

Creating a Healthy Ergonomic Environment Via Business Process Reengineering: A Phenomenological Perspective

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Abstract – This research study aims to reveal how far the Business Process Reengineering (BPR) in organizations create a healthy ergonomic working environment and how far the organizations can take constructive steps to maintain such working place for a long period of time. When the organizations implement the BPR, human factors have been ignored and the financial and competitive benefits have been taken into consideration. This research paper explores by incorporating the qualitative method- phenomenology to investigate and interpret the research findings. It is found that many physical disorders occurred due to the improper implementation of BPR. This research recommends that the transformation of BPR should consider the human safety and health and also the vendors of hardware, software and other manufacturers of equipments and furniture should also pay attention to the human convenience and health for a continuous working schedule to promote a healthy ergonomic working environment.

Keywords – Business Process Reengineering; Ergonomics; Human factors; Healthy Working Environment.

I. INTRODUCTION

Ergonomics (or human factors) is the scientific discipline concerned with interactions among humans and other elements of a system in carrying out a purposeful activity. Ergonomics aims to improve human wellbeing and overall system performance by optimizing human-system compatibility. Human-System interaction design considerations include physical, cognitive, social, organizational and environmental factors [1].

Ergonomics emerged as a discipline during World War II when improving the interaction between human operations and sophisticated military systems which was crucial to the success of the military. After the war the discipline developed to study and improve human productivity and work physiology in the industry. Subsequently its scope has been broadened to include other fundamental objectives such as the provision for safer and healthier working environments and improvement of the quality of working life. The discipline of ergonomics has strong links to cognitive science, human-computer interaction, organizational design and management.

Business process reengineering (BPR) is, in computer science and management, an approach aiming at improvements by means of elevating efficiency and effectiveness of that exist business process within and across organizations. Business process reengineering (BPR) began as a private sector technique to help organizations fundamentally rethink how they do their work in order to dramatically improve customer service, cut operational costs, and become world-class competitors. A key stimulus for reengineering has been the continuing development and deployment of sophisticated information systems and networks. Leading organizations are becoming bolder in using this technology to support innovative business processes, rather than refining current ways of doing work [2].

Ergonomics deals with a system of interacting components which includes the worker, the work environment both physical and organizational, the task and the workspace. The goal of ergonomics is to ensure a good fit between the workers and their job, thereby maximizing worker comfort, safety, productivity and efficiency [3].

The aim of this research study is to investigate how far the organizations can take constructive steps to create a healthy ergonomic working environment when they reengineer their business process.

II. LITERATURE REVIEW

Several research studies have been done in different decades identified the benefits of ergonomics in various business environments.

Human factors/ergonomics (HFE) has great potential to contribute to the design of all kinds of systems with people (work systems, product/service systems), but faces challenges in the readiness of its market and in the supply of high-quality applications [4].

In the last decades, norms and laws on safety and ergonomics of the work place have taken importance among industrialized countries. Design for Maintenance is a design methodology that since early stages of product life cycle outlines needs and necessities of maintainers, in order to reduce time and cost; decreasing the complexity and the difficulties of these procedures and achieving a higher standard of workers' health. In order to reach this goal, Digital Human Models (DHM) have been used to simulate assembly and maintenance processes. Virtual ergonomic analysis performed with a human model allows evaluating visibility, reachability and postures, stress and fatigue. The lack of methods supporting virtual ergonomics simulation has been addressed by proposing a systematic approach based on a step-by-step procedure and proper tools [5].

Hammer had given much emphasis to BPR. He articulates that most of the work being done does not add any value for customers, and this work should be removed, not accelerated through automation. Instead, companies should reconsider their processes in order to maximize customer value, while minimizing the consumption of resources required for delivering their product or service [6]. The idea was also supported by [7].

Re-engineering has been used as a covering label for process management, process innovation, and process redesign. Sometimes it also embodies concepts such as downsizing, right-sizing and restructuring. It is used to boost competitiveness through continuous development of simpler, leaner, more productive processes and related streamlining of work system structures. The term re-engineering has many connotations and as a result, numerous definitions of re-engineering have emerged. Ubiquitous in the published literature is the definition of [8] who defines BPR as "the fundamental rethinking and radical

redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed".

Enterprise Resource Planning (ERP) systems promise to improve the overall effectiveness of organizations through integration of all the functionalities within the organizations. Further, within the context of "managing the supply chain", ERP systems promise to include even more coverage, in essence automating the entire Chain. This is achieved through all-encompassing software. Over the last four years, success stories of ERP implementations have been few and far in between. Besides high initial start-up costs and high implementation costs, the implementation process have been problematic due to lack of due consideration to the 'human' component. Consequently, many companies have minimized their losses by abandoning their projects mid-course. Authors claimed that the perspective that ERP is in desperate need of ergonomic research, design and implementation to minimize the financial and human costs currently being experienced [9].

Further, the researchers proposed how to automate the assembly process of a manufacturing company. The transition from the manual process to the new semi-automated assembly line is composed of 4 main steps: the as-is analysis, the Process reengineering and layout design, the training and finally the mass production. The study has shown that the line automation yields significant improvements: sizeable increase of the workstations saturation, better cohesion with Just in Time principles, reduction of the employed working force, and increasing of the quality control process rigor [10].

Ergonomics deals with a system of interacting components which includes the worker, the work environment both physical and organizational, the task and the workspace. The goal of ergonomics is to ensure a good fit between the workers and their job, thereby maximizing worker comfort, safety, productivity and efficiency. Banking and financial systems have been revolutionized by the ongoing progress of information and communications technology on a global scale. The twin pillars of modern banking development today are Information technology and Electronic funds transfer systems. Even though this phenomenon has largely permeated throughout the Indian banking system, technologies suitable for Indian conditions have also been introduced. Public sector banks and the existing private sector banks (old private sector banks) faced challenges in the form of competitive pressures and changing customer demands both from foreign banks and

new private sector banks. Most of the public sector and old private sector banks (classified as traditional banks) had a number of legacy issues to tackle in their existence of more than a century. While the new private sector banks could adopt the best practices and implement the latest technology in their operations, the foreign banks acquired the practices and technology akin to their host countries within the regulatory framework of India. Influenced by the varied practices and culture of host countries, this segment of banks operating in India was found to be quite heterogeneous in their operations and performance. Faced with the threat of competition from the foreign and new private sector banks (classified as modern banks), the traditional banks employed a number of measures to improve their operational efficiency, meet customer expectations and reduce operating costs. These included going for fully automated systems (Core Banking Solution based operations) preceded by business process reengineering (BPR), training and retraining of staff, lateral recruitment of specialists, emphasis on marketing, advertising, customer relationship management and improving brand image, diversification of activities, introduction of electronic based multiple service delivery channels, setting up of back offices and data centers, business process outsourcing. Some of these banks have undergone rigorous restructuring exercises with the involvement of international consulting agencies to adopt the best international practices and remove bottlenecks in their operations.

A study conducted by [11] and [12] pointed out that the advent of computer technology has meant greater flexibility and increased efficiency for office workers. However, automation does not eliminate human role but rather changes it, often in unforeseen ways and with unanticipated consequences. The continuous use of computers in the workplace means increasingly sedentary jobs. Employees are moving less as they work. The widespread use of computers has contributed to an exponential rise in the number of injuries owing to its user interfaces—video display terminal (VDT), keyboard and mouse. The recent influx of health problems such as carpal tunnel syndrome, cumulative trauma disorders, and repetitive strain injuries caused by inadequate design of the workplace environment has militated against the increased levels of office productivity originally anticipated. This will individually influence the employees. There is no serious research nor are discussions widely conducted in these areas in the Indian context. This study examines the employees' experience on changed office layout of banks due to automation. The

following elements are taken into consideration to examine the following:

- Office seating arrangements and its comfort
- The way in which the office computer monitors, keyboard, mouse etc. are arranged.
- Lighting facilities in the office.
- Disturbance by the sounds from IT devices like printer, Computer, Mobile phone etc.
- Employee free time to stand up and relax
- Employee perception on neatness of office cabin and premises.
- Employee experience on colour combination of the office.
- Eye problems as they look long hours at computer monitor.
- Headache as they look long hours at computer monitor.

All definitions share a common theme, that is, the company embarks on a radical change initiative, essentially focusing on employee empowerment and rethinking and redesigning the ways in which its business processes are performed [13].

There are various definitions for BPR by different authors. However, the definition given by BPR encompasses the envisioning of new work strategies, the actual process design activity, and the implementation of the change in all its complex technological, human, and organizational dimensions [14].

BPR is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in measures of performance such as quality, cost, speed and services. BPR can be introduced in one, a few or all organizational processes (Hammer and Champy, 1993). They argued when old methods are not working, organizations face environmental processes under three Cs – Customers, Competition and Change. At that time there is a necessity for BPR. They further argues that IT can break old rules that limit the manner in which work is performed. BPR creates new architecture for business and management processes. It involves the redrawing of organizational boundaries, the reconsideration of jobs, tasks and skills. It literally means “rethinking everything”.

The five major characteristics of BPR identified by them are:

- (1) Several jobs are combined into one.

- (2) Employees make decisions (Empowerment of employees) and decision making becomes part of the job.
- (3) Steps in the business process are performed in a natural order, and several jobs get done simultaneously.
- (4) Processes may have multiple versions. This enables the economies of scale that result from mass production, yet allows customization of products and services.
- (5) Work is performed where it makes the most sense, including at the customers' or suppliers sites. Thus, work is shifted, if necessary, across organizational even international boundaries. It is supported by the researcher [15].

III. RESEARCH METHODS

This research study purely incorporates one of the popular qualitative research methods-phenomenology as a philosophy and a methodology in order to develop an understanding of complex issues that may not be immediately implicit in surface responses. According to [16], individuals approach the life world with a stock of knowledge made up of common sense constructs and categories that are essentially social in action. As such, the researcher follows this methodology in the current research.

IV. DISCUSSION OF FINDINGS

There are four factors affecting on the BPR process and the factors also has different aspects of the organization like managerial, operational, financial and technical [17]. Managerial factors are associated with the Top level management like the managers, board members etc. as they have the vision and mission, they plays very essential and manifest role in the BPR process are needed for better control over the operational activity we can identify and analyze the different constraints like time, cost, and resources and also change in behavioral and structural changes in the BPR process implementation. Next the financial factors play ore crucial role than the other factors since it deals with the money and also the BPR process consumes lengthy time and it needs more resources. Therefore, in order to bear the cost the financial factors are more important during the execution and implementation time. Finally the technical factors are the inevitable factors which play a vital role in the whole process.

BPR is an important tools used for incorporating change and had proved to be the significant approaches due to its

features and the results produced by the effective utilization of these approach over decades.

From the above findings it is evident that the factors for BPR and the process for BPR should be systematically and appropriately used in order to make a healthy ergonomic environment. When there is a BPR activity recommended or needed for an organization to improve its efficiency and increase the output, the organization should acquire more computer aided devices there. As such the usage of them by people in organization would also increase. At this circumstance, people will use them for a long period of time and affected by several physical disorders. Furniture and musculoskeletal discomfort, visual fatigue and eye strain, effect of heat emissions from the machines are some of them. Therefore, the organization and the relevant team should have the awareness of these factors and create the working place not only as a user friendly environment but also as a user safer and healthy environment.

V. CONCLUSIONS AND RECOMMENDATIONS

The findings of this research study emphasize that there is a need for a healthy ergonomic environment to be established in every organization. The BPR is not an event and it is a process and it takes remarkable time for execution and implementation. When a particular organization implements the BPR, it will only consider the physical and the organizational benefits and the feasibility. No organization will consider the human safety and health in long terms. It will turn into negative consequences and results to the organization. Nowadays many software companies function as virtual organizations to minimize the space and increase the convenience of staff. Further, it is recommended that the transformation of BPR should consider the human safety and health and also the vendors of hardware, software and other manufacturers of equipment and furniture should also pay attention to the human convenience and health for a continuous working schedule to promote a healthy ergonomic working environment.

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