Business Process Reengineering

11.1 Introduction

The company in the last decade of the 20th Century was still largely founded on Adam Smith's principle of division of labour based on specialisation, which was enunciated by him in 1776 in his seminal work *The Wealth of Nations*. He saw that the industrial revolution had unleashed technology for increasing worker productivity, thereby reducing the cost of goods by orders of magnitude. The high productivity levels in manufacturing organisations emboldened followers such as Henry Ford, and Alfred Sloan to further refine this principle of specialised task methodology to apply in managing the manufacturing units, and extend the same to all other companies. The division of labour principle was thus extended to management of production, sales, marketing, etc. This led to the creation of specialised departments in organisations, irrespective of whether they were airlines, manufacturing companies, steel mills, retail outlets, accounting firms, computer companies, banking or insurance companies. Alfred Sloan perfected Adam Smith's principle of the division of labour in so far as it applied to management, by creating smaller decentralised divisions with focus on specific activities or units of work. The division executives had only

numbers to look at in order to manage their units of work—sales, market share, inventory levels, orders, profit and loss, production and so forth. These numbers were, and still are taken to be indicators of the performance of a company.

This way of doing business or running a company resulted in the overall processes of manufacturing a product, or delivering a service becoming increasingly complicated. This was entirely due to fragmentation of processes into a large number of tasks, which fell within the domains of different managers or units. Managing a process across a number of divisions, units, and/or departments thus became more and more difficult. The old processes were modified in a nonsystematic fashion to deal with more and more complex product offerings by companies while accomodating demands for better value by the customer. For example, just-in-time systems were force-fitted with outdated material control and cost accounting systems. This has resulted in the evolution of processes.

Now, what is a process? Hammer and Champy define a business process as a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer.[1] Some of the business processes are: procurement, order fulfillment, product development, customer service and sales. In the existing, traditional departmental/hierarchical structures of companies, the business processes are often fragmented and obscured. They are divided into a number of tasks which often fall under different departments. There is no one in charge of a process from one end to the last at which stage value is generated for the customer. For example, order fulfillment process includes all state changes from order-to-shipment; service process is from inquiry-to-resolution; sales process is from prospect-to-order; manufacturing process is from procurement-to-shipment; product development process is from concept-to-prototype. Studies have revealed that the order fulfillment process can take several days. In one company it took 11 days. At Motorola, order fulfillment for paging devices took 30 days or more to process. With Business Process

Reengineering (BPR) it was reduced to 28 minutes.[2] Progressive Insurance reduced the claims settlement from 31 days to four hours after reengineering.[3] No wonder, BPR has become one of the important management issues of this decade.

The following forces are driving companies to embrace IT, the related technologies of e-commerce and EDI, including BPR, for sheer survival: the four Cs—Customers, Competition, Change, and Cost. **Customers'** demands and expectations have increased. **Competition** has intensified. IT is being leveraged to provide competitive edge in products and services at lower costs. **Change** characterises products and services. The pace of change has accelerated with liberalisation of economies and deregulation the world over. **Cost** of products and services is falling. These 4 Cs are together creating a new world for business. Companies have to dynamically respond to these forces and constantly adjust to the new parameters through the judicious use of IT, reengineering of their business processes, and aligning their business strategy with organisational infrastructure and IT infrastructure. It is IT which is a key enabler of reengineering. BPR uses IT to radically alter the business processes within organisations to dramatically increase their efficiency and effectiveness.

Now, what is BPR? How does this help organisations achieve such remarkable results? How is it associated with e-commerce and EDI? Why is it not only relevant, but also essential now?

When does reengineering of a process or multiple processes become a necessity? If answers to any of the following questions listed by Cross, Feather and Lynch[4] is in the affirmative, the time for BPR is now:

- Are your customers demanding more for less?
- Are your competitors likely to provide more for less?
- Can you hand-carry work through the process five times faster than your normal cycle time?
- Have your incremental quality improvement efforts been stalled or been a disappointment?

11.3 Strategic Alignment Model

As noted earlier, it is IT which enables BPR. But it is not enough to improve the internal Information System (IS) of an organisation. One has to examine the IT marketplace, the available technologies, and those just around the corner, and work out plans to integrate them with business, just as France Telecom did, in order to reap manifold gains while introducing re-engineering. We will now discuss the *Stragetic Alignment Model (SAM)* due to *Henderson and Venkatraman*[5], which provides a powerful framework for achieving alignment between business, organisation, and IT strategies. This model is used by the IBM Consulting Group, and is also part of management training in IBM.

In developing the SAM, Henderson and Venkatraman have viewed Business and IT in terms of *strategy* and *infrastructure*. The components of this model are:

- Business Strategy
- IT Strategy
- Business Infrastructure
- IT Infrastructure

SAM due to Henderson and Venkatraman can be pictorially represented as follows:

	Business	IT
Strategy	Business Strategy	IT Strategy
Infrastructure	Business Infrastructure	IT Infrastructure

Fig. 11.1

The model proposes to align IT with business by involving any three, or all the four components. Thus there are four

possible scenarios, which are based on dominant alignment perspectives.

1. Business Strategy as the driver: Technology transformation

- *Business Strategy–IT Strategy–IT Infrastructure*

In this perspective, Business Strategy drives the IT Strategy which in turn dictates the required IT Infrastructure and processes. This perspective is not constrained by the current organisational setup. The emphasis is on identifying the best possible IT in the market, and the corresponding internal IT architecture.

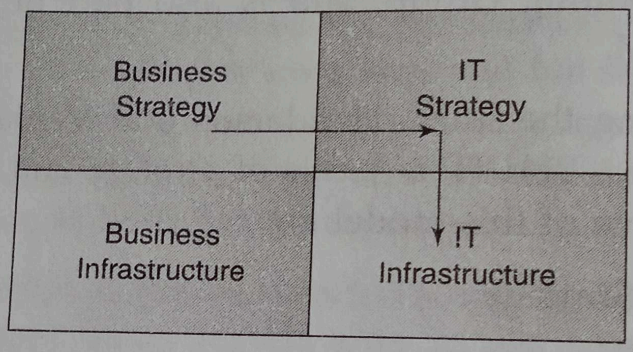


Fig. 11.2

The role of executive management in this perspective is to provide technology vision to suit the chosen business strategy. The performance criteria are based on technology leadership of the firm in the IT marketplace.

2. Business Strategy as the driver: Strategy Execution

- *Business Strategy–Business Infrastructure–IT Infrastructure*

In this perspective, Business strategy drives the Business Infrastructure, which in turn drives the IT Infrastructure. This is the common, hierarchical view of strategic management. The role of management is critical in making this perspective succeed, since the top management has to act as the strategy formulator, whereas the IT manager is the strategy implementor. *This is the traditional BPR model.*

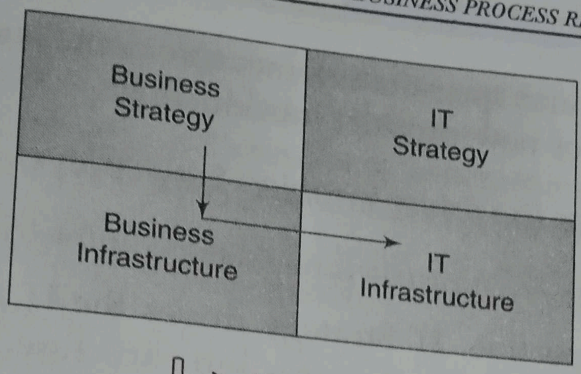


Fig. 11.3

The performance criteria for assessing the IT/IS function in this perspective are based on financial parameters.

3. IT Strategy as the driver/enabler: Competitive Potential

- *IT Strategy–Business Strategy–Business Infrastructure*

In this perspective, IT Strategy drives the Business Strategy which in turn drives the Business Infrastructure. The organisation tries to exploit emerging IT competencies to impact new products and services, and/or enter new businesses. In this perspective, business strategy can be adapted via emerging IT capabilities.

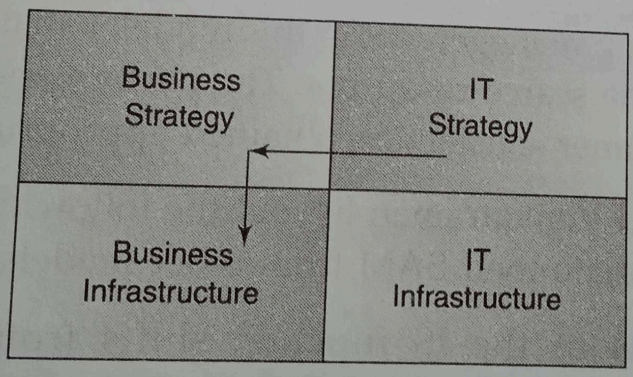


Fig. 11.4

The top management has to act the role of the business visionary. It has to understand and articulate the impact of emerging IT competencies and functionality on the business strategy. The performance criteria in this perspective are based

on qualitative and quantitative measurements such as market share, growth or new product introduction.

4. IT Strategy as the driver/enabler: Service level

- *IT Strategy–IT Infrastructure–Business Infrastructure*

In this perspective, IT Strategy drives the IT Infrastructure, which in turn drives the Business Infrastructure. Here, the role of business strategy is indirect since this approach is expected to provide direction to stimulate customer demand. This perspective is also viewed as necessary to ensure the effective use of IT.

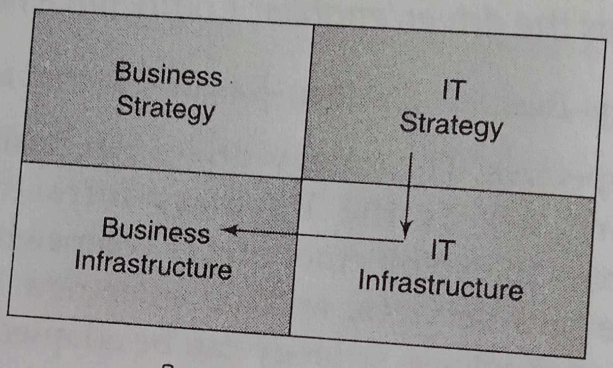


Fig. 11.5

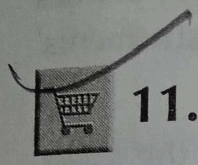
The role of top management in this model is that of prioritizer in allocating the scarce resources. The performance criteria are based on customer satisfaction obtained appropriately.

Henderson and Venkatraman list out the following four criteria which differentiate their SAM from other models:

1. The focus of the IS function shifts from an internal orientation toward one of strategic fit in the IT domain, i.e. existing and/or emerging technologies in the marketplace.
2. Selection of one of the four alignment perspectives, to suit the business conditions and organisational objectives, is the challenge, rather than the traditional management objective of linking the IS function with business requirements.

3. The diversity of roles of management in different perspectives is highlighted in this model.
4. The criteria for performance assessment in various perspectives are analysed. They expand from cost and service considerations to a larger set involving multiple, strategic and operational goals.

Every organisation has to choose the perspective that is strategic for it. Depending upon its state, the competition, IT deployment within the organisation, IT marketplace, customer profile, etc. appropriate SAM choice needs to be made.



11.4 BPR Methodology

BPR seeks to radically redesign the business processes, and to change the organisational structures in conformance with the new processes. It leverages technology and empowers people. Although the top management commitment is enlisted for BPR, there is resistance to change at all levels. People well entrenched in current practices perceive threat to their position, power and even jobs. BPR projects are, therefore, difficult to implement. Consultants estimate that 70 percent of BPR projects fail[6]. Their analysis reveals that organisations create conditions for success or failure. Following issues are considered the biggest obstacles in the success of reengineering projects:

1. Lack of sustained management commitment and leadership.
2. Unrealistic scope and expectations.
3. Resistance to change.
4. Not helping people think in terms of business processes.
5. Neglecting to align measures and rewards with the new business process thinking.

Does this point towards the need for a BPR Methodology to enhance the chances of success of a reengineering project? There are many who do not favour a methodology; instead intuitive thinking and experience is taken as the guide to start on a clean slate. Many of the successful BPR case studies were intuitive,

primarily because no methodologies existed at the time the projects were done. We will describe two BPR methodologies which have developed since then.

1. Gateway's Rapid Re Methodology for BPR due to Klein.[7]
2. Process Reengineering Life Cycle (PRLC) apprcach due to Guha, Kettinger, and Teng.[8]

Every approach recommends that the top management must be committed to BPR, and that there should be a BPR Project Team, and that there should be a Steering Committee. Various authors assign responsibility and accountability to all the entities in different proportions. Broadly, the following 'instruments' should carry out the reengineering process:

1. Top management, through a senior executive as the *leader*, who initiates, authorises and motivates the reengineering project.
2. A *BPR Project manager* with responsibility to drive the analysis of specific processes and their reengineering.
3. A *core BPR team* comprising insiders who know the processes inside out, and outsiders who bring general experience and have questioning attitude on the very existence of current procedures. Team members to work full time on studying existing processes, diagnosing problems, and overseeing their redesign and implementation.
4. A *Steering Committee*, which has senior mangers as its members, to develop BPR strategy for the organisation and to monitor its progress.
5. Individual *Task Teams* for Analysis, Design and Implementation in specific areas such as customer data collection, benchmarking, workflow design, application design etc.
6. A *reengineering guru* responsible for BPR techniques and tools within the organisation, and for synergizing the effect of various reengineering teams/processes.

A BPR project involves analysis, design, and implementation phases. The *analysis phase* establishes understanding of customer

requirements, markets, current process flow in the company, benchmarking of best industries practices, target performance objectives. It helps determine the core business processes which are immediate candidates for BPR. This phase also leads towards a first level design specifications. At this stage management's mandate should be reconfirmed on management's expectations and direction for the reengineering project, and constraints placed on the outcome of the project.

The *design phase* of BPR has to deal with design principles in these categories:

Service quality	:	design processes as they relate to customer contact
Workflow	:	manage flow of work through a series of steps
Workspace	:	economic issues and layout options
Continuous improvement	:	incorporate continuous learning to improve
Workforce	:	keep people in view at design stage of workflow, because only they make it work
Information Technology	:	state-of-the-art IT to be kept in view as an enabler of reengineered processes.

The *implementation and transformation phase* of BPR has to plan training, logistics, facilities modifications, and to manage the transition. People have to be carried along by the BPR team through persuasion and the promised gains, in order to minimise their resistance to change.

Modelling and Simulation tools can help model a complex process and predict its performance. A model comprises objects and their relationships, and tries to replicate a real life system. These tools can help in the analysis stage. A business process model, on the other hand, can also be developed by combining a set of local workflow models. Flow of work for one or more

business processes can be detailed as a local workflow model. Workflow tools fall under the category of implementation tools for automating business processes. Analysis and design must lead to delineation of business tasks and their corresponding workflow oriented application system, as part of the business process model. Thus, this amounts to developing a two-stage modelling procedure. Business process modelling identifies business tasks, which in turn are detailed for their domains related requirements for workflow-oriented application systems through the use of workflow modelling. Workflow tools are available for the following four types of flow of work:

Production Workflow	:	for back office activities
Collaborative Workflow	:	for interactions among users
Administrative Workflow	:	for electronic applications, forms, routing etc.
Ad hoc Workflow	:	for user determined interactions and routing

11.4.1 Rapid Re Methodology

This methodology has been taught in American Management Association seminars. There are five stages of the methodology:

1. **Preparation**: Mobilise, organise, and energise the people who are BPR team members. The BPR Project Team should have **insiders** with thorough knowledge of procedures, and **outsiders**, who are creative, experienced people and who have the ability to ask why things are done in a certain way.
2. **Identification**: Develop a Customer-oriented process model of the business. Include sections/ divisions or departments which are customers of other departments.
3. **Vision**: Select the processes to reengineer and formulate, redesign options capable of achieving breakthrough performance.

4. **Solution**: Define the technical and social requirements for the new processes and develop detailed implementation plans.

5. **Transformation**: Implement the reengineering plans.

The methodology lists out 54 tasks under these five stages. These stages are shown in Fig. 11.6. The tasks are given below:

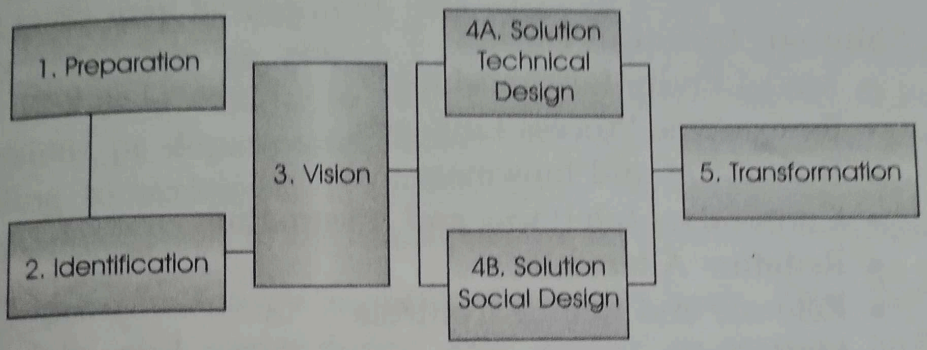


Fig. 11.6 *Rapid Re methodology*

1. Preparation

- Recognise Need
- Executive Workshop
- Train Team
- Plan Change

2. Identification

- Model Customers
- Define and Measure Performance
- Define Entities
- Model Processes
- Identify Activities
- Extend Process Model
- Map Organisation
- Map Resources
- Prioritise Processes

3. Vision

- Understand Process Structure
- Understand Process Flow

- Identify Value-Adding Activities
- Benchmark Performance
- Determine Performance Drivers
- Estimate Opportunity
- Envision the Ideal (External)
- Envision the Ideal (Internal)
- Integrate Visions
- Define Subvisions

4A. Solution: Technical Design

- Model Entity Relationships
- Re-examine Process Linkages
- Instrument and Informate
- Consolidate Interfaces and Information
- Redefine Alternatives
- Relocate and Retime Controls
- Modularise
- Specify Deployment
- Apply Technology
- Plan Implementation

4B. Solution: Social Design

- Empower Customer Contact Personnel
- Identify Job Characteristic Clusters
- Define Jobs/Teams
- Define Skills and Staffing Needs
- Specify Management Structure
- Redraw Organisational Boundaries
- Specify Job Changes
- Design Career Paths
- Define Transitional Organisation
- Design Change Management Program
- Design Incentives
- Plan Implementation

5. Transformation

- Complete Business System Design
- Perform Technical Design
- Develop Test and Rollout Plans

- Evaluate Personnel
- Construct System
- Train Staff
- Pilot New Process
- Refine and Transition
- Continuous Improvement

Each project has to customise the tasks to its needs. Not all the tasks may be required, and some of them may have to be grouped. Likewise, Stages 1 and 2 identify all key processes, but BPR may confine to only a few of them related to some divisions or departments, since the organisation may not be willing to undertake company wide reengineering. So, the methodology has to be tailored to the problem environment.

This methodology requires very few tools. Flowcharting template, and paper forms may suffice as manual tools. If required, the following six categories of *BPR tools* can be used in this methodology:

Project Management: Tools for planning, scheduling, budgeting, reporting and tracking projects.

Coordination: Tools like e-mail, bulletin boards, shared spreadsheets, groupware may be used to distribute plans and to communicate updated details of projects.

Modelling: Integrated Computer Aided Software Engineering (CASE) tools are used for integrated analysis, design, and development of computer systems.

Business Process Analysis: CASE tools can be used for business process analysis too. They help in the systematic reduction of a business into its constituent parts and their interactions.

Human Resource Analysis and Design: Some tools may be available for this purpose, basically for tracking candidate position and history.

System Development: These tools help automate the reengineered processes. CASE tools, visual programming,

application development framework, object oriented tools, etc. form part of this category.

Some of the questions which help decide the approach, and the tools that an organisation may take are the following:

- Is the BPR project a pilot or one of a series of similar projects?
- Scope of project—company wide or department specific?
- Who is the sponsor of the project?
- Who are the BPR team members? Their commitment in terms of time and support?
- Role of consultants, if any? Is an Outside Member of BPR Team Providing Methodology or Tools?
- What are Management's expectations of BPR?

11.4.2 Project Re-engineering Life Cycle (PRLC)

The PRLC approach as a BPR methodology identifies the following six stages in a reengineering project:

1. **Envision**
   - Secure management commitment
   - Identify reengineering opportunities.
   - Identify enabling technologies: IT, EC, EDI, etc.
   - Align with corporate strategy (develop a SAM)
2. **Initiate**
   - Organise Reengineering Team
   - Set Performance Goals in terms of time, cost, quality, etc.
3. **Diagnose**
   - Document Existing Processes
   - Uncover Pathologies
4. **Redesign**
   - Design the New Process
   - Design the Human Resources Architecture
   - Develop Prototype

- Select an IT Platform
- Explore Alternate Design

5. **Reconstruct**
   - Install IT
   - Reorganise
6. **Monitor**
   - Measure Performance
   - Link to Quality Improvement

The PRLC is shown in Fig. 11.7.

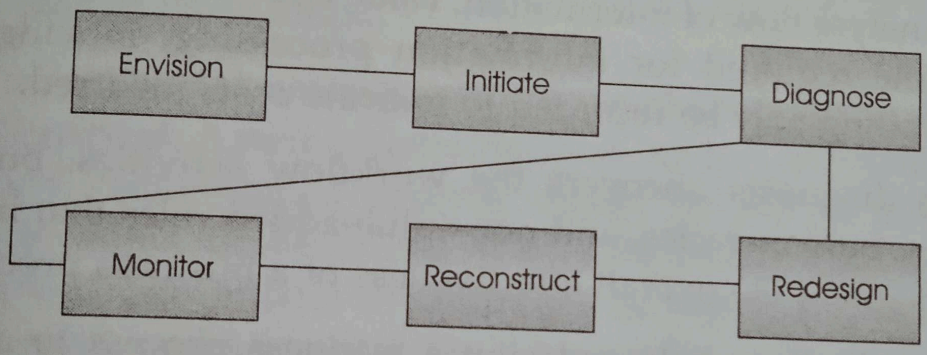


Fig. 11.7 *Six-stage process reengineering life cycle*

Thinking in terms of process types helps in identification of reengineering opportunities. There are three dimensions to a process: entities, objects, activities. Process entities are:

- Interorganisational processes
- Interfunctional processes
- Interpersonal processess

The business processes deal with objects which may be physical or informational. Activities could be classified as operational or managerial. This kind of analysis helps the BPR project identify problems, and to develop a baseline against which to compare new processes.

In diagnosing the processes for reengineering, **documenting the existing process** with the following criteria is of great help.

Management of Change

12.1 Change Management

Management of change in the wake of induction of e-commerce systems, and reengineered procedures is an important element in realising the targeted levels of performance, productivity, profitability and efficiency in an organisation. Old technology and old procedures have been in position for decades. People are used to them; they are comfortable with them. An organisation is a sociotechnical system comprising of people, technology and procedures which has hitherto revolved around paper documents. Management has been hierarchical, based on departments and divisions. Suddenly, people are asked to convert to teams, organised around business processes, with managers converted to coaches. They are to have an end-to-end view of a given business process, in its entirety, so that the projected benefits of reduced delivery time, better design, reduced transaction cost, etc. actually materialise to justify the use of e-commerce.

Old procedures and old methods of work are ingrained in people. They cannot be changed overnight because people don't like change; the power equilibrium is threatened. The change is not an event, it is a process. It does not happen. Change has to be consciously planned, and made to happen, to deliver the tangible and intangible benefits. It has to be embedded in the

work culture. This requires careful strategy on the part of management which is faced with the challenge of managing complex and dynamic process of change.

Individuals in organisations resist change because of perceived loss of power, threat to skills, end of monopoly of knowledge or power, loss of opportunity, loss of security, status loss, etc. This can be traced to a mental model which has not changed with time. The change strategy has, therefore, to focus on altering the mental model which has become frozen because of lack of insight. It has to draw upon behavioral science, since the issues at work relate to human psychology. Some of the Change Management Strategies are as follows:

1. **Education and communication:** This method which is time consuming is often used when lack of information is the perceived cause of resistance.
2. **Participation and involvement:** The entire department or unit of an organisation is enrolled. More empowerment to the people. It is however time consuming and risky.
3. **Facilitation and support:** This approach is recommended when an organisation suffers from morale decline. It deals with adjustment problems and is expensive.
4. **Manipulation:** This method is used to manage when time is of the essence. It can, however, result in staff reaction.
5. **Explicit coercion:** If the change agent has the power, and time is of the essence, this method works. But one has to be wary of long term consequences.

An analysis of case studies reveals that change methods may be crafted around 'indirection', and change packaged as natural evolution rather than revolution.[1] Decisive change may often require the creation of a pseudo crisis to shock an organisation out of its arrogance or misplaced confidence in its belief systems. Crisis can elevate change acceptance, from a state of extreme doubt and resistance to a state of new beliefs. And a state of belief in the new order is the prerequisite for change.

What are the barriers to change? Change management has to overcome the following three classes of barriers:

1. **General:** related to organisation's history, culture, style, etc.
2. **Role:** specific incumbent positions create trouble.
3. **Individual:** specific individual objections.

Typical barriers include fear of failure, disbelief, complacency, expediency, culture, inertia, fear of the unknown. The most difficult barrier, however, is organisational politics. An organisation is a socio-technical system in which different political interest groups exist. These may be based on division of work, training skills, allocation of resources, peer group leader and so on. Any change threatens to shake the existing equilibrium of status, power, resources, opportunities, importance, etc. Some political groups may gain while others may perceive threat. Hence, they attempt to maintain status quo. Preservation of group interests supersedes organisational interests.

Various interest groups can be seen to be active during the change debate. They attempt to control the issues to be debated, manner of division of resources, legitimacy of the proposed change, etc. They use all methods such as formal authority, access to information, control over physical resources and reputation. They will forge alliances to alter the change strategy to their advantage. The change management strategy has to deal with organisation politics, in political and diplomatic way. All sides realise that the change agent is both a creator, and an annihilator, since creation comes with complementary destruction. All the more reason for the expected behaviour: protect and defend "the present", than be at the mercy of the change agent.

Change management plan must, therefore, study the existing political groups in the organisation for their present power, authority, budget, importance, security, etc. and their profile on same parameters in the proposed setup. The change strategy