An Optimization Approach to Analysis of Obstacles and Current Issues of IT Advancement in Business Process Re-engineering

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Abstract— **This paper addresses the approach and identifies the obstacles which does create a barrier during implementation of business process re-engineering for organizational development. Apart from that researchers also try to analyze and optimize the current issues of information technology and its advancement for knowledge refinery which makes a business intelligent system with the help of data mining and data warehousing concept. The objective of this study is to overcome, analysis of obstacles in BPR, implementation of IT advancement in BPR, supporting role of data mining and data warehousing. The researchers are looking an optimal solution related to obstacles problem and current issues of advancement of information technology that would be feasible for organizational development and its co related factors. This research is based on existing study and literature review.**

Keywords-*BPR, IT, KM, ROI, SAP, JD, ERP*

I.   Introduction

Hammer and Champy [1994, p. 19] define BPR as "fundamental revision and radical redesign of processes to reach spectacular improvements in critical and contemporary measurements of efficiency, such as costs, quality, service and quickness." Key words in this BPR definition are:

- *Fundamental:* What is the company's basic style of working?
- *Radical:* All existing procedures and structures must be forgotten and new styles of working must be discovered.   Superficial changes are not useful. Changes must be made at the very root.
- *Spectacular:* Spectacular changes must be discovered, not marginal improvements.

- *Processes:* Redesign must be fixed on the processes not on the tasks, jobs, people, or structures.

Whitman and Gibson [1997] developed a study for discovering why companies use BPR. In order of importance, these reasons are:

- To improve inefficient business processes;
- To be the industrial leader;
- To reorganize business functions;
- To improve current industry position;
- To be among the industry leaders; and
- To dramatically turn the company's position around.

Ardhaldjian and Fahner [1994] consider that BPR is a methodology based on processes and directed by top management who wants better performance from the organization through radical changes.

The role of information technology (IT) has historically played an important role in the reengineering concept [9]. It is considered by some as a major enabler for new forms of working and collaborating within an organization and across organizational borders.

Early BPR literature [10] identified several so called disruptive technologies that were supposed to challenge traditional wisdom about how work should be performed.

- *Shared databases,* making information available at many places
- *Expert systems,* allowing generalists to perform specialist tasks
- *Telecommunication   networks,*   allowing organizations   to   be   centralized   and decentralized at the same time

- *Decision-support tools,* allowing decision-making to be a part of everybody's job
- *Wireless data communication* and portable computers, allowing field personnel to work office independent
- *Interactive videodisk,* to get in immediate contact with potential buyers
- *Automatic identification* and tracking, allowing things to tell where they are, instead of requiring to be found
- *High performance computing*, allowing on-the-fly planning and re-visioning

In the mid 1990s, especially workflow management systems were considered as a significant contributor to improved process efficiency. Also ERP (Enterprise Resource Planning) vendors, such as SAP, JD Edwards, Oracle, PeopleSoft, positioned their solutions as vehicles for business process redesign and improvement

II.   BACKGROUND

A. Analysis of Obstacles

Responses to the issues of knowledge use in the future and obstacles to the management of that knowledge were of critical importance to the overall interpretation of the study. The knowledge culture of an organization is reflected in the philosophy or values of each organization and the outcomes of the management strategy followed. Explicit manifestations of tactics used by some organizations in the pursuit of an effective KM strategy listed in the survey include:

- Attitudes to the exploitation of knowledge to its fullest potential,
- The organization perceiving that it gains an edge by innovation,
- Encouraging people to share,
- Rewarding people for sharing, and
- Managing learning and knowledge acquisition though being a learning organization and taking responsibility for staff learning new skills

B. Internal Obstacles in Business Process Reengineering

The greatest obstacle described by respondents in moving forward with a knowledge use strategy is the management culture of the organization. This manifests itself in a variety of ways that although not broad in description, were more extensively reported than other obstacles:

- Organizations that have a current culture of believing that they are already good at sharing knowledge,
- Maintenance of organizational power associated with keeping knowledge to oneself (knowledge hoarding),
- The co-operative cultural aspects of a KM strategy requiring a strategy for change management, and
- Where change management is used as a remedy for the cultural obstacles but cannot effect the required changes.

A number of other obstacles associated with the structure of management in an organization that inhibit the progress of a KM strategy were indicated:

- Traditional hierarchical organizations with a few key people, who have the knowledge but will not share, disseminate or delegate,
- Ongoing conflict of priorities in organizations - ranging from mergers and acquisitions activities to prevarication about management strategies,
- Financial constraints including staffing allocations, and
- The prevalence of structural silos of information

There are a number of obstacles associated with the implementation of a KM strategy already in place:

- The philosophy of KM not being well understood,
- The need for the development of criterion for KM,
- Organizational leadership that is are not prepared to back KM,
- Difficulties of quantifying the outputs of a KM strategy as ROI,
- The scalability of strategies
- Limited time available for planning and implementation, and
- Limited technology available for implementation.

C. Current Information Technology Issues and its Advancement in BPR

Apart from the usual ways of managing a process in any business information system, it is necessary to enhance the value of the process and also the methods used in improving the process. Some of the concepts of information management for effective information systems are the traditional concept of database, the

emerging concepts of data mining and data warehousing.

- *Data Mining* – Data mining is primarily used as a part of information system today, by companies with strong consumer focus retail, financial, communication, and marketing organizations. It enables these companies to determine relationships among "internal" factors such as price, product positioning, or staff skills, and "external" factors such as economic indicators, competition, and customer demographics. And, it enables them to determine the impact on sales, customer satisfaction, and corporate profits. Finally, it enables them to "drill down" into summary information to view detail transactional data. With data mining, a retailer could use point of sale records of customer purchases to send targeted promotions based on an individual's purchase history. By mining demographic data from comment or warranty cards, the retailer could develop products and promotions to appeal to specific customer segments.

- *Data Warehousing* – A data warehouse is a copy of transaction data specifically structured for querying and reporting. The main output from data warehouse systems are either tabular listings (queries) with minimal formatting or highly formatted "formal" reports on business activities. This becomes a convenient way to handle the information being generated by various processes. Data warehouse is an archive of information collected from wide multiple sources, stored under a unified scheme, at a single site. This data is stored for a long time permitting the user an access to archived data for years. The data stored and the subsequent report generated out of a querying process enables decision making quickly. This concept is useful for big companies having plenty of data on their business processes. Big companies have bigger problems and complex problems. Decision makers require access to information from all sources. Setting up queries on individual processes may be tedious and inefficient. Data warehouse may be considered under such situations.

III. RELATED APPROACH

Maull,Weaver,Childe,Smart,Bennett(1995)focuses on business process re-engineering (BPR) as an approach used by various business organizations to improve their business performance. A step-by-step approach is used for successful implementation of BPR. First is to identify or create corporate, manufacturing and information technology strategies. Next is to identify key process and performance measures, analyze the existing process, redesign, implement and monitor the improvements of its application. Business strategy, the scope of change, performance measures, information technology and human factors are important implications for the researchers [8].

Harrington, Barbara, Mc Coughlin, Kevin, Riddell, Duncan (1998) focuses on the problems of using business process reengineering (BPR) in the public sector organization called Contributions Agency. Discussion of the findings in relation to the current critique of BPR; Social science's assessment on the use of BPR; Implementation of radical organizational change with BPR.[9]

Mitev, Nathalie N (1996) compares the concepts of business process re-engineering (BPR), which has addressed the issue of changing organizations through the use of information technology (IT) and socio-technical design (STD). Challenging the notion that STD can humanize BPR, combination of IT-induced change with soft ideas; Promotion of emancipation and socially responsible choices.[10]

Gunasegaram (2002) analyzes the business process design and business process reengineering (BPR) depends crucially on linking production procedures and organizational services to business goals and objectives. There is currently very little formula support for this kind of reasoning as analytical tasks are usually carried out informally and individual design decisions are hard to relate to business objectives. If BPR is carried out without understanding the way it is done, then the most likely outcome would be continuing less-than-satisfactory current practice and automating outdated processes. This kind of practice misses opportunities for innovation and rationalization. The modeling and analysis of business processes along with business strategies and organizational structures are essential to study the implications of BPR [5].

Ramirez, Melville, Nigel2, Edward3(2010) extended current research examining synergies between information technology, process redesign, and firm performance in three ways: analyze a firm's entire IT and BPR portfolio, examine production and market value performance implications, and conduct analysis using a unique dataset of 228 firms between 1996 and 1999. We find a contingent association between IT, process redesign, and performance. The interaction of IT

and BPR portfolios is positively associated with firm productivity and market value. However, we find mixed evidence of a difference in these impacts across different types of BPR [11].

Pereira, Zulema Lopes, Aspin wall, Elaine (Feb-1997) describes the main principles of the BPR methodology, and presents the main reasons for failure in the implementation, as focused on by various authors. A summary of the current debates on TQM versus BPR follows. The main conclusions about the differences between the two methodologies are discussed and a proposal for integrating them is offered. It is concluded that the major features for achieving success within an organization are the definition of its mission and goals, an adequate analysis of current processes and an appropriate choice of processes for improvement. This will determine whether the change has to be radical or not [12].

Galliers, R.D,Baker, B.S.H(Nov,1995) thinking on business process reengineering (BPR) is evaluated in the context of four schools of thought with respect to business strategy, with aspects of the management of change literature and with concepts taken from the socio-technical and soft operational research (OR) traditions. Based on the latter, a means of undertaking BPR projects is proposed and is illustrated by means of a case study. Inter alia, the centrality of information technology (IT) in BPR is questioned with greater emphasis being given to the identification of required information and an organization's ability to manage its information services [13].

Sampler, Jeffrey L, Short, James E (1994) describes an explanatory framework is developed based on 2 constructs - expertise half-life and information half-life. It is proposed that under certain conditions high project failure rates are associated with weak coupling between reengineering project objectives and the firm's general business and information systems planning agenda. Under other conditions, this weak coupling is associated with successful projects. By conceptualizing information technology's (IT) capability to destroy both tangible and intangible organizational assets in the explanatory framework, 2 central observations regarding strategic assets, IT, and process reengineering are arrived at: 1. IT's capability to destroy tangible as well as intangible assets suggests a far more dramatic and complex role for IT in the development of core competencies in the firm. 2. Reengineering efforts that do not acknowledge the important difference between restructuring physical assets and rethinking the flow or characteristics of intangible assets increasingly are incomplete [14].

G.M. Giaglis, R.J. Paul, R.M. O'Keefe(1999) inherent the interrelationships between business processes (BP) and the underlying information technology (IT) infrastructure imply that the design of these two organizational facets should be performed in parallel, this does not seem to be the case in practice. For example, simulation is being extensively used in both the BP and IT domains, albeit in a disjointed fashion. This paper investigates the potential of integrating different simulation models to facilitate concurrent engineering of business processes and information technology and to support the process of investment evaluation. Drawing on the findings of an example case, a number of pertinent issues are identified and future research directions towards the integration of simulation usage in the business domain are discussed [15].

IV. PROPOSED WORK

Re-engineering recognizes that an organization's business processes are usually fragmented into sub processes and tasks that are carried out by several specialized functional areas within the organization. Often, no one is responsible for the overall performance of the entire process. Re-engineering maintains that optimizing the performance of sub processes can result in some benefits, but cannot yield dramatic improvements if the process itself is fundamentally inefficient and outmoded. For that reason, re-engineering focuses on re-designing the process as a whole in order to achieve the greatest possible benefits to the organization and their customers.
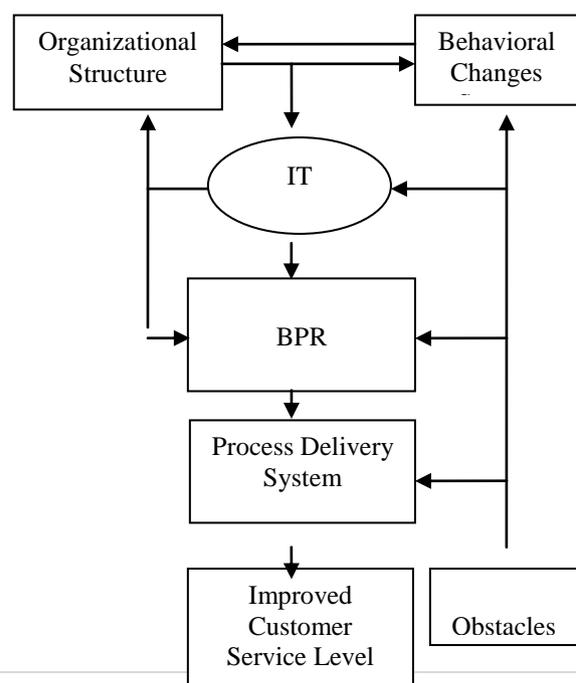
Table1: Conceptual Model for BPR

In this proposed model the researchers are trying to optimize the all development process and its obstacles, which can make barrier each and every phases of the BPR methodology. The advancement of IT supporting as a powerful new technology with great potential to help to discover patterns and relationships in the data in order to help make better business decisions. Data mining and data warehousing can help spot sales trend, develop smarter marketing campaigns, and accurately predict customer loyalty.

Data mining, or knowledge discovery, is the computer-assisted process of digging through and analyzing enormous sets of data and then extracting the meaning of the data. Data mining tools predict behaviors and future trends, allowing businesses to make proactive, knowledge-driven decisions. Data mining tools can answer business questions that traditionally were too time consuming to resolve.

Specific uses of data mining include:

- *Market segmentation* - Identify the common characteristics of customers who buy the same products from your company.
- *Customer churn* - Predict which customers are likely to leave your company and go to a competitor.
- *Fraud detection* - Identify which transactions are most likely to be fraudulent.
- *Direct marketing* - Identify which prospects should be included in a mailing list to obtain the highest response rate.
- *Interactive marketing* - Predict what each individual accessing a Web site is most likely interested in seeing.
- *Market basket analysis* - Understand what products or services are commonly purchased together; e.g., beer and diapers.
- *Trend analysis* - Reveal the difference between typical customers this month and last.

Data mining technology can generate new business opportunities by:
- *Automated prediction of trends and behaviors*: Data mining automates the process of finding predictive information in a large database.

- *Automated discovery of previously unknown patterns*: Data mining tools sweep through databases and identify previously hidden patterns.

A. Obstacles in BPR

Reengineering has earned a bad reputation because such researches have often resulted in massive layoffs. This reputation is not altogether unwarranted, since companies have often downsized under the banner of re-engineering. Further, reengineering has not always lived up to its expectations. The main reasons seem to be that:

- Reengineering assumes that the factor that limits an organization's performance is the ineffectiveness of its processes (which may or may not be true) and offers no means of validating that assumption.
- Reengineering assumes the need to start the process of performance improvement with a "clean slate," i.e. totally disregard the *status quo*.
- According to Eliyahu M. Goldratt (and his Theory of Constraints) reengineering does not provide an effective way to focus improvement efforts on the organization's constraint.

V. CONCLUSION

In this paper the researchers analyzed the obstacles which makes barrier during implementation of BPR methodology for the organizational development. This study also point out the failure features and its conceptual view in a particular organization. In spite of that researchers also focused on current issue of IT and its advancement which help to knowledge discovery and relationships in the data in order to make better business decisions. The future aspect of data mining will be profitable, easy to use, and make imagine intelligent business system.

REFERENCES

[1] Johansson, Henry J. et al. (1993), Business Process Reengineering: Break Point Strategies for Market Dominance, John Wiley & sons.

[2] Hammer, Michael;Champy, james. Reengineering the Corporation;A manifesto for Business revolution, Harper Business, New York 1993.

[3] The role of IT in business process reengineering PR, 2000, term paper on.898599033

[4] Future Role of IT in Business Process Reengineering- Benchmarking Report, Prosci Research and Publishing Company, 1999

[5] Gunasekaran, A.; Nath, B. "The Role of Information Technology in Business Process Reengineering," International Journal of Production Economics, 50, 2/3, 1997, pp. 91-104. ISSN: 00207543 .

[6] Ardhaldjian, R.; Fahner, M. "Using Simulation in the Business Process Reengineering Effort,"Industrial Engineering, 26, 7, 1994, pp. 60-1.

[7] Davenport, T. H.; Short, J. E. "The New Industrial Engineering: Information Technology and Business Process Redesign," Sloan Management Review, summer 1990, PP. 11-27.

[8] Maull, Weaver, Childe,Smart, Bennett,'International Journal of Operations & Production Management', 1995, Vol. 15 Issue 11, p37-52, 16p, ISSN:01443577

[9] Harrington, Barbara, Mc Cloughlin, Kevin, Riddell, Duncan, Source:New Technology, Work & Employment; Mar1998, Vol. 13 Issue 1, p43, 8p, ISSN:02681072

[10] Mitev, Nathalie N. Source: Personnel Review; 1996, Vol. 25 Issue 4, p56, 11p, ISSN: 00483486

[11] Ramirez, Melville, Nigel2, Edward3 'Decision Support Systems' Nov2010, Vol. 49 Issue 4, p417-429,13p ISSN: 01679236

[12] Pereira, Zulema Lopes, Aspin wall, Elaine'Total Quality Management', Feb97, Vol. 8 Issue 1, p33-39, 7p, 1 Diagram, 1 Chart, ISSN:09544127

[13] Galliers, R.D,Baker, B.S.H. INFOR; Nov95, Vol.33 Issue 4, p263-278, 16p, ISSN: 03155986

[14] Sampler, Jeffrey L, Short, James E. Journal of Management Information Systems. Armonk: Fall 1994. Vol.11,Iss.2;pg. 59, 15 pgs , ISSN:07421222

[15] G.M. Giaglis, R.J. Paul, R.M. O'Keefe Logistics Information Management. Bradford: 1999. Vol. 12, Iss. 1/2; pg. 108, ISSN: 09576053