ABSTRACT

Business Process is an age-old definition, which needs no introduction. It is a well-known fact that whenever there is a shift in technology, there is a change in business process. During the late 70's many of the organisations opted for computerisation of their processes. The 80's have seen a shift to automation. The early 90's brought about a transformation in technology with the advent of Information Technology. Information Technology changed the total concept of business. Which was unthinkable, ten years before, is a reality now. Due to the new invention of Information Technology, the organisations were in a dilemma for a time being what to do next. They had already invested a huge amount towards the computerisation and automation. They could not afford to through them out and adopt new technology. Therefore at that juncture of time, that was a major concern to rethink about the situation. Technologist and business professionals worked together to sort out this problem and they came out with the new alternative of redesign of the earlier set up which is now popularly known as "Business Process Re-engineering". Business Process Re-engineering is a very recent concept. After the rapid advancement of Information Technology, BPR has been taken up by academicians and industry professionals to sort out the problem of obsolescent in the industry without restructuring it or without major investment.

Business Process Re-engineering refers to design or modification of the process with the help of Information Technology tools, without a major restructuring, in order to build a cross functional organisation and to obtain wide target of higher quality, lower cost, in time delivery and value aided services, by optimising the sharing of work. Simply stating it is a continuous improvement in process outcomes with the present set up, existing manpower and machine without much investment. It is the re-thinking of the institutionalised processes, which needs restructuring or downsizing, due to the environmental pressure. Information Technology is the major tool for BPR processes.

In 1990 Professor Michael Hammer of Massachusetts Institute of Technology introduced the idea of **Business Processes Re-engineering** for the first time in his

seminal paper in Harvard Business Review entitled "Re-engineering works, do not Automate or obliterate". The concept of "Automation" makes for a time, by which the process runs by a pre defined rules, and formulated methods. But after the process was over it forgets or destroys completely about the past transaction. And in the next attempt, it starts afresh without reforming the previous process. But after the foundation and advancement of different Artificial Intelligence tools and methods, the concept of automation changes towards Re-engineering. Re-engineering is the process that remembers all the past history of transaction and takes a decision according to that. To understand BPR, it is important to distinguish the concept with the traditional system of automation. While automation typically uses machines and computer to speed up existing procedures, BPR involves using the technology to change the fundamental nature of the process. With automation, the capability of technology is applied within the constraint of the current business tasks and facilitates a more natural and rational alignment between IT and the organisation. One of the examples is the new industrial engineering, in place of the old Taylorian industrial engineering based on both task division and specialisation.

Technology is playing significant roles in Business scenario since last 30 years. Whenever there was an invention in technology, there was a change in the Business process. The first application area of computer was business. When only data was handled by computer, the business hours started Data Processing through it. When it was able to derive information from the huge volume of data, business houses started Managing Information Systems in different department. When technology went one step by developing Knowledge Based Systems, it was no longer kept aside but implement in business in the form of various Expert Systems. The present day changing business scenario with growing customer expectation, increasing competition and regulatory compliance have forced organisations to re-design about their process of managing business with customer satisfaction and delight them has became necessary. Organisations will face much difficulties in future to survive, when they have to share their business processes, systems, organisational structure and culture towards achieving a pick performance in terms of costs, quality, speed and service. BPR is not meant for making a small improvement in the process or making a profit in short term. It starts from the scratch, in order to achieve customer satisfaction, process improvement and profit optimisation.

There is a shift in paradigm in BPR after the revolutionary change in Information Technology. Artificial Intelligence (AI), which is one of the major IT tool now, gives many advent applications like data mining, data warehousing, and business analysis. It is a process of simulating human intelligence in computer using different method such as Fuzzy Logic, Neural Network, and Pattern Matching. BPR is also adopting and implementing the advanced networking, Internet tools, HTML etc. in the process. As a result the new process like online marketing, E-Business, E-commerce, Data mining and Data Warehousing, Internet Banking, Portfolio Management on the Net, Virtual shopping has come into existence. Computer scientists have already developed many tools and techniques, in last two decades, but never took off the real life problem in commercial computing area. But the multi-national enterprises look at solutions for gathering and analysing different information using AI techniques in their mainstream business computing, gives rise to the new paradigm of Business Intelligence.

IT enabled BPR involves the radical re-design of inter functional business processes which have an impact of strategic out comes for the organisation such as major business goals, competitiveness etc.. Inter-functional change of the organisation should be planned at the strategic level to integrate IT planning and business planning, through an integrated approach. IT supported business goals can facilitate a rethinking of alternative processes to reach the organisation goal. The flexibility provided by the diversity of the IT tools, makes it possible to tailor change through planning and direction. Once major changes have been initiated, it can be incrementally refined through the inter actions among tasks, people and technology.

Professor Michael Hammer has given a principle of Re-engineering, for the implementation in any organisation:

i)   Organise around outcomes, not tasks
ii) Identify those who use the output of the process and perform/ modify the process accordingly.
iii) Include Information Processing work into the real work, which involves any form of information.
iv) Treat geographically dispersed resources as centralised resources.
v)   Link parallel activities instead of integrating tasks.

vi) Put the decision points, where the work is performed and build control into the process.

vii) Capture information once and at the source.

There are few reasons why the organisations are going for Business Process Redesigning or Re-engineering. Reasons can be modelled into three dimensions. They are 3Cs, i.e. Customers, Competitions and Change.

i) **Customers:** Customers have become much more sophisticated and demanding, they have a large range of alternatives and much more knowledge about their own needs and are exerting greater pressure on their suppliers. For example, a customer who had purchased a main frame last year spending lot of money, is interested in the use of GUI [Graphical User Interface) with the existing data from main frame.

ii) **Competition:** Which was at one time local and relatively gentle, has become global and cut-throat. The database of the organisation gears enormously high, so it could not manage by it self. So it looks for the third party, who will take care of their data for supply when and where necessary.

iii) **Change:** What was unthinkable yesterday is a routine today. There has been changes in technology, change in geo-political realities and change in customer preferences. The different departments have their own information system. But there is hardly any links between them, if some one is interested to retrieve data from the system. There is change in organisational structure. Marketing department, Manufacturing unit, Warehouse and Head office located at different locations, want to communicate with each other. There is also change in the customer's demand.

Many companies are now opting for corporate-wide restructuring. A major element of this programme involves the rethinking of current business processes. The need to improve business procedures has been recognised and many progressive corporations going for administrative re-structuring. Increases in foreign competition, sluggish economies and major advances in technology have all contributed to this need for fundamental organisational change. That is the main reason of the Re-engineering or Business Process Redesign (BPR) processes. It is rapidly gaining attention from both business and academic communities. Many examples of BPR

success have been reported, in achieving dramatic improvement in quality, cost, speed and customer service. In the present day world organisation must change their priorities from traditional focus on planning, control and manage growth to emphasise speed, innovation, flexibility, quality, service and cost. It is very difficult to sustain in this new reality. Business Process Re-engineering is the only solution, which means a group of related tasks in Business that together creates value for a customer. In traditional business organisations processes are orphans, fragmented across many organisational units, which are effectively invisible and essentially unmanaged. But the processes are the hearts of any organisation, without which the organisation can not run. Re-engineering means designing the process again without a major restructuring and with minor investment, to build a cross functional organisation, to obtain wide target as higher quality, lower cost, in time delivery and value added services by optimising the sharing of work. It is a continuous improvement with the present set up, with the existing manpower and machines.

The thesis has been classified into six chapters. The first chapter briefly discusses the development of Process Re-Engineering (PRE) tools [Baboo, Patnaik, Mohapatra, 2003]. The chapter also highlights the last few years development of Business Processes Re-engineering. The chapter gives a brief review on PRE and highlights on the objective and methodology of the proposed work.

Chapter II begins with the manual system and their processes. Subsequently, it covers, automated systems and their process development. The chapter also discusses ongoing business process, and also reengineering concept to improve the process [Baboo, Patnaik, 2002]. It also highlights BPR in public sector undertaking in India due to the invention of Information Technology. The chapter gives an overview of IB Thermal Power Station and their organization. The chapter discusses about the Enterprise Asset Management and Human Resource Management at the end.

Chapter III discusses the implementation of Enterprise Assets Management (EAM) System at IB Thermal Power Station [Mahakul, Baboo, Patnaik, 2005]. The chapter covers the methodology adopted in implementing the EAM besides highlighting the study and scope of Business Mapping Report. The chapter highlights the Data Flow Diagram of the processes involved and describes each activity in detail

and its solution in EAM. This chapter also highlights the configuration and technical implantation of the solution and post implementation experiences.

Chapter IV reports the implementation of HR module in ERP at IB Thermal Power Station [Jena, Baboo, Patnaik, 2007]. This chapter covers the methodology adopted in implementing the module in ERP besides highlighting the study and scope of Business Mapping Report. This chapter highlights the Data Flow Diagram of the HR processes involved and describes each activity in detail and its solution in ERP. It also highlights the configuration and technical implantation of the HR solution and post implementation experiences. At the end the chapter discusses the limitations and the future directions.

Chapter V briefly discusses the different attributes, required for multi-dimensional evaluation approach for assessing ERP projects. This approach can be easily extended to any big IT project. This approach not only helps in assessing the ERP projects but also in monitoring its progress during various phases of its life cycle and thus ensures protection of investment. Today's business is carried out through many forms and media. Enterprise-wide Resource Planning is a knowledge-based system, which is designed for the entire planning of the enterprises. In this chapter we have discussed about the techniques and methodologies of the Enterprise Resource Planning and it's implementation [Baboo, Patnaik, Mohapatra, 2001].

Chapter VI highlights the future area of implementation of ERP towards integrating the capabilities of a Geographic Information System (GIS) into the EAM solution. The GIS enables map-based views of the asset and work information that is managed using an EAM system. Enterprise applications designed to meet different business needs usually have different data structures. Systematic integration of separate EAM is known as Enterprise Application Integration (EAI). Through the process of EAI, enterprise applications share data and even business processes. The goal of EAI is to have the enterprise applications tightly tied together so that they appear as a unified application.

The flow of information between two integrated applications may either be unidirectional or bi-directional. The exchange of information between two integrated applications can occur in real-time, or can be carried out in batches, either set to run

on a schedule, or when certain triggering conditions are met. A real-time, bi-directional interface is a highly complex matter, because of the business rules in each application that must be taken into account. However, the value of a bi-directional interface can be extremely significant and considerable work is required for two enterprise applications to integrate successfully. To achieve the same, various software and data have to be integrated without any slippage or miscommunication. Software developers and consultants have to work together with the existing tools to make the integration successful.