BUSINESS PROCESS REENGINEERING: A PROCESS BASED MANAGEMENT TOOL

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Abstract

Purpose – Business systems are made up of processes. Processes are collection of activities of businesses that results in an output. And when processes become old and inefficient and can't deliver results they must be redesigned or replaced. Business process reengineering is a tool for transformation of business process and unconstrained reshaping of all business processes. This study uses case and critical literature analysis (CLA) to investigate and focus on the development of business process reengineering (BPR) application concept and its outcome to the industrial set-up (service giving and manufacturing).

Approach/methodology – The goal is achieved by case and critical literature analysis (CLA). The case validates its result and justifies its practicality. This study contributed in the context of BPR as a process based management tool for selecting, managing and reengineering selected processes for overall manufacturing or service quality improvement.

Findings – In this study, a series of manufacturing processes and a framework for the guidelines of modeling has shown. Core processes of different industries has presented in effective manner. These validates that business process reengineering is a process-based management tool that can deliver both, either redesign or replace inefficient processes, as required, with a breakthrough result. It can be applied to single, group or entire processes comprising the organization.

Practical implications – On the basis of presented case study & process modeling guidelines the managers can use BPR to redesign their inefficient processes.

Originality/value – This approach suggests adopting BPR at any cost as a tool to improve all business processes as well as overall productivity and performance by managing their whole process. Case study motivates practitioners/managers towards reengineer and manages their business process.

Keywords: business process reengineering, BPR application, business process, process modeling, process improvement/management, quality management.

1. INTRODUCTION

Business process reengineering is not an unknown word to the business world. It has become a most popular process management tool in business sector and attracted great attention from manufacturers, practitioners, and academicians (Goksoy et al., 2012). Most companies are still searching for a method to better manage radical change (Grover & Malhotra, 1997). Academicians and researchers are studying the phenomenon but very less articles have been published. Many basic questions remain unanswered. What does reengineering involve? Are there methods for effectively accomplishing BPR? Why is it so popular? Is there logic behind reengineering? The organizations that do not change according to environment will disappear from the markets (Nisar et al., 2014; Habib & Shah, 2013). Habib and Shah (2013) concluded that change is a continuous process which forces firms/or companies to adjust and readjust their activities (process and services etc.) with every passing day. Goksoy, A., Ozsoy, B., & Vayvay, O. (2012) considers BPR as a strategic tool for organizational change; and stated that firm needs to bring moderate change every year and undergo a major change almost every fifth year if they want to survive in present competitive environment.

The Business Process Reengineering (BPR) is a tool to make a business process efficient in time and cost (Hussein et al., 2014; Essam & Mansar, 2012). It is the only one (consistent) tool (if applied properly and carefully) will produce ground breaking result was said by Weerakkody, V., Janssen, M., & Dwivedi, Y. K., 2011; Goksoy et al., 2012. Typical BPR highlights "process innovation". This identifies processes to be redesigned at first and then, through brainstorming, prototypes of the processes are built. To make BPR more effective, it is necessary to manage and analyze the business system in perspective of all tasks and processes (Freedman, 2013).

In response to this competitive pressure, customer demands and ever-changing regulatory conditions, many companies are fundamentally rethinking the way they do business (Goksoy et al., 2012; Jamali et al., 2011; Rahali et al., 2008). The reality of the current business environment, whether it is service giving or manufacturing, is expressed by fierce competition, globalization, liberalization and privatization (Ishvarsinh, 2014). The business environment has no mercy for inefficiency and weakness (Afsarmanesh & Camarinha-Matos, 2004). Either you re-engineer your business and shape up to the demands of the global situation or you go out of business.

Regardless of the size or the type of business a company is involved in, there are processes and operations that could be done better than they are currently being done. Improving and managing their business process is a necessity for businesses to stay competitive in today's marketplace. Over the last decade, companies have been forced to improve and manage their business processes because the customers have become more demanding for better products and services (Hussein et al., 2013; Dutta, 2007). And if they do not get what they want from one supplier, they have many others to choose from (hence the competitive issue for businesses). Traditionally many companies began business process improvement with a continuous improvement approach (Dogra et al., 2009). This approach attempts to understand and measure the current process and make gradual improvement overtime.

This method of improving business process is effective to obtain gradual, incremental improvement. However, over the last 10 years several factors have accelerated the need for a rapid improvement to business processes (Pettinger, 2013; Bughin et al., 2013).

Business Process Re-engineering (BPR) is the term used to express the process of optimizing organizational processes and structures for best possible end result. Process Re-engineering can be applied to the whole organization (Goksoy et al., 2012), part of the organization or to a single unit with in the organization. Business Process Re-engineering has been practiced as a formal discipline since the early 1920's (Goksoy et al., 2012). Then it was known as "Methods and Procedures Analysis," always searching for new ways of restructuring workflow or improving business organizations. However, the main focus of the paper will remain on discussing BPR as tool for processes change and its management.

Business process reengineering is a tool for process change and management. Thus, it is important to develop a base regarding the need for change and why firms should bring change (Habib & Shah, 2013). Redesign business process is only one aspect of the process management. At least three kind of process management can be identified: management of outgoing business processes; management of improved business processes; management of reengineering business processes (both internal & external) (Rahali et al., 2008).

In this Paper, the following elements, which are considered the backbone of business process reengineering, are dealt with. First, overall assessment of the business process of companies will be considered. Then, how companies can identify their business processes (that is, process mapping) will be assessed. After that, guidelines of process modeling & a method for selecting the process that should be reengineered will be taken up. Then, understanding of the selected process, redesigning the selected process and implementation of the selected process will be considered in a sequential order.

2. BUSINESS PROCESS REENGINEERING (BPR)

Business Process Re-engineering is one of the rising and best growing management tools (Goksoy et al., 2012; Jamali et al., 2011; Jain et al., 2010; Grover & Malhotra, 1997) that aim at optimizing organizational resources for most excellent end result (Rigby, 2013). It is the redesign of business processes and the associated systems and organizational structure to achieve a dramatic improvement in business performance (Saleem, 2012; Goksoy et al., 2012). The business reasons for making such changes could include poor financial performance, external competition, and erosion of market share, emerging market opportunities, global competition, or some other pressing business issue (Radhakrishnan & Balasubramanian, 2008; Carr & Nanni, 2009; Chauhan & Verma 2009). Business Process Re-engineering is not downsizing, restructuring, reorganization, automation, new technology, etc (Stoica et al., 2004; Bhatnagar, 2009; Nzewi, 2015). It is the examination and change of five major components of the business (Davenport, T. H., 1995; Mavetera, C. G., Huisman, M., Mavetera, N., & Lubbe, S., 2015).

- **Strategy:** The common direction of the business, its business model and future direction that must be taken into account while embarking on a reengineering effort. Before reengineering can be done the organizations strategies that can be used as a foundation should be known. This approach helps in selecting the right process for reengineering and sets how and by how much to reengineer (Wachira, 2013).

- **Process:** Processes are the targets of reengineering in BPR (Grant, 2002). Processes are self-contained workflow patterns where there is an input of a series of actions and an output (Draheim, 2010; Dickerhof et al., 2002). In this order, a group of related tasks that collectively create value for a customer is called a business process. A business process can be identified as the type of commodity that flows through the system (Srinivasan, 2011; Barnes, 2001a;Barnes, 2001b). BPR focuses on the whole processes, say starting from product conceptual stage to final product design (Srinivasan, 2011; Bhaskar, 2016).

- **Enabling Tool (Technology):** Information Technology plays a central role in BPR by providing the way to achieve breakthrough performances in organizational systems, but it can be easily misplaced (Bhaskar, 2014). Modern state of the art, IT is the part of the reengineering effort (Hanif, 2014; Goksoy et al., 2012; Thyagarajan & Khatibi, 2004), an essential enabler (Goksoy et al., 2012) since it permits companies to reengineer business processes. However, simply introducing computers into an existing business problem does not cause it to be reengineered. In fact, the misuse of technology can block reengineering altogether by reinforcing old ways of thinking and old behavior patterns (Morabito, 2013; Amanquah & Adjei, 2013).

A process-focus approach provides the opportunities to formally reengineer or radically reduce the number of activities it takes to carryout a process, often with the help of IT (Huang et al., 2014; Hammer & Champy, 1993). IT has played such a vital role in the success of the overall reengineering initiative (Huang et al., 2014; Gunasekaran & Kobu, 2002). The smooth flow of information can be thus eased by adopting IT to improve the integration in various functional areas (Gunasekaran & Nath, 1997). Senior managers always consider IT as one of potential sources for competitive advantage Attaran (Attaran, 2004).

- **Organization:** A reengineering effort triggers changes that are of multidirectional in nature. Job designs, organizational structures, management systems – everything associated with the process must be refashioned in order to maintain a coherent business system (Gupta et al., 1999).

- **Culture:** People require some reason to perform well within the reengineered processes. It isn't enough simply to put new processes in lace; managers must motivate employees to rise to the challenge of the processes by supporting the new values and beliefs the processes demand (Gutierrez, 2001). In other words, management must pay attention to what goes on in people minds as well as what happens on their work place. This includes motivation, empowerment, training, etc.

Business Process Reengineering as its name involve is managing & redesigning the processes of the business under consideration with aim of achieving significant improvement in result areas of the business such as quality, cost, and time (Goksoy et al., 2012). One of the best ways

to explain the concepts and principle of Business Process Reengineering (BPR) is through the definition given by Hammer & Champy (1993).

Hammer & Champy (1993) define Business Process Reengineering as: "Business Process Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, and speed". This definition contains four important words. Clarifying these key words would help clarify the concepts imbedded in Business Process Reengineering. The first key word is "fundamental". In doing reengineering, businesses must ask the most basic questions about their companies and how they operate: Why do we do what we do? And why do we do it the way we do it? Asking these fundamental questions forces people to look at the embedded rule and assumptions that underlie the way they conduct their business. Often, these rules turn out to be obsolete, wrong, or inappropriate. Reengineering starts with no assumptions and no givens (Bose, 2011). In fact, companies that undertake reengineering must guard against the assumptions that most processes already have embedded in them. To ask "How can we improve this or that process?" Assumes that this or that process must be checked. What if the process is not required or is costly to do it in the first place. Reengineering first determines what a company must do, and then how to do it. Reengineering takes nothing for granted. It ignores what is and concentrates on what should be.

The fourth keyword is "process". This word is the most important in the definition. The process of a business is a collection of activities that takes one or more input and
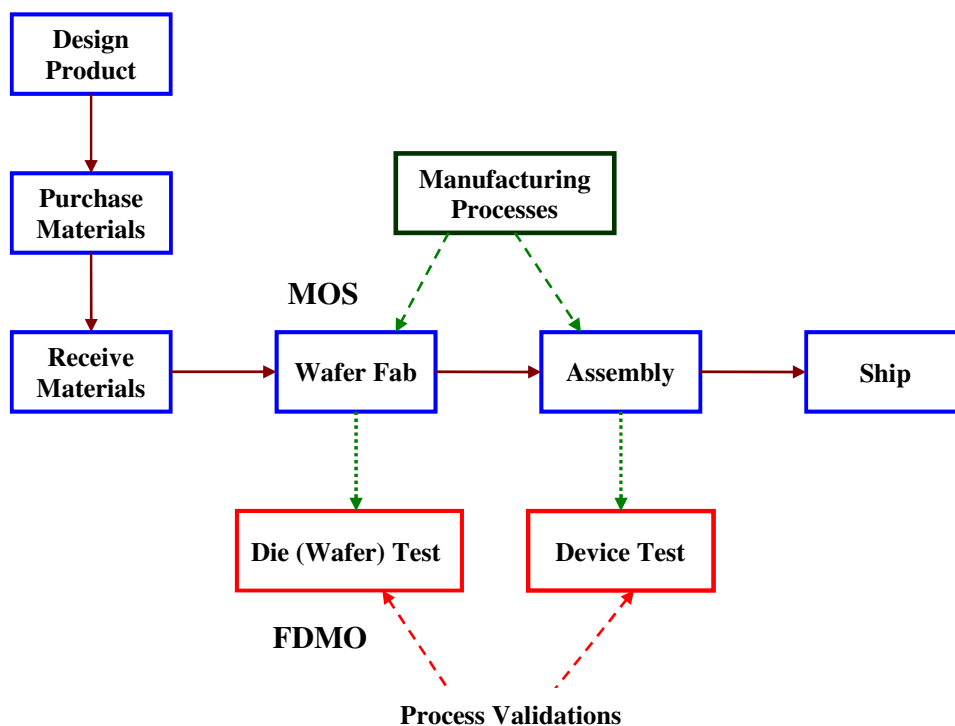

Figure 1. Business as a System (A Series of Processes)

creates an output that is of a value to the customer (see figure 1). The concept of a process is not as familiar as it is expected chosen to most business managers. The reason is that, most business people are not "process-oriented"; they are focused on tasks, on jobs, on people, on structure, but not on process task based thinking, that is the fragmentation of work into its simplest components and their task to specialist workers, has influenced the organizational design of companies for the last two hundred years. The time has come to shift to process based thinking, and Business Process Reengineering promises to deliver just that. According to Hammer & Champy (1993), there are three kinds of companies that undertake business process reengineering.

- *First, Companies that finds themselves in deep trouble.* They are in a situation that can be termed as crisis. They have no choice. If a company's costs are an order of magnitude higher than its competitors or higher than its business model will allow it; if its customer service is so poor then the customers will openly rail against it; and if its product failure rate is higher than competitor's the company clearly needs Business Process Reengineering (Bhaskar & Singh, 2014).

- *Secondly, there are companies that are not yet in trouble but whose management has the foresight to see trouble coming* (Bhaskar & Singh, 2014). For the time being financial results may appear satisfactory, but looming in the distance are stormy clouds in the form of new competitors, changing customer requirement or characteristics, technological breakthroughs, an altered regulatory or economic environment, that threatens to sweep away the foundations of the company's success (Dereje, 2010). These companies have a vision to begin Business Process Reengineering in advance to avoid running into trouble.

- *The third types of company undertaking reengineering are those that are in their best shape right now.* They have no visible difficulties, either now or on the horizon, but their managements are ambitious and aggressive. These kinds of companies see reengineering as an opportunity to further their lead over their competitors. By enhancing their performance, they seek to raise the competitive bar even higher and make life even tougher for their competitors (Hammer & Champy, 2009).

2.1 What is not business process reengineering?

There are various notions about reengineering, from people with second hand knowledge on the subject to those just being introduced to the concept often jump to the conclusion that it is much the same as other business improvement programs with which they are already familiar. BPR is usually equated with automation, downsizing, restructuring or some other business fix of the month (Herath, 1996). BPR has little or nothing in common with any of these other programs and differs in significant ways even from those with which it does share some common premises such as with TQM (Gill, 2012; Chang, 2016).

First, BPR is not automation (Mohapatra, 2013). Despite the significant role played by information technology, reengineering is not the same as automation (Mohapatra, 2013). Automating existing processes with information technology does not necessarily eliminate the inefficiencies or wastes residing in the system. In fact automating might simply provide more efficient ways of

doing the wrong kinds of things.

Reengineering is not restructuring or downsizing (Tak, 2013; Aslam et al., 2005). These are terms used to explain capacity reduction to meet current (lower) demand. Restructuring or downsizing means doing less with less. By contrast, Reengineering means doing more with less (Nehring & Plummer 2014). Reengineering also is not the same as reorganizing, or flattening an organization, although reengineering may, in fact, produce a flatter organization. The problems facing companies does not stem from their organizational structures but rather from their process structures. Overlying a new organization on top of an old process is like patching an old cloth with a new piece of cloth.

3. STATE-OF-THE-ART IN BUSINESS PROCESS REENGINEERING

Processes, not organizations, are the objects of reengineering (Laguna & Marklund, 2013). Companies don't reengineer their service providing or manufacturing departments; they reengineer the work that the people in those departments do.

The confusion between organizational units and processes as objects of reengineering arises because departments, divisions, and groups are familiar to people in business, while processes are not; organizational lines are visible, clearly drawn on organization charts, and processes are not; organizational units have names, and processes most often do not (Laguna & Marklund, 2013).

The entire business system consists of processes. Processes are invisible and unmanaged because people think about the individual departments, not about the process with which all of them are involved (Hammer & Champy, 2009; Aslam et al., 2005; Aslam & Shami, 2002). Processes also tend to be unmanaged in that people are put in charge of departments or work units, but no one is given the responsibility of getting the whole job – that is, the process – done (Hammer & Champy, 2009). According to Adair & Murray (1994), the first step in reengineering endeavor is to assess the company in light of the process it constitutes. This encompasses establishing what constitutes a process, how processes evolve over time, how processes interrelate in business, and characteristics of processes that work well versus those that do not work well. Discussing processes can be confusing because different people have different perception of what a "process" is. To some, a process is an assembler installing wheels on a machine coming off the assembly line.

However, in order to be effective, one must think of processes in such a way as to analyze them effectively and introduce breakthrough improvements. The methods and tools of BPR work most excellent when a process is well defined, with a clear starting point and ending point; is scientific in one or more ways; and can be analyzed step by step.

3.1 Identifying & separating processes from tasks

How can one solve the dilemma of describing the right process to concentrate-on in order to carry out reengineering? To have a simple and easily understood definition of a process would be helpful. Adair & Murray (1994) provide such simple definition. "A process is a series of tasks or steps that receive inputs (Materials, information, people, machine, methods) and

produce an output (physical product, information, a service) designed to be used for specific purpose by the recipient for whom the output is produced" (Pepitone, 2009).

Processes are likely to cross-functional boundary lines. And individuals may be involved soundly in more than one process in the performance of their day-to-day duties. Identifying and separating processes from tasks is an important requirement to process change (Davenport, 2013). The key to identifying a process is observing that a process is not defined by the things people do but instead by the sequence of tasks performed to produce the output. The focus is not on what people do; instead, the focus is on what happens to the material or work as it moves through the process. In other words, every process consists of a series of steps that somehow changes input-output process (product or service) as it moves through the sequence of tasks or functions.

This approach facilitates a way to analyze processes in detail and it helps to expand the understanding of processes to add an additional common characteristic: A process accepts input, supplies and then changes, adds to, or combines them to produce the desired output. Another characteristic common to all processes that will be core in reengineering is that the individual steps and tasks in a process sequence are typically separated by waiting times, involve movement of the output from place to place, and require transfer from one responsible person to another through out the sequence. After process selection for innovation, a firm can begin to think about how it will create quantum improvements in the process and what change tools it will employ (Davenport, 2013).

3.1.1. The four core business processes

All work involves processes. Although, organizations have hundreds of business processes and thousands of sub-processes (Kalman, 2002). There are usually between five and eight core business processes in any industry group (Johansson, 1993); because most core processes are rarely owned and monitored by any one single individual (Harrington, 1991; Kalman, 2002). But author includes only four core business processes. Almost all companies are built around four key core processes upon which the ultimate success of the company depends in providing quality product or service leading to survival and growth. These four core processes are the following:

1. *The product or service development process:* Conception, design, and launch of new products or services to customers.

2. *The order-generation process:* The process of attracting and securing customers and activities meant to interpret and track requests for products or services from the customers.

3. *The order-fulfillment process:* Creation, preparation, and delivery of the order to the customer.

4. *The customer-service process:* Activities designed to sustain customer satisfaction after delivery of an order.

The four processes may look different from industry to industry, and even from company to company with in industry. In fact, one can ask where these processes are in some industries. But they are present in one guise or another, and they are the processes upon which a company focuses the most attention. All other processes, such as financial processes, human resources processes, and legal processes, exist to support and measure the success of these

four core processes (Kalman, 2002). Figure 2 below describes how the core processes relate to each other and how other processes support them. Table 1 identifies more specifically how the four key core processes would appear in a number of diverse industries.

3.1.2. Level of processes

Processes have by their very nature several levels. From a few steps producing a minor output for the use of an internal customer as an input to another process up to a long complex process of many steps producing a major product for the customer. In fact, an entire operation of the company could be viewed as meeting the definition of a process in an all-encompassing set of steps. But that would represent a process too big and complicated to analyze. Therefore, the "family tree" of the company's processes have to be broken down to a manageable process scope for analysis (Harrington, 1991).

The first step is to move to the level of the four core processes and the supporting processes. However, this level too is all encompassing and complex to be analyzed to readily. Therefore, further simplification is needed. In general, at the third or fourth level of simplification of the process family tree, a level of process that is discrete enough to be manageable for the purpose of process analysis for reengineering the business process is reached. At this level the processes are generally, but not always, producing output for the internal customer (www.lexjansen.com/phuse/2012/pd/PD06.pdf).

It is valuable to think of one long, complex process as a series of shorter, more specific processes that can be analyzed at the same time as or sequentially over a longer period of time until the whole complex process has been analyzed and reengineered. Care in selecting the process segments makes this practical without having to redo work that is previously done on certain part of the process.

3.1.3. Root cause for inefficiency

Business processes are almost always in need of improvement (Berman, 2014). According to the experiences of Adair & Murray (1994) and other practitioners (process managers, engineers, BPR teams, quality managers), improvement in the order of 75 percent and above is normal when
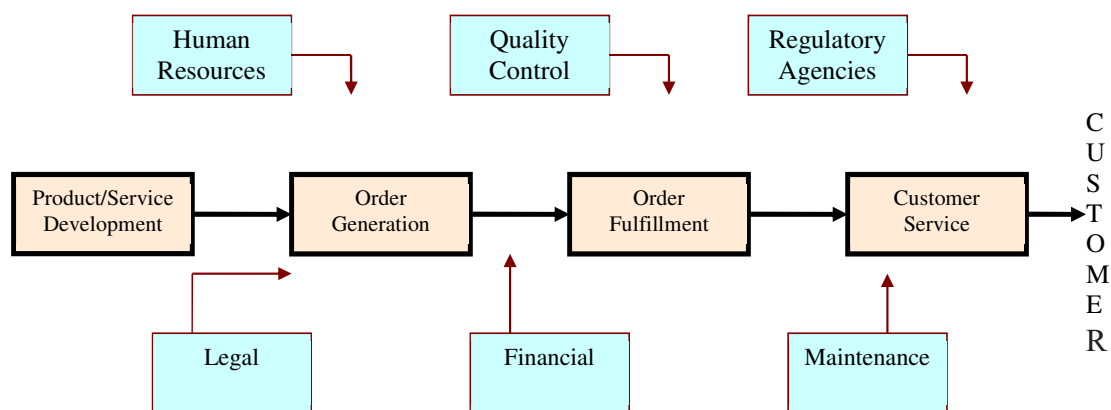

Figure 2. The inter-relationship of company processes (Adair & Murray, 1994)

Table 1. Core processes of different industries. (Adair & Murray, 1994)

INDUSTRY	PRODUCT DEVELOPMENT	ORDER GENERATION	ORDER FULFILLMENT	CUSTOMER SERVICE
Manufacturing Industry	Design & Engineering	Advertising, Sales	Order entry, Manufacturing & Shipping	Warranty Repair
Banking	New loan, Savings, Checking Plans	Advertising, Promotion	Processing Application, Transactions.	Service Clerk, Personal Banker
Home Building	Architecture, Design	Advertising, Sales	Construction, Option Selection.	Warranty Service
Publishing	Reporting, Editing, Creative development.	Advertising, Sales	Printing & Delivery	Subscription Service
Hospitals	Basic-Services, other Customized Package.	Advertising, Prepaid Contracts.	Medical Services	Home Care Follow-Up
Airline Industry	Flight Route Selection Pricing Development Package price.	Advertising, Visual Images at Airports, Ticket sales.	Flying Destinations, Baggage handling Cargo Transportation.	Customer service on Delays, Lost Baggage, etc.

processes are reengineered with an effective methodology and tools and with an open mind free from paradigms about how the process "has to be". Almost any process is a viable candidate for improvement. The situation of most processes is such that their need for reengineering is clearly obvious, just with the first trial assessment.

The reason for this is clear. Processes evolve over their life times. When initially created to produce a specific desired output required by the customer (internal or external), they are usually quite simple and straightforward. When they are installed and first used, they are usually quite efficient. They may undergo some initial refinement and adaptation as experience is gained in order to make them work effectively in specific organization climate in which they are found. These changes are usually minor and constructive.

But as time goes by, the initial process design evolves further in response to customer needs, individual variances introduced by those working within the process, organizational growth and changes, and changes in process interrelationships, as well as to solve problems as they arise. These changes become more complex and more serious the longer the process remains in place. They result in the process achieving some degree of institutionalization and maturity. But at the same time, they begin to erode the effectiveness of the process. These changes can also mark the beginning of the steps that eventually lead to process over-control and breakdown.

At maturity, the process is still working. It is not as effective as it once was, but the output product still meets the customer needs and can be delivered in a timely and flexible way as needed. But the process has begun to acquire extra steps, usually designed to find and correct errors, to divide responsibility along organizational lines, and to create specialists in certain functions. There begins

to be ambiguity in responsibility and authority. Redundancy of steps becomes common. Once steps are added to a process to correct a situation, even a temporary one, they tend to become permanent. They now "belong to someone" and are that person's job and a reason for existence in the company. It would be natural that, that person will zealously protect it from attack.

If this evolution is recognized by a knowledgeable and skilled manager soon enough, he or she may step in and redesign the process to restore it to its original effectiveness. But too often the manager finds that he or she does not have sufficient scope and authority to do so effectively. The process crosses too many organizational boundaries, is defined by too many standard operating procedures and protocols, and has, in effect, taken on a life of its own. The result is that the process continues to evolve in unproductive ways, adding more and more steps, increasing redundancy, and creating queues of output product at each step waiting to be completed. The length of time needed to get through the process is extended, and there is an increase in handoffs between people, approval requirements, checks, double checks, and rework. More time and energy are spent on working process rather than doing the work for which the process was originally designed. Breakdown has occurred and Customer satisfaction (value to the customer) is compromised. Essentially then, when BPR does not capture those process steps that do not add value to the output and remove them through redesign.

3.2. Business process modeling

Business Process Modeling examines the number and variety of process models across the management approaches such as Lean Manufacturing, Total Quality Management, Business Process Re-engineering and others (Becker et al., 2000). Two particular issues concerning BPM include:

- First, the number and variety of model designers and users has spread enormously.
- Secondly, the number and variety of purposes process models are used for is growing.

The growing numbers of people who are not necessarily modeling experts are increasingly involved in the design of process models, which leads to confusion and "a lack of understandability of process models." (Becker et al., 2000)

Becker et al. (2000) proposed a "Framework for the Guidelines of Modeling" [GoM] presented in the following figure. These guidelines include six general guidelines.

Correctness – The model is correct within its language rules (syntax) and the model behaves in a manner that is consistent with the real world (semantics).

Relevance – The selected model addresses the stated goals of the real-world process

Economic Efficiency – The model feasibly addresses cost/benefit constraints. This may influence correctness and clarity of a model.

Clarity – All models must be readable and understandable in order to be useful and prevent obsolescence.

Comparability – One must apply all modeling guidelines consistently throughout a modeling project in order to compare the 'as-is' and 'to-be' models.

Systematic Design - Postulates well-defined relationships between information models which belong to different views.
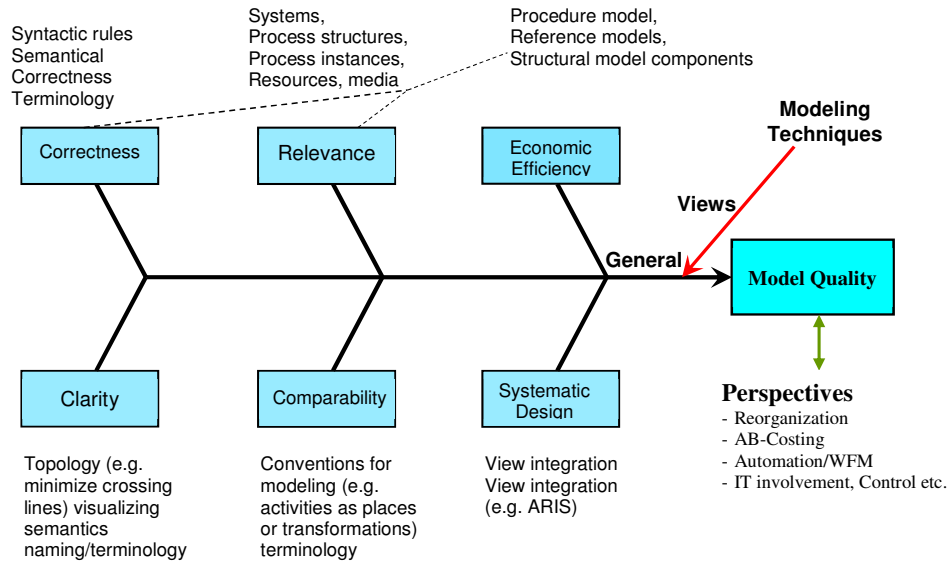
Figure 3. Framework for the Guidelines of Modeling (GoM), (Becker et al., 2000)

3.3. Process mapping

Once processes are clearly defined and their present state and the evolutionary transition that brought them to the state where they are known, the next step will be to find all the processes of the business and map them. Just as companies have organizational charts, they can have process maps that give a picture of how work flows through the company. A process map also creates a vocabulary to help people discuss reengineering (Hammer & Champy, 1993).

A process map can be developed at several process levels (http://sixsigmastudyguide.com/process-mapping/). Usually, the first approach in process mapping is a high level mapping but each of the high level processes can be detonated into smaller or detail process maps. The concentration at this stage is to provide an understandable graphical description of a process that would be difficult to understand or describe in a narrative form. The end product is a diagram that shows how the major steps in a process link together. The process map is particularly useful for analyzing very complex flows – those with many routes or feeder branches. These are particularly difficult flows to describe in words, but the process map makes the relationships very clear. Understanding these relationships and the complexity of the process is useful in setting starting and stopping points for the reengineering effort and ensuring that the scope of the effort is both complete and manageable by the implementation team in the specified time. The development of the process map also gives the opportunity to begin collecting some data about the process (Hunt, 1996; Laguna & Marklund, 2013), such as:

-      Cycle Time: - The time necessary for one unit to pass through the process

-      Area of significant build up of pile of work

-      Major defect producing steps

-      And other relevant data useful for reengineering.

3.3.1. Constructing the detail process map

Developing the detailed process map is like attaching oneself to a piece of work as it begins the process and going through the process with it. The map documents what 65 actually happens to the work going through the process, not what the process design or instructions or routing sheets say is to happen. When completed, the detailed process map tells everything that piece of work has gone through. A detailed process map or a detailed process flow analysis can be organized in either flow chart or as a list of steps. Both methods can be used. The major advantage of the detail process map is in its ability to bring to the surface the two types of steps that are opposite in nature; the value added steps and the non-value added steps (Nielsen et al., 2000). Adair & Murray define the two steps as follows:

- A value-added step is one that (1) physically changes the work passing through the process or the work output produced to make it more valuable to the customer, (2) is a step requested by the customer that he/she is willing to pay for, or (3) is legally required mandate.

- A non value-added step is one (1) for which the customer is not willing to pay, and (2) that does not change the work output in a way that makes more valuable to the customer.

Most value-added steps in manufacturing processes are fairly easy to identify. They physically change the product as it moves through the process. The distinction might not be that clear in service providing processes.

According to the experiences of Adair & Murray, omitting those processes that offer no value at all, the typical process has only 5 to 20 percent value-added steps. This suggests that 80 percent or more of the steps in most processes could be eliminated with out adverse impact on the value offered to the customer. This is a great opportunity for improvement. The concept of value added and non-value added steps provide a very valuable tool for initial analysis of the process: the value added flow analysis. Using this analysis one can:

- Identify and measure significant redesign opportunities.

- Establish a baseline of performance against which to measure improvement.

- Determine which tools are most useful in redesigning the process.

- The value added flow analysis begins with construction of a detailed process map at the 66 lowest levels. This is a detailed examination of the process with some unique characteristics:

- It documents the flow of work, not the things people do.

- It follows one unit of work as it passes through the process. The unit may be one item, one batch, a particular service, or some other increment, but it is always the smallest unit possible to follow separately.

- It documents every step: - moves, waits, delays, operations.

- It identifies what really happens to the typical unit of work, not what is supposed to happen according to documentation or what the supervisor may believe to be the process.

- It is developed with and by the employees who actually do the work on the process, not from engineering documentation or supervisory process description.

3.4. Selecting the processes to reengineer

Hammer & Champy, (1993) have explained in their book reengineering the corporation, once processes are identified and mapped, deciding which ones require reengineering and the order in which they should be tackled is not a trivial part of the reengineering effort. According to Achmad Surjani (General Manager Operations at Sinar Jaya Group Ltd, Indonesia), No company can reengineer all its high-level processes simultaneously. The following three criterions are used in the industry (Hammer & Champy, 1993):

1. The first is dysfunction. Which processes are in deepest trouble?

2. The second is importance. Which processes have the greatest impact on the company and its customers?

3. The third is feasibility. Which processes are the most susceptible to a successful redesign?

3.4.1. Dysfunction – Broken processes

In looking for dysfunction, the most obvious processes to consider are those that a company's executives already know are in trouble. Usually, people are clear about which processes in their companies need reengineering. The evidence is everywhere and generally hard to miss. Some symptoms of broken processes are:

- Extensive information exchange, data redundancy, duplicate effort, data re keying, etc.

- Repeated late delivery of product or service to the customer.

- High ratio of checking and control to value adding. A lot of work goes on in the organization that does not add value to the

company's product or service. The customer does not care about the internal controls, audits, management, and reporting. That sort of activity benefits the company only. It does not contribute to the end product or service. As long as the company consists of people, some amount of checking and control will be unavoidable. The issue is not whether non value adding activities exist in the organization, but whether it forms too great a portion of all the work the organization performs.

- Rework and iteration. Both of them involve doing work again that has already been done. Most often rework and iteration is the consequences of inadequate quality system in place.

- Complexity, exceptions, and special cases. When most systems begin life, they are simple. But they grow complex over time, since every time a new situation or emergency develops, someone modifies the process by adding special case or rule to deal with the exceptions. Soon the process is buried under exceptions and special cases. Then an attempt to simplify what has already become unbelievably complicated might not be easy.

3.4.2. Important processes

Importance, or impact to the customer, is the second criterion to consider when deciding which of the company's processes to reengineer and in what order. Even processes that deliver their outputs to customers inside the company may be of major importance and value to outside customers. However, companies can't simply ask their customers directly which processes are most important to them, because customers, even if they are familiar with the process terminology, have no reason

to know in much detail the processes their suppliers use (Duffy, 2010). Customers are a good source of information in comparing the relative importance of various processes, however. Companies can determine what issues their customers care strongly about – issues such as product cost, on-time performance, product or service features, and so on. These issues then can be correlated with the process that most influence them as an aid to creating a priority list of those processes that need redesign.

3.4.3. Feasible processes

Feasibility is the third factor in selection of process for reengineering which requires considering a set of factors that determine the likelihood that a particular reengineering effort will succeed (Orgland, 2016). One of these factors is scope. Generally, the larger the process – more organizational units involved – the broader its scope. A greater payoff is possible when a process larger in scope is reengineered, but the likelihood of its success will be lower. Broad scope means orchestrating more support, affecting more organizational units, and involving more managers who have their own agenda. Similarly, high cost reduces feasibility. The strength of the reengineering & implementation team and the commitment of the process owner are also factors to be considered in assessing the feasibility of reengineering a particular process (Hammer & Champy, 2009).

3.5. Understanding the selected process

Once a process has been selected for reengineering, the next step is to understand the process. By this is meant not only the details mechanics of the process but also

such a high level questions as what the process is doing and why is it doing it in that particular fashion. Can it be eliminated in its entirety? Can it be replaced by a simplified and less expensive process? Or could the existing system be improved drastically? The detail process analysis can help in two ways. One is when the solution is determined to be to drastically improve the existing process, and the other is to help the reengineering team (usually done as a team) to understand the existing process properly even when the solution is an entirely new design to be started from scratch (Hammer & Champy, 2009).

The best place to begin to understand a process is from the customer end. What are the customer's real requirements? What do they say they want and what do they really need, if the two are different? What problem do they have? What processes do they perform with the output? Since the eventual goal of reengineering a process is to create one that better meets customer needs, it is critical that the reengineering team truly understands these needs. Understanding means considering the customer's underlying goals and problems, not just the mechanics of the process that links the company and its customers. This understanding can't be obtained merely by asking customers what they want, since they will tend to answer from their narrow requirement & experience. The better way to acquire information about the customer is to move to the customer site and observe them. Or a still better way is for the reengineering team to do with their product or service themselves what the customer does to it. Once the team understands the type of process the customer might need, the next step is to figure out what the process currently provides, that is, to understand the

current process itself. To this end the detail process mapping described in the previous section will be employed.

3.6. Redesigning the selected process

At this stage, depending on the customer requirements and the capabilities of the current process, either the current process will be reengineered for breakthrough improvement or, if the current process can't deliver the requirement, a new process that can deliver the customer needs will be designed from a blank sheet of paper. Redesigning the process is best carried out in a team set up. The team can follow brainstorming approach, or benchmark another world-class company, or follow a technique developed by their own. What is important is to make the redesigned process to deliver what it is supposed to deliver and to make it integral with the system in which it is functioning with out much disturbance. There is no hard and fast rule in this area and also there is no standard approach. It is more of an art than a science. However, there are a number of companies who carried out reengineering and succeeded. Their experience can be benchmarked.

3.7. Implementation requirements

At this stage there is a clearly defined "reengineering or process redesign blue print". The blue print contains all the necessary information to carry out the reengineering effort. However, it is people who should carry it out and people have to be convinced to perform their duties properly. The tremendous challenge in reengineering is to persuade people with in the organization to embrace – or at least not to fight – the prospect of a major change. According to

Hammer & Champy (1993), the companies that have the most success in convincing the employees the need for change are those that have developed the clearest messages about the need for reengineering. Senior manager, preferable the CEO, of these companies have done the best job of formulating, and articulating two key messages that they must communicate to the people who work in their organizations. The first of these is: Here is where we are as a company and this is why we can't stay here. The second is: This is what, we, as a company need to become.

The first message must make a compelling argument for change. It must convey a forceful message, why the company must reengineer, that it is essential for its survival. 70 It has to be concise, comprehensive, and compelling. This is a crucial requirement because employees who aren't convinced of the need for change will be disinclined to bear it and may even obstruct it. Process of developing this argument has the supplementary benefit of forcing management to look honestly at the company and its performance in context of a broad competitive environment. The second message, what the company needs to become, gives employees a visible goal for which to shoot. Articulating it forces management to think clearly about the purpose of their change program and about the extent of change that needs to be effected through reengineering. Experience in the industry shows that there are three types of employees as far as change is concerned:

1. *Innovative Type:* These are change pioneers. They actively embrace change and are the best assets for BPR. These are usually few in number.

2. *Listeners:* This type of employees can be easily convinced of the need for change. They comprise of the majority of the

employees in the company.

3. *Resisters:* This is the type of people who resist change even if they know that change is necessary and inevitable. These are also few in numbers. Attempt has to be made to salvage such employees. However, if they persist in resisting the change, they should be presented with the ultimatum, that is, "they should shape-up or ship-out".

Now the blue print is ready and the employees of the organization have given a vote of support for the reengineering effort, it is time to embark implementation. The usual practice in the industry is to organize implementation team who are assigned by and report to the executive/steering committee or the CEO. However, this practice is not a rule. Depending on the particular situation prevailing in the company, a different approach can be followed.

3.8. Characteristics of reengineered processes

A reengineered business process appears significantly different from the traditional process. But what, exactly, does a reengineered process look like? Hammer & Champy who have 71 participated in several reengineering projects have identified that there are striking similarities among various reengineered processes. These similarities transcend industry type. Much of what hold for a manufacturing industry for instance an auto company that reengineered its processes is also true for a service providing company such an airline. The fact that recurring themes are common to all appear in companies that have undergone reengineering is due to the fact that all traditional companies are founded on a few set of fundamental premises. The industrial

model rests on the basic assumption that workers have few skills and little time or capacity for training. This premise unavoidably requires that the jobs and tasks assigned to these workers be very simple. Moreover, Smith (1998) argued that people work most efficiently when they have only one easily understood task to perform. Simple tasks, though, demand complex processes to knit them together, and for two hundred years companies have accepted the inconvenience, inefficiencies, and costs associated with complex processes in order to reap the benefits of simple tasks.

In reengineering, this trend will be reversed. In order to meet the current demands of quality, service, flexibility, and low cost, processes must be kept simple. This need for simplicity has vast consequences for how processes are designed and organizations are shaped.

The following are some commonalities, recurring characteristics that are frequently encountered in reengineered business processes.

- A number of jobs are combined into one (cross-functional teams)
- The steps in the process are performed in their natural order
- Work is performed where it makes the most sense
- Workers make decisions
- Checks and controls are reduced
- Reconciliation is minimized
- Processes have multiple versions
- Central manager provides a single point contact
- Hybrid centralized/decentralized operations are prevalent

4. EXAMPLES OF BPR APPLICATIONS AS A TOOL

The manufacturing or service companies are mainly applying BPR as a tool to reduce costs and cycle time because BPR reduces costs and cycle times by removing unproductive activities. It also Improve overall quality by reducing the fragmentation of work and establishing clear ownership of processes (Jha et al., 2016). Workers gain responsibility for their output and can measure their performance based on prompt feedback.

There are so many companies that has been applied BPR as a tool for managing their business processes such as- Mahindra Satyam (now Tech Mahindra), Mahindra & Mahindra Ltd., General Motors Corporation, Dell, Ford Motor, IBM, Xerox, British Telecom etc. (Bhaskar, 2014), but author provides here single case of client company to show the outcome of BPR after implementation.

4.1. Enterprise-wide BPR for an Indian auto manufacturer

The client, a leading Indian automobile manufacturer of multi-utility vehicles and light commercial vehicles (LCVs), had plants in four locations, an extensive supplier base and a distribution and service network across India. For decades, the client dominated its market. Recently, however, it has battled substantial competition in several product categories. The client was concerned that its dominance would wane due to globalization, entry of foreign companies, import of pre-used vehicles under World Trade Organization (WTO) mandates, and more stringent emission, noise and safety norms. The client planed to reengineer and

manage their core as well as generic business process for breakthrough improvements in cost, quality, production, customer satisfaction, service and speed. The client engaged with Mahindra Satyam to analyze emerging scenarios and create a five-year plan.

Mahindra Satyam (formerly Satyam Computer Services Limited, merged within Tech Mahindra on 24th June 2013.) was a leading global business and information technology services company based in Hyderabad, India; that leverages deep industry and functional expertise, leading technology practices, and an advanced, global delivery model to help clients transform their highest-value business processes and improve their business performance.

4.1.1. Mahindra Satyam's solution

Mahindra Satyam (now Tech Mahindra) outlined three broad phases the client would undergo during a BPR program. They were:
- Long-term Business Strategy: Mahindra Satyam helped the company identify suitable business opportunities and craft strategies to capitalize on them, enabling it to achieve its business objectives, despite mounting competition.
- Process-Centric Enterprise (PCE) Phase I – Preparation: Mahindra Satyam created a plan for the client to migrate into a Process-Centric Organization.
- Process-Centric Enterprise (PCE) Phase II – Transformation: Mahindra Satyam helped the client become a PCE by redesigning key business processes.

As part of the long-term business strategy, Mahindra Satyam recommended to the client to establish new lines of business to mitigate

risk. It also suggested that the client leverage its current capabilities in new markets. Mahindra Satyam then assessed the client's business functions and reconceived them as key business processes. Senior managers were made responsible for the end-to-end performance of these business processes. Later, fixed process goals, derived from the corporate vision, were established. As part of this undertaking, Mahindra Satyam folded competitiveness improvement initiatives into the business process framework, classifying them with the appropriate business process, and asking respective senior managers to own them. Mahindra Satyam also suggested that management change its strategy slightly to sensitize employees to the need for change, as well as its business impact.

Mahindra Satyam's role also involved conducting a gap analysis and documenting the company's strengths and weaknesses for each of the business processes. This enabled the team to identify the root causes for performance gaps, and gave it a better understanding of how to redesign the client's process, structure, and performance monitoring frameworks. It also helped Mahindra Satyam identify the company's core processes, which became the centerpieces of its operational excellence program.

The core processes were identified as:

- Business Planning: Responsible for creating business strategies, setting policy and outlining guidelines for operations and monitoring performance.

- Product Management: Responsible for conceptualizing, designing, and developing new and upgraded vehicles, as well as setting up manufacturing facilities for their production.

- Order Management: Responsible for converting orders for vehicles and spares into finished products. Also oversees purchasing, manufacturing, assembling and dispatching of finished goods.

- Customer Management: Responsible for generating demand for vehicles and spares, resolving customer complaints and maintaining relationships with customers, and monitoring dealers and other intermediaries.

- Vendor Management: Responsible for identifying and selecting vendors, monitoring their performance and helping them upgrade as necessary. Identifying these core processes allowed Mahindra Satyam to focus its BPR during this company-wide transformation and gave the client a significant advantage over its competition.

4.1.2. Benefits

The results of this unique study indicate that the BPR program produced dramatic benefits that affected every area of the company. In the Product Management process, the manufacturer reduced new product development time by 50 %, from 72 months to 36 %, while eliminating launch delays by instituting upfront planning mechanisms. In Order Management, schedule adherence for vehicle dispatch improved from 70 % to 95 %. And, in the Spare Parts Department, order-to-delivery cycle times were trimmed by more than 50 %. Customer Management Processes were enhanced, too. Sales forecasting improved from 30 % to 70 % and a customer complaint redresses were reduced by 50 %. Finally, in Vendor Management, the client reduced materials costs by 6 % and vendor development time by 30 %.

5. CONCLUSION

Business process reengineering is one of fastest growing management tool that is most effective to industries that are in dire need of change and improvement, particularly when the scale of change needed is big. In this study, author has examined reengineering as it has developed from its original conception and studied the fundamental components of reengineering such as- Strategy, Enabling Tool (Technology), Organization, & Culture. Four core business processes are briefly explained which may look different from industry to industry. Core processes of different industries are also summarized in a table form.

Business process reengineering, by its very nature is process oriented. This means that the company's processes can be reengineered one by one using BPR. The only thing to be concerned here is how to choose the process, prioritize them apply the BPR model and implementation strategy developed in the above section. In this regard therefore, similar work should be carried out on processes selected as per the model developed. Furthermore, the principles of BPR and the model developed in this study can be easily adapted to other sector of the industry that wants to reengineer their processes. Framework for the Guidelines of Modeling" helps also to understand the different aspect of business process.

Process system of a manufacturing industry (see figure 1) demystify the concept of business process and helps to develop a high quality of process map. The advantages of process map are identify and measure significant redesign opportunities, establish a baseline of performance, and determine which tools are most useful in redesigning the process.

Application of BPR and its impact on manufacturing company has been discussed through a case of reputed Indian manufacturing company. This method provides practical means for business process reengineering and motivates to those companies which hesitate to employ BPR being suspicious about the result.

The future of reengineering as the concept evolves is difficult to evaluate without considering the current business trends. A global economy has mandated greater operational effectiveness and efficiency, and imposed fantastic pressures for cost reductions. These pressures have cut across different segments of the economy, and greatly impacted the operations of service and manufacturing.

References

Afsarmanesh, H., & Camarinha-Matos, L. M. (2004). Collaborative networked organizations: A research agenda for emerging business models. Springer Science & Business Media, 22.

Amanquah, B., & Adjei, K.S. (2013). Business process reengineering (BPR) in the financial services sector: A case study of Ghana commercial bank (GCB) limited. European Journal of Business and Management, 5 (29), 59-66.

Adair, C. B., & Murray, B. A. (1994). Breakthrough process redesign: New pathways to customer value. New York: AMACOM, American Management Association, 1-268.

Attaran, M. (2004). Exploring the relationship between information technology and business process reengineering. Information & Management, 41 (5), 585-596.

Aslam, M.F. & Shami T.A. (2002). A

РЕИНЖЕЊЕРИНГ ПОСЛОВНОГ ПРОЦЕСА: АЛАТИ ЗА УПРАВЉАЊЕ ПРОЦЕСОМ

Hari Lal Bhaskar

Извод

Сврха - Пословни системи се састоје од процеса. Процеси су скуп активности предузећа које као резултат дају одређени излаз. Када процеси застаре и постану неефикасни и не могу да дају жељене резултате, они морају бити редизајнирани или замењени. Реинжењеринг пословног процеса је алат за трансформацију пословног процеса и неограничено преобликовање свих пословних процеса. Ова студија користи анализе случаја и критичке литературе (ЦЛА) да би истражила и усредсредила се на развој реинжињеринга пословног процеса (БПР) као апликационог концепта и његов исход у индустријској структури (пружању услуга и производњи).

Приступ / методологија - Циљ се постиже анализом предмета и критичке литературе (ЦЛА). Студија цлучаја потврђује очекивани резултат и оправдава његову практичност. Ова студија допринела је контексту БПР-а као алата за управљање базираном на методама за одабир, управљање и реинжењеринг одабраних процеса за побољшање квалитета производње или побољшања квалитета услуга.

Налази - У овој студији представљен је низ производних процеса и дат оквир за смернице моделовања. Основни процеси различитих индустрија су представљени на ефикасан начин. То потврђује да реинжењеринг пословног процеса представља алат за управљање заснован на процесима који могу да испоруче или редизајнирају или замене неефикасне процесе, по потреби, са унапред задатим захтевима дефинисаним очекиваним резултатом. Може се применити на појединачне, групне или целокупне процесе који чине организацију.

Практичне импликације - На основу представљених студија случаја и смерница за моделирање процеса менаџери могу користити БПР да редизајнирају своје неефикасне процесе.

Оригиналност / Доприноси - Овај приступ предлаже усвајање БПР по било каквим трошковима као средство за побољшање свих пословних процеса, као и укупну продуктивност и перформансе управљањем целим процесом. Студија случаја мотивише практичаре / менаџере ка реинжењерингу код управља њиховим пословним процесом.

Кључне речи: реинжењеринг пословних процеса, БПР апликација, пословни процес, моделирање процеса, побољшање / управљање процесом, управљање квалитетом.

decentralized process-oriented approach for power-system operation. Science Vision Quarterly, 8 (1), 54-58.

Aslam, M. F., Hassan, T., & Shami, T. A. (2005). Reengineering of systems operation; A solution to the challenges in the deregulated market environment-I. Proceedings of the 5th WSEAS Int. Conf. on Power Systems and Electromagnetic Compatibility, Corfu, Greece, 23-25.08.2005. 460-465.

Berman, P. K. (2014). Successful business process management: What you need to know to get results. AMACOM Div American Mgmt Assn. 93.

Bose, T.K. (2011). Total quality of management. New Delhi, IN: Pearson Education India.

Bhaskar, H.L. & Singh, R.P. (2014). Business process reengineering: A recent review. Global Journal of Business Management, 8 (2), 24–51.

Bhaskar, H.L. (2014). BPR as a quality improvement tool, Handbook of Management, Technology and Social Sciences, ISBN: 978-81-928926-2-7, Vol. 2, pp.1-10, SEMS Publication, Noida. DOI: http://dx.doi.org/10.2139/ssrn. 2739368

Barnes, D. (2001). Research methods for the empirical investigation of the process of formation of operations strategy. International Journal of Operations & Production Management, 21(8), 1076-1095.

Barnes, D. (Ed.). (2001). Understanding business: processes. Business & Economics, Psychology Press, 119.

Bhaskar, H.L. (2016). A critical analysis of information technology and business process re-engineering. International Journal of Productivity & Quality Management, 19 (1), 98-115.

Becker, J., Rosemann, M., & von Uthmann, C. (2000). Guidelines of business process modeling. In Business Process Management. Springer Berlin Heidelberg, 30-49.

Bughin, J., Chui, M., & Manyika, J. (2013). Ten IT-enabled business trends for the decade ahead. McKinsey Quarterly, 13, May 2013, 1-52.

Bhatnagar, S. (2009). Unlocking e-government potential: Concepts, cases and practical insights. New Delhi, IN: SAGE Publications India Ltd.

Carr, L.P., & Nanni Jr., A.J. (2009). Developing results: managing what matters. New York, US: Springer Dordrecht Heidelberg London.

Chauhan, R.K., & Verma, R. (2009). Significance of business process reengineering. chapter 52nd, In Enterprise Information Systems in 21st century: opportunities and challenges. 537-538.

Chang, J. F. (2016). Business process management systems: Strategy and implementation. CRC Press.

Davenport, T. H. (2013). Process innovation: Reengineering work through information technology. Boston, MA, US: Harvard Business Press.

Davenport, T. H. (1995). Will participative makeovers of business processes succeed where reengineering failed?. Planning Review, 23(1), 24-29.

Dickerhof, M., Jakobs, P., & Schmidt, A. (2002). INFOFLOW-A process oriented workflow and information system for micro system development and production. In System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference on IEEE. 2558-2565.

Dutta, S. (2007). Recognizing the true value of software assets. INSEAD & micro focus ltd. 1-29.

Draheim D. (2010). Business process technology: A unified view on business processes, workflows and enterprise applications. Springer-Verlag Berlin Heidelberg.

Dogra, B., Kaur, K., & Kaushik, D. (2009). Enterprise information system in 21st century: Opportunities & challenges, New Delhi, IN: Deep & Deep Publications Pvt. Ltd.

Dereje, K.G. (2010). Implementation of Business process reengineering: An analysis of key success and failure factors, a case

study of Ethiopian Revenues and Customs Authority Mekelle Branch (Doctoral thesis, Mekelle University).

Duffy, G. L., Moran, J. W., & Riley, W. (2010). Quality function deployment and lean-six sigma applications in public health. ASQ Quality Press.

Enterprise-wide BPR for a leading Indian auto manufacturer. (2011). Available at http://www.studymode.com/essays/Enterpris e-Wide-Bpr-For-a-Leading-Indian-859451.html

Essam, M.M., & Mansar, S.L. (2012). Towards a software framework for automatic business process redesign. ACEEE International Journal on Information Technology, 2 (1), 23-28.

Freedman, L. (2013). Strategy: A history. New York, US: Oxford University Press.

Goksoy, A., Ozsoy, B., & Vayvay, O. (2012). Business process reengineering: Strategic tool for managing organizational change an application in a multinational company. International Journal of Business and Management, 7 (2), 89-112.

Gunasekaran, A., & Nath, B. (1997). The role of information technology in business process reengineering. International journal of production economics, 50 (2), 91-104.

Grover, V., & Malhotra, M. K. (1997). Business process reengineering: A tutorial on the concept, evolution, method, technology and application. Journal of operations management, 15 (3), 193-213.

Gunasekaran, A., & Kobu, B. (2002). Modeling and analysis of business process reengineering. International Journal of Production Research, 40 (11), 2521-2546.

Gupta, B., Crowe, T.J., & Noble, J.S. (1999). Business Process Reengineering. Wiley Encyclopedia of Electrical and Electronics Engineering [online]. 2016-11-1 Availabe at

http://onlinelibrary.wiley.com/doi/10.1002/04 7134608X.W3355/full

Gutierrez, J.O.G. (2001). Extending the precautionary principle to work redesign: The implications of business process reengineering for low-level white-collar work. Available at http://www.collectionscanada.ca/obj/s4/f2/ds k3/ftp04/MQ58697.pdf

Grant, D. (2002). A wider view of business process reengineering. Communications of the ACM, 45 (2), 85-90.

Gill, K.S. (2012). Information society: New media, ethics and postmodernism. Springer Science & Business Media.

Hunt, V. D. (1996). Process mapping: How to reengineer your business processes. John Wiley & Sons.

Huang, S. Y., Lee, C. H., Chiu, A. A., & Yen, D. C. (2014). How business process reengineering affects information technology investment and employee performance under different performance measurement. Information Systems Frontiers, 17 (5), 1-12.

Hanif, M., Khan, Y. S., & Zaheer, A. (2014). Impact of organizational resistance to change on BPR implementation: A case of state bank of Pakistan. European Journal of Business and Management, 6 (4), 186-196.

Hussein, B., Hammoud, M., Bazzi, H., & Haj-Ali, A. (2014). PRISM-Process reengineering integrated spiral model: An agile approach to business process reengineering (BPR). International Journal of Business and Management, 9 (10), 134-142.

Hussein, B., Bazzi, H., Dayekh, A., & Hassan, W. (2013). Critical analysis of existing business process reengineering models: Towards the development of a comprehensive integrated model. Journal of Project, Program & Portfolio Management, 4 (1), 30-40.

Habib, M.N., & Shah A. (2013). Business process reengineering: Literature review of approaches and applications', In Proceedings of 3rd Asia-Pacific Business Research Conference 25 - 26 February 2013, Kuala Lumpur, Malaysia. 1-25.

Hammer, M., & Champy, J. (1993). Reengineering the corporation: A manifesto for business revolution. Business horizons, 36 (5), 90-91.

Hammer, M., & Champy, J. (2009). Reengineering the Corporation: Manifesto for Business Revolution, Zondervan. Available at https://books.google.co.in/books?isbn=00618 08644

Herath, S.K. (1996). The role of the management accountant in business process reengineering. Master of Commerce (Hons.) Thesis, Department of Accounting and Finance, University of Wollongong, 1996. Available at http://ro.uow.edu.au/theses/2280

Harrington, H. J. (1991). Business process improvement: The breakthrough strategy for total quality, productivity, and competitiveness. New York, US: McGraw Hill Professional

Ishvarsinh V.D., (2014). New economic policies: liberalization, privatization, globalization. Journal of Social Science, 2 (5), 1-8.

Jain, R., Chandrasekaran, A., & Gunasekaran, A. (2010). Benchmarking the redesign of business process reengineering curriculum: A continuous process improvement (CPI). Benchmarking: An International Journal, 17 (1), 77-94.

Jamali, G., Abbaszadeh, M. A., Ebrahimi, M., & Maleki, T. (2011). Business process reengineering implementation: Developing a causal model of critical success factors. International Journal of e-Education, e-Business, e-Management and e-Learning, 1 (5), 354-358.

Jha, M., Jha, S., & O'Brien, L. (2016). Combining big data analytics with business process using reengineering. In Research Challenges in Information Science (RCIS), 2016 IEEE Tenth International Conference on IEEE. 1-6.

Johansson, H.J., McHugh, P., Pendlebury, A.J., & Wheeler III, W.A. (1993). Business process reengineering: Breakpoint strategies for market dominance. Chichester, England, UK: John Wiley & Sons.

Kalman, H.K. (2002). Process mapping: Tools, techniques, & critical success factors. Performance Improvement Quarterly, 15 (4), 57-73.

Laguna, M., & Marklund, J. (2013). Business process modeling, simulation and design second edition. CRC Press, Taylor and Francis Group.

Mavetera, C. G., Huisman, M., Mavetera, N., & Lubbe, S. (2015). An investigation of a specific system development methodology for business process reengineering, Alternation, 22(1), 351-366.

Mahindra Satyam. (2012). Available at http://www.techmahindra.com/sites/Resource Center/factsheet/investors/financials/TechM %20Final%20Press%20Release.pdf

Morabito, V. (2013). Organizational absorptive capacity and the use of information. In Business Technology Organization pp. 129-142. Springer Berlin Heidelberg.

Mohapatra, S. (2013). The need for BPR and its history. In Business Process Reengineering. 39-49. Springer US.

Nehring, D., & Plummer K. (2014). Sociology: An introductory textbook and reader. New York, US: Routledge Publisher.

Nisar, Q.A., Ahmad, S., & Ahmad, U. (2014). Exploring factors that contribute to success of business process reengineering and impact of business process reengineering on

organizational performance: A qualitative descriptive study on banking sector at Pakistan. Asian Journal of Multidisciplinary Studies, 2 (6), 219-224.

Nzewi, H.N., Nzewi, U.S., & Moneme, P.C. (2015). Business process reengineering and performance of courier service organizations in Anambra State, Nigeria. American journal of social and management sciences. 6 (1), 24-33.

Nielsen, S. P., Easthope, C., Gosselink, P., Gutsze, K., & Roele, J. (2000). Using domino workflow. IBM. Available at http://www.redbooks.ibm.com/redbooks/pdfs/sg245963.pdf

Orgland, M. Y. (2016). Initiating, managing and sustaining strategic change: Learning from the best. Springer. 156. Available at https://books.google.co.in/books?isbn=134914703

Pepitone, J.S. (2009). Human performance consulting. Routledge. Available at https://books.google.co.in/books?isbn=1136397450

Pettinger, T. (2013). What caused globalization?, Economic Blog, 6th April 2013. Availabe at http://www.economicshelp.org/blog/401/trade/what-caused-globalization

Rahali, E., Chaczko, Z.C., Agbinya, J.I., & Chiu, C.C. (2008). Business process re-engineering in Saudi Arabia: A survey of understanding and attitudes. International Journal of Artificial Intelligence & Interactive Multimedia, IEEE, 1 (2), 33-38.

Rigby, K.D. (2013). Management tools 2013: An executive's guide. Boston, MA, US: Bain & Company, Inc.

Radhakrishnan, R, & Balasubramanian, S. (2008). Business process reengineering: Text and cases. New Delhi, IN: PHI Learning Pvt. Ltd.

Srinivasan, R. (2011). Business process reengineering. New Delhi, IN: Tata McGraw-Hill Education Pvt. Ltd

Stoica, M., Chawat, N., & Shin, N. (2004). An investigation of the methodologies of business process reengineering. School of Computer Science and Information Systems, Pace University. Available at http://csis.pace.edu/csis/data/comArchive/techReport202.pdf

Smith, A. (1998). Core competence and change management', Management Development through Cultural Diversity, Ronnie Lessem. 201.

Saleem, P.M. (2012). Contemporary Office Handbook. Kottayam, IN: DC Books.

Tak, R. M. (2013). Reengineering Government Process of Elections by Introducing Unemployed Ad Hoc Work Force Registered through Employment Exchanges in India. International Journal of Computer Applications, 78 (15), 22-26.

Thyagarajan, V., & Khatibi, A. (2004). BPR-A tool for managing the change. Journal of Human Ecology, 15(1), 57-61.

Wachira, J.K. (2013). Competitive strategies and performance of financial sector companies listed in the Nairobi Securities Exchange. (Doctorate thesis, University of Nairobi).

Weerakkody, V., Janssen, M., & Dwivedi, Y.K. (2011). Transformational change and business process reengineering (BPR): Lessons from the British and Dutch public sector'. Government Information Quarterly, 28 (3), 320-328.

Web references

http://sixsigmastudyguide.com/process-mapping/

www.lexjansen.com/phuse/2012/pd/PD06.pdf