CHAPTER 3

BUSINESS PROCESS REENGINEERING

Many organizations use BPR as a means to improve productivity and gain competitive advantage. A survey (Jackson 1997) of 180 U.S. and 100 European companies indicated that 75% of these companies engaged in significant reengineering efforts in the past three years. Regardless of the number of companies involved in reengineering, the rate of failure in reengineering projects is over 50% (Hammer and Champy 1993). Some frequently mentioned problems related to BPR include the inability to accurately predict the outcome of a radical change, difficulty in capturing existing processes in a structured way, the level of costs incurred by implementing the new process and inability to recognize the dynamic nature of processes.

BPR initiatives usually arise at the strategic level then promulgated to lower levels by a high-ranking champion, the Chief Executive Officer. A powerful champion is needed for BPR projects because process redesign crosses functional areas and affects the culture of the organization. Streamlining the processes by means of BPR often involves moving decision making to lower levels, thus changing the locus of power.

As the changes in business requirements and IT development increase steadily, organizations have dramatically redesigned their methods of doing business and their IT infrastructure to compete effectively in today's
global market. According to a survey of Business intelligence, BPR practices is carried out by 60% of the companies surveyed considered IT a critical enabler for their BPR effects.

In describing IT’s role in BPR, Chu et al (1996) state; “Most analysts view Reengineering and IT as irrevocably linked. Walmart, for example, would not have been able to reengineer the process used to procure and distribute mass-market retail goods without IT. Ford was able to decrease its headcount in the procurement department by using IT in conjunction with BPR, is another well known example.”

While software tools are useful in analyzing and modeling business processes. IT infrastructural enablers are also essential to the implementation of BPR (Duncan 1995 and Lyons 1997). However, results from CSC Index (1994) show that getting the information-systems and technology infrastructure in place is the most difficult aspect of BPR in both the United States and Europe. This explains the findings of a Delphi study of key Information System (IS) management issues, which shows that building a responsive IT infrastructure was ranked at the top of the list (Brancheau, Janz and Wetherbe 1996). The study also shows and suggests that BPR is a major driver for IT infrastructure-related change. It stressed that if companies are to succeed in today’s complicated environment, they need to build a reliable and responsive IT infrastructure.
3.1 BUSINESS PROCESS MODELING: CURRENT ISSUES

The increasing interest in organizational change and BPR by academia and industry has multitude of approaches, methodologies and techniques to support these design efforts. Kettinger, Teng and Guha (1997) conducted an empirical review of existing methodologies, tools, and techniques for business process change and developed a reference framework to assist the positioning of tools and techniques that help in reengineering strategy, people, management, structure and technology dimensions of business processes.

It is identified a need for more user-friendly multimedia process and software packages, which could allow easy visualization of business processes and enable team members to actively participate in modeling efforts. It is apparent that there is a lack of comprehensive, scientifically established design methodology to structure, guide, and improve business process modeling efforts. Many authors argue that a major problem that contributes to the failure of business process change projects is a lack of tools for evaluating the effects of designed solutions before implementation.

3.2 UNDERSTANDING INFORMATION TECHNOLOGY IN BPR CONTEXT: IMPERATIVE FOR SUCCESS

As BPR is an interesting concept, several researchers and practitioners have defined it in different ways. However, their overall emphasis is on redesigning business process using a radical IT-enabled approach to organizational change. This suggests the following four essential elements for BPR implementation.
**Business process:** BPR focuses on the core concept of business process rather than of function, product or service. Hinterhuber (1995) defines BPR as “a set of integrated and coordinated activities required for producing products or offering services”. A business process has structure, inputs, outputs, customers (internal and external) and owners (Davenport and Short 1990 and Hinterhuber 1995) and is built by integrating fragmented functions that contribute to its operation and internal and external flows (Andreu, Ricart and Valor 1997 and Hammer 1990). As business process are the manner in which work gets done within an organization, they are a distinguishing characteristic among organization and thus a factor leading to competitiveness (Hinterhuber 1995).

**Radicalness concept:** BPR involves radical and fundamental changes. Andreu et. al (1997) consider a change as radical, “if it breaks the implicit hypothesis on which the old way of doing things was founded” and think of the level of radicalness in terms of how innovation business has been done. While advocating the integration of BPR with total quality management (TQM), Harrington (1991) considered the magnitude of radicalness as the main difference between the two improvement approaches. This argument is ascertained by Andrew et al’s (1997) findings that radical change applies to BPR and the non - radical improvements belongs to TQM efforts. When it comes to the issue of whether BPR and that should follow a “clean slate” as suggested by Hammer (1990) and Hammer and Champy (1993), Davenport and Stoddard’s (1994) empirical study reveals that few organizations are able to follow this approach. However, Davenport (1993) suggests that BPR may use the clean slate thinking in the design for change but follows an evolutionary implementation taking the current state in to account. Due to the difficulty in identifying the appropriate degree of radicalness that particular BPR related
change project should reach to bring about the describer level of improvement, Kettinger, Teng and Guha (1997) develop a “project radicalness planning worksheet” technique that is based.

Organizational change: BPR results in change and successful BPR implementation requires fundamental organizational change in terms of organizational structure, culture, and management process (Davenport 1993). Change management is a tool used to manage such a change.

Though the aforementioned elements are recognized at a conceptual level, a misunderstanding has arisen ever how they are actually positioned. This, however, has been reflected negatively on both BPR concept and applications. Dickinson (1997) states that “We must not allow ourselves to lose the real potential of re-engineering itself.: A survey of 50 companies claiming to be reengineering their business processes showed that only 30% of these companies were engaged in efforts that lead to incremental changes. And that 28% were not doing BPR at all (Carr and Johansson. 1995). However, based on Hammer and Champy’s (1993) suggestion that BPR is the last chance for most American organizations to maintain their competitive positions, Green and Wayhan (1996) claim that making the distinction between BPR and other management techniques is likely to be vital for organization to be successful. The widely used techniques that are often confused with BPR are shown in Figure 3.1.
BPR is also confused with restructuring and reorganization of an organization because of their similarity in sound. However, these approaches are different in their motivations, outcomes and processes (Green and Wayhan 1996). Restructuring aims to reduce business capacity to meet lower demand and poor financial performance by eliminating unprofitable businesses or personnel (Markridakis 1996) through a downsizing program. While BPR might result in a reduction in organizational staff, it is unlike downsizing, which sets the reduction in personnel as its main target. Moreover downsizing does not entail reinventing business processes for strategic gains (Dickinson 1997 and Green and Wayhan 1996). In organization projects organizational structure is modified by delivering several levels of middle management (Green and Wayhan 1996) to notice the number of layers in the organization. In reorganization projects, focus is on the hierarchical structure of the organization.

**Technical approaches:** BPR is always mixed with two technical approaches: automation and software reengineering without IT. The sole automation of inefficiently designed business processes often fails (Dickinson 1997). It merely helps to “do the wrong things faster.” However, organizations that have embarked on BPR in conjunction with automation efforts were able to gain significant benefits from investing in new IT systems (Davenport 1993). On the other hand, the process of software reengineering aims, among other things, to use more cost-effective hardware or software platforms. Add new functions to existing systems, ease software maintenance and minimize its cost. Though it results in more efficient and faster systems and applications; Software Reengineering does not involve business-process redesign, although in many cases it is considered part of the BPR implementation process as a whole when it supports the newly designed business processes.

While software tools are useful in analyzing and modeling business processes. IT infrastructural enablers use of whether BPR should follow a “clean slate” as suggested by Hammer (1990) and Hammer and Champy (1993). Feasibility of IT to change process, process breadth, senior-management commitment, performance-measurement criteria, process functionality, project source availability, structural flexibility, cultural capacity for change, management’s willingness to impact people and value-chain target.

Most researchers and practitioners consider IT a major tool and a fundamental enabler for BPR efforts (Davenport 1993, Davenport and Short 1990, Grover, Teng and Fiedler 1993, Hammer 1990, McDonald 1993 and
Henderson and Venkatraman (1993). Hammer (1990) emphasizes the need to use modern IT to support and enable BPR implementation. IT reshapes business processes by facilitating the flow of information between globally distributed processes and ensuring that they are instantly and consistently available across the business.

3.3 ROLE OF INFORMATION TECHNOLOGY IN BPR

Several researchers have discussed the role of IT in BPR from different perspectives. Childe et al. (1996) classify IT and BPR under two groups: change technologies and support technologies. They describe support technologies as relating to implementing IS to support the process configurations needed. By change technologies, they mean analyzing, modeling, and mapping existing processes, assessing their efficiency and effectiveness, measuring performance, and providing structured support for the change project's management and associated planning and control functions. Lyons (1997) discusses the imperatives for effective use of IT in BPR. He sees the role of IT in BPR as having three major aspects:

- Knowing what new business opportunities are made possible with computer-based technologies.
- Building an active platform of systems and capabilities
- Focusing on the process of delivering new systems.

Based on their support of different business-process requirements, Lyons (1997) focuses on the types of support that various technologies can provide for various business-process requirements. He classifies them as: process integration and communication, process coordination and control, front-
end data capture and validation integrated work support, information storage and access, document management, process work support and process-systems development.

3.3.1 Benefit of IT-Enabled BPR

IT, when accompanied with BPR efforts, can provide business with a number of benefits such as cost reductions, time elimination and error minimization. However, there are other benefits that are mostly related to IT enabled process orientation. These can be summarized in the following.

**Enabling parallelism:** Moving from a sequential structure of process into a parallel one reduces the process' cycles time, problem resulting from delays, process disruptions, and handoffs. For example, a well-designed database that is linked to Computer-Aided Software Engineering (CASE) tools enables the exchange of design specifications to be used in redesigning process concurrently (Davenport 1993 and Hammer 1990).

**Facilitating integration:** Moving from the division of labor approach into the "case management" approach (Davenport and Nohria 1994) eliminates unnecessary tasks and improves communication and quality of services. Pacific Bell redesigned a Centrex telephone service process requiring 11 jobs, five days, and at least nine computer systems down to a single computer workstation delivering the same service in 2 days and one Centrex coordinator to interface with customers (Davenport and Nohria 1994).

**Enhancing decision making:** Reducing the number of levels in an organization’s hierarchies enhances the decision-making process. For example,
the Ford Motor Company shifted the payment-authorization task from the accounts payable to the receiving dock, resulting in an enormous reduction of workers from 500 to just 125 (Hammer and Champy 1993).

Minimizing points of contact: BPR, when combined with IT, eliminates intermediaries at different levels and reduces time and distance in the exchange of information required in any process (Grover, Fiedler and Teng 1994). Human mediation is an inefficient component that can be discarded and replaced with new IT-based, structured workflow processes. The use of conferencing technology and the Internet also enables an instantaneous exchange of business information around the globe.

3.4 BPR STRATEGY

The framework of IT infrastructure for BPR implementation is shown in Figure 3.2. Bhattacharya and Gibbons (1996) define a strategy as “a specific course of action designed to meet the business objectives. As business strategy determines objectives and guidance on how business capabilities can be best used to attain competitive advantage.” BPR strategy leads the process of changing business activities and workflow into integrated processes (Hammer 1990). Therefore, a careful alignment of businesses strategy with BPR strategy (Bruss and Ross 1993, Grover et al 1993 and Guha, Kettinger and Teng 1993) is crucial to the success of BPR efforts.
Figure 3.2 Framework of IT infrastructure implementation of BPR (Mashari and Zairi 2000)
Different authors have different views on BPR strategy development. Grover et al. (1994) found that many organizations implemented BPR through a systematic approach through which they can ensure a strong link between BPR and business strategies. They contend that identifying all of an organization's business processes establishes a long-term BPR program.

Edwards and Peppard (1994) argued that the gap between strategy formulation and implementation is bridged as BPR defines the business architecture that enables the organization to focus more clearly on customer needs. Edwards and Peppard (1994) differentiate between four types of business processes: competitive, infrastructure, core, and underpinning processes. They claim that a combination of both competitive and infrastructure processes directly supports business strategy.

Bhattacharya and Gibbons (1996) propose a framework of strategy formulation of BPR that focuses on core competencies and processes and defines a link between strategy and structure. Makridakis (1996) describes core competencies as "special skills or technologies that provide lasting competitive advantage to firms." They consider core competencies, capability, functions, and processes as three dimensions to link strategy to structure. In their view, competency and capability form the core of the strategy content, while processes form the core of organizational structures.

Huizing, Koster, and Bouman (1997) study how organizations align their strategy to their environment and bring internal factors (such as structure, systems, style, and culture) in line with their strategy to maintain a balance in the process of BPR-related organizational change. Their study shows that five dimensions of change have to be correctly matched to ensure an integrated and
successful implementation of BPR—breadth, depth, level of ambition, planning and coordination. They conclude that distinguished dimensions of organizational change have to be balanced and, if mismatches occur, rebalanced.

Schmidt (1998) argues that there is a mutual relationship between a firm's strategy and processes. He believes that, in addition to a traditional "process follows strategy" understanding, which entails that strategies are implemented by means of processes to achieve competitive advantage through core competencies, there is an opposite direction, "strategy follows process," that is implemented by transforming a company's core processes into strategic capabilities that provide superior value to the customer. Overall, there seems to be no single approach that is appropriate all the time for BPR strategy development. Rather, depending on the business case for change and the current business position in the market, this process may be approached in different ways.

3.5 INFORMATION SYSTEM

Information system integration for BPR can be viewed as the extent to which various information systems are formally linked for the purpose of sharing complete, consistent, accurate, and timely information among business processes (Bhatt 1996). Data integration and communication networking are the most important enablers for information system integration. Within an integrated organization, a full set of integrated information system use a common IT infrastructure, which enables data sharing and communications to support all business processes (Murray and Lynn 1997). The new advanced techniques offer better mechanisms for integrating various organizational
information system that support business processes with their information needs (Bhatt 1996, Duncan 1995 and Murray and Lynn 1997).

Data-integration technologies have evolved over a time to respond to the increasing need to develop a mechanism by which organizations can align their processes with those of their customers and suppliers. With the recent move toward open architectures and the use of client-server technology, there appears to be a greater focus on developing integration tools. The Internet and Intranet technologies are increasingly used to support integration of wide-area heterogeneous information repositories. Enterprise resource planning (ERP) packages such as SAP/R3 is also used to integrate major systems within the organization (e.g., manufacturing, financial, and supply-chain management).

A recent survey of critical issues in information system management shows that companies are still dominated by function-based software development approaches, despite their accumulating experiences in BPR for six years and the advancing techniques of supply-chain management (Lyons 1997). This indicates a gap between the way business process are being redesigned and the approaches used to develop their supporting information systems. At the heart of many BPR projects failure is the development of information systems based on traditional approaches that are function-based (Gerrits 1996 and Lyons 1997). However, advanced technologies, such as the Intranet, Internet, some ERP and workflow computing, are useful in connecting functionally organized systems and data across function boundaries and thus provide opportunities to build process-oriented applications (Lyons 1997).
3.6 MANAGEMENT PERCEPTION

BPR, is undoubtedly the most influential development in management thinking in the 1990s. Although BPR seems to have run its course as companies turn from an efficiency focus to a search for new growth, reengineering concepts have been driving organizational change in many leading North American and European companies.

Hammer and Champy (1993) enunciate principles of business process design. In particular, they advocate a reintegration of industrial work, reversing the trend toward specialization and division of labor that has been with us since the early industrial revolution. Also Hammer and Champy advocate dramatic change, as opposed to an incremental or evolutionary approach, in implementing new process designs and associated organizational structures. Indeed, many managers’ primary association with the term ‘reengineering’ is the bold approach to change management advocated by Hammer and Champy.

Leaving aside the important subject of change management, this research work focuses attention on principles of business process design. A large body of knowledge associated with process design has been developed by Practitioners and scholars over the last century. At this time when BPR is subsiding, it is natural to ask which of its precepts are likely to endure, and how they relate to the pre-existing.

The reengineering movement has made an important contribution simply by putting in the foreground of top management concern the operations side of business through which work in routinely accomplished, without the wasted effort and fire fighting that characterize inefficient operations. By
focusing attention on processes as the means of achieving effective operations, reengineering leaders have reinforced a central theme of the 1980s quality movement. The process design cycle is summarized in Figure 3.3. To be effective, organizations must put creative energy into the design, documentation and maintenance of processes that satisfy customer needs on a routine basis. Workers must understand the overall function of core business processes, and performance must be measured in terms of value delivered to customers.

**Figure 3.3 The Iterative Cycle of Process Design (Christoph Lock 1998)**
3.6.1 Organizational Transformation

The process oriented approach enables the implementation of the new process and work characteristics, by making information available in a decentralized way and by automating routine tasks and the new world of work are referred to as 'process orientation' and summarized in Figure 3.4.

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<tr>
<th>Rethinking Process</th>
<th>The new World of Work</th>
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<tr>
<td>• Process steps performed natural</td>
<td>• Work units from functional to process oriented</td>
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<tr>
<td>order</td>
<td>• organization from hierarchical to flat</td>
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<tr>
<td>• reduced checks and controls</td>
<td>• jobs from simple tasks to multi dimensional</td>
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<tr>
<td>• minimized reconciliation</td>
<td>• people's roles from controlled to empowered</td>
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<tr>
<td>• several tasks combined into one</td>
<td>• job preparation from training to education</td>
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<tr>
<td>• workers made decisions</td>
<td>• performance measures from activity to results</td>
</tr>
<tr>
<td>• processes have multiple versions</td>
<td>• advancement from performance to ability</td>
</tr>
<tr>
<td>• work done where it makes the most</td>
<td>• Values from protective to productive</td>
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<td>sense (incl. Customers and suppliers)</td>
<td>• Executives from store-keepers to coaches</td>
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<td>• hybrid centralization</td>
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<td>• case manager as single point of</td>
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<td>contact</td>
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Figure 3.4 Principles of Process Orientation (Hammer and Champy 1993)

The 'new world of work' refers to 'implications (of fundamental changes in business processes) for many other parts and aspects of an organization'. These implications are in the organization (flatter and process—rather than functional-oriented), the workers' capabilities, performance measurement, and the organization's culture and values. It is, however, misleading to view these changes only as results of process reengineering; they are at the same time essential enablers of reengineered processes. Workers cannot perform integrated work or make decisions without first acquiring the capabilities to take on the additional functions. Similarly, without appropriate
customer-oriented performance measures that relate an individual's activities to
the overall process purpose, workers may revert to pursuing narrow and
possibly dysfunctional goals. Finally, in a decentralized process with delegated
decision power, it is impossible to fully monitor everyone's individual
contribution. If culture and values do not support responsible behavior,
decentralization and delegation may lead to prohibitive abuse. Indeed, it
introduces the business diamond, where process design, jobs, performance
measurement, and values are depicted as forming an iterative cycle.'

How then, do the process design principles relate to operation and the
processing network paradigm? In Figure 3.5, the principles (excluding the IT
enablers) under the process specification questions from Figure 3.3. The first
three principles relate to defining a task structure, such as performing steps in a
natural (e.g. parallel) order. We also find principles about upgrading resource
capabilities, assigning tasks to resources (e.g. combining tasks and delegating),
system status information (hybrid centralization via IT), and performance
measurement.

It becomes clear that the principles in the first six categories in Figure
3.5 harmonize with the process specification step in Figure 3.3. The principles
mainly relate to the left-hand step of the process design iteration in Figure 3.3.
Thus, BPR is heavily oriented toward process specification, but has little to say
about process design evaluation. On the other hand, the BPR principles of
values and culture, as well as the shape of the organizational structure, are
outside the processing network paradigm. They are clearly important since
organizational structure may influence the ease of co-ordination across units,
and values may impact how well workers are willing to perform without being
monitored.
1. **Define task structure**  
   - Process steps performed in natural order  
   - Reduced checks and controls  
   - Minimized reconciliation

2. **Determine resource capabilities**  
   - Jobs from simple tasks to multi-dimensional  
   - People's roles from controlled to empowered  
   - Job preparation from training to education

3. **Assigning tasks to resources**  
   - Several tasks combined into one  
   - Workers make decisions  
   - Work done where it makes the most sense (incl. Customers and Suppliers)

4. **Devising a method of system status reporting**  
   - Hybrid centralization/decentralization

5. **Case manager as single point of contact**

6. **Assessing individual contribution**  
   - Performance measures from activity to results  
   - Advancement from performance to ability

7. **Fostering values and culture**  
   - Values from protective to productive  
   - Executives from store keepers to coaches

8. **Process-centering the organization**  
   - Work units from functional to process-oriented  
   - Organizations from hierarchical to flat.

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Figure 3.5  Principles in Processing Network (Hammer and Champy 1993)
Based on this comparison between process design principles and the processing network paradigm, we come to the conclusion that BPR has made a very important contribution to the specification aspects of process design. First, BPR has elevated process management and operations to the attention of top management. Scholars and practitioners in strategy and organizational behavior have adopted the concept of a process in their thinking. Second, BPR has emphasized that in many cases major improvements can be achieved by creatively rethinking the basic structure of processes which have not been examined for a long time. An operation has tended to take basic process structure as given and to concentrate on sophisticated but formal improvement tools. Third, the BPR literature has collectively illuminated the fact that IT is a key enabler for effective processes and has the potential of shifting tradeoffs in the decentralization of decisions and in work automation and simplification, and fourth, BPR has attempted to present the manager with an integrated approach by tackling together the issues of process design (where to go) and change management (how to get there) These are conceptually separate, but represent two parts of the same problem for the manager facing severe performance problems.