "deliver more with less." Properly executed, reengineering can be an effective tool for organizations striving to operate as effectively and efficiently as possible. This study examines various methodologies of business process reengineering (BPR) and the reasons for failure of BPR efforts. Our examination of BPR research shows that companies need a BPR methodology that takes a holistic and systematic approach.

Keywords: Business process reengineering, business process improvement, business process reengineering methodology, holistic approach

1. INTRODUCTION

Business Process reengineering (BPR) is the redesign of business processes and the associated systems and organizational structures to achieve a dramatic improvement in business performance. BPR is not downsizing, restructuring, reorganization, automation, or new technology. It is the examination and change of five basic business components: strategy, process, technology, organization, and culture.

BPR, as a term and as a practice, has a short but a complicated history. Reengineering became very popular in the early 1990s. However, the methodology and approach were not fully understood or appreciated. Some improvement projects given the title "BPR" were poorly planned and executed, and the term came to be viewed by many in negative terms. Employees and organizations cringed at the thought of another "BPR" experience. Towards the end of the 1990s and after 2000, the term itself is used less often, or is changed so that the projects are not associated with the "BPR" of the past.

Despite abuses of the practice and the negative associations of the name, the practice of redesigning business processes along with associated technologies and organizational structures is more popular today than ever. Companies continue to reexamine and fundamentally change the way they do business. Intense competitive pressures and a sluggish economy provide the motivation for continued efforts to "deliver more with less." Properly executed, reengineering can be an effective tool for organizations striving to operate as effectively and efficiently as possible.

2. BACKGROUND

The continuing demand for business process improvements has resulted in a proliferation of consultants, methodologies, techniques, and tools for conducting BPR projects (Kettinger, Teng, and Guha 1997). In fact, the market is flooded with methodologies for BPR. The situation is further complicated by the fact that business processes are different in different industries, and methodologies must be tailored to the processes of each specific industry.

A report by Prosci (2003) states that good reengineering projects design and implement solutions that are customer focused, capitalize on best practices and learning from others, are designed for the future, and produce significant bottom-line improvements for the business.

The above guidelines provide a basic framework for judging the effectiveness of a BPR project. The methodology selected for each specific project impacts

the size of the improvement and how fast the improvement will be realized.

The initial period of BPR was characterized by a chaotic "trial and error" approach and a lack of universally accepted methods. A study done by Kettinger et al. (1997) places these methodologies, techniques and tools (MTTs) into a classification framework that permits project planners to assess the "fit" between their unique organizational problems and available MTTs. Methodologies are considered the highest level of abstraction for conceptualizing problem solving methods. At the next level of abstraction, a technique is commonly understood to be a procedure or a set of specific steps for accomplishing a desired outcome. At the lowest, most concrete level is the tool, which typically refers to instruments or certain tangible aids in performing a task. In the Kettinger et al.'s study (1997), a tool is defined as a computer software package to support one or more techniques**.**

A typical methodology developed by Gateway, a BPR consulting firm, helps illustrate three levels of abstraction of MTTs for BPR. The Gateway methodology consists of six stages: preparation, identification, vision, technical design, social design, and transformation. Within each stage, there are many specific activities. As a part of the vision stage, for instance, one of the activities is to "identify value-adding activities" To accomplish this effectively, a technique called activity-based costing (Tunney and Reeve 1992) can be used in conjunction with a software tool called Easy ABC-Plus developed by Cost Technology Inc.

Kettinger et al. (1997) use eleven categories of BPR techniques, which were identified by the researchers through an iterative process of literature research, classification and Q-sort. These categories can be used as a "primary index" for understanding and learning reengineering techniques. Primary indexes, in turn, are subdivided into "secondary indexes." For example, the "creative thinking" category contains techniques such as brainstorming, nominal group technique, out-of-the-box thinking and force field analysis, all of which encourage unrestrained development of ideas aimed at identifying alternatives in problem formulation and solving. Many techniques belong to a single category, while others are assigned to more than one category. These categories and typical techniques are listed below:

- Project management: budgeting, project scheduling (PERT, CPM, Gantt)
- Problem solving and diagnosis: fishbone diagramming, Pareto diagramming, cognitive mapping
- Customer requirement analysis: QFD, benchmarking, focus groups
- Process capture and modeling: process flowcharting, IDEF, role activity diagramming, speech interaction modeling
- Process measurement: activity based costing, statistical process control, time motion studies
- Process prototyping and simulation: hierarchical colored petri net, role playing, simulation techniques
- IS systems analysis and design: software reengineering, CASE, JAD/RAD
- Business planning: critical success factors, value chain analysis, core process analysis
- Creative thinking: visioning, out-of-box-thinking, affinity diagramming, the Delphi method
- Organizational analysis and design: employee and team attitude opinion assessment, job design, team building techniques
- Change management: search conferences, assumption surfacing, persuasion techniques

Techniques for project management, problem solving and diagnosis are essential for management and basic problem analysis of all projects, regardless of their particular characteristics.

Fitzgerald and Murphy (1996) state that since BPR is considered by much literature as automatically good for an organization, there have been few reports of actual BPR failures. Estimates of failure rates vary: Caron, Jarvenpaa, and Stoddard (1994) report a 50 % failure rate, while Murphy (1994) reports a failure rate of 70 %. As a result, many companies only begin to consider BPR when they are faced with a survival-threatening crisis and radical surgery is required. One example is Rank Xerox, which was forced to reengineer its business processes when their market share plummeted from 90 percent to 9 percent following the entry of Japanese competitors into their marketplace (Hammer and Champy 1993).

One of the key issues in BPR is "how" questions. Because of the high failure rate of BPR projects and the high costs and effort involved, it is important that companies use a structured approach to reengineering. Andrews and Stalick (1992) have argued for a systemic approach to BPR, suggesting that "reengineering . . . should be based upon numbers and facts, not guts and politics." BPR projects cannot be planned meticulously and organized into precise steps prescribed as universally applicable in all situations (Caron *et al*. 1994; Hammer 1990). Nevertheless, since BPR requires a fundamental reappraisal of business operations, a methodology that can act as an anchoring framework to coordinate the complex web of BPR activities is essential. It is also important to have clear progress guidelines. Many researchers have noted that BPR projects often confuse motion with progress and charge about in random directions hoping that any recommended changes can be successfully implemented as a matter of course (Evans 1993). Caron *et al*. (1994)

state that implementing BPR recommendations may require a fundamental change in organizational culture and mind-set, and that this cannot be left to chance but must be carefully managed. They also argue that transparency in BPR projects is vital and must intensify as the project proceeds.

3. INVESTIGATION OF BPR METHODOLOGIES

Valiris and Glykas (1999) state that methodologies exist to solve many frequently occurring problems. They consider a problem to be any expression of concern about a situation and regard a methodology as a structured set of guidelines (or principles) that enable an analyst to derive ways of alleviating this concern. According to Valiris and Glykas (1999), the central concerns that BPR methodologies try to alleviate stem from differences between business activities and organizational strategy, and between current and desired productivity of organizational resources.

They classify existing BPR methodologies into two main categories according to the approach they take to BPR: management accounting and information systems (Figure 1). They also identify a new trend: methodologies that view BPR from an organizational theoretic perspective and concentrate on the understanding and analysis of the organization by using principles such as accountabilities and the role of individuals in business processes.

Davenport and Short (1990) prescribe a five-step approach to BPR:

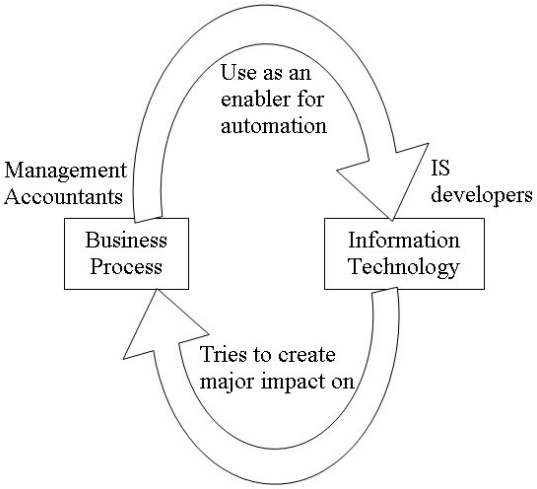

Figure 1: Two Different Approaches to BPR (Valiris and Glykas 1999)

Step 1 – Develop a business vision and process objectives: BPR is driven by a business vision that implies specific business objectives such as cost reduction, time reduction, output quality improvement, QWL/learning/empowerment.

Step 2 – Identify the processes to be redesigned: Most firms use a high-impact approach that focuses on the most important processes or those that conflict most with the business vision. Not many firms use an exhaustive approach that attempts to identify all the processes within an organization and then prioritize them in order of redesign urgency.

Step 3 – Understand and measure the existing processes: Avoid the repeating old mistakes and provide a baseline for future improvements.

Step 4 – Identify IT levers: Awareness of IT capabilities can and should influence process design.

Step 5 – Design and build a prototype of the new process: The actual design should not be viewed as the end of the BPR process. Rather, it should be viewed as a prototype, with successive iterations. Prototypes help produce quick delivery of results when projects are implemented, improving performance and customer satisfaction.

Fitzgerald and Murphy (1996) made use of their practical experience with systems development methodologies and combined this with specific BPR methodological guidelines from current literature. The relevance of systems analysis is confirmed by Earl (1994), who sees it as an essential skill in BPR. As discussed earlier, many BPR researchers have stated that BPR projects cannot be planned meticulously in small precise steps. However, Evans (1993) adopts a bridge metaphor to suggest a broad framework for BPR projects. Evans proposes four general stages:

Stage 1: To Be: Define where the organization wants to be and what it requires of its business processes as a consequence.

Stage 2: As Is: Define current business processes.

Stage 3: The Plan: Make a plan to accomplish the move from the “as is” stage to the “to be” stage.

Stage 4: The Crossing: Implement the plan.

Although Fitzgerald and Murphy (1996) acknowledge the fact that this general high-level approach has its advantages, they argue that it has weaknesses as well. One weakness is that it tries to build a vision of the future process before understanding the current process. This requires a fresh and open mind, but it must be

grounded in a thorough understanding of the operation of the current process. The term "process" in business process reengineering means differentiating between the logical activity of what the process does or should do and the physical manifestation of how the process is accomplished.

Fitzgerald and Murphy (1996) adapt the structured approach to devise their BPR methodology. The methodology is expressed as a series of phases, each of which addresses a basic question. These are summarized below:

- Select the process to be reengineered: "Where are we going to start?"
- Establish process team: "Who is going to do it?"
- Understand the current process: "Where do our stakeholders see us now?" This phrase also establishes the current physical to logical mapping of the process.
- Develop a vision of the improved process: "Where do our stakeholders want us to be?" In this phase, the new logical model of the process is defined.
- Identify the actions needed to move to the new process: "What do we need to achieve?" Here, the new physical process model is established.
- Negotiate/execute a plan to accomplish these actions: "How will we achieve it?"

The methodology is expressed from a first-person point of view, reflecting the fact that culture and mind-set changes are required. These can only come from within the company itself, not from actions taken by external consultants.

The methodology is based on an iterative approach. At any stage, it is permissible (and may indeed be desirable) to revert to a previous stage for further refinement. In practice, processes that work well during later phases often go through considerable revision and reconsideration in earlier stages.

As in the development of any methodology, Fitzgerald and Murphy (1996) mention the need to test a new model so it can be verified empirically and validated and modified as appropriate. In the case of BPR, this poses a problem since a typical reengineering project can last between one and two years. It has been argued that BPR efforts cannot be uniformly applied across different cultures but need to be tailored to the specific contingencies of the situation (Murphy 1994; Caron *et al*. 1994). For these reasons, Fitzgerald and Murphy (1996) propose an action research approach described in Figure 2.

According to the report by Prosci (2003), the recommended approach for a business process reengineering project includes the following phases:

- Project planning and launch: team selection, objective setting, scope definition, methodology selection, schedule development, consultant selection, sponsor negotiations, change management planning, and team preparation
- Current state assessment and learning from others: high-level process definition, benchmarking, customer focus groups, employee focus groups, and technology assessment
- Solution design: process design, enabling technology architecture, organizational design, and job design
- Business case development: cost/benefit analysis, business case preparation, and presentation to key business leaders
- Solution development: detailed process definition, system requirements writing and system development, training development, implementation planning, operational transition plan, and pilots and trials
- Implementation: larger-scale pilots and phased implementation, measurement systems, and full implementation
- Continuous improvement: on-going improvement and measurement of new processes and systems

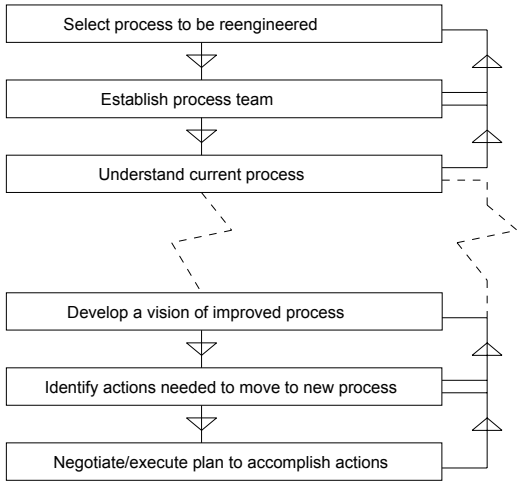

Figure 2: A Methodology for Business Process Reengineering (Fitzgerald and Murphy 1996)

When asked about what they would do differently next time, participants in Prosci's benchmarking research made the following suggestions:

- Spend more time for planning. Many participants would extend the overall interval, if necessary, to ensure that planning is comprehensive. Planning

activities that should receive more focus include the following:

-learn about BPR and best practices before starting the project
-establish clear objectives and scope
-carefully select a reengineering methodology
-clarify roles and contributions from managers and team members
-prepare the team for reengineering

- Increase team training on reengineering and change management.
- Carefully select team members to ensure they have the competencies to ensure a successful reengineering project (the best, brightest, most respected and well-networked in the organization). Seek team members who can be dedicated to the project (more than 80% of their time is devoted to the project).

Prosci (2003) found the following startup activities to be of most importance:

- Secure executive management support and sponsorship.
- Communicate the need for change throughout the organization.
- Define the scope and boundaries of the project clearly.
- Establish measurable objectives for the project.
- Select team members with experience, skills, leadership, and full-time availability.
- Train the team on business process reengineering techniques and tools.

Figure 3 summarizes this process and shows decision points and deliverables.

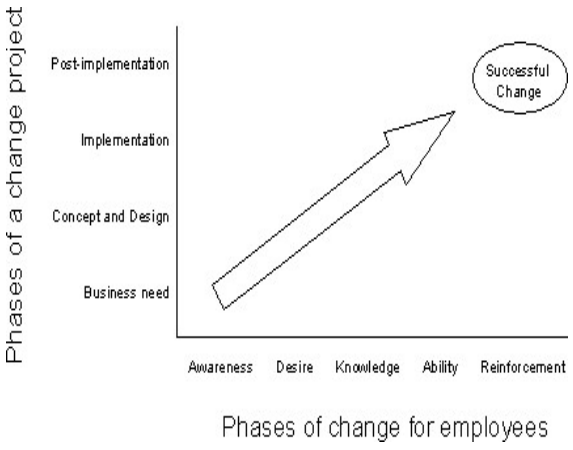

Figure 3: Business Process Change Phases

Another important decision to be made when starting a BPR project is with whether to use a continuous-improvement methodology or a business process reengineering (BPR) approach. The three major differences between the two are: 1) the BPR goal is to achieve a breakthrough gain and achieve dramatic process performance, 2) BPR is not a continuous improvement, and 3) typically BPR targets greater than 50% improvement.

Figure 4 shows dramatic performance improvement achieved by BPR.

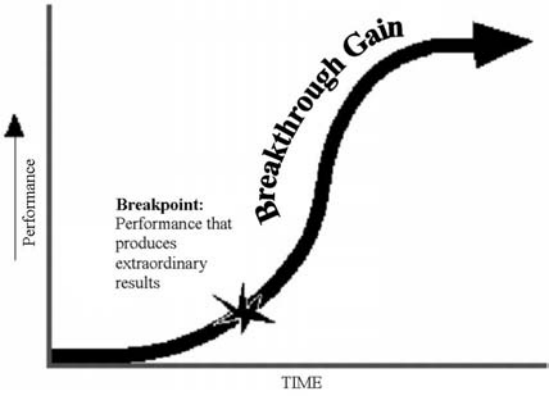

Figure 4: Dramatic Performance Improvement Achieved by BPR

Muthu, Whitman, and Cheraghi (1999) summarize methodologies previously investigated:

Activity	Methodology 1	Methodology 2
1	Develop vision & strategy	Determine customer requirements & goals for the process
2	Create desired culture	Map and measure the existing process
3	Integrate & improve enterprise	Analyze and modify existing process
4	Develop technology solutions	Design the reengineered process
5		Implement the reenfineered process

Activity	Methodology 3	Methodology 4	Methodology 5
1	Set direction	Motivating reengineering	Preparation
2	Baseline and benchmark	Justifying reengineering	Identification
3	Create the vision	Planning reengineering	Vision
4	Launch problem solving projects	Setting up for reengineering	Technical & social design
5	Design improvements	As Is description & analysis	Transformation
6	Implement change	To-Be design and validation	
7	Embed continuous improvement	Implementation	

Methodology #1: Underdown (1997)
Methodology #2: Harrison and Pratt (1993)
Methodology #3: Furey (1993)

Methodology #4: Mayer and Dewitte (1998)
Methodology #5: Manganelli and Klein (1994)

Based on the above five methodologies, Muthu et al. (1999) developed a consolidated methodology (Figure 5).

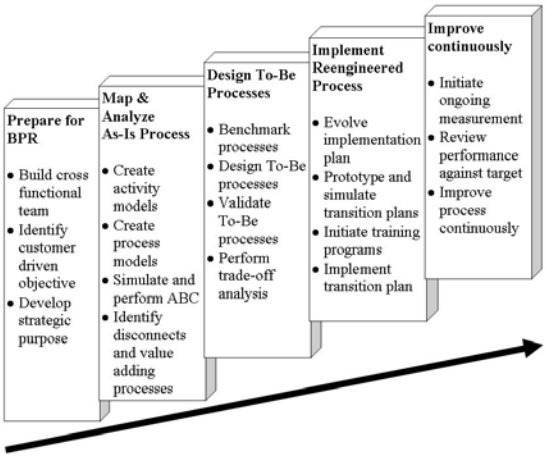

Figure 5: A Consolidated BPR Methodology (Muthu et al. 1999)

4. WHY BPR PROJECTS FAIL? WHAT CAN BE DONE ABOUT IT?

Malhotra (1998) estimates that 70% of the BPR projects fail and states that the most important obstacles are: 1) the lack of sustained management commitment and leadership, 2) the unrealistic scope and expectations, and 3) the resistance to change.

Based on interviews with BPR consultants', Bashein et al. (1994) outline the positive preconditions for BPR success: senior management commitment and sponsorship, realistic expectations, empowered and collaborative workers, strategic context of growth and expansion, shared vision, sound management practices, appropriate people participating full-time, and sufficient budget. They also identify negative preconditions related to BPR: the wrong sponsor, a "do it to me" attitude, an overly cost-cutting focus, and a narrow technical focus. Negative preconditions relating to the organization itself include: an unsound financial condition, too many projects under way, fear and lack of optimism, and animosity toward and by IS and HR specialists. To turn around negative conditions, firms should do something smaller first, conduct personnel transformation, and get IS and HR teams involved.

King (1994) views the primary reason for BPR failure as overemphasis on the tactical aspects while leaving the strategic dimensions unattended. He notes that most failures of reengineering are attributable to the process being viewed and applied at a tactical rather than strategic level. He argues that there are important strategic dimensions to BPR: developing and prioritizing objectives, defining the process structure and assumptions, identifying trade-offs between processes, identifying new product and market opportunities, coordinating the reengineering effort, and developing a human resources strategy. He concludes that the ultimate success of BPR depends on the people who do it and on how well they can be motivated to be creative and to apply their detailed knowledge to the redesign of business processes.

Prosci (2003) summarizes the mistakes commonly made by top management during a large-scale change:

- Not being directly involved with the project - this mistake occurs when the sponsor fails to keep informed about the project's progress, delegates sponsor roles to others, and does not intervene soon enough when problems arise.

- Sending inconsistent signals or not communicating enough - the following errors are typical of those cited: "tries to control things using old style of command - the message was mixed." "fails to communicate adequately with the staff" "dictates change without communicating the benefits"

- Ignoring the impact of change on employees - top management tends to focus on the business issues and neglect the employee side. Employees can become fearful and confused without adequate information and guidance.

- Shifting focus or changing priorities too soon - the fourth mistake of top management sponsors is changing their priorities midstream in the project, or diverting their attention to other areas before the project was through implementation. Projects can incur high resistance and require strong sponsorship not only at the beginning of the project, but also throughout their implementation.

- Not providing adequate resources - the fifth mistake is not providing Adequate resources, e.g., people, time, and money and failing to engage all management levels in the change. Sponsors tend to undermine efforts by not allocating resources appropriately and underestimate the amount of sponsorship time and effort required.

5. CONCLUSION: A HOLISTIC APPROACH TO BPR METHODOLOGY

An examination of BPR research shows that companies need a methodology that takes a holistic view of the organization. One notable BPR methodology is Agent

Relationship Morphism Analysis (ARMA) proposed by Valiris and Glykas (1999). This methodology combines accounting BPR principles (e.g., efficiency, effectiveness, and cost), organizational-theoretic concepts (e.g., roles and accountabilities), and some powerful systematic business modeling techniques applied from IS development (Figure 6).

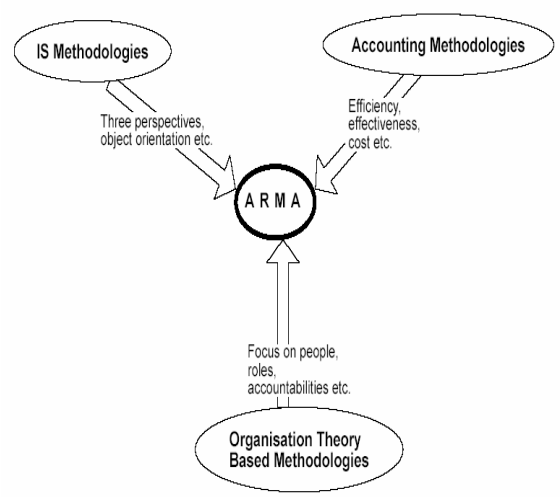

Figure 6: An Overview of ARMA (Valiris and Glykas 1999)

According to Valiris and Glykas (1999), ARMA highlights the importance of organizational strategy and its links to business processes throughout the redesign exercise. It also provides a set of modeling techniques, to support the modeling of business processes that go beyond the limitations of existing modeling techniques. It views the organization from both an individualistic (employee level) and a holistic (business process level) view, and integrates both static and dynamic aspects of the organization. The ARMA methodology presented by Valiris and Glykas (1999) may go beyond the limitations of other existing BPR methodologies because it takes a holistic and systematic approach to BPR.

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