3. INFORMATION TECHNOLOGY REVOLUTION

3.1 INTRODUCTION

Information Technology is the key enabler of the Business Process Re-engineering. In the last decades technology has changed the business ground rules. Hence it is important to understand the impact of the technology changes on the industries.

3.2 EVOLUTION OF INTERNET & IMPACT ON BUSINESS

Internet Technology has revolutionized the way we can do business [R. Fichman (71)][P Attewell (72)]. But business itself is only slowly adapting to the new possibilities. The new economy needs a new paradigm, but the process of conversion will take some time to complete. The necessary technology is ready & waiting. Business needs to re-align or re-engineer its process to adopt this change. This research will try to define the methodology to adopt this new opportunity with minimum risk.

Over the last few years the Internet has evolved from being an only scientific network to a platform that is enabling a new generation of business. This first wave of electronic business was fundamentally the exchange of information through electronic media (example EDI, E-Mail etc.). This wave had changed only the speed of business but not the ground rule of business. But Internet has changed the ground rules of the business [Manheim (55)][Keen (59)][I/S Analyser (52)]. Now we can buy books through Internet. We can access large shopping mall from our home. A largest books store on Internet maintains one-fifth of inventory than its conventional competitor. We need not go to bank to check our balance or transfer money.

The general ideal of Business Process re-engineering is to provide means for optimising & enhancing business process, both in the production & in the administration. Using information technology in general & in the Internet in particular many business processes can be streamlined & service level can be improved along with the reduction of cost.
Key theme of BPR is Process change [Stoddard (2)[C. Frye (49)] [Agarwal (21)] where effect of change is “radical”, “fundamental” & “increase of benefit by factor”. In most of the cases effective use of this new technology delivers above result.

In the Indian context, scope of the web technology is limited for industries with B2C (Business to consumer) applications due to low penetration of Internet access in Indian home. However possibility of B2B (Business to Business) applications are enormous. Growth of Internet population in the Indian metro cities are increasing rapidly. Internet technology can be successfully used in the Government sector in India to improve the service level. Technological opportunity can truly drive the change of Business process. However, the success of e-BPR will depend on methodology that with minimize the risk & cost & maximize the benefit. Proposed methodology in this research will try to address this issue.
3.3 NEW PARADIGM OF E-BUSINESS

As the popularity of the Internet increases, people become more aware of its colossal potential. The World-Wide Web (WWW) is a product of the continuous search for innovative ways of sharing information resources. It is important to understand the history, background & basic concepts of this technology for effective use in the business.

3.3.1 World-Wide Web

People have dreamt of a universal information database since late nineteen forties. In this database, not only would the data be accessible to people around the world, but it would also "easily link to other pieces of information, so that only the most important data would be quickly found by a user." Only recently has the technology caught up to make such systems possible. The most popular system currently in use is the World-Wide Web. The official description defines the WWW as a wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents. In simpler terms, the Web is an Internet-based computer network that allows users on one computer to access information stored on another through the worldwide network.

3.3.2 Structure of the WWW

The WWW project is based on the principle of universal readership. If information is available, then any (authorized) person should be able to access it from anywhere in the world. The Web's implementation follows a standard client-server model. In this model, a user relies on a program (the client) to connect to a remote machine (the server), where the data is stored. The architecture of the WWW is the one of clients, such as Netscape, IE, Mosaic, or Lynx, "which know how to present data but not what its origin is, and servers, which know how to extract data", but are ignorant of how it will be presented to the user. One of the main features of the WWW documents is their hypertext structure. On a graphic terminal, for instance, underlined text, or an...
The term *hypertext* was coined by Ted Nelson in his book "Literary Machines," where he defined it as "non-sequential writing," and only later it became considered a medium limited to computers. Vannevar Bush published the earliest electronic model of such system in 1945. In his reference to the Bush's article, David Hirmes writes:

By 1945, Bush had realized that an era of information was approaching. He commented: "The summation of human experience is being expanded at a prodigious rate, [but] the means we use for threading through the consequent maze to the momentarily important item is the same as was used in the days of square-rigged ships."

Bush wrote of a "memex", a conceptual machine that could store vast amounts of information, in which a user had the ability to create information "trails": links of related text and illustrations. This trail could then be stored and used for future reference. Bush believed that using this associative method of information gathering was not only practical in its own right, but was closer to the way the mind ordered information.

Although 'memex' was never implemented, in 1960 it inspired Ted Nelson to develop the modern version of hypertext. In his newsletter Nelson writes:

[It occurred to me] that the future of humanity is at the interactive computer screen, that the new writing and movies will be interactive and interlinked. Bridges of translation will unite it and we need a worldwide network to deliver it with royalty. ]

Learning from Ted Nelson's ideas, Tim Berners-Lee conceived the idea of the World-Wide Web in 1989.
3.4 TECHNOLOGY DRIVEN BPR

Information Technology is the key enabler of BPR which is considered as the "radical change." [31][Hammer (32)]. The role of IT (Information Technology) is to challenge the assumptions inherent in the work processes that have existed since long before the advent of modern computer and communications technology. The heart of reengineering is the notion of "discontinuous thinking -- or recognizing and breaking away from the outdated rules and fundamental assumptions underlying operations... These rules of work design are based on assumptions about technology, people, and organizational goals that no longer hold." Following "principles of reengineering" should be reviewed.

| Organize around outcomes, not tasks; |
| Have those who use the output of the process perform the process; |
| Subsume information processing work into the real work that produces the information; |
| Treat geographically dispersed resources as though they were centralized; |
| Link parallel activities instead of integrating their results; |
| Put the decision point where the work is performed, and build control into the process; |
| Capture information once and at the source. |

BPR requires taking a broader view of both IT and business activity, and of the relationships between them. IT should be viewed as more than an automating or mechanizing force. It helps to fundamentally reshape the way business is done. [Short (3)].

Business activities should be viewed as more than a collection of individual or even functional tasks: in a process view for maximizing effectiveness. IT and BPR have recursive relationship. IT capabilities should support business processes, and business processes should be in terms of the capabilities IT can provide.
Business processes represent a new approach to coordination across the firm; IT's promise and its ultimate impact - is to be the most powerful tool for reducing the costs of coordination. Davenport & Short [Short (3)] outline the following capabilities that reflect the roles that IT can play in BPR:

(a) Transactional
(b) Geographical
(c) Automatically
(d) Analytical
(e) Informational
(f) Sequential
(g) Knowledge Management
(h) Tracking & monitoring

The way related functions participate in a process i.e., the functional coupling of a process, can be differentiated along two dimensions: degree of mediation and degree of collaboration [Teng (4)]. Degree of Mediation of the process as the extent of sequential flow of input and output among participating functions. They define the Degree of Collaboration of the process is the extent of information exchange and mutual adjustment among functions when participating in the same process. In their framework, information technology is instrumental in Reducing the Degree of Mediation and Enhancing the Degree of Collaboration. Also, innovative uses of IT would inevitably lead many firms to develop new, coordination-intensive structures, enabling them to coordinate their activities in ways that were not possible before. Such coordination-intensive structures may raise the organization's capabilities and responsiveness, leading to potential strategic advantages.

Information Systems (IS) Function has an important role in BPR. Although, BPR has its roots in IT management, it is primarily a Business Initiative that has broad consequences in terms of satisfying the needs of customers and the firm's other constituents. The IS group may need to play a behind-the-scenes advocacy role, convincing senior management of the power offered by IT and process redesign. It
would also need to incorporate the skills of process measurement, analysis, and redesign. The Information Systems group had to develop a new set of basic values that reflected a change in focus from technology to a focus on business processes and results. The specific business divisions led the BPR initiatives; IS groups served as partners in enabling the radical changes.

3.5 CONCLUSION

Information technology has changed the ground rules of the Business operation. Hence IT has become the integral part of the Business Process. In most of the case IT has become the key enabler of the process change.