4 – STUDY OF THE REENGINEERING PROCESSES

(4A – 4E)
1 - SIEMENS A PROFILE

1.1 THE JOURNEY'S BEGINNING INTO THE FUTURE

The problems, trends and aspirations of the electrical industry arose through German initiative making its way in the world through a combination of remarkable technical achievements and bold business enterprise.

Werner Von Siemens (1816-1892) was amongst the pre-eminent pioneers who transformed Germany. On October 1, 1847, he formed a partnership with Johann George Halske Telegraph Construction Company at Berlin. A week later, Siemens was granted a Prussian patent for his design of a Pointer Telegraph, manufacturing which became its core activity. The Company's British subsidiary, Siemens Halske & Co., was founded in autumn 1858 to look after its interests in the British Empire. In 1865, after the resignation of Halske, the company changed its name to "Siemens Brothers".

1.2 THE WAY TO THE DYNAMO

The great distances spanning Russia and unreliability of batteries prompted looking for more powerful sources of electric signals. In 1856, Werner Siemens invented the Armature, an alternating current inductor that was equally suitable for the construction of a battery-less pointer telegraph and electrical interlock systems. His discovery of the dynamo-electric principle in 1866 and subsequently, the invention of the dynamo opened a new chapter in the development of electrical power engineering.

With the dynamo, electrical energy could be generated and distributed economically in large amounts, whether for lighting purposes or for electromotive power application. The numerous engineering interests made it necessary to give the Siemens Group an organic structure in which the two parent firms were supported by numerous subsidiary companies. In the year 1966, various Siemens Companies were merged to form Siemens ERG (Actiengesellschaft).

1.3 THE CONTINUATION

Today it leads in several application areas of electrical technology, sales and service facilities in more than 150 countries, and 240 production facilities outside Germany. Its 373,000 employees are committed to providing the highest standards of electrical technology.

1.4 THE FUTURE

The desire to offer products of optimal technical design & quality has been a basic rule of the Siemens Group to which all other considerations are subordinate.

Table source – House monthly
More than a century ago Werner Von Siemens wrote:

- The rapid growth of our factories is, in my view, essentially due to the fact that our products are based on a large part on our own invention. But, it is the reputation of solid reliability & quality that our products enjoy throughout the entire world which will secure a lasting effect.”

Today, it implies a guarantee of modern technique, reliability and the highest quality. Dr. Heinrich V. Pierer (President and Chief of Siemens AG) said:

- Work must combine ingenuity and persistence with a sense of the market and business to create future oriented innovations. Fascination with change, and the desire to shape changes is a must.”

Along with inventions and patents, Dr. Heinrich V. Pierer emphasized the role that the employees of Siemens had to play:

- I envisage a flexible organization, supported by open-minded employees, who set the required standards for themselves and for the company and actively help in making the necessary changes.”

1.5 SIEMENS AG: ACTIVITIES

Siemens India grew out of a response to the needs of the nation. India’s rapid growth technically would have been impossible without pragmatic policies and farsighted investments in electrical power generation. Siemens matched its manufacturing programme with the country’s industrial development needs by playing a key role in its industrialization—keeping India in the frontline of international technology.

Its strengths lie in developing new technologies, incorporating them in products and systems, which meet customer requirement. It is committed to be a world-class supplier of systems and manufacturing technologies besides production and logistic processes.

1.5.1 GROWTH OF SIEMENS IN INDIA

Former MD - A. Hoser calls Siemens an elephant. According to Hoser: “We don’t want to be-fly by-night operators.” All echo that Siemens is like an elephant which doesn’t have speed initially once it gathers momentum, nothing can really stop it.

1.5.2 SIEMENS’ MOMENTUM IN THE NINETIES

Mr. K. Pernstich, MD, stated, “However, the changing environment, while opening up new opportunities, has also considerably stiffened competition.” “To keep ahead of competition, we need to set ambitious targets to reach world-class performance. As we seek new innovative avenues, we must continuously optimize technologies and processes. Besides, we have to successfully identify and overcome barriers on
our path. Achieving this required the active involvement and participation of empowered employees, working in closely-knit teams, thus creating a motivational learning organization, which is able to win the confidence of customers."

1.5.3 Projects

For Siemens, "Off the Shelf" solutions were no longer the best answer. Planning and execution of turnkey projects called for integration of products, expertise and services. From Siemens, as a "single source", customers can obtain everything for their projects. Siemens AG as "Center of Competence" has certified the projects division for the project management engineering and software for S. E. Asia in the Cement & Steel industry.

1.5.4 ITS CORPORATE MISSION STATEMENT EMPHASISES THE ABOVE:

- To be one of the most competitive companies in the field of electrical and electronic engineering and set the pace for advance in technology.
- To provide products and services of the highest quality that offer maximum benefits to our customers worldwide.
- Their employees' creativity and commitment are the foundations of our success.
- To achieve consistently high profitability to ensure corporation's future and to increase the value of shareholders' investment.
- To establish and maintain worldwide business relationships that is constructive, long term and based on mutual trust.
- To be a responsible towards society and the environment.

1.5.5 THE ACTIVITIES THAT SIEMENS AG ENCOMPASSES:


Versatile products and the adaptability of its systems required a sales organization that keeps close customer contact. Its services are sold through a closely-knit sales organization in more than 150 countries throughout the world. It also offers:

- Consulting and installation – Includes alternative proposals and economic appraisals.
- Delivery and installation – Includes delivery, assembly, installation, testing, handing-over and commissioning of installations and systems.
• "Maintenance and after-sales services - Includes inspection, trouble-shooting, training of customer personnel.

1.6 ROLE AND ORGANIC STRUCTURE
To achieve its corporate objectives, Siemens Corporate Structure ensured maximum market responsiveness, customer contact, flexibility, effectiveness and enterprise. Its corporate structure is based on a concept of decentralized responsibility supported by a flat hierarchy and short decision making paths.

The three basic elements of their corporate structure are:
*GROUPS* *REGIONAL UNITS* *CORPORATE DIVISIONS AND CENTRALIZED SERVICES.*

1.7 THE SPIRIT OF INNOVATION
To stay ahead in its various business areas, Siemens puts strong emphasis on R&D with 48,000 employees engaged in key activities. It spends DM25 Million a day on R&D

New products & processes are essential to maintain a strong competitive position in the world market. This emphasis on innovation has led many to travel new paths and generate a creative turbulence that has given rise to an assortment of new ideas & products.

Ever since the pioneering achievement of Werner-Von-Siemens in 1847 in patenting the pointer telegraph, Siemens continues to add new links to a long chain of distinguished innovations, with many 'first' to its credit.

1.8 FUTURE ROLE OF SIEMENS
Siemens shall play a vital role in priority sectors like Telecommunication, Power Generation, Software, Transportation, Medical Engineering, Modernization and Technical Up-gradation & Globalization.

1.8.1 THE FUTURE IN A LIBERALISED ECONOMY
With the Indian Govt. ending decades of centralized economic planning in the spring of 1991 it has become one of the world’s hottest markets with foreign investments going up from US $ 200 million to more than US $ 3 billion. This process is relentlessly leading to a true sense of LIBERALISATION. The open market situation led to intense competition with the entry of global players and expanding business opportunities in sectors like Power and Telecommunication.

This meant that the Indian customer’s expectations in terms of quality, cost, delivery, reliability and service have arisen to international standards. And so Siemens AG is gearing up to meet these major challenges and is now ready to take advantage of the new liberal climate in India.
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**1.9 THE CHANGING PACE OF REFORMS PROMPTED SIEMENS TO CHANGE PACE.**

By the end of year 2000, Siemens Limited aims to become a Rs. 7500 Crore company with major focus being on the telecom and power sectors. **This is in line with what Mr. Von Pierer said when he addressed a press conference in Bombay (04 - 92):**

"During this period of transition (in Indian economy) we in Siemens will not adopt a wait and watch attitude. We shall not wait to see India succeed and only then help her. We shall help India succeed as best we can. It is at this time that India needs catalytic investments that will trigger, in a multiplier manner, more investment."

**1.9.1 ORGANIZATION STRUCTURE OF SIEMENS LTD.**

In order to be closer to the customer and effectively meet the challenges in the new market environment, the company was recently restructured. The Management of Siemens Ltd., comprises of the Corporate Management (CM) and Executive Management
The CM consists of the Management Director, the Executive Director and Directors. In the CM, the members represent divisions, Regions and special areas of responsibility. There are 12 Business Divisions and 2 Non-business Divisions as under:

1. Automation (AUT)
2. Components (CMP)
3. Motors, Drives and UPS (MDU)
4. Medical Engineering (MED)
5. Power Generation (PGE)
6. Projects (PRJ)
7. Power transmission & distr. systems (PTD)
8. Railway &Transport Systems (RTS)
9. Switchgear (SGR)
10. Telecommunication (TCM)
11. Private Communication System (PN)
12. Automotive business (AT)
13. Finance & Administration (F&A)
14. Personnel (PER)

Besides, there are 7 departments namely, Corporate communication, Corporate Planning, Corporate Secretary, Internal Audit, Productivity Improvement Programme & TOP, Corporate Quality and Research & Development. The Corporate Management along with the Business Division heads constitutes the Executive Management of the company.
2 – KALWA BUSINESS CENTER

As early as 1914, 30% of Siemens employees worked abroad i.e. outside Germany. The overall change in the world pattern, need for rapid industrialization of developing countries, allowed the logical decision to expand the manufacturing activities beyond Europe to the developing countries.

After the World War-II Siemens rebuilt their predominant worldwide position in the electrical industry. This resulted in a bigger overseas expansion drive of which the Kalwa project was a part.

2.1 EXTENSIVE PLANNING

Planning of Kalwa project began in Germany some time in 1963. The Central Planning Department of the Siemens motor factory in Erlangen, Germany set up a planning group. Kalwa Planning Department was set up to bridge the geographical gap between Germany and India. It provided feedback to the planners in Germany executing plans under the direction of the Works Management of Siemens of India in close co-operation with The Central Planning Department in Erlangen.

The Kalwa Factory was built, machinery installed and was commissioned in January 1966. In April 1966 the very first motor type 1LA2 116-4 entered the test field.

Dr. Wilhelm, erstwhile Director of Siemens India, while inaugurating the Kalwa factory said: "We have laid in your hands the equipment & tools - & we have no doubts that the confidence in you will again be crowned with success, from which everybody will benefit."

Kalwa achieved a turnover of Rs. 9.15 million in its very first financial year.

2.2 HEART OF MANUFACTURING ACTIVITIES IN INDIA

The Kalwa Factory equipped with some of the most modern machinery & testing facilities started with producing Motors & later diversified in 1973 to produce Switchgear & Switchboards in 1975. Today, 40% of the employees of Siemens India work at Kalwa contributing ~ 45% of the total production of Siemens India. Thus making it the heart of the manufacturing activities in India!

The Kalwa Complex comprises of 3 manufacturing units:

* The Switchgear Factory (SGR)
* The Motor Factory (MOT)
* The Switchboard Factory (SWB)
2.3 MAIN FUNCTIONS AT KALWA WORKS
The three manufacturing units in Kalwa have various main functions. Some of the common functions are:

2.3.1. Technical (Product Development)  
Product Designing --- Preparation of Design drawings AND Laying down standards and acceptance norms
- Assembling and making new designs in development shop AND Testing of new design prototypes or design verification

2.3.2. New Products Development  
Here, a new product is developed from conception to its final release for regular manufacturing. Its development is done in either of the following ways:  
* Know-how from the parent company  
* Indigenisation

Product development is a continuous process in Siemens that involves -
* Finding substitutes for Indian needs so as meet new process requirement and increase speed in
* Rationalizing cost of product through import substitution
* Reducing cost while redesigning a part/product to give better performance.

2.3.3 The product development cycle can be described as follows:-
Proposal from marketing department to develop a new product

Study product requirements & specifications
Design & prepare drawings,
Decide about investment required
Preliminary product costing
Study Product feasibility
Finalize product launching
Decide on make & Buy.
Develop vendors, tools, fixtures, jigs, testing facilities.
Selection of machines, technologies & processes based upon the product design Requirements
Designing and ensuring availability of tools, jigs & fixtures.
Industrial engineering
Fixing time standards
Computation of manpower & capacity requirement

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2.3.4 Logistics (Materials Management)
* Receipt & processing of orders placed by sales division
* Scheduling - involved assigning priorities based on urgency & material availability
* Overall coordination between marketing, client, excise, etc.
* Management of Stores AND Dispatch of completed consignments

2.3.5 Manufacturing
* Pre-manufacturing - of components, sub-assemblies & painting of parts.
* Assembly of manufactured & bought-out components

2.3.6 Quality Assurance
* Inspection of incoming material
* In-process quality check
  * Verification of the standard of finished goods against preset quality specifications or as demanded by the customer.
* Routine testing once the product is ready. Verify compliance with client's requirements.

2.3.7 Commercial
* Product cost calculation
* Cost accounting and control
* Planning & budgeting
* Financial accounting
* Input's for Company's balance sheet

2.3.8 Personnel
* Attendance recording and leave
* Wage & salary related administration
* IR - Maintaining discipline & harmonious relation with partner unions
* Personnel planning & development
* Training & development in coordination with central HRD sources customers
* Study on customer requirements
* Collaborates with the technical & manufacturing sections
* Markets products made by the factories
The Switchboards factory, came into existence in 1954, in a small workshop under the Mahalaxmi Bridge, at Bombay Here assembly of LT switchboards was carried out. Its first major order was from the Mawana Sugar Factory, M.P for manufacturing of 11 panel boards. It was with this order that the switchboard manufacturing started.

In 1975, the switchboard factory shifted to where it is presently situated at the Kalwa-complex, and is one of the single largest manufacturing units of switchboards in India falling under the Power Transmission & Distribution (PTD) Division of Siemens Ltd. One of the subdivision of PTD is: * Medium Voltage Switchboards & Switchgear (EVM) and * the switchboard factory at Kalwa Works.

3.1 PRODUCT SPECTRUM
It is important to understand what a Switchboard is and what is its significance As it was the center of the BPR activity so --- What is a Switchboard?

A Switchboard forms an important link in the distribution chain of power, from its source of generation to its end user. The simplest form of a switchboard is found in our homes - the board on the wall on which the switches for lights & fans are mounted. It consists of a circuit breaker inside it - switchgear, which makes and breaks the circuit as and when, required. One of the major applications of a switchboard is in distribution of electric supply in cities, industrial centers, or electricity boards like Maharashtra State Board (MSEB) etc.

Technically speaking, a switchboard is made up of structures of sheet steel of different thickness and is assembled by joining different sub-assemblies like
- Circuit Breaker Chamber
- Busbar Chamber
- Cabling Chamber
- Control Equipment Chamber
- Doors - vary with the size and requirement of electrical controlling and metering equipment. A unit structure consisting of the above is called a panel.

This wiring is done inside the panel. Current at high voltage flows through the breaker and crosses the panels and passes through copper or aluminum bars of various cross sections called "BUS" conductors or "BUSBARS". The overall size of the panel is standard or non-standard depending on the clients' requirements. Switchboards are made from the rating of 6KV to 33 kV system voltages.

3.2 THE SWITCHBOARD MANUFACTURING PROCESS
The Switchboard factory is divided into 3 major sections: They are a direct outcome of the re-engineering activity carried out at the location:
A. Pre-manufacturing
B. Assembly
C. Auxiliaries
A. PRE-MANUFACTURING:
The pre-manufacturing section is further divided into a number of sub-divisions.

3.2.1. Sheet Metal Shop: Sophisticated machines straighten, shear, punch and bend RM e.g., sheet metal.

3.2.2. Welding Shop: Three processes carried out in this shop are.
   i. Arc Welding (Rod Electrodes):
      This is preferred for heavy structures with parts having higher thickness etc.
   ii. MIG Welding (Carbon dioxide Welding):
      This is faster and frequently used for the standard and smaller parts.
   iii. Stud/Nut Welding:
      Studs and nuts are welded to sheet metal parts using various fixtures.

3.2.3. Phosphating Plant--(Phosphating process): Here a number of tanks contain different types of treating chemicals and solutions in which the sheet metal structure of the switchboards is painted and treated to maintain paint finish and to prevent corrosion.

3.2.4. Paint Shop: The Paint shop is the hallmark of Siemens Switchboards unit and carries out:
   i. Powder Coating:
      has a conveyor moving at a constant speed to two stations where powder is sprayed by two reciprocating guns as per thickness of the coat desired.
   ii. Spray Painting:
      has three spray booths for Spray painting of machines having complicated bends.

3.2.5. Bus bar Manufacture: The Busbar are the conductors of current used in a Switchboard and are made up of: Copper & Aluminum. They are fabricated as per design with necessary holes for later assembly. These are first straightened and then holes are punched. The Busbar group is also equipped with small drilling and deburring machines for working on the busbar.

The panels along with the electrical devices are mounted and assembled in the assembly shop. The assembly section is divided into the following categories:

3.3. Medium Voltage (MV) Assembly: The switchboard panels for high voltage ranges (from 3.3 kV to 3 kV) are fabricated in the structure group and assembled. Then they are taken to the assembly section after welding and painting. In the assembly section, various sub-assemblies and equipment are mounted on the panel, wiring is properly done and circuit breaker truck is inserted. Finally thorough testing is carried out before sending it to packing and despatch.
3.3.1 Circuit breaker Assembly:
A circuit breaker is a current interrupting device in switchgear performing two functions:
* Switching during normal operation conditions or the purpose of operation.
* Switching during abnormal conditions for interrupting the fault current.
Vacuum circuit breakers of various ratings are of either indoor or outdoor types. They are custom manufactured. The breakers have long life expectancy & require minimum maintenance. They are not affected by adverse environmental conditions.

C. Auxiliaries:
This section was further divided into the following sub-departments:
1. Main Stores: All the standard parts, internally manufactured parts, bought out parts etc are stored
2. 'D' Parts Stores: The internally manufactured parts, belonging to the specific orders,
3. Tool Stores: All the tools required in the pre-manufacturing division like dies for the CNC machines, drills, taps, nut runners and riveting guns are stored in the tool stores besides smaller equipment for carrying out minor jobs of tool modifications.

3.4. ORDER PROCESSING
On finalizing specifications and technical instructions, sales places a switchboard order to the logistics department where upon receipt, it is processed. For order
processing, various documents like Order Part list (OPL), Purchase Requisition (PR), Material Card (MC), Work Card (WC) exist which flow through various sections for efficient information transfer. The logistics Department is divided into three sections:

1. Technical Order Processing (TOP)  
2. Administrative Order Processing (AOP)  
3. Equipment Planning

3.4.1. Technical Order Processing (TOP):

The TO processor converts the clients’ specifications into the order part list (OPL). A unique item number identifies each item and assembly. OPL gives a list of items/assemblies along with their quantities required to make the panels for the order. It also gives a rough estimate of the material required like Copper and Aluminum to Material Procurement and Material Administration section in advance which helps this department to control the inventory of raw material in stock. This list is called 'Advance material allocation list'. The TOP group also prepares the non-standard drawings for customized orders by a client. The OPL and these additional drawings are sent to the "AOP" Administrative order-processing Group for further processing of the order.

3.4.2 Administrative order processing (AOP):

The AO Processors do further break-up of individual assemblies to prepare a document called "Material Card" which is of four types:

i. I.M.C. (Internally manufactured components) - stock,  
ii. I.M.C. - Non-stock,  
iii. B.O.C. (Bought out components)-Stock,  
iv. B.O.C.-Non-stock

The IMC and BOC stock components are listed together and "Stock Material Card" is prepared. This document is sent to Material Procurement & Administration section. The IMC no stock components also known as "D" parts (Direct Order Related Parts). These are listed in "D" parts Material Card and sent to the Work card group which prepares the Work Cards.

The AOP group attaches the relevant drawings of the parts to be manufactured to the work card and the whole set is sent to the Material procurement and Material Administration section for reservation of raw material.

The reservation procedure - included writing the item number, quantity of raw material to be reserved and order number in a standard format. The reservation system is used to check the inventory of raw material. The work card is sent to the Manufacturing Control and Scheduling (MC) section, which prepares "Input
Statistics: by noting the manpower required completing the work when the work cards are loaded on the shop floor.

3.4.3. Equipment Planning:
The order which is received from the Sales consists of two parts, one containing details of the assembly parts and the other of the equipment.

The activities of the Equipment Planners are:
1. Send Requisition for Non-stock and Bought Out stock equipment to the Purchase section.
2. Send Requisition to Switchgear Factory for Non-Bought out electrical equipment.
3. To give intimation to the Assembly Scheduler as and when the equipment are received in stores.

3.5 ACHIEVEMENTS & FUTURE PLANS

REENGINEERING THE PROCESSES

Switchboard factory has made tremendous progress ever since it started in 1775.

The Switchboard Factory has a number of achievements to its credit:

* 8BK80, primarily designed & developed indigenously to meet the requirements of Indian & SE Asian markets, has now been accepted by Siemens AG as a "global" product which can be supplied in the world market.
* First to indigenously introduce vacuum circuit breaker technology.
* First to introduce powder coating as a surface treatment activity.
* First electrical manufacturer in India of 8BKMV switchboards and 8PULV switchboards which have passed the most severe seismic tests as per international standards.
* 12KV Outdoor Vacuum Circuit Breaker marketed all over the world.

The above features were reengineered and supplemented by SAP, which allowed for sequential logistics planning and execution requiring minimum effort and time. This helped in processing an order whether standard or non-standard many times quicker than before.

THIS FURTHER LED TO THE IMPLEMENTATION OF $top^+$ the name given to the Reengineering project.
4 - REENGINEERING AT SIEMENS

Having dealt with the background it would be but pertinent that to move on to the issue of BPR at SIEMENS – INDIA. The researcher will dwell upon activities primarily related to the exercise in India and touch upon its affects worldwide only lightly.

4.1 MOP -- MEASURE OF PERFORMANCE -- allowed an employee or for that matter the group leader of a particular module to write up his/or the progress made by him/her group. It served as a direct indicator of the level of productivity of the individual or the group as a whole.

The Board is first filled in the morning wherein it is indicated the requirements of the day and later at the end of the day wherein it indicates the productivity level or performance achieved during the day.

This MOP system acted more of a motivator than anything else did. It allowed the employee and the whole group to see how they have performed and analyze any shortcoming.

4.2 top+ -- TIME OPTIMISATION PROCESS

This was the name given to the Reengineering Process at Siemens because Reengineering is but the optimization of processes besides elimination of waste on all fronts. The name top+ further illustrates the optimization of time. It not only helped to proceed faster but also to have adequate time to think of innovative ways to do things.

As a part of its future plans, Switchboards’ division intended to focus on new strategic areas like Private Power Plants & Vacuum Interrupters to nurture the future growth potential. It is also going in for the global development of new generation air insulated switchboards.

In doing so it hoped to increase customer satisfaction, employee motivation, and better use of human, technical and organizational resources. To do so it will have to make a sustained effort to constantly rationalize, increase productivity, reduce costs, and produce quality products of international standards at competitive prices.

Its experience has given it leadership in switchboard design and manufacture. Recently the RW TUV, Germany, has certified Siemens Power Distribution System with the ISO 7001 certificate for meeting the quality standards wrt ISO. Siemens switchboards being modular in construction are easily adaptable to meet individual customer needs besides being custom built to meet the specific requirements.

Figures & Diagrams Source: Siemens Management Consulting Practice
4.3 ACHIEVING WORLD CLASS PERFORMANCE --- A PATH TO REENGINEERING

During the early 80's, many companies rediscovered the power that came from superior manufacturing ability and initiated a variety of activities to improve their competitiveness. Some said their "Manufacturing Strategy" was to become world class. In pursuing this goal, they adopted one or more of a growing number of improvements programs, not to mention team manufacturing, reengineering, benchmarking, etc.

The problem was that simply improving manufacturing by, for example, adopting JIT, TQM or some other three-letter acronym - was not a manufacturing strategy to achieve competitive advantage.

At Siemens the thought process was how they could achieve competitive advantage if their only goal was "to be as good as" their toughest customer?

To achieve beyond this they integrated the notions of both core competence and a learning organization. If one looked at the manufacturing strategy as an intended aspect of running a corporation because it implies that the key to long term success was being able to do certain things better than its competitors could. However, in today's environment the goal of a strategy at Siemens has become that of strategic flexibility.

To achieve this they had first to identify the parameters that would help them move towards improvements. Using the fine-tuned Japanese manufacturing process, the following productivity improvement ratios were used for all manufacturing activities

4.4 PERFORMANCE MEASURES OF WORLD CLASS MANUFACTURING

A. Movement Ratio = Total lead-time = 2 or 3
   SMH (Only value addition portion)

B. Inventory Ratio = No. of parts between workstations = 2 or 3
   No. of Workstations

C. Space Ratio = Total Area = 2 or 3
   Total workplace area

D. Handling Ratio = Distance travelled = 2 or 3
   Total workplace width

E. Activities Ratio = No. of Non Value Adding Activities = 2 or 3
   No. of Value Adding Activities

These ratios provided a good indication of how Siemens compared its own systems with the best manufacturing practices and how these helped to canalize resources to achieve optimum results. Besides, the slides below depict some of the Performance
measures as devised by Siemens during the BPR process and used effectively to achieve its BPR goals.

PERFORMANCE MEASURES OF WORLD CLASS MANUFACTURING

How clearly have you worked out your goals and how widespread are your commitments?

Division and Region specific top activities for goal setting

Fig. 1

Action oriented goals must be worked out by all Divisions using dedicated key drivers

Goals

- Increase Return on Net Assets
- Achieving World class benchmarks

Business - specific driver analysis

Key drivers:

- Extract
- Penetrate through new channels and reach new markets
- Explore cross selling opportunities
- Generate new products & services
- Grow with the market, improve margins
- Continuous improvement in design / processes
- Improve efficiency, productivity of workforce
- Reduce in-process wastages & extra costs
- Outsource low value adding activities
- Keep factor costs low
- Operate on a lean resource structure
- Improve terms (Payables / receivables)
- Minimise Throughput time
- Faster collection of receivables
- Operate on a lean resource structure
- Quick Debt disposal

Actions

- Portfolio
- Optimisation
- Gearing the business using cockpit charts 2)

... and the business should be consistently focused on these goals.

FIG - II
How are you planning to make the consequences transparent & what type of consequences you foresee?

Division and Region specific targets and consequences

Success Factors e.g.
- RoNA, Profitability
- Asset Management
- Working capital management
- Volume improvement programs
- Customer account management
- Cost efficiency programme
- Strategic Purchasing
- Benchmarking
- Innovation
- Best practice sharing

Through Metrics e.g.
- RoNA: Plan vs Actual
- PBT
- Asset Turnover ratio
- Receivables Monitoring
- Market Share-Plan vs. Actual
- Breakeven Turnover
- Customer Satisfaction survey feedback
- Employee Satisfaction survey feedback
- Staff dialogue

The cost gap shows the relative cost position for each influencing factor.

CALCULATING THE COST GAP: AIMS

 dez Determining the relative cost position in comparison with the competition
 dez Demonstrating the influencing factors and main levers for improving the cost position
 dez Determining the competitors' cost structure
 dez Determining the cost structure of a financial world-class competitor
 dez Drawing up a program to formulate individual measures
 dez Assimilation of best-practice procedures

 dez Definition of objectives for restructuring

Source: Siemens Management Consulting Practice Benchmarking
They at Siemens understood that they had to continuously monitor and maximize the fundamental truth for business success, i.e.,

\[
\text{RONA} = \frac{\text{Income (PBID)}}{\text{Net Assets}} \\
= \frac{\text{Income}}{\text{Sales}} - \frac{\text{Sales}}{\text{Net Assets}} \\
= \frac{\text{Margin}}{\text{Assets}}
\]

**FIG - V**

Through pilot workshops --The Divisions were oriented towards these drivers

**Tasks of the Pilot and the Division**

- Corporate Division
- Strategic Objective
- Business Drivers
- Measurement of success
- Targets
- e.g., Departments
- e.g., Locations/Functions

**Division**: Orientation towards drivers
- Elaboration of further operational key drivers
- Elaboration and implementation of actions
- Checking and adjustment of key drivers

**Targets for the business**: Increasing the awareness of all employees for RoNA and other specific key drivers

- Sensitivity analysis - Specific key drivers
- 1st Workshop with executive management
  - Top-level cockpit chart for business
- Workshops:
  - Operational key drivers according to functions/processes

**FIG - VI**

The division elaborates actions and further operational key drivers

---

Fig 6.

The division elaborates actions and further operational key drivers
4.5 CORPORATE VISION:

It is difficult to envisage today, a world without electrical power. Interestingly, the pulse of the nation can be gauged from the electricity flowing in its power lines. India's rapid strides in the economic and technological fronts would not have been possible without the pragmatic policies and foresighted investments in electrical power generation.

With such a market demand, the corporate goal is definitely to grow faster than the industry. The electrical industry is growing at a phenomenal pace of 17.8%. **Siemens endeavors to grow at 25% rate and aims to be a 7500 Crore company by end 2000.** For achieving this goal they need to increase their scale of operations without any significant increase in resources.
4.6 STRATEGIC INTENT:
In order to reach their corporate vision, they at Switchboards intend to find ways to optimize use of available resources to achieve a turnover at least twice the existing turnover. In order to do this they have and are taking a look at their core areas so as to know what they should be doing, and more importantly what they ought not to be doing, to enable them to allocate the available resources to:

-- Generate heightened volume for increasing the market share or achieve higher operating results.

Hence they had to look at the various options available to them.

The possible routes they decided that they could take were:

* Become an assembly shop with minimum pre manufacturing activity to take care of order related work. This meant subcontracting the fabrication activities as far as possible.

OR

* Become a unit with high pre manufacturing capacity, which implicitly meant duplicating their existing set-up to cater for double the turnover. But this was not a sound option, because they could end up with a high installed capacity and not enough orders to justify the high investments in machinery.

In either case:

* Auxiliarization was inevitable
* Layout Changes To Suit Long Term Goals A Must &
* Suitable Infrastructure To Be In Place.
5 - PRE - BPR MANUFACTURING PHILOSOPHY

In the beginning at Switchboards, the manufacturing process was complex and had too much diversity in terms of items manufactured. They were handling diverse material from sheets to aluminum and copper busbars, phosphating, welding, powder coating, assembly hardware and wiring etc.

Their core competence lay in areas of electrical, electronics and communications. Their manufacturing activity was therefore more focused on these strengths and capabilities. With infrastructure available outside they realized that they did not have to continue having welding, painting, busbar manufacturing in house.

Therefore they needed to turn from a broad based manufacturing unit which fabricated, painted, welded, assembled & tested to essentially an assembling and testing unit (B) with a minimum order related internal fabrication, where unavoidable. They needed to do only those activities, which were most value adding and not cost adding. To the activities, which gave them a competitive edge, and criticality of which did not allow them to take up outsourcing.

5.1 Pre BPR Manufacturing Philosophy: The basic flow for manufacturing a switchboard could be broadly classified as follows:

* Pre-manufacturing + Structure assembly + Mechanical assembly.

Diagrams & Figures Source: Siemens Switchgear Unit Kalwa
How were orders executed on the switchboard shop floor?

The MV orders a group of panels. The quantity of panels per order was totally dependent on client's requirements. Hence they had no control on the order/batch size. They had to deliver according to client's requirements.

The Pre-BPR manufacturing philosophy was order based at the final assembly stage having nine medium voltage final assembly groups. Each was made up of 15 workmen each having 10 wiremen, 4 fitters and 1 group leader and 1 non-productive helper.

The parts required for each order were both stock items and order related. The entire assembly of the panels was executed as a single batch per order. The batch size today varied from one panel to > thirty panels (See FIG - II for batch size for 8BK80 panels).

5.2 Isolated islands arrangement (Pre-BPR Manufacturing Philosophy)

The sheet metal parts, equipment from other Siemens units, out sourced components, order related relays and control equipment, hardware etc., first flowed to the stores. A BOM for each order was loaded to the store for issue of material to one of the nine groups. Simultaneously material also got issued to the mechanical structure groups.

As the order got loaded to the final assembly groups there were two parallel activities which were carried out, viz.

* LT Chamber Wiring

* Mechanical Assembly

5.3 Problems with this method of working:

Now since they operated the assembly as one big pool of activity, the material required for
each group had to be delivered and stored around nine groups spread across the shop floor.

**ISOLATED ISLAND ARRANGEMENT**

<table>
<thead>
<tr>
<th>Vendors</th>
<th>Other SI units</th>
<th>Paint Shop</th>
<th>Pre – manufacturing</th>
<th>Stores</th>
<th>Structure groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nine Final Assembly Groups

Testing

Dispatch

Existing Material Flow – A few nagging problems

- Plenty of batch/back tracking
- Multiple stock/stockout points
- Indirect method of material administration (i.e. from vendor/pre manufacturing to stores then to assembly)
- Lack of customer orientation due to no specific flow line or supplier - customer linkages established between various groups.
- The wiring work was a critical activity. The peculiar nature of the product forced them so that the work could not be carried out by putting more than one person on one panel. Hence the processing lead-time became a direct function of the number of wiremen and number of panels per order and number of orders loaded to each group.
- This was a case of under utilization in one group and excess/urgent loading in another group. There was no flexibility between the final assembly groups although it existed within the group. This was specifically so because the incentive was group linked and did not allow them frequent / daily manpower transfer.
- During shortages it became virtually impossible to estimate the available stocks on the shop floor since similar material was to be delivered at multiple locations.

This style of working led to peculiar problems like:

- Plenty of batch/back tracking
- Multiple stock/stockout points
- Indirect method of material administration (i.e. from vendor/pre manufacturing to stores then to assembly)
- Lack of customer orientation due to no specific flow line or supplier - customer linkages established between various groups.
- The wiring work was a critical activity. The peculiar nature of the product forced them so that the work could not be carried out by putting more than one person on one panel. Hence the processing lead-time became a direct function of the number of wiremen and number of panels per order and number of orders loaded to each group.
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- During shortages it became virtually impossible to estimate the available stocks on the shop floor since similar material was to be delivered at multiple locations.
This encouraged a tendency of hoarding critical stock.

Due to lack of flexibility among groups they were not able to push out orders exceeding the wiring strength.

The batch mode of working delayed the next stage of production, i.e. testing, since at a given time they had more work in progress than completed items/panels.

5.4 ANALYSING THE PERFORMANCE

Pre BPR method of working required approximately 7 weeks to process one 8BK80 order from assembly loading to dispatch. (see Fig - II - for lead time analysis of existing product mix).

By the year 2000, 8BK80 will constitute to about 80% of their target value. Today they manufacture approximately 2100 panels in the existing set up with an average lead-time of seven weeks in assembly for each order. This means that they have to make about 175 panels per month. The output targeted for the year 2000 was 4500 panels. In order to achieve this they had to either reduce their lead-time by half or expand their working space and manpower to continue in the present method. But both of these were not possible in the existing method. As there was a minimum level beyond which they were not able to crash the work content. Also the existing method of assembly permitted them to work on only 30 panels per group at a time, i.e. 270 panels at any given time. From this they were getting 175 panels output per month, while the required output in the year 2000 would be 375 panels per month.

Hence, they needed to radically rethink the way they operated today than work on incremental improvements.
6 - REENGINEERING THE MANUFACTURING SYSTEM

In the previous chapter the researcher has tried to show their need for going in BPR and that they needed to do a re-think about their way of working. A shift was proposed from batch mode of working to a single panel flow for the assembly --- such as in cellular manufacturing (CM).

Cellular manufacturing CM is the pursuit of product-oriented production (as opposed to process-oriented production). The pursuit of production in a product-oriented fashion had significant impacts on:
- layout of workstations and equipment,
- material procurement,
- organization of shop floor labor,
- work in process material flow,
- material handling, and
- Production scheduling.

6.1 Objectives

According to Mr. Kulkarni, “To introduce an effective manufacturing operating plan for manufacture to facilitate the introduction of cellular manufacturing operations”.

6.1.1 Cellular manufacturing (CM)

Cellular manufacturing (CM) comprises of machines grouped into cells for example a family of parts, and a cell of machines. Typically, machines in a cell were located in close proximity to other machines in a cell.

Further applicability of CM varied in terms of size, variety and type of production volume. Traditionally, one of two principal approaches in the layout of production equipment, namely the job-shop (or process-based layout)--where machines of a similar functional type are grouped together, and the transfer line layout--characterized by dedicated manufacturing lines.

Cellular manufacturing (CM) techniques offered a middle-ground alternative to the traditional job-shop or transfer line approaches. The driving force behind developments towards Cellular manufacturing was need based to simplify production management while still ensuring production flexibility in the production environments.

6.1.2 Objectives

Further some of the reasons for going in for cellular manufacturing at Siemens were:

Diagrams: Yogesh, Siemens Kalwa Switch Gear Unit
• To improve competitiveness by reduction of lead times and throughput time (primarily reduction of times associated with movement of parts and material).
• To use modern production techniques and respond to pressure from customers to introduce productivity programs that are compatible with their own CM programs.
• To reduce the high cost of work in process (WIP) under an existing system, and desire to reduce WIP, achieved by the introduction of reduced batch size policies.
• To increase plant capacity by reducing the time required for setups.
• To counter erratic delivery performance (primarily by simplifying operational management issues so that more delivery performance visibility is obtained) via improved delegation of responsibility and assignment of accountability.
• To become more cost-effective, and increase worker productivity.
• To reduce material and part transportation distances and reduce handling losses.

In the researcher’s opinion, the single most important feature of the successful CM environment at Siemens was the organization of production into several cells of dissimilar production equipment, that is, product-focused instead of process-focused. These cells service were a small subset of the total product mix of a plant. The parts assigned to a particular cell were called a part family, and have similar processing requirements.

The pursuit of cellular production was also termed "product-oriented" production in that the layout was specifically structured to service the production requirements of products. The practice of cellular manufacturing did not stop with the layout as many benefits accrued by exploiting the structure of the production environment in scheduling, material handling, labor organization, quality control, etc.

According to Mr. Kulkarni, multi-skilled workers dedicated to a particular cell manned the cells, and were capable of servicing and tending all equipment in their cell.

Work in process in the cell was just a day’s supply of material—this requires that material be supplied frequently in small amounts. Preferably, product will be partly manufactured in a single cell, and will require little in-plant transportation. Work was scheduled for cells, not machines, and workers in each cell performed in-cell scheduling. In special cases, a scheduling technique based upon “kanban” is used to control work flow in each cell.

The workers in each cell are responsible for quality programs and preventive maintenance programs within their cell (with engineering assistance where necessary). Their performance is rewarded through incentive remuneration schemes that were based directly on the quantity of top-grade final product that exits their cell (note that the workers
can be held fully accountable for the quality and quantity of final product manufactured as the product is manufactured exclusively in their cell.

Successful CM environments seldom had formal store areas. They required only a staging area from which material was distributed (in a timely manner) to cells, and from which finished product is shipped. Special supplies are stored in each cell.

6.2 The proposed material flow was re-layed as follows:

Benefits of Work-cells:

Cellular manufacturing is an integral part of most advanced manufacturing strategies. Stockless Production, World-Class Manufacturing, Just-In-Time. Toyota Production and other variants all use workcells as a centerpiece. Cellular operations yield major improvements in productivity, quality, and response, and can result in 80% reductions in inventory.

<table>
<thead>
<tr>
<th>New manufacturing Philosophy --- Proposed Material Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendors</td>
</tr>
<tr>
<td>CIS</td>
</tr>
<tr>
<td>MZ Lager</td>
</tr>
<tr>
<td>Four self-sufficient production cells</td>
</tr>
<tr>
<td>Pre. Mfg.</td>
</tr>
<tr>
<td>Paint Shop</td>
</tr>
<tr>
<td>Dispatch</td>
</tr>
</tbody>
</table>

Salient Features:

- Order-wise production (one piece flow — order flow)
- Optimum output
- Streamlined Assembly flow
- Better material flow
- Increase in Area for assembly
- Shift from a Push system to a Pull system

FIG - IV
How do we form the Cells????
Redeployment & Retraining of manpower

![WORKMEN DISTRIBUTION OF SWITCHBOARD](fig-v)

![NON PRODUCTIVE WORKFORCE DISTRIBUTION](fig-vi)

6.3 ADVANTAGES OF THE NEW LAYOUT.
As clear flow lines emerged for all product groups they could afford to think of creating self-sufficient product cells leading to the concept of cellular manufacturing. This enabled storage of parts on the shop floor along the flow lines with minimum duplication. Besides the material could be directly delivered to the shop floor due to close proximity of the user.
Based on this philosophy the Shop floor layout after Reengineering would look like this.

This further allowed for better visual control on inventory with a fixed location for each item along the flow line. Successful Cellular Manufacturing depended upon employees who were able and willing to think on the job.
Each production cell was set up as an independent management unit in itself, regulating its own pace within general constraints, deciding its own methods and earning a collective remuneration. Internal quality control is carried out and responsibilities for maintenance function also lay within the group, thus making it a completely independent unit. Since all contribute towards the same product a total commitment occurred. This gave greater job satisfaction and variability when tasks within the group were interchanged. This system reduced involvement of management in day to day running of the firm and allowed the work force to control its own immediate environment. This gave rise to an establishment of a factory within factory, which eventually increased productivity, unless they deviated from company's goal and this would be so noticeable that early redirection would be possible.

Diagrams: Yogesh, Siemens Kalwa Switch Gear Unit
7.1 ON DEMAND FLOW – Concept of Single Panel Flow

Today, besides processing panels in batches, they also joined panels into shipment sections of 2 or 3 panels based on the execution. In order to do this, almost 30% of the mechanical assembly was redone. Also a shipment section of 3 panels needed more space to the left for gangways in order to facilitate their movement to testing or dispatch. Transporting such a big shipment called for employing a pool of transport workmen. A shipping section of this size led to difficulties in handling at site.

Earlier a single panel was idle for 66% of the time in batch mode or working. Hence, it was proposed to process the panels as a single panel or unit. This would give greater flexibility, maneuverability, facilitate more panels to be worked on and be completed in a linear fashion.

How a single panel flow will work vis-a-vis the stages is depicted in the following diagram:

7.2 Working of a Single Panel Flow Cell for 8BK80 Series Panels

Based on the capacity calculations for the 4500 panel mark, the group strength for such a manufacturing cell will be 65 workmen. The key to the successful working of such a cell lay in the multi-skilling and flexibility of the workmen within the cell. The main features of a 8BK80 production cell were - the material movement will be manual and minimal, the material required will be stored along the flow lines. Each cell will have its own scheduler and the production, logistics and quality functions will be integrated into one function for each cell.
Stage 2 structure
Mounting of CT
Earthing Switch Assembly if applicable
Busbar link / Feeder connection Assembly
CB insertion / alignment
Upper / Lower contact system
CT connection
Cable connections
Heater mtg & wiring

LT Chamber Wiring Workstation
Wiring of Mtg. Plate inside LT chamber
LT chamber door fixing / Equipment designation
LT chamber testing with CB

Wiring workstations

Door Hinge fixing Workstation
Door stand

LT Chamber assly. Workstation

Stage 2 structure
Hardware and Related Material
Workstations
Structure
Stage - 2

Hardware and Related Material
Stage - 2 Structure

FIG - X PRODUCTION CELL STAGE - II

FIG - XI Production Cell Wiring Stage

Wiring Related Material
Plate mtg. Material
Based on the nature of the product, the organization was verticalised along two broad product groups, viz., Medium voltage switchboards and Circuit breakers. Under these two distinct product divisions, they assigned various functions like logistics, manufacturing, quality, technical, process planning and commercial to separate individuals and made them sit together. This *inculcated a sense of team working or group working*.

The quality assurance & products development group will form the strong the base for future and the service group will cater to the order related requirements. Having grouped the functions together, they switched attention to work enrichment and multi-skilling.

**8.1 Work Enrichment**

The formation of production cells and divisional set up of the entire organization created tremendous work enrichment through out the organization at all levels.

**8.2 Workmen – cell as a management unit**

*Each cell became a management unit in itself*, regulating its own pace within general constraints, deciding its own methods and earning a collective remuneration. Internal quality control was carried out and the responsibility for the maintenance function also lay within the group, thus making it a completely independent unit. Since all the workmen contributed towards the same product a total commitment occurred, giving

Diagrams: Yogesh, Siemens Kalwa Switch Gear Unit
greater job satisfaction and variability when tasks within the groups were interchanged. This system reduced the involvement of management in the day to day running of the firm and allowed the workforce to control its own immediate environment.

In such an organic situation the inevitable changes with time were more acceptable and management was free to plan these within the overall corporate strategy. Thus, a well functioning cell satisfied the psychological needs of its members, friendship, identity, self-esteem security, power achievement or whatever fulfillment an individual required in addition to his economic satisfaction. This increased group cohesion and led to reduced labor turnover and absenteeism. Overtime group norms were created and standards of conduct developed which reflected the desires and aspirations of the members. Total conformity to the norms depended on the discipline developed within the group. The establishment of group goals increased productivity. Deviations were so noticeable that early redirection was easily possible.

As shown in Fig. – VI they had 37% non-productive workforce who could be re-deployed into each production cell after some amount of retraining and orientation. Besides, a lot of manpower was released from the pre-manufacturing era as planning was afoot to out source capacity short fall in these areas besides rationalizing on existing processes. Hence the net result would be that a multi-skilled and flexible workforce would be the profile of workmen of the future.

Although self-certification would be possible in most of the places, a specialist would be required for client inspection for some more years to come.

8.3 Multi-skilling of staff

An all rounder for all staff jobs would be more preferable. Primarily they required people who would be able to do the technical order processing, administrative order processing, purchase function, drafting designs etc., i.e., a single man capable of doing all the above mentioned jobs.

To reach this level called for sustained efforts to develop young recruits such as diploma engineers for multi-discipline roles. But this would take at least 4-5 years. Meanwhile capable staff were identified and given higher responsibilities. This helped as more time was required for extending the cell concept back upto the office/marketing.

The cell manufacturing system provides necessary attributes to satisfy the “social man”, but what of the "complex man"- this important factor needed consideration. As far as possible group was more or less self-selecting because within a cell harmony is a must.

The principles have been developed; now they needed to put the strategy in to action.
FIG. 6.1  SUMMARY OF BENEFITS FROM THIS PROJECT

Now ----- Batch Production!!

Proposed one piece flow through Production cells

Reduced

<table>
<thead>
<tr>
<th>Material Distances</th>
<th>146 mts</th>
<th>70 mts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batch Size</td>
<td>7 wks</td>
<td>1 wks</td>
</tr>
<tr>
<td>Manufacturing Lead time</td>
<td>2,24 sq. mts</td>
<td>1.04 sq. mts</td>
</tr>
</tbody>
</table>

Increased

- 15 Workmen per assembly
- 50 workers per cell

- Flexibility Between Output
- Staff / Output optimization

Other benefits:
- Self-sufficiency production cells
- Multi-skilled workmen: Material along flowlines
- Minimize material handling staff / Output optimization
- Self inspection / Material transfer
- Each cell to make parts from scratch
- Each cell to employ self certification

FIG-0.2
As the flow was established, all materials required for panels at various stages of assembly could be put physically along the flow. They decided to maintain a one-month consumption stock level at which they would operate. Annual blanket orders would be placed for all the items. Vendors would be identified to supply at pre-fixed delivery schedules thereby bringing inventory levels down to one-third the existing level and eventually making it zero – moving more towards JIT management.

The pull effect would be evident, as the material would flow only on demand from the next customer in the chain.

9.1 WHAT WILL BE BENEFITS OF THE NEW PERFORMANCE MEASURES?

Presently they measured productivity, the productivity bonus index, the extra costs incurred and the idle time. No, these performance measures do not serve the purpose of improvement; they do not focus nor stimulate customer focus. The new performance measures developed helped in enhancing the capability for achieving a continuous improvement stimulus.

The new performance measures were:

* Delivery Reliability
* Cost Overruns
* Cost of Quality &
* Quantity of finished panels linked incentive scheme

Further work needed to be done on these performance measures.

9.2 Some Pre-requisites before Implementation of a Single Panel on Demand Flow are:

* Standardization of plug socket arrangement for inter panel control and bus wiring. This would not only reduce the work content at the plant but would also facilitate easy installation at site.

* Reliability of vendor deliveries. As decided material inventory would be considerably reduced sharply so that it becomes all the more important for vendor quality and deliveries to be highly reliable.

* An output based culture and an appropriate incentive scheme was put in place to get maximum advantage of the on demand flow. This was accomplished through re-negotiations with the workers and staff unions.
In order to ensure a smooth flow of panels a real time network with the ESD (engineering Services Department) became a must.

9.3 Advantages Coming out of the Single Panel Flow are:
* The gangways were reduced in width to release more area for assembly.
* Material handling was become very easy.
* Through put time was reduced.
* Panels were less prone to handling damages.
* More panels could be worked upon and at a given instant there would be more number of complete panels than unfinished ones.
* It became easy to gauge the progress of the job.
* Self-certification became possible.
* Manual material transfer became possible.

9.4 PERFORMANCE MEASURES OF WORLD CLASS MANUFACTURING
BENEFITS OF ON DEMAND FLOW

9.4.1 World Class Ratios
1. By changing over from batch more to single panel method of working they were able to process 200 panels more within the same working area. Hence the area productivity went up from present 175 panels to 375 panels i.e. a 114% improvement.
2. Space utilization ratio therefore improved from 1:6 to 1:3.
3. Area requirement per panel changed from 2.24 sq mtrs. per panel to 1.04 mtrs.
4. By shifting from batch mode to single panel, the lead-time would come down from 7 weeks to 4 weeks thus improving the movement ratio from 1:39 to 1:10.
5. Due rationalization & single panel concept the increased manpower required for doubling the turnover was only 21%.
6. With the new method of working, the panels produced per workmen would go up from 10 to 18 per annum.

The ratios mentioned provide a good indication of how Siemens compare with the best manufacturing practices and how these help to channelize resources to achieve optimum results.
9.4.2 THROUGHPUT TIME REDUCTION

Capacity utilization:
For existing plan for manufacture of 2100 panels per year the required output is = 2100/52 = 44 Panels.
For the present lead-time of 7 weeks on the shopfloor,
Average WIP = 7x4 = 308 Panels
For the reduced lead time of 4 weeks on the shopfloor,
Average WIP = 4x44 = 176 Panels
Therefore Reduction of WIP = 308 - 176 = 128 Panels
Assuming an average cost of WIP = (0.3+0.17)/2 = Rs 0.235 Million

9.4.3 Total reduction WIP = 0.235 x 128 = Rs. 30.08 million.

This reduction was possible with:
* Existing manpower
* Existing Area
The capacity utilization went up by 114% for 4500 panels in the year 2000.

Reduced Interest Burden on WIP
Interest cost @ 20.5% p a for 8BK80 panels

<table>
<thead>
<tr>
<th>Department</th>
<th>value / panel / week</th>
<th>Lead time in Weeks</th>
<th>Interest cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly</td>
<td>(0.235x.205)/52</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>3704 to dispatch</td>
<td>= Rs 926</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Savings per panel</td>
<td>= 6482 - 3704 = Rs 2778</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For existing level of output of 2100 panels of 8BK80 the savings will be
Rs 2778 x 2100 = Rs 5.83 million

Assumptions: Cost per panel at the assembly & Dispatch stage has been taken from the weekly Inventory Statement (Rs. 0.17 million / panel & Rs 0.3 million/panel)
Like every journey this too was filled with varied experiences. During a voyage by ship to a distant place, the threat of the impending storm looms large, the entire crew has to set to work. Guided and directed by the captain, the coordinated efforts of the entire team are required to successfully weather the storm, each member performing his or her duty with complete responsibility.

And this is what people at Siemens did. While the external environment was not in anyone's control, internal actions were. And, one could do all that was required in his/her control to reduce its negative effects. For this, every person had to know his or her target and act towards the ultimate goal.

With the storm of change led by BPR, well set in they had to take charge of their bearings least they lose sight of their goal. They had to reset their sails and take advantage of the wind's direction. They charted out a course so that they could come out of the storm and for this they stabilized their direction and proceeded ahead. In the process, they understood that they would have to remove excess flab in order to move faster towards their destination - customer orientation / customer satisfaction. At Siemens they wanted that the customer should look to them as his best choice to work with, and together they should be able to give them a clear advantage over his competitors. Only then would he accept the organization as a long-term partner, nurturing a win-win situation.

The deep-seated recession made the going tough. Though it has shown signs of improvement in India the South East Asian crisis has aggravated the position. On the internal side, the cost structure was still high and they did not have the right level of productivity. This still adversely affected its competitive position. The net effect - a shrunk market with lower volumes and prices. It was like trying to hit a rapidly moving target while having to continuously adjusting its aim & sights to score a successful hit.

A lot of emphasis was laid on the waste front which included all aspects of – waste. At SIEMENS they were of the view that the worst kind of waste is the waste of not utilizing people's talent. Even people at the top were considered useless unless they contributed ideas to move the organization forward. Worse still was when they did not support and / or provide opportunities for others to utilize their creativity.
To be able to address these problems and reach their vision of excellence they needed to be creative and understand that superficial vision would give them only superficial results. Using IT was not the end by itself; they did not need to have experts tell them of the problems in the office when there were untapped resources out there on the shop floor. Again the critical element in all this was the idea of self-management - each individual contributing to the whole, yet each being self-sufficient.

10.1 Creating a learning organization!

In order to do so they needed to re-look at their performance measures. The new performance measures should be able to create output awareness, customer orientation & a continuous improvement. These were best captured by the following performance measures.

• Delivery Reliability (Plot on commutative basis for each cell)
• Standard Panel Output (Comparative panel output for each group)
• Target costing vis-a-vis completion of orders (Measures cost over run)
• First pass yield for wiring of LT Chambers (to identify common wiring mistakes).
• Employee morale
• Safety Index
• Housekeeping Index
• Cost of Quality (Extra cost Analysis)

Having made a broad framework they strove in the same direction and set bench-marks needed to re-established their performance to reach the target values.
11 - WHAT WOULD THEY ACHIEVE FROM BPR?

To achieve what they set out to do the researcher has penned down their four-point program that they set for themselves before starting on the BPR journey:

- Improving the cost, productivity and quality.
- Review of the portfolio.
- Balance sheet re-structuring/asset disposal
- Amplified focus on our Human resources.

It was time to make a critical analysis of each one. Everyone had to stop and think about how each one had participated in the recovery process. To have a qualitative look at what had happened. According to their MD, "We are clearly on the recovery path, but have only crossed half the way."

11.1 Improving the cost, productivity and quality

COST

Till recently, they were not cost-conscious. Only when they were faced with the crisis, did they realize this. In the last year and a half, they certainly have made progress. For example, on the material side, the strategic purchasing group has made substantial headway. They have made considerable in-roads on their funds management, which alone have yielded them substantial savings in interest. Also, the wage bill has come down as a result of the number of persons who availed of the VRS. Besides this, there has been a conscious effort on the part of every one to contain the overhead expenses. But this was not enough.

Cost, was the key driver that determined the organization's competitiveness and thereby its success. At Siemens, they constantly benchmarked themselves against the best in the world to reach a target cost based upon an assumed volume. Since the variables were many, the target kept changing and they had to continually make adjustments. Yet in whatever one did, one had to ask - is the customer going to pay for all the costs and expenses? Does it add value for him, and if yes-how much? The people of Siemens had to be the first choice for the customer and for this, they had to help him reach his goals.

For this one needs to have the right cost competitive position, the right quality and the right reliability. Finally, it is only the customer who determines the company's existence in business, persons' jobs and salaries. According to their MD, "We are today in an extremely price sensitive market and can no longer command customer loyalty without justification." He strove to motivate all to detect
new ways to reduce costs or add value for the customer and make it their personal goal to contribute towards the turnaround efforts of their company. Each one of their efforts would count and it is only the summation of all our efforts taken together, which will bring the company back onto the path of progress.

11.2 PRODUCTIVITY

To be competitive and reach world standards, they did not need incremental, but quantum jumps in the level of productivity.

Here, at Siemens, MOST (Maynard Operation Sequence Technique) was a mandatory pre-requisite to attain the desired productivity levels to remain competitive. The unfortunate part, however, was that it has not been implemented seriously in many places. One had to understand that MOST was not a game. If they wanted a future together, they would have to agree on some basic ground-rules. While he (MD) understood the position of the unions on this matter, his viewpoint was that all should feel responsible to deal with the reality. It was imperative that in factories that they needed a further reduction in personnel to reach optimum level to avoid difficult times ahead. Productivity equally applied to the offices. **While there had been a major clean up in the manufacturing sector of the organization, they were now intensifying the efforts to re-engineer the processes in the offices, particularly in the area of sales and service.** Each person had to look into his or her "personal productivity".

Personal productivity meant having set personal goals and reaching them as fast as possible in the best way possible and to shoulder the responsibilities assigned to each. This meant achieving more in less time, without additional effort. This was possible in this era of computerized machines, tools and information technology, both in which Siemens had expertise. **The key here was getting things right first time.**

The **Figures XIII to XXII** beside being self-explanatory bear out clearly the advantages of implementing MOST as a means of improving productivity.  (**SOURCE – Mr. D Kulkarni**)
Our Time standards are approx. 25% to 40% loose today.

Now we have a new & objective Technique
Like “MOST” to correct our Time - Scale

MOST = Maynard Operation Sequence Technique

- It can measure time for ALL "Manual Motions" for "Work Measurement"
- It is "Pre-determined Average Time" for body motions (based on "MTM" standards).
- It is user friendly.
- It is Method sensitive, identifies process deficiency like non-value adding activities.
- It can calculate time Off-Line.
- It eliminates "subjectivity" e.g. Rating Factor, Allowances, etc

<table>
<thead>
<tr>
<th>Types</th>
<th>Application</th>
<th>Cycle time</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BASIC MOST</td>
<td>Repetitive Operations (Operator moving, steps)</td>
<td>15 seconds - 2.5 minutes</td>
<td>Machine operations, Assembly operations</td>
</tr>
<tr>
<td>2. MINI MOST</td>
<td>Repetitive Operations (Operator sitting)</td>
<td>&lt; 15 seconds</td>
<td>Assembly operations, Fixed work table</td>
</tr>
<tr>
<td>3. MAXI MOST</td>
<td>Non-Repetitive Operations</td>
<td>&gt; 2 minutes</td>
<td>Stores, Maintenance</td>
</tr>
</tbody>
</table>
Our Time standards were approx. 25% to 40% loose. 

* Old Standards
* Loose Allowances
* Rigid to Process changes
* "Subjectivity" & Acceptance

The solution was

**MOST = Maynard Operation Sequence Technique**

- It can measure time for ALL "Manual Motions" "for work measurement"
- It is "Pre-determined Average Time" for body motions (based on "MTM" standards).
- It is user friendly.
- It is Method sensitive, identifies process deficiency like non value adding activities, etc.
- It can calculate time Off-Line.
- It eliminates "subjectivity" e.g. Rating Factor, Allowances, etc

---

Age analysis of Time-standards in Kalwa

**FIG - XVII**

- < 3 years: 5 - 17%
- 3-10 years: 5 - 37%
- 10-20 years: 4 - 29%
- > 20 years: 0 - 32%

Estimated: 16 - 59%
POTENTIAL OF DIRECT & INDIRECT WORKMEN in SWB

The Total Potential is 27% through 1st Estimation of "Revised Time Standards", & Work Flexibility; in spite of 20% increased Volume in 97-98

<table>
<thead>
<tr>
<th>Process</th>
<th>Gap at 100%</th>
<th>1. with existing standards</th>
<th>2. with time standards</th>
<th>Total</th>
<th>Balance potential Man-Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel Assembly factory</td>
<td>159</td>
<td>8%</td>
<td>4%</td>
<td>16%</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td>31%</td>
<td>128%</td>
<td></td>
</tr>
<tr>
<td>Circuit Breaker factory</td>
<td>47</td>
<td>0%</td>
<td>14%</td>
<td>4%</td>
<td>34%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0%</td>
<td>22%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>OVCB factory</td>
<td>14</td>
<td>0%</td>
<td>33%</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0%</td>
<td>14%</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>414</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1. with existing standards</th>
<th>2. with time standards</th>
<th>Total</th>
<th>Balance potential Man-Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prereq factory</td>
<td>84</td>
<td>10%</td>
<td>9%</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23%</td>
<td>27%</td>
<td>59%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Cost reduction: 22% & Rs.
The efficiency of workmen in MOT production is 66% lower than in NES/NBG.

**POTENTIAL OF WORKMEN**

<table>
<thead>
<tr>
<th>Factory Type</th>
<th>Direct</th>
<th>Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly</td>
<td>63+6</td>
<td>31</td>
</tr>
<tr>
<td>Water</td>
<td>127+7</td>
<td>46+3</td>
</tr>
<tr>
<td>Rotor</td>
<td>48+6</td>
<td>20+3</td>
</tr>
<tr>
<td>Cast Iron</td>
<td>59+6</td>
<td>26+5</td>
</tr>
<tr>
<td>Total</td>
<td>457</td>
<td>135</td>
</tr>
</tbody>
</table>

---

**FIG - XIX**

**Key Success Factor out of MOST environment**

**FIG - XX**

We can now... We have to now...

Define Expected Output / per workman per shift & Monitoring Mechanism

Set-up of Right working environment

- Good Machine & tool condition
- Immediate Response and Quick Maintenance
- Uninterrupted supply of material
- Overall Discipline in services, etc.

---

*excluding temporary = 0.189 Rs. per day

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**FIG - XXI**

**Present Practice**
Allowance Content in SMH difuses focus on Actual Work Content

8 Hrs = 480 mins./shift

**IMPROVEMENT IN PRODUCTIVITY**

- **Process Design**
- **Utilisation of Time**

```
Figures:
- 1: Before Process Improvements
- 2: After Process Improvements
- 3: Existing Productivity Level
- 4: After Increased Utilisation

Effective Working Time = Actual work content / Most
```

```
Allowances:
- Tea Break (20 mins) 4%
- Cleaning + Order Reporting (10 mins) 2%
- Personal Allowance (20 mins) 4%
- Fatigue Allowance + Others (8 to 30%) (40 mins to 145 mins)

```

```
GAP

Effective working time
```

```
Productivity
```

```
AMH

SMH

Productivity = SMH / AMH
```

```
Attended hours

Process Design
```

```
Utilisation of Time
```

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11.3 QUALITY -- CHANGE

With the onset of liberalization, if Siemens India wished to remain a part of the global network of Siemens, quality was going to be the determining factor, along with cost and Productivity.

When employees talked about Quality, it meant not only the products and systems that were manufactured or developed, but everything, including personal quality and the customers were happy with. Right from the manner one responded to a telephone call ... to ... the promises on delivery dates or the way one communicated externally and internally. The MD called upon each one to pay special attention to the quality aspects of their work.

11.3.1 Review of Portfolio

There was a time when people at Siemens could boast of manufacturing the largest variety of many products. Today, with the lowering of the import tariffs, they had to assess whether it made business sense to manufacture such a wide range or is it more economical to import some of the products in case customers do insist on the whole range? The answer lay in rationalizing the small volume products, by resorting to import substitutes. This additionally gave the double advantage of offering the latest in technology, at lower prices.

Secondly, they needed to assess which businesses were really profitable and had future growth potential. Only such business should be held onto and invested in or acquired. Un-viable and unprofitable businesses that were bleeding the company would have to be spun off.

The portfolio analysis was an on-going process. The possibilities were many, but the hampering factor was productivity and quality. They had a chance only if they reached the right levels. And this lay entirely in their hands.

11.3.2 Amplified Focus on Human Resources

At Siemens it was adequately acknowledged that human resources were undoubtedly the Company's greatest assets. With the continually changing business environment, where technological and cultural barriers were breaking, it was imperative that people were equipped to face the new world-order. This called for updating knowledge, skills and attitudes at all levels. To this end, they invested time, money and resources to fulfil their objective of having an unmatched class of skilled entrepreneurs.

Starting with the Officers, the management sent batches of Junior Managers to the Indian Institute of Management (IIM) for various programs. Also, a group of Senior Managers too were covered for a shorter capsule. To deal with "Change", a group of Managers were
given inputs by a team of professionals. A new commercial training program in
association with SIES college was been launched, as part of their objective to provide
qualified Workers with better jobs, they sought applications for various commercial
positions and would re-train such selected employees. Also in Switchboards, cross-
functional teams were formed to enhance competence levels. The positive effects
of this are already visible.

Though the management was investing in updating skills and knowledge of the
employees, in return it expected top class and measurable performance. In the new
setting, every one would be given a fair chance in an environment of freedom and
openness - and this also meant that there was no place for complacency.

11.4 The next steps
Besides, now after a period of two years, it was time for all to once again assess the
situation in the light of the present market environment and take corrective action. The
basic assumptions in all the planning was that they had to be successful in getting orders
once they were competitive and were in a position to deliver quality products in the
desired time. It was deemed important to do the right things and doing them right
first time.

In a recessionary market, this was a difficult task. They had to be careful so that in
their anxiety, they did not get loaded with bad orders, which either did not get off the
ground or had payment problems. The key today was getting good quality orders with
volumes that would help their units break even and all efforts had to be made in this
direction.

11.5 THE PRIORITIES WERE
11.5.1 CREATING A CUSTOMER - CENTERED ORGANIZATION
Together, they could create a win-win situation by offering right products/solutions, best
service, best quality, best delivery, best price to performance, best reliability, and best
customer relations.

11.5.2 CREATING AN EMPLOYEE-DRIVEN ORGANIZATION
Employees were the backbone of the organization. They should feel proud in belonging to
the company and proud of the successes they brought in. The captain or the leader alone
cannot achieve results. It's the team that matters. For a winning team, they needed the
right atmosphere and culture, with open communication, where work in itself is fun. For
this it was essential that:
* top most motivation driven by a sense of purpose
* top class performance driven by creativity

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11.5.3 CREATING SHAREHOLDER VALUE

It was emphasized that the shareholders were the owners of the company, including many of the employees who have purchased stock.

All were motivated to take the initiative and not wait for instruction to always come from the top. All this showed a high level of TOP management support for the change process.

They, as employees had a call - that of responsibility and of commitment. Each individual was responsible for creating a lasting impression and their actions today would reflect on the company’s well being tomorrow. They supported each other in order to have a distinct competitive advantage. Particularly, in an event of crisis, it was important that all joined hands and worked as One Team to see all through the difficult time.

A strong team with a deep sense of unity and commitment was the need of the day.
12 - WHAT MADE THEM A WINNER?

During discussions with BPR team managers, Mr. Kulkarni, Mr. Manoj and Mr. Yogesh, the researcher was given a unanimous and enthusiastic statement:
"There is much written and spoken about Best Practices, Reengineering, management of change, etc, but there is little evidence of its embodiment and best results. Is there in fact a 'best practice'?

A few years back, the Siemens Group, in conjunction with their office in Germany, completed an international survey of best operations practices in manufacturing businesses as part of their continuing effort to track trends and attitudes in the Organization. In the survey, their focus expanded internationally to what companies of the Group were doing within their operations to supply quality products - existing and new - at a competitive price and at the right time to meet continually changing customer needs.

Of what was found much was positive:

* Manufacturing is a dynamic activity and many of Siemens' companies had undertaken change programs. Wide range of improvement techniques were used – surprisingly these worked.

* Working closely with suppliers and customers was underway. The customer gives his specification and if the specs match the ones of the product on stock the product is dispatched immediately. For minor changes, drawing / planning departments were consulted and the product was made to customer's specification.

* There was widespread recognition of untapped potential within people, and a stated intention to release that potential.

There were also some notes of caution:

* The stark realities of the market had resulted in massive emphasis on cost reduction.

Various group companies had to toe the top line of action.

* Those not functioning optimally & not able to make the best of the people within their business operations were made to understand the value that HRs were the true assets of the Organization and must be handled with care.

* New product introduction was probably a bigger problem now than eight years ago, with the relentless need to update or repackage products for different markets. In order to meet this challenge the Siemens group has re-invented the whole range of
production steps - right from the drawing board to the finished product. They produce custom-built products to others' standardized products.

So, what was the "Best Operations Practice"? In analyzing the survey data, they found that one-quarter of surveyed were Frontrunners; who considered themselves world-class or almost there. One-half were Followers, or above average. And rest were classified as Firefighters, or un-competitive and having "a long way to go."

A brief summary is given below:

12.1 The Competitive Environment
They needed to reduce product cost, as it was the dominant operational issue. A cost reduction on the order of 11 percent to 15 percent annually was targeted over the next three to four years. Mr. Kulkarni was emphatic, saying that for achieving this they had to adopt radical new approaches affecting all areas of operations. This was probably why, despite cost reduction being the driver, respondents said that bigger performance improvements were needed in lead time and inventory holding, i.e., reduce inventory by a large volume as they had done in Switchboard plant of the Kalwa unit where they were doing their best in trying to follow JIT or just in time management. Besides trying this they did not have any time period stock beyond two days of RM in any bin along the assembly line. This went a long way trying to curb the urge to hold inventory unnecessarily. Along with cost and lead-time reductions, improvements of similar magnitudes in on-time delivery were being sought. As the products at the Switchboard plant were now custom built the idea of late delivery has been reduced to the barest minimum.

"Need to keep cost down because of not being profitable enough." Dr. Gunter Wilhelm in 1998 commented that for every 100 DM of sales the earnings yielded only 4 DM. This made Siemens only an average performer.

12.2 Inside Operations
Major changes have always been a way of life at Siemens manufacturing units for most of the past decade. "(Successful programs) built on people creativity and innovation and required little capital. Why? People involvement."

12.3 "People's attitudes are very difficult to change."
Highly motivated personnel or Frontrunners were collocated interdisciplinary teams. Given the respondents' repeated emphasis of the importance of people and teaming - their crucial impact on organizational effectiveness, progress, and improvement-project success - it was clear that best operations practice today must involve successful team working.
No one was ever satisfied with new product introduction. The reason for this was that it took too long. Relative to this process, the Frontrunners were satisfied with cooperation of their in-house interdisciplinary teams, while Firefighters were least satisfied.

12.4 Routes to Best Operations Practices

To achieve operational performance, Frontrunners made more use of various techniques than the Followers and Firefighters. This was evident from the way these people worked as they had always viewed new techniques as enablers and not as hindrances as did the followers and the firefighters.

Mr. D. Kulkarni, "Over the last eight years, all (tools and techniques) have shown lasting benefit. If empowerment is in place and continuous process improvement is well entrenched within the culture and developed further."

At Siemens it was well evident from the fact that over the last few years they have sent a number of their staff abroad to learn newer techniques and to become what Mr. Yogesh termed -- Champions of change within. And true to this, they have actually performed this role with gusto.

Cellular manufacturing was viewed today as highly effective with benefits growing over time. Other techniques - specially: employee empowerment, continuous improvement, supplier partnering, and JIT – were beneficial and popularly used.

12.5 Performance Measures

Lead-time reduction was listed as a dominant operational issue, 10% of respondents’ listed it as a key operational performance measure. ¼ of the respondents viewed unit cost, and utilization as key measures for Manufacturing effectiveness measures such of productivity. ¼ listed Delivery performance as a key operational measure.

"The key to Best Practice is employee involvement to the lowest level. The success or failure must be measured and appropriate level held accountable for the success or failure."

12.6 Investment Justification

In the past, Frontrunners have had a relative balance in their investments in various spheres. The Followers and Firefighters have proportionally invested more in machine tools and process equipment and proportionally less in both recruitment/training/people and in product research and development. Over the next few years, Frontrunners, Followers, and Firefighters all plan to invest in a proportionally balanced manner.

Kulkarni & Yogesh, "I suspect that historically performance was thought good and straightforward cost cutting (heads) was sufficient!"
This limitation was overcome by formation of a Central Engineering and Commissioning (E&C) group located at Kharghar comprising the Engineering group earlier based in Nashik together with the Head Office RSC which were based at Kharghar. By doing so, the engineering and commissioning function would now be handled by the Central E&C group on an all India basis. The rationale behind this re-alignment was to generate efficient and workable solutions for the customer, without time and information loss which would be doing the right thing, 'first time right', fast and cost-effective. This re-grouping would facilitate All India deployment of service engineers directed from a central location, whenever necessary arising from the requirement for expertise and availability.

Effective 1st October 1998, the RSCs serve as single point interface to the customer for all after-sales service. This includes services such as break-down service, annual maintenance contracts, service spares, repairs, and training for products like switchgear, motors and contactors in A&D 1 and high-end automation products and system solutions offered by A&D 2.

13.1. Break-down Service: In the earlier set-up, in the event of break-down of a system or product, the customer had to approach either the RSC or the sales department who in turn got in touch with the RSC.

This process of cross-references led to delays and customer dissatisfaction. TODAY – With the barriers removed, the customer can directly interact with the RSC. The RSC also has the support of E&C. Thus, a service complaint that cannot be handled by the RSCs is referred to the Central E&C group. If yet unresolved, it would be addressed to Siemens AG giving rise to the escalation chain concept, which guarantees customer satisfaction in a reasonable time.

13.1.1. Repairs: Until recently, a customer seeking repair service had to approach either a) Sales department, b) RSCs or c) Nashik / Mahape or the Authorized Repair Centers (ARCs) would repair simple cards, while older cards were repaired at Mahape. Newer and complex cards were repaired at Nashik.

This limitation has been overcome; as repairs have now been re-cast through a more focused approach. This implied shifting all repairs from Nashik to Mahape resulting in reductions in repair time and cost, transparency in processes and consolidation...
of repair capability. Henceforth, the customer could contact the RSC who would coordinate the repairs or advice the customer to send the material for repairs to the ARCs.

13.1.2. Service Spares: Until recently, service spares were maintained by the individual RSC and HO RSC or obtained from the Nashik Works inventory. According to the new reengineered service set-up, spares required for regional requirements of 4-5 days were stocked locally (zone-wise) and all other spares were be maintained centrally. This resulted in a low inventory holding costs, facilitate availability of stocks from a central location as and when required and simultaneously bring in more flexibility together with the repair process.

13.1.3 Training: In the earlier service set-up, product and application training to A&D customers was organized through the Advanced Training Unit (ATU) located at Andheri (till Sept. ‘97) and the Regional Training Units at Bangalore, Calcutta, Delhi. The new set-up in addition to providing the product and application training, enabled customer's maintenance engineers to attend to his own maintenance, minor faults and facilitate the operator to receive the maximum benefit of Siemens HMI equipment. A&D in turn setup a Central training unit at Mumbai which offered quality training to its customers through courses in:

- Dedicated maintenance/trouble shooting
- Operator training in HMI
- Product Training
- Application Training

BENIFITS

13.2 What did Siemens expect to achieve?

13.2.1. Volume Improvements

A volume improvement of approximately 10% was targeted which was made possible by increasing the sales by 24%. The new sales outfit that was tailored to the customer's need and enhanced customer reach will see the company through each of its goals.

13.2.2. Reduction in Selling Costs

A cost reduction of 39% was targeted and achieved, over the past two years. An elaborate performance measurement system (PMS) was been installed to monitor the progress. Through sincere and concerted efforts, a cost reduction of 60% of the target was achieved in the first year ended September ‘98 was achieved. The balance 40% of the target was achieved by Sept ‘99 for which actions enumerated earlier above were already initiated.

13.2.3. Education and Personal Development

For effectively reengineering the Sales/service sector they at Siemens went about Education and Personnel development aggressively. This helped in obtaining a positive
response towards effectively changing customer expectations. This in turn, helped them become a preferred supplier to their customers, both existing as well as new.

13.2.4. Effective Customer Service

With the service set-up, which has been realigned/re-engineered, it is desired to achieve:

- A faster response and resolution time in line with the customer's expectation
- 'First time right' resolution
- A permanent resolution
- Generation of appropriate and cost effective solutions
- Substantial cost reductions overall
- A satisfied and retained customer

13.3 Future Outlook

According to Mr. Baijal, "There were various inherent shortcomings in the earlier set-up. These issues are being systematically addressed with a view to improve our situation with regards to sales volume, selling costs, business acumen and behavioral and training issues".
The Emerging Marketplace

Imagine walking down Link Road in Mumbai. You are drawn amidst the glitz and glitter of the new era of department stores, food stores, cyber cafes or for that matter, strobe lights reflecting images of the crystal ball in the corner, where crowds throng in to catch up with the Jones-/me too. It's a 'happening' place is the buzzword.

What makes these places tick and attracts you and so many others to them, not once, but again and again? A combination of factors, indeed! The most important is - understanding you, the customer (need); giving you what you want (quality and variety); at your convenience (service), by making you feel good (care), all at reasonable price! In short, these enterprises are highly customer-driven.

Moving onto Siemens, they too have awakened to the reality of the marketplace and changing customer needs. A question remained, 'can they successfully face the tide?'

So, what has changed?

Or rather, one should ask --- what has not? ------ Basically, three things:

14.1. First: there was a radical change in the economic framework and ground rules of the market structure resulting in a highly competitive market.

14.2. Second: this gave rise to consumerism. The newfound power of choice, awareness and intelligence was putting stringent demands on price and performance.

14.3 Third: relationships were redefined. The customer was no longer a mere buyer, but a partner, supporter and advocate. The customer wanted to be treated as a distinct and unique individual, not one of the so-called masses.

14.4 What did this mean for Siemens?

This meant that they needed to be fast and flexible. Gone were the days of rationing and that of arrogance; in are the days of merit-based marketing and selling built on a foundation of mutual trust, understanding and care. If they are unable to adapt to the new calling which is changing at an accelerated pace as never before, others will be waiting to cease the opportunity. In fact, considerable ground has already been lost and it would require putting in that extra steam to regain the position.

In particular, the A&D standard products divisions, dealing in a wide range of Motors, Switchgear, Automation and Derived products, solutions and systems, have been badly affected. This segment has seen a sea-change, on various fronts - be it technology (Electro-mechanical to electronic), number and type of players (local to global), the manner in which the business is handled and approached (make or buy), etc.
CHAPTER – 15
REENGINEERING THE SALES/SERVICE SECTOR – PART - II

With the changing market scenario affecting Siemens, it was time for them to face reality and the challenges. This compelled them to re-think methods and style of operation requiring they be more responsive and improve their efficiencies.

To address the situation, the key areas identified by A&D Sales were volume improvement, reduction in selling costs, customer account management, training and effective customer service. Briefly looking, at each of these the researcher will try to bring out the outcome of Customer Account management concept:

15.1. Volume Improvement:

i. Re-organizing to improve interface with the customer

To better service the customer’s needs and bring them closer, the sales organization was now re-grouped. Many customers, who bought products across their business divisions, have separate purchase cells for electrical products and electronic products. Effective 1st October 1998, the set-up has been re-aligned into 3 groups:

- The whole country was divided into small sales territories
- Each sales engineer was assigned a territory with clear sales and profitability targets.

This grouping was done considering the geographical spread and business potential of customers. Besides, it would motivate the engineer’s to visit each customer and discuss all the requirements for products under his responsibility.

To facilitate this, a PC based sale system was installed to help the sales engineer schedule customer visits appropriately and monitor the business volume versus potential of each customer. It also offered the advantages of forecasting business trends with the
available information that was fed into the system, sending mails to customers and much more. This on the whole provided ease of accessibility to the sales people wherever located.

15.2. Pruning Selling Costs:
It was revealed that their selling costs were 21.9% of turnover in 1996-97. While benchmarking selling costs, against internally available best practices, a reduction in selling cost by 39% to be achieved over a period of two years. To bring about this improvement and to be more competitive, the following six initiatives were undertaken:

15.2.1. Process Improvement: This was aimed at streamlining and simplifying all factory forward processes - be it orders registration, execution or the billing process. Now, the processes have been re-designed to make the operations user-friendly. While doing so, some non-value adding activities have been eliminated, and the new processes have been integrated with SAP.

15.2.2. Personal Productivity: The commitment of all sales personnel and the new sales system installed, aided the sales personnel to chart out customer visits in a well-planned manner, leaving them with more qualitative time to be spent with the customer. In short, this action was aimed at improving personal productivity.

15.2.3. Reduction in promotion Costs: As e-mail and internet are cost effective alternatives facilitating communication, the sales personnel were encouraged to use these services more effectively when compared to the costs of phone and fax. Further, proper planning of sales tours would not only reduce travel time and costs but would also enable the sales personnel look for additional opportunities to cross-sell products to the customer.

15.2.4. Asset Management: In the past, turnover apparently was given the highest priority. With the result, improper management of assets (both fixed and current), was the single largest contributor to rising selling costs and corresponding reduction in its profitability. According to Mr. Dalvi (GM BPR) “In the last one year, with commitment and participation of every sales employee, this trend has been reversed and we have made tremendous progress in bringing down our current assets (debtors, stocks etc.) were much below the 96-97 levels. However, we still have a lot of ground to cover.”

Further, initiatives currently under implementation include:
* Reconciliation of receivables account;
* Concentration on quality turnover i.e. sales where recovery of money was not doubtful.
* Better planning of timely deliveries of complete supplies.
* Facilitating a financing agreement between a bank and channel partners.
* Optimization inventory in pipeline from factory until it reaches channel partners.

15.2.5. Channel Efficiency: The distribution channels, namely, Dealers and Systems played a crucial in its marketing efforts. It therefore, was their endeavor to continuously review their effectiveness by removing inefficiencies by removing them and enhancing strengths. This would entail re-defining the role of their channel partners and identifying what percentage of its existing dealer network and system houses are fulfilling the assigned role. Methods were devised to bring about improvements and a new policy for trade terms with channel partners was in the offing.

15.2.6. Reduction in Extra Costs: This action was initiated to bring down the extra costs incurred on account of repairs, re-work, warranty and logistics cost. The target was to bring down this cost as close to zero as possible.

15.3. Customer Account Management:
This effort was initiated to identify the key customers of Siemens from the existing customer base. This identification was done by taking into consideration various parameters, some of which have been listed below:
* Total purchase volume in a given year.
* The purchases made across the A&D product spectrum.
* Leadership in a particular industry segment.

Such identification helped Siemens develop customer account managers who would interface with these key customers. This will help in better customer interaction and managers in turn could identify potential customers to increase sales volume.

15.4. Education and Personal Development:
To better equip the sales personnel, three-tired programs were designed to:
1. Enhance technical and application knowledge of products to be conducted internally by Product Management Groups.
2. For business related skills - being conducted by internal and external faculty like the Indian Institute of Management in Bangalore.
3. Improve behavioral skills - to be conducted by internal and external faculty.

15.5. Customizing Service:
In common day parlance, ‘service’ to a customer is commonly understood in terms of offering him after-sales service after a sale is closed. In real terms, ‘service’ as a function
comprises two parts; one is the upstream activity comprising system integration i.e. engineering, start-up (commissioning) and the other is the downstream activity of after-sales service. After-sales service includes service offered in the event of breakdown or failure of products, repairs, spares, annual maintenance contracts, customer training and upgradation / modernization. Training of their service/customer personnel by imparting knowledge about the product or system, application, process, trouble shooting/maintenance and Human Machine Interfaces (HMI) is extremely vital and an essential aspect of service. This knowledge-based service must be future compatible, leaving ample scope for feedback from customer interactions and continuous updates from or in consultation with Siemens AG, which is important for their continuous learning and growth.

15.6. Engineering and commissioning:

Earlier, when an engineering order for A&D 2 systems was placed by the customer to the Sales department, it was passed on to the Engineering (ECS) group located at Nashik. The sales department in turn would contact the Regional Service Centres (RSCs) for commissioning. At times, the RSCs would refer to the Authorized Service Centres (ASCs) for commissioning. This resulted in a lot of time and information loss, firstly because of the locational disadvantage and secondly because the responsibility for solution generation and realization rested with different departments.
16 - EFFECT OF REENGINEERING ON THE SALES/SERVICE SECTOR

How has Reengineering affected all at Siemens?

16.1. Volume:

First, in today's shrunk market, the demand has declined. With a smaller pie to apportion, amongst a larger number of players, the company's volume too has reduced. Other factors that have affected low volumes are:

1. Today, Siemens has its own strategic purchasing cells through which it consolidates its purchase requirements through national contractual agreements. In doing so, it streamlines its purchases to become efficient. Also, they expect a better deal based on a bundled volume. For Siemens, this means a) Potential to increase volume b) an aggregate lower price realization.

2. Dealers, another important customer group, no longer needed to place speculative orders like before because of the present recessionary trends and related liquidity crunch.

3. Competition offered a wider range of technologically superior and competitively priced products, affecting the company to loose out on technical advantage on its products.

4. Considering the large geographical spread they were not flexible and fast enough to reach out to their customer in time. This of course resulted in competition capturing orders since very often they could not meet customer expectations.

5. To add to it, the internal sales organization was not suitably geared to optimally address the customer requirements. First, there were several sales engineers visiting one customer for the separate products and second, that the sales people were not out in the field as much as they ought to have been.

16.2. Selling costs:

Customers and the competition today pegged the selling price. It was a result of market dynamics. In order to maximize profits in the given circumstances, the selling costs needed to be minimized. So let us look at the composition of selling costs at Siemens:

i. Personnel Costs include salaries, allowances etc.

ii. Capital costs, which are mainly interest costs, locked in on fixed assets, trade debtors, stocks, etc.
iii. Promotion Costs are the costs that are incurred on travel, entertainment, advertising costs communication etc.

iv. Extra costs refer mainly to product warranty costs incurred during the warranty of products, and

v. Other costs that are mainly the other fixed operational costs.

Here it was observed that their capital costs and extra costs were higher as compared to the benchmark.

16.3. Enhancement in selling skills:

According to Mr. Kulkarni, (DGM Switchboard), "In a fiercely competitive environment, where orders are difficult to come by, technical skills and knowledge of its product combined with a go-getter attitude were essential to be successful in the marketplace. These attributes needed to be further augmented with enhanced training and requisite behavioral inputs particularly essential whilst dealing with the customer. Based on the old success factors, (seller’s market) at Siemens, complacency had set in. Now, with the changed success factors, (buyer’s market), new demands have arisen eliminating complacency and plotting a new trajectory."

16.4. Service Outlook:

Although technologically the products were good, service - a key differentiator was till now inadequately addressed. As a result, the sales engineer who was the point of interface with the customer was in reality a sales-cum-service engineer. In the process, service was neglected and got a stepchild treatment. To rectify this situation, a few years ago, Regional Service Centres (RSCs) were set up.

The sales engineer still served as the first point of contact with the customer and monitored customer complaint resolution.
17 - FURTHER TO THE REENGINEERING PROCESS

IT WAS ESSENTIAL TO PUT THE COMPANY’S PRINCIPLES INTO PRACTICE

With a global workforce of some 380,000, Siemens generated over 60 percent of its sales outside Germany. The company though active on the global scale, is far from being a true global player.

According to Goth, (Head Human Resources), “They still had to overcome major challenges to achieve this status,” But elaborated that they had to succeed if Siemens was to be successful in the long term. Goth has also identified some of the key challenges facing the company:

* "Local customer requirements, both large and small, must be met. In this respect, it is important to remember two points:
  
  **First** the prime market potential is increasingly located in Southeast Asia.
  
  **Secondly**, the structure of demand is moving away from a product-based business and toward systems, infrastructure and global service.

* As far as value added is concerned, it was understood that they had to strike a balance between the regions and headquarters - that is, they had to locate value added activities in those locations where they could be generated efficiently and cost-effectively.

* The Organization had to become more flexible and assume the form of a worldwide network with centers located according to a regional and/or competence-based principle.

* And, naturally, the overriding challenge was to make a healthy profit!"

17.1 HOW WORK HAS CHANGED

What would work be like in the future at Siemens?

According to senior managers at Siemens they knew that, for one thing, they could not assume that it would be simply an extension of what they are used to.

**Many factors would force change: These include == fiercer competition; more exacting customer requirements; the growing integration of commerce, transportation, communications and capital markets; and increasingly rapid innovation cycles in technology and knowledge.**

Today’s traditional labor and organizational structures, were largely geared to carry out uniform tasks and hierarchical organizations, were losing significance in the new working environment. Project-based activity is set to increase.
Adaptability, flexibility, innovation and the capacity to work toward a common goal are the only means of guaranteeing success in this environment.

Customization would be and stock to sell out. This is exactly what took place at the Switchboard unit at Kalwa where made to order is the order of the day rather than stocking standardised items which would be equivalent to carrying unnecessary inventory.

17.1 What was needed

The consequences of such a transformation were new forms of labor division, cooperation and management. This further meant that not only must the best market-access be utilized worldwide, but the best know-how and the best cost-benefit ration must also be found and exploited. It was not a simple matter to ensure that the links within the value-added chain could be optimized while maintaining the company’s competitive edge.

The question of where things were done in the global added-value chain depended on where the best know-how, market access, capacity and lowest costs were to be found. For this tasks had to distributed dynamically according to the principle of where they could be done in the best and/or the most cost-effective way. In this respect, the secret to overcoming limited capacity lay in the ability to call up resources - often remote and distributed around the world - in a flexible manner. Similarly, in order to overcome knowledge deficits and the ability to call on worldwide expertise to address the developments, it was essential that:

* more expertise and decision-making power be transferred to the regions,
* operational responsibility be assumed on an international basis,
* management structures be decentralized network structures for management and cooperation be developed.

The fundamental requirement for optimizing teamwork was mutual understanding and the ability to think and to act in concert. The greater the degree of convergence in common value and objectives, the better the quality of cooperation. Siemens’ eight guiding principles adequately illustrate how this could be achieved.
WHY MANAGEMENT CULTURE NEEDED IMPROVEMENT

This judgement was also confirmed in the individual interviews conducted as part of the survey. Interviewees came from the ranks of senior and middle management and salaried employees. The conclusion was that management would have to take its "role model" function more seriously. **Bosses should adopt a "buck-stops-here" mentality and drop the culture of compromise.** They should show the courage to take risks and make mistakes. Agreements should be more strictly enforced and the appropriate conclusions drawn more quickly. All in all, respondents reported that they are ready to take on more responsibility.

The guiding principles support the goals of top⁺ in the following manner:

The Organization’s guiding principles formed the basis for top⁺. They gear employees' behavior to the goals and measures in top⁺. eg., without the ability to cooperate, the readiness to learn, or outstanding management to support this, Best Practice Sharing - one of the primary measures in top⁺ - would not be possible to achieve. All three points are part of the guiding principles.

17a.1 Business success means --- we win from profits

It's the other way round. The guiding principles were not invented or prescribed, they simply grew out of the values expressed by the employees - in other words out of organizational culture. These values were found out by means of a representative international survey. So the prerequisites were there and all that had to be done was to uncover the hidden treasure. In the long run, successful businesses are possible only with motivated employees who want to and are able to strive towards our goal. Looking around the Indian scenario it would be difficult to identify another organization, which has adopted this approach to re-invent the organization.

17a.2 Cooperation at Siemens has no limits

Admittedly, there may be a number of programs running simultaneously. The situation in the company makes each of them necessary. What's important, though, is that they all fit together. For instance, Win is the yardstick for top⁺, giving it a uniform orientation to ongoing added value. In contrast, the company principles ensure the right 'thought processes' in the company and therefore provide the conditions under which productivity, innovation and growth can thrive. These had to be communicated in such a way that these interconnections were even clearer in the future.
productivity, innovation and growth can thrive. These had to be communicated in such a way that these interconnections were even clearer in the future.

17a.3 Corporate citizenship was the Organization’s global commitment

Today it can be proudly said that Siemens is a powerful company with a great future. To make the most of this they have to recognize, promote and unleash the potential of the employees.
18 - THE CHANGING FACE OF HUMAN RESOURCES

At Siemens it was recognized in the early stages of $\text{top}^+$ that in order to be successful it was important that HR be reorganized appropriately. One of the primary concerns in the field of human resources is how to help ensure that the key conditions for implementing the company’s principles are in place. In the final analysis, implementation of these principles signifies a transformation in corporate culture, i.e. the underlying principle of top. If work at Human Resources is to focus on Siemens’ principles, it must concentrate less on administration and more on actively shaping events. The majority of work in this field must be directed at areas likely to increase the value of the company, boost the efficiency and commitment of the workforce and management, and elevate good leadership to the status of a prime competitive factor. In the final analysis, one thing must be clear: anyone ultimately incapable of living and breathing these principles will have a tough time pursuing a successful career at Siemens.

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### POTENTIAL OF DIRECT & INDIRECT WORKMEN in SWB

The Total Potential is 27% through 1st Estimation of “Revised Time Standards”, & Work Flexibility; in spite of 20% Increased Volume in 97-98

<table>
<thead>
<tr>
<th>P - CB - OVCB</th>
<th>Ø Plan 97/98</th>
<th>1. with existing standards</th>
<th>2. with time standards</th>
<th>Total potential</th>
<th>Balance Man-Power</th>
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<tr>
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<td>11% 4</td>
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<td>28%</td>
<td>13 13 34</td>
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<td>17</td>
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<tr>
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<tr>
<td>8</td>
<td>0%</td>
<td>33%</td>
<td></td>
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<tr>
<td>Total:</td>
<td>414</td>
<td>Ø 7% 382</td>
<td>Ø 20% 301</td>
<td>113 72</td>
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- Inspection only at end of Production
- Only Inter-Group Transport by

**Cost reduction 226 Rs**

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Diagrams: Kulkarni, Yogesh, Siemens Kalwa Switch Gear Unit
The efficiency of workmen in MOT production is 66 % lower than in NES/NBG.

**POTENTIAL OF WORKMEN**

<table>
<thead>
<tr>
<th>Factory</th>
<th>Potential (0 95/96*)</th>
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</tr>
<tr>
<td>Stator Factory</td>
<td>127+7</td>
</tr>
<tr>
<td>Rotor Factory</td>
<td>46+3</td>
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<tr>
<td>Cast Iron Factory</td>
<td>48+6</td>
</tr>
<tr>
<td>Total</td>
<td>457</td>
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</tbody>
</table>

<table>
<thead>
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<th>Factory</th>
<th>Achieve 100% Productivity</th>
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<td>Gap K-Mot vs. NES/NBG with 130% productivity</td>
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<td></td>
<td>1 with existing time standards</td>
</tr>
<tr>
<td>Assembly Factory</td>
<td>35%</td>
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<tr>
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<tr>
<td>Rotor Factory</td>
<td>30%</td>
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<tr>
<td>Cast Iron Factory</td>
<td>35%</td>
</tr>
<tr>
<td>Total</td>
<td>30%</td>
</tr>
</tbody>
</table>

**18.1 NO PROFIT NO BUSINESS!**

There was certainly little room for complacency at a recent seminar in Munich attended by approximately 200 people from the groups and regions. In fact, the regional managers and sales representatives were promptly given a homework package to be turned in as quickly as possible. The reason for concern is simple: last year, every DM 100 of sales yielded earnings of just DM-4. On this basis, Siemens is just an average performer. For this reason, corporate executive committee member Dr. Gunter Wilhelm is demanding that top also make a substantial contribution toward increasing the value of company business. What productivity gains the company has made have been effectively wiped out by falling prices over the few last years. Its competitors haven't exactly been sleeping. In fact, some have actually edged ahead. As far as Wilhelm was concerned, "top+" would concentrate in the future on clear targets, concrete measures and monitoring results. And if the results aren't right, the company must take appropriate action. Wilhelm's target was to increase the value of the company by a minimum of DM 3 billion over the next three years.
Views as given by Mr. Dalvi/Mr. Manoj/Mr. Kulkarni/Mr. Yogesh Dattar

Often, we blame the organization, the Management or the circumstances for a given situation. Very few stop to think that we too have an equal responsibility in it. E.g., hockey's team where the objective is to win. To reach its objective, a top coach is hired to guide the team to victory. Success is likely if the team is good, but if the players are not motivated to put in their best, success will always remain a distant dream.

The management, like the coach in the above example, is only a part of the whole and therefore has only a part of the responsibility. It falls on the employees (the players in this example) who too are responsible for the failure or the success of the team.

Take Siemens pre-BPR situation. Few would stand up to say, "I want to do something about it; I know what to do; I can do something about it; and I will do something about it?" Mostly, employees just slid back into a cocoon and chose to leave things, as they were. After all, it's the management's baby, let them take care of it. This is a Me vs. Them culture - not an Us culture.

19.1 The winning Team – How to build a winning team? -- Mobilize everyone's energy. All must have a common objective and be driven by a whole-hearted and target-driven effort, a unique personal promise is demonstrated. This is commitment.

When employees are committed to the success of the company, the company is said to have an employee driven culture.

According to Mr. Kulkarni, the prime role of the Leader was being a Visionary, who inspires people; setting challenging agenda and empowers; one who translates his

Diagrams: source TOP program
dreams into a shared vision; and one who communicates, communicates & communicates.

A manager must translate the shared vision into goals and set broad plans to reach them by coaching, delegating, motivate & building teams.

Mr. Yogesh added that if the employees were driven by commitment, they would translate these plans (purpose) into action though creative means, conducting themselves with self-responsibility.

19.2 Employee driven organization

19.2.1. Purpose whatever one undertakes always has an underlying purpose and goal-directed behavior.

For example, at work, from the organizational level to the individual level, one has to have purpose, objectives, goals and targets to achieve. Each individual's targets, added up eventually will sum up to the company's targets. Hence, one must know what the broader picture looks like, as the goals must be in line with those of the organization.

19.2.2. Creativity

Having an understanding of the goals and targets is of no use. They have to be put into action by the use of creative abilities. Creativity refers to the way people think. To be creative, an idea must be appropriate, useful and doable.

Mr. Dalvi, "To put the idea into action, one needs the expertise the skill and aptitude, without which, the idea may remain on paper or may be poorly implemented."
Expertise and creative thinking are an individual’s raw material-his or her natural resources.

But a third factor, motivation and initiative determines what people would actually do, yet all forms of motivation do not have the same impact on creativity. There were two types of motivation-extrinsic and intrinsic. Passion and interest - a person’s inner desires to do something - are intrinsic motivation. The work itself is motivating. Yet, for a creative spirit to flourish, it is pertinent that there is an environment of freedom. One may have all the above three factors, but what was needed most was the space to spur creativity.

19.2.3 Responsibility

Mr. Manoj (manager BPR) was convinced that Responsibility was the key element and without which the other two elements were meaningless and ineffective. Responsibility, he said, “means stretching one-self towards achieving what was promised, irrespective of the circumstances, not absolving oneself by giving excuses. This feeling of total responsibility for the results within one’s own sphere of activities is the main motivating force. This led to the next higher emotional level, where employee began to personally feel responsible (self-responsibility) for the results of the company or for a prevalent situation.”

Mr. Kulkarni giving an example of happenings on the shopfloor echoed what Manoj had just said. He brought about that, “with the feeling of self-responsibility, the people felt an inner urge of wanting to make real contribution to the company, doing something different. This self-confidence pushed an employee to accept the challenge head-on, however tough it may be and successfully meet the challenge. It gave the individual a sense of pride and self-esteem. This too is the greatest intrinsic motivator that drives an employee to consistently perform.”

19.2.4 Trust

All the three chorused, “that in whatever one does, the most important factor was the environment of TRUST. Our core credo is “Co-operation based on trust”. Trust begets trust and every single individual through his or her actions must create this environment
Trust, put simply is belief, is conviction that whatever is done, is done first keeping the organization's best interests in mind."

According to Mr. Dalvi, it the individuals at Siemens today exhibited the highest degree of honesty and openness, integrity and loyalty to the organization; care for the organization and concern about its well-being. On the other hand the organization demanded that the people have the competence to run the company. This had to be embodied with a feeling of mutual aspect for one another.

19.3 Commitment
For Siemens to survive, it had to have continued growth and development. It was not enough that the top management was committed - all employees must be involved. For this a whole-hearted effort was required. Everybody had to be an active player and each should use his/her energy to solve problems, not point them out or find scapegoats.
The top movement launched four years ago has made progress. While it did put them on track, it was now time to adjust the course, set precise goals and push ahead with renewed vigor with the help of top+

The researcher has reproduced extracts from a letter written by Dr. Heinrich von Pierer to Siemen’s employees worldwide. According to Dr. Pierer, “To generate lasting success across the board, we are re-doubling our efforts with top, and intend to give new impetus to the program, which will be denoted visually by the plus sign: top+

- **top+** will be pushed forward on a business - specific basis in all the Groups, with the Corporate units providing assistance and support where necessary.

*With top+, each business will set clearly quantifiable objectives for itself, devising concrete measures and drawing the necessary conclusions.*

*Employees will be fully included in establishing targets and measures within the business units, and translating these into reality. Compared with top in its initial form, the revamped program is more precisely formulated.*

*Organization’s goal is to increase the economic value of the Company, which will be the gauge of our success or failure. Only in this way we will be able to continue to meet the cost of financing the successful development of innovative products and solutions for our customers.*

Diagrams: Siemens TOP program
to meet the cost of financing the successful development of innovative products and solutions for our customers.

* The measures are based on broadly applicable benchmarks, in other words, comparisons with the best in the sector. These are backed up by the systematic, inter-disciplinary exchange of practical examples.

**Best Practice Sharing** - the process of learning from the best within the company - must become second nature to us. In the field of asset management, which involves the optimum deployment of the assets of the business, this is already in full swing.

* And finally we come to **Culture Change**, where the new mission statement has provided them with a broadly-harmonized basis for deciding the direction Culture Change ought to take. In addition, specific personnel management tools have been developed which will help bring about the changes in behavior they sought.

- In many Groups and Divisions, the successes already achieved have generated a mood of dynamism and enjoyment will spread throughout the company. Dr. Pierer said that he was convinced that **top+** would see to that!

According to Mr. Chindarkar (HR head), "In India, our initiatives follow the above principles, by making adaptations for our needs. The formula for **top+** is 3 pronged: **Well defined and measurable goals** - we want to increase our company’s value. **Every** group, business, department, team must work towards this goal. **Concrete** measures and actions - We will reach our goals with specific measures and actions.

**The key here is that benchmarking had to be the best in the industry and best in class**. **Clear consequences** - Progress will be measured through score cards which
includes matrices and targets and we will draw consequences from the results - both for operations and personal advancements.

In conclusion, he said, "Siemens approach to top+ was to improve economic value addition is through:

A. **Volume Improvement**
B. **Cost Efficiency Improvement**
C. **Asset Management**

All these can be achieved through the active and wholehearted participation of employees at all levels. Our actions are directed towards increasing value to the customer and enhancing the economic value of the company on sustained basis."

**20.1 Strategic Purchasing - hub of purchase activity**

Two years back, at Siemens it had been communicated that a new department in the Company to enhance the purchasing function had been formed. With the prime objective of reducing costs and improving purchase performance, the Strategic Purchasing (SP) department has come a long way now. This department today- the hub of all purchasing activity has streamlined operations and the benefits that Siemens has reaped so far.

After fifteen months of existence, the SP team comprising 15 members located at several locations networked to their department on-line. Six members concentrate on the project business and the remaining are relegated to the factories. In the first phase of its activities, the SP team identified major material / purchase fields, which constituted 85% of the total, bought out volume of Siemens. Once this identification was complete, the next step was to clearly assign each of these material fields to the SP representatives as their individual functions. This allocation of function implied a responsibility on the individual for his function or material class on an All India basis. This also enabled every team member to function as mini-entrepreneurs responsible and accountable for their functional area.

In the second phase, (BENEFITS) the cost reduction potential in each material class in every unit was worked out in detail, which then became the targets to be achieved. To meet these targets individual measures that were taken up and the methods to ascertain the cost reductions were finalized. This culminated into the evolution of a monthly Project Monitoring System (PMS). This system enabled monitoring the cost reduction potential vis-a-vis planned targets. Today, this department can proudly boast of its efforts. **The SP team has achieved 75% of its set targets. In the project business, even 100% of the target for 97/98 have been achieved.**
Besides cost reduction, other areas of importance included:

- reduction of the total No. of suppliers
- increasing the No. of self certified suppliers.
- creation of a Purchasing Database.
- bundling of demand by using same suppliers wherever possible
- installation of a Common Information Platform (CIP) to share relevant information among all SP representatives in all locations online
- Introduction of individual performance oriented Target Agreements.
- Updating and amending of the purchasing procedure manuals with regard to Strategic Purchasing aspects.
- Of which, upto 75% has been achieved.

Presently, the important task is the finalization and fine turning of the SP database. This will provide information on recent product prices and suppliers with their manufacturing range, which will be constantly updated. It will also be integrated into SAP as part of the Central Database (CDB) for easier accessibility. However, updating of information will lie solely with the SP team.

Further, what began, as an initiative has today become a reality. The SP department initiated the formalizing of the Strategic Buyers Forum (SBF) amongst purchasing managers from various industries such as automobile, engineering, chemical, electrical and food industry. The aim was to interact, share information and experiences related to purchasing, EDI, purchase marketing, global sourcing etc.

In a nutshell, the SP departments' effort to consolidate the purchasing activity has undoubtedly been the need of the hour. This also fell in line with the 4-point program that Siemens had embarked upon and the results of re-structuring the purchasing function, was nevertheless evident.

Says Mr. Schmidt, confidently, "If the company achieves 100% savings in purchasing, it is possible to attribute 70% of account of co-ordinated purchases, 10% of bundling of demand and 20% which comes through better negotiation of strategic purchasing".
21 - CONCLUSIONS:
SIEMENS NEW CORPORATE IDENTITY
* The customer determines our actions.
* Our innovations shape the future.
* Successful business means we win by making profits.
* We can maximize our achievements through excellent leadership.
* We can continue to improve through constant learning.
* Our cooperation knows no boundaries.
* We are socially responsible.

CHARACTERISTIC VALUE PROFILES
Employees’ shared values can be summed up in seven value profiles:
* Being useful for the customer
* Innovative
* Doing business successfully
* Leadership qualities
* Learning
* Teamwork
* Social responsibility

"value profile" is a combination of several strongly held beliefs that boil down to a particular value such as "Learning." These value profiles affect the way Siemens employees behave and reflect what they want to achieve.

Diagrams: Siemens TOP program
Siemens was established in India in the year 1922. However, the story of Siemens' association with India began in 1867 when Werner von Siemens personally supervised the laying of the first telegraph line between Calcutta and London. That historic event initiated a long association. Making the country's priorities its own, Siemens has put its experience and expertise in the major core sectors namely, Power, Industry, Transportation, Telecommunication and Health Care.

In the last three decades, Siemens has played an active role in India's technological progress. In the 60's the nation's expanding investment in power generation called for a range of high quality electrical and auxiliary equipment. Siemens grew out of a response to this need.

First, in a small way, assembling switchboards at a workshop in Mumbai. Later, manufacturing units were established at Worli and Kalwa in Mumbai and at Joka and Salt Lake in Calcutta. To meet the growing demand for industrial electronics products and systems, an ultra-modern factory was set up at Nashik. At Aurangabad, Siemens' factory has gone on stream to manufacture Switchgear. And now the new factory at Goa manufactures top-of-the-line diagnostic equipment.

Today, Siemens provides state-of-the-art equipment for all the core industries. With products as varied as Switchgear, Motors, Drives and automation Systems, Power Transmission and distribution systems, Power Systems automation, Railway & Transport Systems, Medical Engineering and total solutions in Telecommunication, Siemens is keeping India in the front-line of International Technology. Siemens extensive network in India includes 10 manufacturing units, 12 sales offices, 30 representatives and over 350 dealers and system houses all geared to meet the requirements of our customers.

Being closely associated with our principals Siemens AG, Germany gives Siemens in India access to the world's latest developments in every field.

Today, India has initiated measures to ensure a rapid and dynamic growth and Siemens is proud to be one of the foremost companies speeding the nation into the 21st century.
4B MAHINDRA & MAHINDRA
INDIA LTD
1 - HISTORY OF MAHINDRA & MAHINDRA LIMITED

Mahindra & Mahindra Limited was founded 50 years ago by Mr. J.C. Mahindra and Mr. K.C. Mahindra on 2nd October 1945. They laid the foundation of one of the India's largest industrial conglomerates. Business consisted of assembling Jeeps from completely knock down (CKD) parts imported from Willys Overland Export Corporations, Toledo USA.

In 1954 – Govt. Of India permitted it to manufacture Jeeps on a progressively phased deletion basis of collaboration with Willys and their successors. The very next year they began rolling out CJ-3A jeeps. While the manufacturing license increased from 2500 vehicles in 1954 to 40,000 vehicles in 1987, the installed capacity grew to 35,000 vehicles by the end of 1986. An active program of product diversification led to the introduction of different models both in the basic jeep and Forward Control (FC) truck version. In 1973, the oil crisis and the resultant worldwide recession led to an escalation of costs of raw materials and ancillary products.

This had two-fold impact on M&M: While sales decreased, the Company's engineering experts sat down and put their heads to think up low-cost alternatives, resulting in intensified Research and Development activity. The result: spectacular diesels version of the FC truck and the jeep before 1975. One achievement led to another, with improved, more efficient techniques replacing outdated ones. The Mahindra model XDP 4.90 engine and 4-speed transmissions became part of regular production and were introduced in various models of Mahindra Vehicles.

1.1 THE VISION OF J. C. AND K. C. MAHINDRA

TWO brothers - J.C. Mahindra and K.C. Mahindra together with Ghulam Mohammed conceived the idea of a secular company without caste or creed, and Mahindra & Mohammed was incorporated on 2nd October, 1945.

J.C. Mahindra, after obtaining his degree in Mechanical Engineering from VJTI, joined Tata Iron & Steel Ltd., and was GM Sales located in Calcutta, at the time of the outbreak of the Second World War.

During his stay in the States, K.C. Mahindra met Barney Roos, the inventor of the famous Jeep. Barney suggested that his vehicle was the ideal vehicle for India and he would be happy to be associated with the Mahindras' in their quest for rapid
economic development in India. Thus began the story of the relationship between the Jeep and the Mahindras'.

Keshub Mahindra, the present Chairman of the Company after graduating from Wharton did his apprenticeship in an engineering Company in Pittsburgh and on his return joined the Group in 1947. Joining him at M & M, in the same year, was Harish Mahindra who had just graduated from Harvard.

The name of the Company was changed to Mahindra & Mahindra Limited in 1947 when Ghulam Mohammed left on being invited to be Pakistan's first Finance Minister.

The first thing the newly established Company did was to import Jeeps in semi-knocked down condition and assemble them. Such were the modest beginning of the Mahindra Group. Over the years, the Group has expanded into many diversified manufacturing activities ranging from automobiles, tractors, steel, chemicals etc. with the prime objective of meeting national needs. Many new enterprises with foreign collaborations both technical and financial were promoted. The Mahindra Group today comprises several companies and ranks among the top industrial Groups in the Country.
THE PHILOSOPHY AT M&M IS TO BE RESPECTED AS AN ORGANISATION AT HOME & ABROAD THAT:

* Cares for It’s Customers.
* Works for it’s Shareholders.
* Provides a challenging environment to its empowered employees.
* Works together with its suppliers.
* Is responsive & responsible to the community.

2.1. **In caring for their Customers:**
They shall strive to provide Automotive Vehicles designed and manufactured to deliver:

* High Quality - Safe, Reliable, Comfortable, user friendly & of high performance.
* Value of Money - Low operating costs & high performance
* Effective & efficient - Which is response friendly & service friendly service

2.1.1 **In working for their Shareholders:**
They shall strive to continuously build & increase shareholders wealth by

* Upgrading Technology
* Investing in New Technology
* Developing new Products
* Restructure, Re-engineer & Revitalise the Organisation continuously to be Competitive.

2.1.2 **In providing a challenging environment to its Empowered Employees**
They shall strive to:

* Build a resilient, flexible & productive organization
* Create an open, collaborative & dynamic working climate where their Employees feel motivated & cared for.
* Reward individual employees & terms for value added hard work, creativity & innovation
* Continuously encourage learning, training & development.

2.1.3 **In working together with their suppliers**
They shall strive to: Work for long-term mutual benefits & competitive advantage.
2.1.4 In being Responsible and Responsive to the Community

It shall strive to:
* set high ethical standards
* care for the social environment
* be its own Competitor and above all be a Good Corporate Citizen

This allowed it to adopt a principled approach towards becoming a Moving Force In The Nation's Progress

2.2 M&M's OPERATING PRINCIPLES AND OBJECTIVES

CUSTOMER FOCUS: To achieve this they adopted the following:

2.2.1 QUALITY DISCIPLINE:
- by positive preparation for quality
- by following international quality assurance systems & procedures
- by working through process control
- by delivering right first time & every time

2.2.2 COST DISCIPLINE:
- by elimination of non-value added work
- through continuous improvement
- by productive use of assets

2.2.3 TIME DISCIPLINE:
- by meeting set targets
- by delivering on time
- by ensuring service on time
- by quick response to needs
- by throughput time reduction

2.2.4 PEOPLE CULTURE:
- by encouraging team work
- by training & developing
- by providing healthy & good work environment
- by safe work practices
- by fair appraisal & reward system.

2.2.5 COMMUNITY CULTURE:
- by setting high ethical standards
- by responsible to environmental needs
- by contributing to community welfare.
3.1 MILESTONES ALONG THE WAY

1947: First batch of 75 Utility Vehicles (UVs) imported in CKD condition from Willys Overland Export Corporation in October.

1949: The first Willys Overland Jeep built in India at the Assembly Plant, Mazagaon, and Bombay.


- 1962: Indigenous content of Jeep 70% plus. 137 acres of land purchased at Kandivli to centralize manufacturing operations.
- 1965: FC 150 Petrol Trucks introduced.
- 1967: Two-wheel drive UVs introduced. Indigenous content 97% plus.

1970: Contracts for export of 3304 UVs, mainly to Yugoslavia and Indonesia. 1971: Separate R&D section set up. 1974: CJ 4A introduced with new transmission and axle ratio. Collaboration with Jeep Corporation was signed. 1975: FC 260 A light Diesel truck was introduced. CJ 500 D Diesel introduced with MD 2350 Diesel Engine. 1979: Government of India approves in principle, the technical collaboration with Peugeot, France for the manufacture of XDP 4.90 Diesel Engine

- 1983: FJ 460 model introduced with 4-speed gearbox. Mr. Jean Boillot, President of Peugeot Automobiles of France, formally inaugurated engine plant at Igatpuri for the manufacture of 25000 Peugeot and Petrol engines.
- **1985**: New Mahindra Vehicle-MM 540 launched in Bombay.
- **1986**: CJ 640 DP Vehicle introduced.
- **1987**: MM 540 DP metal Body Wagonette introduced.
- **1988**: M&M signed a MOU with Hyderabad Allwyn Nissan to form Mahindra Nissan Allwyn Ltd.
- **1989**: CJ 340 DP model introduced. M&M and Peugeot announced their tie up for the manufacture of Peugeot 504 pick up truck, BA 10 gearboxes and latest XD 3 diesel engines. M&M acquired automotive pressing unit at Thane, from Guest Keen Williams Ltd.
- **1993**: Mahindra Armada launched. It withstood recession and with increasing sales.
- **1996**: New LCV model Cabking DI 3150 & Mahindra Classic vehicles were launched. New Commander 5 Door Hard Top was introduced. The company was the first automobile manufacturer to get all the engine types approved for the new emission norms effective from 1st April, 96. IDAM (Integrated Design & Manufacturing) set up for designing entirely new vehicle with the help of internationally renowned consultants.
- **1997**: Commercial production of Ford Escort commenced at Nasik Plant. License & Technical Assistance Agreement was signed with Mitsubishi Motors Corporation for Manufacture of SL Body at Zaheerabad (Voyager with XD 3 and BA 10). Soft/Hard top versions of CL/MM 550, 8 seater Armada, Commander 650 DI with longer wheel base and MM 540/550 XDB models were introduced. *Kandivli and Nasik plants received ISO 9002 certificate from RW-TUV*
4 - MAHINDRAS -- AUTOMOTIVE SECTOR

4.1 CHALLENGES FOR THE AUTOMOTIVE SECTOR
* Intense domestic competition
* Competition due to entry of Global Players
* Enhanced Customer Expectations

4.2 CHANGES DESIRED
* Quantum Jump in performance in all areas
* Step change
* Revolutionary thrust
* Speed

MAHINDRA & MAHINDRA LTD. - FLAGSHIP COMPANY OF THE GROUP

- The flagship of the Mahindras is now over 50 years old and it is the
  - 10th largest (by sales) private sector Indian company having a
  - Turnover 96-97: US$ 1 bn.
  - Estimated turnover for 98-99 is expected to be in excess of: US$ 1.50 bn

[Pie chart showing Key business areas: Farm 8%, Equipment 32%, Automotive 60%]

Its Key businesses are in the areas of:
- Farm 8%
- Equipment 32%
- Automotive 60%

Source: Company data

Diagrams source – Mahindras TOP Gear
The Business Process re-engineering (BPR) effort at Mahindras was an outcome of the desire to eliminate unnecessary wasteful activities at all phases of manufacture.

It was essentially a felt need - the need to excel.

In 1993 - 1994: The competition was making the going difficult and finding avenues to increase the overall productivity was essential. This led Mr. Anand Mahindra to think of ways to march head on and meet competition as it came and also overcome it in the face of all odds.

5.1 Industrial Scenario in India:
The industrial scenario post liberalization was such that there was a
- Breakdown of entry barriers which was a direct consequence of
  a) De-licensing and
  b) Inflow of off-shore funds through FII / ODR / FDI
  This in turn led to heightened
- “Competition” and “Quest for global standards” which in turn was
  a) An outcome of liberalization
  The outcome of all this was that it proved to be
A somewhat bumpy ride for industry due to the learning curve in the economy

Besides this competition led market, it became essential to achieve customer satisfaction - and this was considered to be of paramount importance if the company was to continue as the leader in the sector of automobile manufacture.

5.2 CUSTOMER SATISFACTION (CS) was related to the following four factors:

<table>
<thead>
<tr>
<th>COST</th>
<th>QUALITY</th>
<th>DELIVERY</th>
<th>SPEED</th>
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</table>

5.2.1 Cost: Cost is and will always be a primary consideration in the mind of the buyer. The buyer is always conscious of what he will be required to pay in comparison to other utility vehicles available in the same sector. He will no doubt compare the price of each.

5.2.2 Quality: The quality notwithstanding was also a pivotal factor. But it had to be borne in mind that quality should be such that it is affordable. Providing Quality at an exorbitant price would turn away the customer no matter how well the product is presented. So it was the endeavor of Anand Mahindra and his team to deliver the product
that would be appreciated and was within the reach of the customer. It had to provide the desired result as purported in various advertisement campaigns.

5.2.3 Delivery: The schedule / time frame to meet targets was equally important. A commitment to schedule was important so that a timely delivery to various outlets across the country was possible. This would not only build brand loyalty but also increase sales vis-à-vis its competitors.

5.2.4 Speed: In any manufacturing system, speed - in manufacturing the product and delivering it on schedule also meant and led to the survival of the organization. Hence, the endeavor of the team was to reduce and eliminate all bottle-necks, that hindered free flow in terms of men and material in the production unit as these caused delays in the final assembly of the product.
6.1 BUSINESS DRIVERS VISION: For the company to embark on a journey of change it was important that the Vision was focused in a similar direction so that issues going astray were taken care of and helped the organization. WITH this in mind Anand Mahindra set the Vision for the Organization so that M&M could try:

- To become a recognized global player in Utility Vehicles & world’s highest volume producer in Agricultural Tractor.
- “My biggest challenge in 2000 will be to elevate Automobile product design and Engineering, up to world-class levels”.

-Mr. Anand Mahindra
MANAGING DIRECTOR, M&M

Increasing global competition: In order to respond befittingly to the growing Global competition M&M decided:

> To carry out Market Expansion in the country as well in Global Markets
> To bring about a revolution in the manufacturing strategies that would eventually lead to Enhanced Manufacturing Productivity
> Price elasticity of rural / semi-rural demand
> To Outsource spare parts business (high volume low value) as these were unnecessarily using up time and space that would in all sense be used for other value adding activities.
> To study the customer profiles country - wide and understand their requirement in terms of quantity and time of requirement. This would further lead shorter product introduction lead-time due to changed customer perspective
7- BUSINESS PROCESS REENGINEERING at M & M (PART- II)  
“BPR PROJECT CHRISTENED TOP GEAR”  

7.1 TOP GEAR PROGRAMME  

IT WAS THE IMPERATIVE TO CHANGE & CHANGE FAST THAT LED M&M TO FEEL THE NEED TO MOVE QUICKLY  
Its TARGET AREAS WERE:  
* Customer focused world class manufacturing strategy  
* World Class Product development strategy  
to  
* Transform manufacturing systems  
* Revamp supply chain management  
* Revitalize souring through sourcing strategy  
* Re-engineer product development strategy  

To quote Michael Hammer: Re-engineering is a part of something larger, namely, managing your business by managing its processes. You can't re-engineer unless you focus on processes, but managing by process means more than just re-engineering. It entails a new mind-set, a new way of looking at the business, a new way for everyone in the company to understand where they fit in. So in the long term, managing by process is the bigger issue, and re-engineering is a temporary issue to help us get there.  

7.2 ‘TOP GEAR’ – CUSTOMER FOCUS  
A Customer focused product development strategy linked to a world class manufacturing Strategy which:  
* Used a ‘Management by Projects’ style to meet targets and measures of performance at all levels.  
* Organized cross-functional natural groups around key business processes to operate and continuously improve them to world class standards.  
* Sought to eliminate non-value added activities and enhance core competencies  
* Redesigned processes, practices and procedures to make them more customer driven, involving employees from all functional groups and all organizational levels.  
* Met all information needs of the business.  
* Developed appropriate supplier relationships and business alliances.  
* Trained, developed, involved and empowered employees to enable them to realize their capability and potential.
In order to
Create a globally competitive organization, capable of effectively meeting customer expectations and achieving benchmark measures of performance on:

* QUALITY
* LEAD-TIME
* SALES / EMPLOYEES
* CAPITAL TURNOVER INDEX
* RETURN ON SALES
* RETURN ON CAPITAL EMPLOYED
7a - BUSINESS PROCESS REENGINEERING at M & M

(PART – III)

‘TOP GEAR’ PROGRAMME

To ensure success of the Reengineering Programme -- code named TOP GEAR and to fulfill the company's mission of becoming A MOVING FORCE in the nation's progress --- Multi-functional Teams were formed to work on:

7a.1 MAKE or BUY DECISIONS

To adopt a scientific approach to decide which components / aggregates were to be made in-house & the ones to be out sourced from vendors after considering -

- Competence to make
- Importance of component to the Company's Final Product
- Cost Competitiveness
- Long Term Industry perspective
- R.O.I.

Having decided what to MAKE & what to BUY the following PROJECT TEAMS were formed:

i) Manufacturing Systems Design (MSD) for all components to be made in-house.
ii) Supplies Module Design (SMD) for all Components to be bought (out-sourced) from Vendors.

7a.2 MANUFACTURING SYSTEMS DESIGN (MSD)

The project was divided in the 4 stages.

i) Data collection

ii) Concept Design

iii) Detailed Design of Demonstrator Cell

iv) Implementation of Demonstrator Cell

The team used a systematic approach of challenging the existing way of working and came out with a concept of PRODUCT UNITS.

The manufacturing plant at Kandivli was divided into 7 autonomous Product Units (P.U.s). These P.U.s are like autonomous factories within a factory, having almost all support services like Quality Assurance, engineering, tool room, maintenance, procurement and even training along with manufacturing activities.

LIST OF PRODUCT UNITS (P.U.s)

1) Axle  2) Chassis  3) Engine
4) Transmission  5) Body  6) Vehicle
7) Foundry

7a.3 SUPPLIES MODULE DESIGN
Objectives was to design & implement a supplies module that included all processes relating to supplies chain which encompassed the existing disciplines of planning, purchase, stores, vendor inspection, excise & bills payable. Each module is responsible for all the aspects of cost, quality & delivery within the supplies area.

7a.4 STRATEGIC SOURCING:
Management at M&M sought to harness the skills of the Supply Industry to optimize sustainable competitive advantage for the business & its customers. It has helped the Organization to develop sourcing strategies for the commodities to result in reduced total acquisition cost & secure responsive supply base capable of meeting business needs in terms of Quality, Cost of Delivery.
8 - BUSINESS PROCESS REENGINEERING at M & M

(PART – IV)

All the above looked very rosy and easy to achieve but the going was as tough as tough could be. Mr. Anand had his hands full during the pre-Diwali period of 1991 and tackling this would prove his worth as the MD and also decide the future of the Organization.

8.1 TACKLING INDUSTRIAL RELATIONS

In the first incident, just before Diwali in 1991, Mr. Anand, along with other company officials, were gheraoed by union members when, in exchange for a bonus settlement, the workers were asked to do more overtime and increase the quota of vehicles produced. He said, “It was pretty life threatening, with the workers banging away at the door of the office that we were stuck in.” Tempers finally cooled down after Mr. Anand came out and told them that they could have his resignation if they wanted, but that he was not going to back off. The workers gave in.

He was bewildered and said, “I never understood psychology, but it was one of those life-changing experiences. I started to think whether I had pushed it too far. But at the time I said no way. I wanted something out of them and I got it. It was a turning point in M&M’s labour relations.”

The other big turning point in the labour relations came in 1994, when the company decided to implement its Business Process Reengineering (BPR) programme, as an experiment at its engine plant in Igatpuri. BPR was based on the principle of cellular manufacturing, where plant layout was re-organized drastically, and workers were asked to do multitasking through multi-machine manning. The company conceived the programme with help from Lucas Engineering Systems of UK.

BPR was seen as the only way to attack the company’s age-old problem of manufacturing inefficiencies, poor productivity, long production cycle and sub-optimal output. Although quite common elsewhere in the world, it was a new concept in India. According to Mr. K.J. Davasia, who, as executive director in charge of the tractor division, had fought many a battle on the labour front with Anand Mahindra. “BPR was going to be a crucial part of the Company’s plans of global level quality and cost by the near year 2000 - 2001,”
As a prelude to implementing it in all the five manufacturing facilities, a decision was made to assess its benefits and impact on unions at the Igatpuri plant. According to Mr. Anand: "The idea was to build up something which could serve as a framework for the future."

Expectedly, there was stiff resistance from the unions. A five-month strike followed, but the management refused to back down. Recalls Mr. Anand, "It was also rumored in the corridors of the head office that one should work towards a settlement." But, he insisted that there would not be any going back. Because the entire future of the company depended on what the BPR was going to achieve."

Anand's strategy prevailed. A determined management kept the plant running with the help of the senior staff, and the first sign of the benefits of BPR was visible almost immediately, when around a hundred officers were able to produce more engines-a-day, as against the striking employees who were earlier producing less engines.

The workers finally gave in, and in exchange got a pay hike. Productivity at Igatpuri has since doubled. While the number of engines produced has doubled, the number of employees has reduced by half. The excess workers were re-deployed at the company's new Ford Escort assembly plant in Nashik.

According to the Company treasurer, Mr. Ulhas Yargop, who also doubled up as the spokesman on the success of BPR, "BPR has been implemented at the Nashik plant and has achieved a 125 per cent improvement in productivity."
9 - MAHINDRA & MAHINDRA ---- KANDIVLI UNIT

As mentioned earlier: The BPR effort at Mahindras was an outcome of the desire to eliminate unnecessary / wasteful activities at all phases of manufacture. It was essentially a felt need. The need to excel.

At the KANDIVLI unit, cellular manufacturing concept, was adopted. This involved a U-shaped layout & Single Piece Flow. At the Kandivli plant of M & M, the old system of line assembly was deep rooted before the BPR effort. On introspection, many areas were highlighted which could be reengineered to increase productivity wrt., output and quality.

9.1 TRANSMISSION ASSEMBLY UNIT:
According to the Change Management Team (BPR Team) led by Mr. Vijay Dongdey:

9.1.1 BEFORE REENGINEERING a lot of data gathering activity was conducted so that nothing was left to chance. On analysis, it was evidenced that piecemeal work of assembling at the Transmission Assembly unit was not yielding the desired results, which led to delays in the overall assembly of the whole vehicle. This was so, as one was highly dependent on the machining section for various parts. The milling personnel were in-turn dependent on their colleagues for the part to be fabricated. It was much like the watch assembly where one person did only one sort of activity along the assembly line. This made the task monotonous and tardy. Besides, this gave the management all the more reason to divulge deep and go in for Reengineering the whole concept of fabricating and assembling the Transmission assembly unit

Aply put by Mr. Anand Mahindra, "If you ask me what it is that keeps me awake at night, I would say it is the thought that I should make sure that we continue the momentum to make our production as efficient as the global benchmarks we have. That means that the BPR programme has to be carried through to its logical conclusion."

According to the Senior secretary, M&M workers union: "With the opening up of the economy, we feel that we have to work according to scientific management techniques to be able to compete."

IT IS APTLY SAID THAT THE MOST IMPORTANT HAS TO HAPPEN FIRST IN THE MIND. At M&M they took pains to take care of this very important factor.

According to the Module Manager (HRD) Transmission Production Unit (PU), M&M had worked hard in educating the workers on the advantages of BPR, even flying
some of them abroad to have a look at how it has worked for companies in other countries. Not surprisingly, the Kandivli plant union officials are today themselves highly optimistic. This led the personnel of the Unit to endorse the BPR programme enthusiastically.

To bring about change, the employees were first made to go through rigorous training sessions, so that all aspects of BPR to be implemented would fall in place and no one would have any doubts about the processes to be adopted. According to the Change Management Team: The changes that were brought about led to:

1. The assembly unit parts manufactured by many individuals at different stages in lots or batches have been done away with. Today a group of well-trained workers work on a number of machines to manufacture a single component from start to finish, e.g., the Transmission Unit case. Earlier a worker worked on only one machine doing only a piece of the work to produce the end product. This led to delays as efficiency levels varied. Moreover the parts were manufactured in batches where the margin for error and rejection rate was always very high. This led to delay in the assembly of the whole transmission unit, which in turn delayed the complete production of the Jeep. This reduced the competitiveness of the company as a whole.

2. The reengineered process led to the complete processing of the transmission case by a small group of workers, each working on a number of machines.

3. The Module Manager, Production, Transmission PU, explained how the various systems functioned. It was aptly clear from his explanations and the actual working as to why they had implemented the cellular system of manufacturing. According to him, “The reengineered process implemented the Cellular System of Manufacturing where the processing of a component is sequential. No haphazard processing is possible and any non-conformity that occurred, occurred with ONLY one single-piece that was detected immediately.”
10 - THE MANUFACTURING SYSTEMS –
TURN-AROUND

“CELLULAR MANUFACTURING” AT M&M

10.1 BEGINNING
According to the Change Management Team leader Mr. Vijay Dongdey, Cellular manufacturing benefited M&M in many ways, “Many firms delay starting cells because they aren’t sure how to begin.” They followed a well-defined course of action. Accordingly they abided by a set of rules which guided them all along.

10.2 THERE WERE THREE LEVELS OF INVOLVEMENT:
The executive team’s commitment to waste elimination was a good first step.
Then there was the need to identify a steering committee made up of managers or key players from the departments that supported the manufacturing mission.
The third level of involvement was the use of cell team members who would be responsible for making the cell achieve its goal. Functions represented on the steering committee included purchase, production planning & control and cost accounting.

10.3 IMPROVEMENT WITH THE IMPLEMENTATION OF CELL
Lead-time was reduced by over 80%
Inventory reduced by more than 25%
WIP reduced by 80%
Transit point and waiting time was reduced
Number of vehicles produced per day increased over 100%
Productivity increased by more than 150%
Floor space utilization went up substantially ~25%.
Direct labor = one worker mans multiple machines in Cell – a good example of multi-tasking.
* Production control changed its focus to finished goods management. Orders for subassemblies typically were not required as the subs were made within the cell.
* Cost accounting changed its focus to the output of the cell and stopped analyzing subassembly standards. The cell team members worked to increase the cell's output and flexibility for each of the product produced. The table below displays improvements from an actual cell conversion project after three months of operation.

10.4 Tasks. Ideally, each operator in the cell could perform all the tasks required to produce the part in that cell. Improved quality and reduced rework costs are among the

Table source: M & M Reengineering Exercise
improvements that can be achieved from the conversion to cellular manufacturing. Since
the material processed in one operation it is tested for fit at the following operation, there
is a quick feedback on the on-going quality of the part, which often results in a substantial
reduction in rework. **When a part is processed in a batch, it may take weeks to
discover that a hole is too small.**

<table>
<thead>
<tr>
<th>TABLE</th>
<th>(Source DGM BPR)</th>
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</thead>
<tbody>
<tr>
<td>RESOURCE</td>
<td>BATCH BUILD</td>
</tr>
<tr>
<td>Lead Time</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Scrap and Inventory</td>
<td>30 days</td>
</tr>
<tr>
<td>Floor Space utilization</td>
<td>-65%</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>1 man mans 1 machine</td>
</tr>
</tbody>
</table>

10.5 **DIRECT LABOUR REDUCTIONS**

At M&M it was borne in mind that to introduce Cellular Manufacturing Systems was
no cake - walk because some managers were disappointed in trying to use cellular
manufacturing to reduce direct labour. This happened because labour improvements were
often modest compared with other waste reductions programmes. They were made to
understand that direct labour efficiency was difficult to improve overnight due to the
traditional way they measured efficiency. Often, many of the parts were not needed for
weeks or even months. Earlier, in traditional manufacturing system they used to
manufacture to stock while today in the Cellular manufacturing it was just the opposite.
They were also made to understand that a cell could not improve on a machine that
produces at a given capacity, but they could reduce the waste generated due to
inefficiency and storing of parts for long periods.

**Efficiency improvements** related to cell conversion from batch type of manufacturing.
Operators had to be cross-trained AND in this M&M was not lagging behind as they
considered this to be most vital to implementing BPR successfully.

The DGM, Change Management Team, was of the view that batch manufacturing
was dominant world over was and accounted for ~75 percent of all manufacturing
activities. Such manufacturing activities involvec a high level of product variety, small
manufacturing lot sizes and interaction of many strategic, tactical and operational level
issues. “By going in for Cellular manufacturing system the objective was to design the
formation of machine groups and parts-families (aggregates) in such a way, that each
family of parts undergoes maximum processing within a machine cell. This would
eventually lead to such improvements: improvement in productivity, reduction in product
cost and lead times for batch manufacturing.
The primary objective for designing a Cellular Manufacturing (CM) system was to partition the factory into cells having a group of machines and associated families of parts or aggregates. According to the DGM - BPR, "To keep up with the competition, M&M had to improve the productivity, reduce the product cost and lead time, and increase product quality."

Some of the advantages of Cellular Manufacturing are:

* Reduced set-up times, flow times and WIP
* Improved productivity

Better overall control of operations.

* Other advantages are reduced in-process inventories
* Improved product quality
* Reduced tool requirements.

11.1 Synchronous Flow, Manufacturing and Cycle Time Reduction

According to the Change Management Team, "Though the company as whole was doing well it could not afford to remain complacent in the face of the ever-changing Global Economic Scenario." "Competing in today's global marketplace can be compared to a competing in a world level sporting event. The goal in the competitive race is to keep moving forward as quickly and efficiently as possible.

11.1.1 Route to synchronization:

As a manufacturing company like Mahindra & Mahindra synchronized planning, scheduling and execution. It helped the manufacturing enterprise become a flexible, agile, faster and more efficient manufacturer, while simultaneously reducing costs, inventories and cycle times. This in turn allowed them to quickly meet the customer’s expectations, and their own business objectives and bottom line financial targets.

11.2 "Cellular manufacturing" best described how one can transform a traditional manufacturing operation. One could go around the plant and ask what was MRP and ERP (Manufacturing or Enterprise Resources Planning) -- An expert on the shop floor could easily answer that they are not the same as Cellular Manufacturing. They might say that MRP and ERP and were bad things as they strangle operations and add a lot of non-value-added work. Mr. Dongdey emphasized that No computer system could simplify a complex manufacturing operation. You must simplify the
manufacturing operation itself, then you will not need all the computers (although a few computers will still be helpful).

If several things with different names have the same ingredients, they are still the same thing. Cellular Manufacturing and all its equivalents required the same set of ingredients to make them work all over the plant:
- Set-Up Reduction & Reduced Batch Sizes (two sides of the same coin)
- Workplace Organization, Orderliness, and Cleanliness
- Kanban (Pull Scheduling) and Inventory Control
- Factory Floor Layout into Work Cells
- Mistake-Proofing ---- eliminating mistakes at the very onset
- Preventative Maintenance
- Teams of Employees Who Think and Take Initiative

"A rose by any other name is still a rose..."

According to the Change Management Team,

"To make Cellular manufacturing successful, People at Mahindra & Mahindra had to first learn and master all the above concepts.

Quoting, D. Regan ... Teaming by itself is many times more difficult than the rest put together. Successful Cellular Manufacturing depends upon employees who are able and willing to think on the job."

11.3. MANUFACTURING PROCESSES

Cellular Manufacturing, implementation and utilization of Build to Order, Just In Time and Synchronous Manufacturing Methods

Process Improvements resulted in robust manufacturing methods that provided reliable, repeatable, fault tolerant production systems

11.4 HIGHLIGHTS IN MANUFACTURING PROCESS IMPROVEMENTS;
- Reduced floor space requirements >250%
- Improve product flow times >195% (from 30 days to 12 days)
- Improved first run quality acceptance (from 66% to over 99%)
- Improved shipped quality from (87% to 99.5%)

These successes included work based on:
- Implementing Flexible Manufacturing Systems, automatic assembly and integrated inspection. (This plant has been recently set up at Kandivli Location and has gone on stream since April 99)
- Designing and Implementing advanced manufacturing systems utilizing cellular manufacturing on both single production lines and/or plant wide basis.
12 - THE REENGINEERED MANUFACTURING SYSTEM
(PART – I)

12.1 PERFORMANCE OF CELLULAR MANUFACTURING

12.1.1 AUTONOMOUS CELLS:
It was observed that the performance of cellular manufacturing systems at M&M was intrinsically sensitive to demand variations and machine breakdowns. A cell formation methodology that addresses, during the shop design stage, system robustness with respect to product demand variation has been adopted. The system resources were aggregated into cells in a manner that minimizes the expected inter-cell material handling cost.

The statistical characteristics of the independent demand and the capacity of the system resources were explicitly considered. In the first step of adoption of the approach the expected value of the feasible production volumes, with respect to resource capacities, were determined. Subsequently, the shop partition that resulted in near optimal inter cell part traffic was found, formed and implemented.

12.2 THE WORKING OF CELLS AT M&M

The Cellular concept as adopted by Mahindra & Mahindra: addresses customer/supplier relationships through the product-based cell system.

M&M’s factory, which has been in existence almost 50 years, evolved and expanded with a traditional, functionally oriented layout for product flow. Accordingly, machining operations and fabrication sections were clustered in different sections of the factory building.

In late 1991, a need arose that systems required revamping and the whole structure required Restructuring and new product addition was necessary. In early 1994, the management decided to go in for Business Process Reengineering and introduce Cellular Manufacturing, so as to, move more basic, primary manufacturing operations into the available space and closer to the final assembly line.

12.3 Jeep assembly

A Jeep can be broken down into a significant series of small subgroups. In-depth evaluation of the current manufacturing approach, and estimated improvements, highlighted sub-assemblies with the greatest cost-reduction potential. Senior management wanted the review to consider products and sub-assemblies beyond those traditionally included in the building’s assembly - only operations.
wanted the review to consider products and sub-assemblies beyond those traditionally included in the building's assembly - only operations.

*Another major objective was to create cells as close to the point of use as possible.* This provided the setting for locating the "supplier" and "customer" next to each other; in the long run, it would encourage the evolution of work teams. *This was all tied to a final objective of creating smaller business units within a larger factory to reduce complexity and increase manageability, while concentrating on continued quality improvement.*

**THE WORKING OF CELLS AT M&M**

**12.4 APPROACH AS ADOPTED BY M&M :**

M&M is a recognized leader in the application of Group Technology (GT) concepts in manufacturing. Most plants within the corporation have become well versed in creating GT cells such as Igatpuri and Nashik. However, a GT cellular approach inside the Kandivili complex had its own problems. To address customer / supplier relationships more closely, a higher level of cellular manufacturing - product cells - was chosen. The guiding principle for the formation of product cells was to create as much vertical integration within the cells as possible.

As explained earlier, a core BPR team led by the DGM - BPR was formed to go ahead with the planning effort. The team's first responsibility was to review all possible aggregates / candidates.

*One of these major components was the Engine and the Transmission assembly.* Available space was not an issue for these components. Additionally, machines for the cell were readily available and the savings potential was high. Once the Engine and Transmission assembly had been identified as a pilot project, the team verified basic criteria for the cell, including:

- Machine moving costs
- Floor space required
- Extent of appropriate vertical integration

*The conceptual information and detailed plans were turned over to the Transmission and engine assembly team made up of engineers, supervisors, operators, and Suppliers.*

This team then detailed the cost reductions, along with process and method changes and the capital requirements, holding quality as the overall driver. *The cost to implement the cell amounted to 44 percent of the total annual manufacturing cost savings, with a projected ROI of Six months.*
PART - III

THE WORKING OF CELLS AT M&M

12.5 RESULTS

Before the cell was implemented, the typical lot size was greater than a two-week supply of Engine and transmission assemblies. With much smaller lot sizes in cells, machines making the parts could now occupy space previously occupied by them (parts). Machines were moved closer together, resulting in a closely-knit layout, so that operators could easily transfer parts to their customers (internal).

In total, space requirements were reduced by more than 25 percent. The Engine and Transmission assembly manufacturing arrangement before cellularization was a long-traveled, time-consuming process.

Specifically, the benefits of the transmission and engine module include:

* 55 percent inventory reduction
* 65 percent reduction in the distance traveled by transmission units
* 55 percent reduction in material handling
* 80 percent reduction in manufacturing lead time

These results were gained almost immediately upon start-up of the Engine and Transmission assembly cells. There were additional tangible and intangible benefits as well. For example, one of the intangible aspects of the cell was the simplicity brought to the manufacturing setting. Under traditional methods, a randomly selected part was routed through 38 different inventory control transactions as it progressed through the old flow routes; the cell reduced this to three transactions. More tangible were the quality improvements: In the first six months of tracking, no Engine and Transmission assembly rejects occurred in the assembly operation and neither did anyone have to wait for a part to complete the operation.

PART - IV

THE WORKING OF CELLS AT M&M

12.6 CONCLUSIONS

One of the most significant results of the project was the change in thought process of the employees. Manufacturing personnel started accepting that product cells were more beneficial than group technology cells producing families of parts. The vertical integration concept permitted many people from different disciplines to come together to generate
benefits that were not achievable in a conventionally oriented factory. *The success of the Engine and Transmission assembly Cell has resulted in several additional product cells being planned and implemented at M&M, Kandivli Complex.*

Taking the concept even further, once the manager of product engineering saw the benefits emerge from the rear-axle and transmission assembly module; he began to rethink the reorganization of his department, which he himself was in the process of developing. *He realized that organizing engineering areas into "modules" aligned within the factory would provide a potential for significant benefits.* While this may not work for every engineering discipline, the versatility of the concept has been widely recognized across M&M.

According to the Module Manager HRD, Transmission, Mr. PU, change itself is the most difficult challenge; spending ample time trying to educate and convert the organization is essential. Here the researcher suggested a small improvement to augment that which they already had:

* Communicate with all areas
* Be sure to involve the areas that are affected most
* Include both salaried and daily employees
* Top-down commitment was *critical*

*When it was finished* the product stayed in process. In a manned cell, the people operating the process hardware could usually be trusted to take personal responsibility for its operation, since they were mutually dependent for success. Management became easier, too.

Employee empowerment started to make sense, because the individuals were more focused - working as a team - an environment that management had been trying to create for as long as one could remember was today possible. This mutual interdependence worked another advantage: There was now some incentive to learn more than one of the tasks needed to make a product. When one cell member was missing, it was helpful to have others capable of replacing him or her, thus maintaining some level of production, even with an incomplete staff, which created a second benefit for management. When demand ebbed, the number of people in the cell could be reduced to accommodate the lower demand, since everyone had all the skills needed to operate the cell. *--- THIS LED TO THE CONCEPT OF MULTI-TASKING.*

*Quality improved in many cases. Since the supplier to the next process step was only a few feet from the consumer of his output, there was instantaneous feedback when something went wrong.* Since each task was well known to more than one person,
and perhaps all the cell members, they could help each other find solutions to production problems.

PART - V

THE WORKING OF CELLS AT M&M

12.7 Inference

Cells don't work when they are required to make more than four or five different products. According to DGM Change Management Team: *The key word was different.* Minor variations of the same part don't count. The cell doesn't care if the size of the product varies a little, or it is a little longer or shorter. Colors usually don't make any difference either.

Problems arise when parts are much different, need different work-holding devices, or very different or complex set-ups, or if going to new part forces a major rearrangement of the cell. A subset of this is that cell performance degrades very quickly when the products use the resources and processes in different sequences or randomly. That can become a scheduling problem beyond the ability of the operators to solve. So as far as possible variations were kept to the barest minimum unless required for product improvement.

12.8 An indicator:

*According to the DGM, Change Management Team, if the cell operators begin to ask for an MRP package to help them plan their work, the cell should be dissolved and re-thought.*

There's a trade-off to be made, too. Where the utilization of a very costly piece of capital equipment is more valuable than the cost of carrying inventory, or when a process demands batch operation. *It may make more sense to divide the cell in two;* one cell with those steps taking place before the operation and another with those steps taking place after the operation. This way, *the costly process can be used to serve several cells or more,* and gain both the economics of scale for any cell operation and the economics of intense use of the costly process at the same time.

*This showed that* when they could concentrate equipment and processes needed to make a product in the same area, they usually achieved dramatic benefits in reduced inventory and better responsiveness. Where the quantities and similarity of products were close enough to make full automation practical, the firm could carry the cell to a total lights-out operation and this has been made possible in some of its cells. Where factors did not permit automation, there were still considerable benefits in creating production cells. The benefits included inventory reduction and responsiveness gains, besides significant improvements in quality and employee morale.
Mr. Vijay Dongdey pointed out that:

"The key to a successful cell was: First, clearly understand the group technology leading to formation of the cell. Second, understand the criteria that limits when/where and how a cell can be used."

PART - VI

THE WORKING OF CELLS AT M&M

12.9 ELIMINATING WASTE

It was now clear that, the central focus of cellular manufacturing implementation was the elimination of waste by linking parts between operations. However, there were still opportunities to improve the cell. By reducing the time a product needs to flow through the cell usually reduces production costs. A simple tool often utilized to illustrate the waste associated with material handling is a flow diagram for a single product. With batch processing, it is not unusual to record material flow of several stages just to make a simple part. The diagrams tracing this movement are referred to as spaghetti charts, which aptly describes what it looks like when complete. Compared with batch build, cells can reduce most product movement substantially. Kanban the Japanese word for "signal." Too much inventory in queue is an effective system that ensures that excess inventory is reduced between process steps.

A full pan or space signals the operator to stop and help the station that is not able to keep up. In order for this to be successful, operators had to be cross-trained — multi-skilled, to perform at multiple cells so that operators may frequently take on some indirect work such as material handling, which allows indirect labour jobs to be converted into direct, value-adding positions.
Today BPR has been introduced at the Kandivli facility besides the other facilities. The benefits of its implementation along with the Nashik and Igatpuri facilities have already made an impact on the balance sheet. Employee cost as a per cent of net sales has already come down from 12.4 per cent in 1994 to 10.1 in 1993 and today it is further down. Inventory levels in the same period have come down from 74 days of net sales to 56 days and value added per employee has risen from Rs 3 lakh to Rs 4.6 lakh.

According to Mr. Bharat Doshi, executive director: "We are already seeing the benefits in the form of low-hanging fruits. The savings on account of BPR will be substantial and it would provide a buffer against increased depreciation and interest cost over the next three to four years."

With the programme now completed, productivity as a whole has gone up steeply. At the Kandivli plant, no of vehicles produced has more than doubled, much of it through improved productivity after the implementation of BPR. A lot, though depended upon the success of the BPR at Kandivli, where a major chunk of M&M’s workforce is employed. Says Prashant Reddy, analyst with I-Sec, one of the few firms bearish on M&M, "Labour is a major area of concern and success of the BPR depends on the labour."

Negotiations to introduce BPR at the Kandivli plant went through and today the work force have come to accept the work style that was introduced by BPR. Earlier there were fears in some quarters that this could lead to a strike, badly affecting the company's bottom line but as things would have it, it worked out just as fine like in the other plants.

M&M’s management worked hard in educating the workers on the advantages of BPR, even flying some of them abroad to have a look at how it has worked in other countries. Not surprisingly, the Kandivli plant union officials themselves are much more optimistic. The Senior secretary, M&M workers union, says, "With the opening up of the economy, we feel that we have to work according to scientific management techniques to be able to compete."

BPR has enabled the company to achieve two things simultaneously: a new and modern working relationship with its employees, where productivity is the main criteria; and, equally important, bringing its manufacturing systems to meet international standards. According to Ms. Sangeeta Mehta-Fernandes of Kotak Securities: "It is one of the few companies which has increased profits by improved productivity rather than investment in fixed costs."
Alongside the implementation of BPR, a meaningful product development department has been set up. Anand Mahindra says that one of his first tasks after moving into the Kandivli plant was to create a design and development committee, which for the first time looked at product development in an integrated manner. "For the first time," says Mahindra, "everyone involved - manufacturing, quality, marketing service - sat down together to talk about new products and about improving the old ones."

Another important aspect in the remaking of M&M in the 1990's has been the management restructuring of December 1994, probably the most far-reaching change of its kind initiated by a front-ranking Indian company. The restructuring worked on several levels. At the most basic level, it redrew the lines of responsibilities in the company. What was a functional organization, with centralized divisions like marketing and manufacturing, was recast into six independent business sectors - automotive, farm equipment, infrastructure, trade and financial services, telecom-software and automotive components - each under a president.

Mr. Keshub Mahindra, "The basic idea behind the restructuring, was to prepare the company for global competition by empowering people much more than ever before." As Anand Mahindra saw it, restructuring worked at an even more important level: it transforms the way a promoter family looks at the business. "The idea is that we, the promoter family, kicked ourselves upward into the corporate center," says Anand. "That we began seeing ourselves as aggressive venture capitalists who would provide the drive towards creating long term strategy, set goals, monitor performance, provide capital and merge synergies across the sector measure and motivate performances of each of the divisions."

The professionals, in turn, ran their own division with a great deal of autonomy. "The structure allows the management of complexity," Anand adds, "because the complexity is reduced to distinct elements. It reduces the complexity for the presidents of each sector, but you have created a structure which is resource-based, resource-allocation based and strategic direction-based."
14 - I T AN ENABLER OF
BUSINESS PROCESS REENGINEERING

The Information technology package as used in M&M was SAP. Essentially, SAP is a packaged solution, but this was not be seen as undermining the need to find a software that met M&Ms specific business needs. It (SAP) had been developed using industry best practices in all sectors, and the idea is that after deciding to implement a SAP system, one could choose those modules that were relevant to it and if required, specify custom changes. What you do not do - is reinvent the wheel.

This, however, is not by any stretch of the imagination, a simple task. The world of SAP is a massive one; and with the emphasis on picking and choosing modules as well as on customization, the need for a large team who all know what they’re dealing with is paramount. Hence the need to carefully choose the right consultants to help in implementing SAP organization wide.

14.1 The key features of SAP as visualized by the BPR team in brief:

* It covered every facet of manufacturing, finance, logistics, warehouse management, sales and customer service.
* Information was made available immediately, as soon as it is recorded.
* Transactions recorded were automatically posted into the general ledger eliminating the need for reconciliation.
* Data entered by various points were stored in one location thus providing a common database to all users.
* It computed real costs of every transaction based on actual consumption of resources.

They further realized that in order to fully realize the benefits of SAP it was imperative that users maintain discipline in working the system. All relevant data had to be entered accurately; transactions had to be recorded immediately in the required mode; and finally, users had to adhere strictly to the logical processes determined by the system.

With all functions and locations going live on April 1, 1999, M&M entered the new millennium prepared to stand up and take its place among the giants in the international market.

14.2  IT Scenario at Starting Point – It all began keeping in view the

- Two main manufacturing locations (AD & TD, Kandivli, Mumbai), which had a host centric system with legacy software.
- All other locations had PC-based non-integrated systems.
- Payroll on UNIX-based system (now obsolete), was not integrated with financials
- HR on PC-based system
- Sales & distribution on PC based independent system

**BESIDES IT WAS ALSO ENVISIONED THAT A NUMBER OF IT ISSUES COULD CROP UP SUCH AS:**

- Rapidly changing technologies
- Shorter product life cycles
- Propriety systems
- Customized software modifications
- Incompatible software packages
- Costly upgrades
- Project delays
- Project risks

**14.3 As part of its IT strategy, M&M**

Was in line with the ongoing high impact change process

- And Sequel to BPR and the changed organizational set-up of SBUs
- This was to be included within the business strategy

**Goal:** To enable the enterprise to meet the changing market conditions effectively and to maximize

- Further to the above, to ensure value for customers’ money

**14.4 IT Strategy at M&M**

On carrying out an analysis of the IT requirements it was recommended that they:

- Enhance data interchange capabilities (MS-Windows on all PCs inter-connected in work-groups, LAN & WAN)
- Extend IT support to Marketing, Service, Dealer Network and to R&D
- Substitute legacy ERP with a robust, optimal, well supported one in an open, scalable, distributed computing environment.
- Train for computer literacy across the Company & also give training on MS-Access or similar tools.
- Install E-mail on all PCs
- Implement Dealer & Vendor -Ordering
- Systems & Network using E-mail.
- Implement Video-conferencing at the desk-top
- Create a Corporate Data-warehouse covering all SBUs
- Implement an Executive Information System
IT Strategy implementation at M&M

Business

- Corp. DB Video-Conf. Consulting
- Productivity
- Corporate mail
  - Dealer Ordering
  - System & EDI
  - Vendor EDI
  - Productivity Market-Oriented Cost-Effective
  - AS400s moved to Marketing, EDI

Info. Tech Group

- "Marines" Consulting Mission
- Coverage Expansion
- Applications
  - Mahindra Network
    - Install MS-Mail/CC-Mail
    - Install Open ERP at Re-engineered Plants
  - Pilot Open ERP at Nampur
    - Second
    - Pilot at Zahirabad
    - Access Training To all Users
  - AS400 Upgrade at Kandivli
    - Client Access/400 Implementation
    - Re-do Applications in SYNON

Pervasiveness

- Client-Server Based ERP S/W
- User
- Created Applications Access as a User Tool
- Consolidation of Applications
  - PC per Desk
  - Windows on PCs Regular Use of MAPICs
15 - BUSINESS REQUIREMENT FOR SAP

It was the critical need for enhancing customer responsiveness through an up-to-date market information system, optimized product features and side by side a flexible manufacturing system

BUT THE QUESTION often asked during the initial stages was - Why SAP?
The management acknowledged that: the obvious answer was, _SAP would help enable the ongoing BPR exercise in the organization_. Besides it would provide an:

- Online Integrated Enterprise solution vis-à-vis centralized system with legacy software that was prevalent at the time.
- A scalable ERP for multiple sites
- An economics of Client-Server Model besides a PC per desk at the Front-end

15.1 EVERYONES’ EXPECTATIONS

Expectations from SAP/ERP were that it should be able to provide a platform, which would in turn enable the organization to have:

- Common Systems at All Locations and allow it to achieve
- An Enterprise-wide Integration through
- Mail, Web Integration besides providing it - an Advanced Functionality (Sales and Marketing)

For it to be successful a VISION was a must as its

- User-driven and managed Applications and its
- IT staff must evolve themselves as Marines (The Few, The Brave)
- The role of the Consultants was to be able to leverage the effort.

15.2 Hurdles

At the start there were innumerable hurdles that had to be overcome before they could earmark seriously on the journey towards total integration of the organization.

These were:

15.2.1 Dis-integrated systems
- Each plant had a different set of systems with: Proprietary mid-range systems, Unix, PC-LAN – etc---
- Sales and Distribution on PCs in Branches --- gave an air of working alone

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- Payroll was not integrated with Financials leading to realigning at a later stage – leading to time and money wastage.

H.R. on PCs

15.2.2 Nonstandard order processing systems
- Two core ERP modules + 1000 RPG Home- grown Programs

15.2.3 Interfaces
- There were Manual (faxes from branches) being sent to Sales and Distribution System placed a burden on the people as the messages transmitted took some time for realization. --- This had to change if any integration was to be had amongst the producing end with that of sales to enhance synergies on all fronts.

  Manual form of Payroll to Financial System was highly desired, as work being done at various locations would then be done under one roof leading to reduction in manpower and allied resources.

❖ Interfaces Vs Integration

  Scores of interface (5 Plant Systems, H.R., Payroll, etc.)
  Reams of reports (not online with the main systems).
  These required immediate action to sort out differences on all grounds so as to add value to the bottom line.
16 - SAP --- BEYOND THE FUTURE

Going In for SAP allowed the organization to look beyond into the future and

16.1 ONE COMPANY VIEW

ALLOWED EVERYONE TO HAVE A -- ONE-COMPANY VIEW of inventories, funds, etc.

The benefits derived can be briefly listed as under:

✦ Sourcing from various sources was improved besides being qualitatively better as the
  choice factor was further heightened.
✦ Distribution across plants was improved with judicious allocation of resources.
✦ The Sales and Supply Chain too saw light with better integration between the two.
✦ SAP led to transparency of data processing and data sharing.

Data was entered in time and not kept on hold as earlier. This saved time and made
available data to people who required the data to enable correct decision making on time.
✦ On-line availability of data

![VALUE SUPPLY CHAIN]

Inter Enterprise Value Creation
SUPPLY CHAIN

The value supply chain is the combination of material and information
Flow required to source, make, and deliver goods and services to the
Customer at an optimized cost / value of service ratio

16.2 SAP Implementation – STAGE - 1

16.2.1 Business goals at M&M, to be achieved by implementing SAP
- To introduce and implement Model Business Processes on BPR recommendations, for
  all Manufacturing Processes at all Locations
- Commissioning of SAP at all locations by June 1999 ----- done
- The only mission-critical system to replace numerous patchwork systems
  
  More emphasis was now laid on CPP (Critical Process Parameters) as these would
  eventually have a major bearing on the product quality besides its availability.

16.2.2 The executive sponsor

It was none other than the Managing Director, Mr. Anand Mahindra.

Diagram source: SAP
16.3 SAP Implementation ---- STAGE - 2

16.3.1 What was the implementation approach?
Manufacturing Process BPR Completed and was used to model SAP.
The whole SAP implementation was phased across all locations but went live with a Big Bang at each location.
Initially Three pilot sites were chosen (Auto Sector Plant, Farm Equipment Sector Plant, Marketing HQ) beside “Greenfield” pilots (no legacy ERP)
SAP AG consultants were hired to help in the process of implementation of SAP across the organization.
The team responsible for the implementation of SAP was jointly led by the SAP AG team and the of M&Ms.
The group leaders were M&M’s Project Manager and SAP AG Project Manager
Once decided they negotiated the price which in this case was a Fixed Price contract with SAP for its overall implementation
Implementation of SAP was Distributed with the Plant and was given a lot of leeway besides a great deal of Autonomy Networking was done using WAN for bringing about integration across all locations and various sales points -- countrywide.

16.4 SAP Implementation –STAGE - 3

16.4.1 What was the Structure of the implementation team?
- It was essential to bring about synergies amongst various functions across the organization that the team be a Core Team cross-functional (Module x Locations)
- Besides the above – for SAP to percolate down the line it became all the more necessary to include one member from each module team and train them as SAP Specialists. They would in turn provide all sorts of inputs to the SAP team so that integration could be had across all functions.

16.5 SAP Implementation – STAGE - 4
The question oft asked in the corridors of the company was --- Did it have the best people?

16.5.1 The answer was not so simple as one would think – But the management knew what it was doing and so it decided to
- Chose from the select BPR team that was carrying out and responsible for implementing SAP together with SAP AG and moreover ---
- The BPR Team was working with CSC Index (Lucas) on Manufacturing Processes
16.5.2 The modules that were implemented
The modules that were implemented were:
- MM+QM+PP+ PM+ SD+FI+ CO in the First phase
- AM in the Second Phase
- TM+HR+PS in the Third Phase

16.6 SAP Implementation- STAGE - 5
- Business Process Re-engineering : started from April '94
- Software selection : Sept. '95 - May '96
- SAP implementation- Phase I
- Conceptualization : Jun.-Jul. '96
- Customization : Nov.-Dec. '96
- Prototype & Documentation : Jan. '97
- Implementation of modules : From 1st Apr. '97
- Phase-II : (F'98) Two major plants
- Phase-III: (F'99) Balance locations & SBUs
- F'98/ F'99: EDI to Branch Offices/ Dealers

16.7 SAP: Achievements, Success Factors, and Challenges
- Short implementation time: They took only nine months.
- Top Level Support was key (Visibility, Cooperation, Coordination, Resources)
- Country version of SAP was and continues to be a major worry
- Data purity and conversion were major internal challenges
- Acceptance at legacy sites is a challenge (old tailored shirt versus new ready-made ones)
- Don't Underestimate Integration Testing Time, Complexity, Effort, Importance

16.8 Return on Investment
- Estimated investment on IT over a four year period: about US$ 40 million on LAN/WAN, Desk-top PCs, ERP- software, hardware, implementation, training
- Expect 30%+ as ROI: From Efficient Operations (incl. Reduced communication and travel costs) + Avoidance of Lost Sales
17 - Tangible benefits of SAP...

According to the DGM HR, Automotive sector, "We went live on April 1, 1997 and by April, 1999 every business of M&M were covered by SAP. The tangible benefits achieved over the years were:

- data and process transparency;
- continuous access to on-line data;
- no wastage of resources on data collection;
- capacity to meet market needs promptly;
- awareness not only of how much is sold but how much sales is lost."

17.1 OTHER BENEFITS OF SAP ---

"The package has a built-in system for correcting human error. Data is entered only once in an integrated system. And it is entered where it is generated. If there is any reconciliation, the system will do it, and much better. So, if the required data is missing, it will stop the logical process of a transaction and won't proceed from step 1 to step 2.

"For example, the gate pass could not be given for the materials as it had not been entered into a production. Before SAP, they would have made the entry later, but now the system says no way, the truck can't leave. So our experts had to be called in to resolve the problem. The SAP system will indicate what is wrong and where but you must be able to interpret it correctly.

Role of IT

- Provide Competitive Advantage
- Increase Operational Efficiency
- Realize Functional Effectiveness
- Identify Opportunities
- Capitalize on Advantages
- Facilitate Decision-Making
- Create & Enhance Products & Services
- Reduce Time-To-Market
- Link Up with Customers & Partners

Diagram source: SAP
"The need for IT services was highly intense in the first six months as people had to learn to use the system, but gradually, as the disciplined manner of working set in and became routine, the intensity diminished."

M&M's GAINS FROM SAP...

However, to exploit the package optimally, they had to ensure the people were made IT literate. The IT initiative was driven to improving market response of the company. But they had to ensure that business was not complicated by IT. Rather they at M&M endeavored to enslave IT towards good business.

"In business there is a distinction between value-added and non value-added products. For M&M, IT is a non-value product. The problem, therefore, is how do you compensate IT people adequately, how do you challenge them intellectually. The solution was to create a separate IT company where their needs would be taken care of. Hence, the creation of Mahindra Asyst.

"The new company was established with a view to provide expertise in this highly evolving field of information technology. M&M's IT strategy has a long road to travel and Mahindra Asyst can help it go the distance. But they need not stop there. The competence that they gain from putting M&M through its paces will help the company grow Synergistically. What they learn here today, they can offer to others tomorrow."

_The process of planning, implementing and controlling the efficient and effective flow and storage of goods, services, and related information from point of origin to point of consumption and/or destruction for the purpose of conforming to customer requirements..._"

Source: Council of Logistics Management
The SAP package...

"SAP ensured that you had forward and backward integration of data, but it also demanded absolute integrity of data entry. The package had adequate flexibility and depth, which ensured that all 'stranger' processes were taken care optimally. According to one manager at the Kandivli Plant, "The implementation process at the pilot sites at Nashik and Nagpur taught us a lot. We learnt to be more careful in recording stranger events."

"Take for example the case of steel sheets that are planned for Kandivli, received at the vendor, and ultimately were effected only after an elaborate work-around was created in the system. The problem cost the Company several precious days in a tight implementation schedule. This underlined the need to be meticulous and comprehensive in data gathering as also the need to be simple in their business processes."

18.1 On how the problems were overcome...

"The fact that Kandivli had a basic PC culture was initially a disadvantage. The Kandivli users had a notion that they were using MAPICS. But what had started as MAPICS had got distorted beyond recognition. Islands of information had been created that could never be integrated. Hence, the users had to unlearn some of what they knew before they could learn the new system properly."

"To discourage creation of islands of information once again, M&M has adopted a fixed software policy. The master server is located at Kandivli. Customization is closely controlled through this single unit. If any unit of the Company desires a change, the request must come to the control server at Kandivli. There it will get tested for suitability. Only if it is found to be acceptable to all the sites will the requisite programme be made and exported to all the other plants. This ensures that the configuration and hence the business process will remain uniform at all M&M sites."

18.2 On what SAP brought to the Company...

"As an integrated system, SAP reduced response time considerably. The package has a rich variety of reports useful for decision-making. SAP uses the world’s best practices. But before it could be used optimally for decision-making, it had to be ensured that discipline was maintained down the line and that the system was tuned well enough to run on its own. I believe it will take about a year for the system and its usage to mature fully."
Mr. Anand, "As of now all I can say is that SAP has forced everyone to work in a very disciplined and formal manner. People are beginning to see the effects of integration and the benefits it can afford them. An integrated ERP system has the potential to project the real image of M&M as a dynamic, progressive company, committed to the future. The pace at which users and IT have driven the SAP implementation and upgrading of the system, in terms of scope and time, clearly demonstrates that M&M has the marks of a winner."

At Kandivli, though everything went smoothly, there were a few minor hiccups. according to a site Project manager, "The system that was in use had its limitations and had ceased to be integrated."

"There were islands of information. Each one believed that his data was right so he guarded it carefully. We had to open their minds to the organizational point of view, to shift from the 'I' mode to the 'we' mode."

Earlier, a data entry was just that, a data entry. But with SAP, every data entry affects costs, stores, profitability and so on. Hence, a timely, accurate data entry not only benefits the operator, it also helps in decision making at his and at other levels too.

"SAP not only enforces integrity of data entry, it also enforced discipline," adds the site project manager. "The system does not allow the next step to proceed unless the earlier step has been correctly inputted. This requires that everyone is up-to-date in recording data information. Initially, this may be difficult but soon it will happen out of habit. It's only then that we will see the limitless advantages that SAP can offer us."

According to a Team leader, "Integration of data has helped bring down the number of rejected items and has thus saved on costs." "On the shop floor, rejected items were calculated in terms of numbers of rejects. Therefore, one rejected axle did not seem much of a loss to a worker. But when he sees that that one rejected axle has cost the company a loss of say Rs. 10,000, then he starts getting worried.

"You see the package has an accounting system for every 100 transactions. This means that they can now see what their mistake has cost the company. This has created a tremendous difference in their attitude to their jobs. They have started to view their work in terms of rupee value to the company."

Accordingly the site project manager sees a great future for M&M in implementing SAP. "Sitting in my office in Mumbai I can view production figures of Nagpur and Nashik instantaneously on line. I don't need to wait for reports to tell me what's happening. This helps me to make speedy and prompt decisions based on
accurate data. There will soon come a time when we will have a totally paper-less office as everyone will communicate directly through the system."

Given the fact that IT systems are becoming obsolete by the minute, it is pertinent to ask whether SAP too will become redundant in may be five years. "SAP is an extremely flexible package and can address all business requirements in the foreseeable future. AT the same time, continuously upgrading of the package are also keeping pace with the changing requirements and environment," says the team leader. A computer is only as good as its operator. With this fantastic communication system in place, it is imperative that every one of us at M&M must learn to use it optimally and intelligently so that we, as an organization, can derive its benefits to the maximum.
19 - IMPLEMENTING SAP AT KANDIVILI

“A CAKE WALK”

19.1 On what SAP has already done...

DGM BPR, "When we went live at Nagpur and Nashik, there was a transport strike for 11 days which was useful. It eased the pressure and so we could start slowly. But nothing like that could save us at Kandivli and yet, given all the apprehensions, Kandivli was a cakewalk.

"The pressure on usage will start now as more and more people use the system. Earlier when people used isolated system they took responsibility for their own data. In an integrated system you have to learn to take responsibility not only for that which relates to you but also for that which is not relevant to you.

19.2 Islands of Information

"What SAP has done away with is islands of information. At M & M they realized that as long as they had islands of information, there would always be a need for reconciliation. Now, with this issue taken care of, everyone is able to work on the same data, only each person looking at it differently depending on his function and need. There are no more disputes on data. That is where initial problems lay, in ownership of data. Now data operators are responsible for every data entry. Earlier they would say I misread an item because someone else wrote it wrong. The onus could be passed on. That does not happen when using the SAP platform. You can't enter in just anything, you must own the data because one mistake could cost the Company millions."
The place is Chandigarh. A farmer walks into a dealer agency to buy a tractor. On display in the showroom is not a line-up of vehicles, but a row of computer screens. The salesman keys in the customer’s requirements into the computer, and suddenly the screen lights up with images of tractors that fit the farmer’s needs. He chooses the one he likes best, and the salesman transmits the specifications of his booking to the Kandivli factory. On the requested date, the farmer arrives at the showroom where his tractor awaits him. It is just what he wanted, down to the last detail. The delighted customer drives home his new machine.

Does this read like a fantasy from a science fiction film? May be it does, but at M&M we believe this is a vision of things to come. On April 1, 1997, our state-of-the-art communication system went live and M&M took a giant step into the twenty-first century.

The implementation of this project has been a major achievement and one that we are justifiably proud about. “Normally such a job would take about two and a half years, but we did it in just nine months,” says one of the team leaders of the ERP Implementation Project, proudly. What’s more, the system is running smoothly even though its working has demanded a revolution in business operations.

**INFORMATION FLOWS**

Information technology allows integration so that different geographical and functional units can work efficiently together — The enterprise system — M&M
4C ARVIND MILLS LTD
1 - HISTORY OF ARVIND MILLS

The time - 1931, The event - the Swadeshi Movement...
the result - non availability of fine and superfine fabric in the Indian market.
At this juncture, The Arvind Mills was set up with the pioneering effort of the Lalbhai brothers. With the best of technology and business acumen Arvind Mills became a true multinational. The management chose to invest strategically, where demand was high and quality required was superlative.

1.1 ARVIND MILLS -- THE JOURNEY

Arvind, paraphrasing, President Collidge, wanted to assert that the business of business must be business. Understanding customers, designing products and services to meet their needs effectively efficiently, and harnessing technology to enhance productivity is the "real work" of businesses. Of course, in doing so, they knew that business must conform to the societal norms of good governance. If businesses worked within the societal norms of ethics, they should not strictly a part of their "real work." Such situations arise when a society fails to resolve its major problems, leading to circumstances that threaten the long-term existence of business organizations. As Control Data Corporation's founder chairman and CEO, William C Norris, has aptly said, "You can't do business with a town on fire. So you stop and think why this has happened. It happened because of inequities." Also, such situations arise when the societal values require a business organization to undertake activities that are not directly concerned with its "real work." Arvind's attempts to set the tone for resolving some major societal problems were the result of similar circumstances.

FOOTPRINTS

THAT MARK THE TRAIL TO BECOMING A SUCCESSFUL INDIAN MULTINATIONAL

and need not be apologetic for concentrating their energies on their "real work.". However, there are situations when businesses must undertake activities that are
1.2 THE JOURNEY --- HIGHLIGHTS

1931 The Arvind Mills Ltd. is incorporated during the Swadeshi (freedom) movement... the objective - to indigenously produce fine and superfine cotton fabrics for the Indian market.

1972 Narottam Lalbhai Research Center established. Its India's only textile research center with a pilot plant.

1986 Arvind's first denim plant commissioned at Naroda Road.

1991 Acquisition of Nagri Mills, now known as Arvind Intex Ltd. A 100% Export Oriented Unit, Arvind Exports, commences operations at Naroda Road, to manufacture denim for exports.

1992 Arvind International, a 100% Export Oriented Unit, starts operations at Khatrej, Gujarat.

1993 Arvind's $125 million GDR issue is oversubscribed more than 20 times.

1994 The Asoka Mills Ltd., merged into Arvind.


1997 $125 million Floating Rate Note transaction completed.

Arvind International received ISO 9002 and ISO 14002 certification.

Arvind’s 40 million meter per annum, rope denim plant commences operations.
1.3 QUALITY OF LIFE

By December 1998, Arvind’s investments reached approximately Rupees Fifteen billion (about US $ Three Hundred and ninety-five million) besides fast becoming a global company. In such a case it had to attract the most talented people to work with the company. To do so, the “quality of life” in Ahmedabad, the company’s headquarters had to be of international standards. BUT could it be possible when 40% of the city’s population resided in “slums.” Obviously, Arvind alone could not solve the gigantic problems of the city slums. However, it was at least possible for Arvind to establish the feasibility of upgrading the city slums. To do so, it decided to work with the Ahmedabad Municipal Corporation. Thus enlightened, it made Arvind participate actively in the slum-upgradation programme.

This would ensure that the residents in these areas would have the basic facilities that should be available to all citizens in modern cities. A unique feature of the project is that it is a partnership project between the Ahmedabad Municipal Corporation, business houses, Non-Government Organizations and the residents of the areas to be upgraded. The households in the community would share one third of the cost incurred in upgrading the infrastructure facilities. Arvind Mills has of late started upgrading the skills of the people living in distressed areas. By doing so, the company will enable them to face the fiercely competitive world of the next millennium.

Though these activities were not directly related to Arvind’s “real work.” The Company, without the competence developed in doing its “real work”, would not have been successful in carrying out the activities described above. Company’s skills in project management helped the company to complete the programme within time and budgeted cost. Its customer orientation developed through competing in highly competitive international markets, helped the in treating the slum residents as customers and not as beneficiaries. It used its expertise in forging and carrying out competitive strategies for upgrading the slum dwellers’ skills for competing in more attractive service industries.
2 - STATEMENT OF VALUES
OPENNESS AND TRANSPARENCY

At Arvind they are open and transparent in all that they do and say - in all working relationships at every level. Involvement, trust and willingness to listen are the guiding principles for decision-making. They believe in open communication, offer freedom to speak one's mind and act demonstrating openness and clarity in all their actions.

2.1 DIGNITY OF THE INDIVIDUAL AND THE INSTITUTION

Each individual is an integral part of the institution, and due diligence is core to both. The human dignity and worth of an individual is acknowledged and maintained at all times. Nothing shall impose upon the dignity and stature of the institution, which has its roots in these articulated core values.

2.2 INTEGRITY

This is cherished above all and whatever they say and the way they do it, emphasizes their integrity and dependability. Their employees, products and services clearly communicate this strength to their suppliers, customers and all stakeholders. They practice integrity in its real sense in all their personal and business actions.

2.3 TRUSTEESHIP

A strong sense of ownership and commitment towards the organization and the business as a whole is the basic premise of all actions. They manage their institution as a trust, as empowered leaders and do all that needs to be done ethically for the purpose of the institution for today. They believe in leaving behind a vibrant institution for the future of this nation and the world at large.

It is surprising that these dominant societal values of Indian society have influenced Arvind's philosophy, guided its actions and illuminated its path. Below, I have reproduced a conversation that took place between the late Kasturbhai Lalbhai, founder of the Lalbhai Group, and his cousin, and is illuminating:

A few years before his death Kasturbhai called his young cousin, Chinubhai, and asked: "When you go out, don't people pay their respects? Don't they call you affectionately as Sheth? Don't they offer you hospitality when you happen to visit them?" A flabbergasted Chinubhai, without any clue to the purpose behind these questions, answered that they did. "What have you done" shot the older man, "what have you done to repay their debt?"

Diagrams source: Reengineering Exercise at Arvind
Its attempts to resolve major societal problems epitomize Kasturbhai's way of repaying his debts to society. In business, success is about seeing things differently from the competition. It's worked for Arvind ——— Repeatedly

During the Indian textile crisis of the late 1980s, when inexpensive family-run "power-looms" forced large mills close, Arvind shifted to top-end, high-value fabrics. Cynics laughed. It worked for them.

At a time when Indian mills were focussed almost wholly on the domestic market, Arvind turned to the export market. Cynics sniggered. It worked for once again.

2.4 Renovision: Arvind looked at the vast potential of the "economy" end, and launched brands for this segment. Cynics were delighted ... they thought they'd finally get what they deserved. Guess what? The brands they launched became mega-hits - Way beyond their wildest expectations. We call it Renovision.

Look at the visuals above. Is that a wineglass or a picture of 2 girls face to face? An arrangement, of fingers or the outline of a rabbit?

In business, success is about seeing things differently from the competition. It's easy once you shift perspective. This ability to see beyond the obvious, to find opportunities where none seem to exist ... we call it Renovision.

Search any dictionary - you won't find the word. They coined it and it's worked for them.

Repeatedly
Venture into the world of RENOVISION It means a new way of looking at issues --- Of seeing more than the obvious. --- It is our corporate philosophy. ----
-In our own way, this is something we attempt all the time.
Yes, there is life beyond the obvious.
Serving lesser fortunate people, in the society, has been a dominant value in the Indian society. For example, Sri Ramakrishna, had taught that "in everything living exists the divine & service of the living is therefore, worship of the divine." In a similar vein the famous Indian poet Bhavabhuti says that wealth is desirable because it helps in discharging our social obligations. Bhavabhuti observes "philosophical knowledge is prized for ascertainment of truth; wealth is desired only for the help it affords in discharging social, economic, religious duties and obligations."

There has been no looking back........

Arvind Mills the flagship company of the $ 570 million Lalbhai Group has focused its attention on a few selected core product groups. Such a focus seemed pertinent to prepare the company for playing a dominant role in the global markets.

Arvind adopted an organizational structure akin to "Strategic Business Units". Under this structure the company grouped under one business unit, distinct product groups. This pattern of organization allowed it to concentrate its energies on important businesses. It exports 70% of its production. Arvind's manufactures and marketing operations is spread across US, UK, Germany, Hongkong, Mauritius, Dubai and Bangladesh with aggressive plans to locate itself in S.America, Africa, CIS and Australia.

While analyzing any corporate house entering the consumer business one would inevitably look closely at its brand building and marketing strategy. But consider India's biggest textile house that has products tailored to fit virtually every segment of the consumer market. Brands fostered by Arvind include Lee & Arrow for super premium segment, Newport for mass market and innovative ready-to-stitch jeans "Ruf & Tuf".

Best known for its global dominance of the denim market, Arvind Mills, with an annual turnover in excess of $ 205 million and a PAT of > $ 40 million in FY 96 accounts for more than 75% of the total denim manufactured in India. It is the world's fifth largest denim producer and is well on its way towards achieving a turnover of $ 1 billion by 2000 AD.

The company is in the process of expanding its existing production facilities with a Phase - I investment of $ 340 million and Phase - II investment of $ 285 million, over a
The company is in the process of expanding its existing production facilities with a Phase - I investment of $340 million and Phase - II investment of $285 million, over a 1000-acre land. This will consist of state-of-the-art machinery for composite textile units of High value Shirting’s, Industrial fabrics, Home furnishing and Suiting.

*The most important factor in a competitive environment is something that has not been comprehended in India; the need for articulating a vision and then bolstering it by ironing out the glitches in the strategic focus.*

3.1 ARVIND’S VISION

“To achieve global dominance in select businesses built around their core competencies, through continuous product and technical innovation, customer orientation and a focus on cost effectiveness”

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<tr>
<th>ENVIRONMENT - MACRO</th>
<th>BUSINESS OPPORTUNITIES</th>
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<tr>
<td>• Household sector wants better quality fabrics</td>
<td>• Global demand</td>
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<tr>
<td>• Rapidly growing domestic readymade garments</td>
<td>• Relative standard content</td>
</tr>
<tr>
<td>• Growing international trade in yarn, fabrics and clothing</td>
<td>• High entry barriers</td>
</tr>
<tr>
<td>• Favourable Govt. policies towards exports</td>
<td>• Large investments</td>
</tr>
<tr>
<td></td>
<td>• High standards of quality</td>
</tr>
<tr>
<td></td>
<td>• High technical skills</td>
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The society was at the threshold of a paradigm shift with the changing economy and millions of opportunities. The Lalbhai Group has maintained a responsive yet levelheaded attitude the society and its constituting individuals to create a corporate culture that fosters excellence. To give substance to its vision *KNOWLEDGE MANAGEMENT* was seen as an important tool in this direction.

3.2 KNOWLEDGE MANAGEMENT

Working in this direction Arvind’s management has created a learning environment that nurtured individual talent and intellect. It provided a platform that challenged the individual capabilities urging him/her to constantly strive greater heights using development as the fundamental tool.

Individuals were infused with a spirit of entrepreneurship, which gave courage, and conviction to pursue set goals towards logical achievement and a global mindset that transcended geographical and cultural boundaries evolving and organizing him/her to be a world leader. All this was manifest in an environment fostering innovation and leadership.
Drawing upon their **SBU set-up**, they encouraged individuals to **mesh into cross-cultural teams** in all operational processes. This process provided opportunities for individuals to match their capabilities with organizational expectations and creating a mechanism for updating the system.

### 3.3 WORLD CLASS TECHNOLOGY

To manufacture world class products, it required top class technology. They realized this and invested in the best available and then concentrated on making these technologies more cost efficient.

Its innovative new denim production processes developed indigenously, reduced production and operating costs substantially.

### 3.4 RE-THINK

Its engineers did a serious **re-think** on ways to produce heavy denim on sophisticated Air Jet looms. **Making it the first company in the world** to produce heavy denims on a large scale by this method. They used "**slasher**" technology for indigo dyeing, instead of the more common multi-stage method. They used **foam technology**, as against the conventional "wet and dry process", thereby reducing the finishing cost. They have developed water repellent permanent press cotton fabrics.

They have the **largest in-house R&D department than any other Asian textile company**, consistently introducing new techniques and methods into the Indian cotton textile industry. **Interestingly they even worked with Indian farmers to develop better cotton collection methods.**

Their R&D department has played a pivotal role in developing jute fiber for a United Nations Development Project. Fabric testing machines, originally developed for in-house use, have found commercial acceptance.

In 1972, Narottam Lalbhai Research Center was setup. It is the **country's only textile research center** with a pilot mill, a comprehensive library and skilled staff. The Center has helped in developing new products and processes and **improving existing ones**, thereby achieving finer qualities at **lower costs**. It was at this center that **multi-beam-dyeing technology**, an essential step in the production of Arvind's Classical Oxfords, was developed.
Following the commissioning of the new facilities at Santej, the company has an evenly balanced portfolio. The vulnerability of single sector exposure is reduced and other sectors will counter cyclical downturns in any product segment.

3.5 CORPORATE NEEDS
Coalescing corporate needs with the individual needs was deemed as crucial. These processes would in time articulate the connections between corporate success and individual behavior. It was thought that it would help instill an institutionalized processes so as to reinforce connectivity, and catalyze the chemistry that allowed the connections to be translated into action which would be beneficial to both the organization and the individual.

A strong sense of ownership and commitment towards the organization and the business as a whole, was the basic premise of all their actions. They at Arvind managed their institution as a trust, as empowered leaders and did all that needs to be done ethically for the purpose of the institution. They created a vibrant institution for the future of this nation and the world at large.

**CORPORATE STRATEGY**

TO COMPETE BY ALTERING THE COMPOSITION OF THE PRODUCT PORTFOLIO SO THAT AN INCREASING PROPORATION OF REVENUE IS GENERATED FROM SOPHISTICATED PRODUCTS TARGETED FOR INTERNATIONAL MARKETS.
4 - ARVIND
THE REENGINEERING EFFORT - I

The saga of Business Process Reengineering started way back in 1993.
It was not just another gimmick or some fancy thing to put things right. **It was essentially an exercise to re-allocate, re-locate, re-structure and above all to optimize on all fronts conceivable.** For this to become a success, employee participation and support was considered essential.

4.1 Why reengineering?
Because their processes seemed full of:
1. Disconnects
2. Bottlenecks
3. Delays -- where processes crossed departmental lines which meant lost orders, delays, mistakes and other failures which cost the organization, time, money and customers.

How did Arvind's processes get badly organized?
1. These developed over time
2. These developed as quick fixes and stayed
3. These were not focused specifically to meet existing / future customer requirements.
4. Many of the individual activities or whole processes were not adding any value to the organization.
5. There were resource imbalances across the line and the limited resources were allocated to function / departments not processes.

**HAVING DOCUMENTED THE ABOVE PROCESSES HELPED KEEP THE PROCESSES ORGANISED AND WITH THIS STARTED THE JOURNEY TOWARDS PROCESS REENGINEERING AT ARVIND.**

When the idea of B.P.R. was conceived, McKinsey consultants were called into help the management sort out its bag of problems and put them in a sequential manner so as to tackle each one systematically / sequentially. Besides, it was desired that McKinsey help the company in its Acquisition and Mergers in the country and abroad.
THE REENGINEERING EFFORT - II

*Best is a matter of standards. At Arvind they set their own standards. They had inherited a legacy. They stood at the end of a great tradition. They hoped that they would perhaps, stand at the beginning of a new one.*

Why reengineering was required is very clear from the above. With recession setting in rapidly it became all the more urgent for the organization to make a struggle to stay above water. This finally led the Management led by Mr. Sanjay Lalbhai to decide to tread the path - **Business Process Reengineering** with the help of McKinsey.

4.2 **REASONS FOR REENGINEERING AT ARVIND.**

**WHY WAS THIS CHANGE APPROPRIATE**

- Global competition was creating global benchmarks for performance
- Customers were forcing the pace of change

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<thead>
<tr>
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- With the change in the business environment within the country as well as globally it was reasoned that its traditional system of management would not help to achieve market dominance putting its competitive edge to naught. The need of the hour was to go in for a functional management.
- *The changing trend required a paradigm shift*, from go-easy sort of approach to production / production development to taking the plunge lock-stock and into developing new products.
- Earlier it was an expected norm that the consumer would accept what was produced But, today with a galaxy of manufacturers, traders entering the market, it became imperative for Arvind to reengineer its D&S scenario. (*Competitive environment*)
- *Benchmarking* against the best and do better.
- To achieve excellence it was desired to do a portfolio analysis.
- Above all, to achieve an affective reengineered organization it **needed to reengineer its HR**, which without say is one of the best of its kind - excellent example of reengineering its HR.
4.3 BUSINESS PROCESS REENGINEERING

4.3.1 PRELUDE: The 1980's proved to be crisis ridden for the textile industry, with the Govt. bringing in the power loom (small time operators) under the cottage industry. These in turn churned out inexpensive fabric making the composite mills lose ground. *This forced the company out of its slumber and made it shed its paranoid outlook towards the way it was doing business.*

In 1991 the excise policy set forth by the then policy government proved to be favorable for the textile industry. The global trade environment reached macro levels and set forth a new thinking process within the company.

In 1993 - The Management drew up its vision as under:
During the post liberalization period - high entry barriers were created and quality became a norm for competing locally as well as globally.

**BUSINESS PROCESS REENGINEERING**

In order to respond to the transferring times it was necessary to go through a

4.4 CONNECTIVITY SHIFT

4.4.1 ORGANISATIONAL RENEWAL PROCESS.

The journey on the road to business transformation / reengineering started way back in 1993 with the easing of global trade environment and the easing of the exim policy. This led it to acquire a number of companies worldwide so as to position itself favorably in

<table>
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<tr>
<th>ARVIND'S GLOBAL RENEWAL PROCESS</th>
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<td>• IT’s JOURNEY BEGAN WITH GLOBAL ENDEAVOURS</td>
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<tr>
<td>• THE 7S MODEL FOLLOWED FOR THE RENEWAL PROCESS</td>
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terms of trade and leverage its activities at home and abroad.
In order to make the BPR activity of successfully the company decided to use the 7s model, for its Renewal Process.

4.5 **Mckinsey’s 7s Model**

THE MODEL: - An apt model, which defines the organizational charts. It shows their interdependence or being complementary to each other.

Besides the above, the organization wanted to focus on the systems - to synchronize these so as to optimize in all directions.

4.6 **TAKING STOCK**

THE SITUATION TODAY WARRANTED ----- TAKING STOCK WHICH MENT

- Need for a well articulated and broadly shared vision statement
- A Strategy as the starting point in all action Programs
- Significant thought and action on structures
- Strong focus on talent search at all levels
- Performance driven entrepreneurial mind set and a
- Systems focus was required

* Well articulated and broadly shared vision statement.

To have a focused thought process throughout the organization it was essential to have a **vision** - not just that of the management but also that which had the support of all in the organization. It was imperative to do so, so that all would be guided by a common set of guidelines for achieving the vision.

With the above in view the **vision** was framed as under: -
"TO ACHIEVE GLOBAL DOMINANCE IN SELECT BUSINESSES BUILT AROUND OUR CORE 
COMPETENCIES, THROUGH CONTINUOUS PRODUCT AND TECHNICAL INNOVATION, 
CUSTOMER ORIENTATION AND A FOCUS ON COST EFFECTIVENESS"

HOW THIS WAS DIFFERENT 
FROM THE PAST

- GLOBAL THEME IN ALL ACTIONS
- NEW FOCUS ON CUSTOMERS
- REDEFINED MARKETS & COMPETITION
- BROADER SHARING ACROSS THE 
ORGANIZATION

4.6.1 Strategy as a starting point in all action programmes.

After framing the vision, an action plan was drawn for which some guiding principles were 
framed for which a strategic viewpoint was established.

4.6.2 Significant thought and action on structures.

Structures through out the organization spelt out the management hierarchy vis-a-vis the 
management style of functioning. So on the path of Business Process Reengineering it 
was prudent to put in a lot of thought into this area. Extensive rethinking was required and done so that the emerging structures would be flatter organization-wide enabling 
smoother flow of information and allowing departments function move smoothly.

"Strong action laced with fore bearing / foresight was taken, which made the ride, 
though not smooth initially, exquisite. Today, it is there for all to see what this has brought about - excellent service / HR management at the personnel end, smooth information-sharing within departments for meeting overall organizational goals - on the dot. Able to 
solve production, quality and technological problems more swiftly as encumbrances have 
been removed."

4.7 STRONG FOCUS LAID ON TALENT SEARCH AT ALL LEVELS.

The management in its quest for excellence and to meet the challenges posed by the 
emerging new trends in the market laid a strong focus on talent search.

Mr. Ganesh emphasized that it was not essential that talent was always the 
prerogative of the newcomers at the entrance level. It was also borne in mind that talent 
from other spheres of related business was also desired and a head-hunt was initiated 
leading to the organization's renewed focus on the overall scenario - on how to function
globally. The best combination of brain and technical skills has led to achieving synergies on this front.

4.8 SKILL MIX- CHANGING IN TUNE WITH FUTURE TRENDS.
Skills required in earlier times at the onset of the industrial revolution were entirely different. Today, skills desired in the day to day functioning of a business enterprise are totally the opposite - today specialization in a particular field is desired though not essential. According to Mr. Ganesh, today the desire was to have a multifunctional personality who was vibrant to the ever-changing needs and functions of the business environment - immediate as well as distant. He should be able to gauge the depth of any eventuality and take appropriate action.

☞ An example of skill mix can be cited as under:-
A personnel manager in order to be able to take decisions which bear on employee morale / functioning must in essence know / or must endeavor to learn to some level so as to know what goes on, on the other side of the fence.
Besides the peers must bear cross-functional skills to deliver their best.
At Arvind Mills, a few shining examples are Mr. Ganesh Sormen and Mr. Vinayak. Excellent to the core - cross - functionally.

4.9 PERFORMANCE DRIVEN - ENTERPRENEURIAL MIND-SET.
In today changing business scenario, a person unlike the past, has to have an entrepreneurial mind-set wherein he has to be vibrant to the changes taking place around him and change accordingly. His performance levels has to change in accordance to the times and needs. Only people with an entrepreneurial mindset can do this. At Arvind the winds of change are continuously blowing in order to keep up the changing scenario in the textile industry.

4.10 SYSTEMS FOCUS
Anything done in isolation bears no connectivity to other activities going on around it. Born in isolation one exists in isolation with no bank for comfort. Different works drawing their raw material from same suppliers will do so through a centrally organized supply operation. Products from the various works were often sold in same markets or some major customer. Under such circumstances strategic decisions about any one works could not be taken in isolation.
It looked Ok to people at the corporate level, but for managers or trade unions officials at individual works, things looked very different - particularly when encouraged from an operational point of view as a profit centers themselves. An extreme example of
such a conflict arose when it was argued that a works, which was in profit, should be slowed down and its load transferred to other works. To face all such outcomes at Arvind it was decided to go in for an integrated systems approach as given/illustrated in the fig below (Mckinsey's - 7s).

In such circumstances strategic decisions about any one work or product could not be taken in isolation. This has, since Mckinsey carried out the exercise at Arvind’s, been well entrenched and followed religiously with today’s operations and functioning proving this point beyond any doubt.

**Arvind's Reengineering group's role** changed with time. Initially, outside consultants Mckinsey:

1) Educated the Core group on reengineering concepts,
2) Furnished them with a reengineering methodology.
3) Assisted in project leadership where beneficial. Soon the Reengineering Core group's own expertise and knowledge exceeded or at least was equal to that of outside consultants. The outside consultants’ role changed to bringing fresh thinking and specific skill sets. The Reengineering Core group assumed the broader change roles of consultants.
5 - A SYSTEMATIC O.D

In order to make things happen and affect change judiciously and effectively ------

5.1 A SYSTEMATIC O.D. (INTERVENTION WAS CARRIED OUT.) Why?

Because:

* Complementary technology and organization, both led to mutual leveraging &
* Facilitate in integrating new technology with a flexible organization.

It was true at Arvind, according to Mr. Ganesh Sormen, "It is easier to integrate
new technology within a flexible organization than within an inflexible organization with
people having a fixed mindset and virtually unwilling to change. In a flexible organization
warrants change, people are practical to the needs of the organization and accept the
integration of new technology at a fast pace. The management allowed groups to
carry out brainstorming to evolve ways to smoothen the process so that old
systems could be blended with the new - giving way for chaos free change today one
can actually see the change.

5.2 REDESIGNING THE ORGANISATION WITH INFORMATION SYSTEM.

At Arvind IT offered limitless possibilities as: -

i) Information System was linked to the business plan. Through this:
   a) Purpose of the Plan was chalked out and  b) Stated the strategic business plan
c) Highlighting the current systems and d) New developments were reviewed and
e) Strategy to achieve Planned organization change and thereby business transformation.

ii) It was deliberated, on the need to use Information System Strategies to
    compliment overall corporate strategies so as to derive maximum benefit
    while redesigning business process.

5.3 Growth

It was all the more relevant in today's dynamic environment. It was accepted that it was
only through the systems that the organization could move and grow smoothly. If the
systems were inappropriate they could stall the process of change.

The following systems were listed:-

4. Etc... They are endless giving rise to the other being complementary to each
   other. They are dependent on each other for survival & hence systems had to be
   appropriate for smooth growth.
5.4 EFFECTIVE STRUCTURING

During the various meetings, the BPR CORE group came concluded that an inappropriate organization structure would hamper flat structuring of the enterprise. This would curtail free flow of information as well as proper management of the enterprise.

**STRUCTURE**

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<th>FROM</th>
<th>TO</th>
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<tr>
<td>Functional/Locational</td>
<td>Strategic Business Units</td>
</tr>
<tr>
<td>Central Intervention “everywhere”</td>
<td>Central Participation “Value addition”</td>
</tr>
<tr>
<td>Command and Control</td>
<td>Decentralization and Delegation</td>
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Hence it was envisaged that it must restructure in order to have an effective setup where sharing of information was least restricted and the flow matched all round requirements. It prevented any information technology was also stoppage in the manufacturing and delivering setup. Besides, the considered essential to flat structure to reduce reporting levels transparency across the organization. This led to sharing of information to put into effect various plans and policies at a rate not imaginable earlier – The information is available on the Intranet.

5.5 STRATEGIC IMPLEMENTATION: -

They realized that in order to implement strategy properly it was first essential to put systems in place and validate these at intervals so that any weak link could be taken in to consideration and put right before the whole chain collapsed. Implementation could be hampered if unwanted spanners were put in the works by inappropriate systems.

5.6 REENGINEERING THE HUMAN RESOURCE

Hammer and Champy recognize the importance of the human resource when they state "companies are not asset portfolios, but people working together to invent, sell and provide service."

To enable a smooth transition the senior management ensured a constant flow of information throughout the company about BPR expectations and successes. The performance appraisal system was revised emphasizing new values of teamwork and cooperation.

Two fundamental obstacles to the success of its reengineering activity were fear among employees that their jobs were endangered and that years of experience would account for nothing. To overcome these apprehensions, managers at Arvind were highly instrumental in constantly communicating the organization’s plans and expectations.
5.7 PEOPLE EFFECTIVENESS:
These were considered vulnerable as any system not conducive to HR development and ineffectiveness would jeopardize the whole organization. These could lead to serious Industrial Relations situations and further to breakdown of all activities.

Unlike other activities people effectiveness at Arvind was put in the right direction by:
First putting the Human Resource systems in place, such as, recruitment policies, target development plans, growth plans, succession plans and so on.

MORALE: - Ineffective systems lead to low morale amongst the working personnel. As the above illustrates it is possible to boost the morale of the people by having systems to provide support to the employee well being.

5.8 INVESTMENTS
ALL THE ABOVE ENTAILED / INVESTMENTS
In areas which would affect the overall performance of the organization. This would mean making investments such as:

5.8.1 TECHNOLOGY COST: - In order to put everything in right perspective it was at Arvind it was decided to contain technology cost -- by first putting various systems in place which would allow cross-functional sharing of knowledge as well as encourage partnering. This would in turn allow understanding and implementing as well as developing in-house technology to produce products of a better quality, allowing it to pay more emphasis on customer focus.

5.8.1 RESEARCH, REDESIGNS AND IMPLEMENTATION COST: - This was valid as various systems subscribed to different ways to thinking and functioning. Synergy amongst various functions was lacking though all were doing good work. So in order to synergise focus it became essential for all at Arvind to work with a common goal towards a set objective.
1. Here came in -- the in-house research factor, redesigning of various old ways of working and finally implementing the results across the organization. This synergy at Arvind helped in bringing down research, redesigns and implementation costs drastically. This was all the more pervasive as this allowed sharing of know-how across the organization.

5.9 OPPORTUNITY COST OF MANAGEMENT TIME :
No BPR activity can be initiated and completed without a certain price / cost tag which comes along with it. Similarly at Arvind too the management too was prepared for this.
6 - THE BPR ACTION PLAN

To be able to give adequate support to the BPR activity so as to see it through, it became evident that an action plan must be drawn up. This would in all future course of action act as the guiding spirit.

6.1 Developing Business Processes

The development of Arvind's business processes did not stop with just creating a process model. In fact, that's when the real work actually began. The major steps of business process development project at Arvind included:

- Identifying each business process as it functions in your company
- Discovering the current state of the process
- Collecting information on problems and bottlenecks
- Soliciting ideas for improvement
- Redesigning the processes
- Validating the redesigned processes
- Implementing the redesigned process

The objective of development was to find a better way of doing things. Once it was identified what problems they wanted to resolve and where they wanted their company to be in the future, there were important key issues for ensuring a successful development project:

6.1.1 Target-setting. Targets had to be clear and measurable, e.g. "After this project the lead time of their design to manufacturing must be reduced by more than 75%.

6.1.2 Commitment from both management and personnel was essential in any project and had to be strong and demonstrated in reality - for example, when allocating resources for the project.

6.1.3 Involvement: Mr. Ganesh Sormen, President HR lay strong emphasis on HR. This was adequately clear when he said, "Our personnel are a valuable source of information both in understanding the current state of the company and planning for the future. Involvement has greatly assisted in creating the commitment and ensuring the acceptance of the proposed changes."

6.1.4 Communication was an integral part of the BPR activity, as all the work done in the project, had to be communicated to all.

Diagram Source: SAP Programme
6.2 ACTION PLAN: THE SYSTEMS FRONT

Under this two phases were highlighted:

Phase I Preparation of the blue print.
Phase II Implementation of change.

It was clear in the minds of all the think-tanks as well as all those who worked in company that it was OK to succeed an extent but in order to go all the way it was important to understand that up to now the going was OK.

Perhaps this was the time to get rid of their old systems....
7 - THE BPR ACTION PLAN
PHASE - I -- PEOPLE FRONT

The blueprint to bring about the process of change was designed after lengthy deliberation. The outcome was the realization that in order for BPR to be successful they had to have goals and meet them on schedule beside other important issues.

7.1 THE IMMEDIATE GOAL
7.1.1 GAINING COMMITMENT FOR INITIATING THE CHANGE PROCESS

To move ahead they had to gain the support of the employees to be able to make any worthwhile decision. In order to sell the idea, management expectations were circulated throughout the Organization to spread awareness wrt the changes the company wanted to bring about. This was done so that the overall efficiencies would be enhanced and productivity heightened.

7.2 CREATING CHAMPIONS FOR CHANGE.

To induce change successfully the management had to create Champions for the Change process to advocate the positives of the change. Members from amongst the Workers and Staff were taken into confidence and trained so that they could in turn spread the good word down the line.

Dedicated Senior Executives shared a common Vision and the desire to succeed. A strong team of Top performers was assembled with diverse experiences and skills. By now everyone was as convinced of the project's success, though not at first. One engineer, who was brought on board to manage the technology team, was initially skeptical of the new design. When the prototype was declared a success he, bolstered by his newly won assurance, started to persuade his team of the BPR's future success.

7.3 CREATING AN ENABLING ENVIRONMENT FOR THE CHAMPIONS.

Adequate leeway had to be given in which the champions could operate without suffocating. This was necessary, so that they could groom others in their own way. Testing the prototype was only the first step in winning the confidence of middle managers and front-line employees. Mr. Sormen believed that involving front-line employees in the design of the new system helped create Champions for the project. Training and communications programs - like basic skills, training and brochures - too contributed to boosting employee confidence in the need for change.
7.4 Technology change
This was, is and will always be a great anxiety generator. With any change in technology it was evident that fewer people would be required to do the same job. The systems change would determine the number of people required. This became a threat factor and it was here that Champions for change took over.

But in most cases at Arvind the change process was smooth such that the management instead of re-deploying or giving an attractive VRS, instead trained and educated the people on the change process directly as well as through the change agents (champions). To absorb the excess HR the management expanded capacity and brought in newer projects having the latest technology. The Cycle time required was also greatly reduced.

The State of the art factory at Santex produces heavy denim on sophisticated Air Jet looms. It is the first company in the world to produce heavy denims by this method. They use "slasher" technology for indigo dyeing, instead of the multi-stage method. Foam technology is used instead of the conventional “wet and dry process,” to reduce the finishing cost. They have developed water repellent permanent press cotton fabrics. All this meant that the old employees in order to continue work had to go through a process of un-learning and re-learning. This was adequately done as the employees went through grueling sessions so as to survive in the new era.
8 - THE BPR ACTION PLAN
PHASE - II -- THE NOT SO DISTANT FUTURE

8.1 CREATING A WELCOME CLIMATE FOR CHANGE
For re-engineering to be successful, people have to be first on the agenda because without them, it is impossible to endorse any BPR programme. In order to create a welcome climate the management ensured the smooth flow of ideas to the lowest levels, to educate and inform the employees of the Management's plans for the Organization.

8.2 CREATION OF MECHANISM FOR ABSORBING HUMAN IMPACTS
Arvind has always viewed HR vital to its proper functioning. Mr. Ganesh VP Human Resources, "HR should always be at the heart of any BPR effort." He further elaborated that they, i.e., HRs must change its role from administrative paper pushing to proactively helping the HR managers do their jobs more effectively. This was not difficult in a reengineered environment. It becomes essential when mechanisms are required to absorb human impact. He bears this out in that that one must be strategic, focused and foresighted when dealing with the HR.

8.3 H.R. SYSTEMS SUPPORTING THE NEW ORGANISATIONAL SYSTEMS
They at Arvind understood that HR systems would have to undergo an evolution to shoulder the challenges that would set in once the change process was complete. This was realized in the early stages and led by Mr. Sormen, Mr. Vinayak, Mr. Tojo and others like them (CORE TEAM), to ensure that the HR systems were so developed that they became an enabling factor in the BPR process. It was emphasized at the very onset that they had to get unstuck at various levels and lay the foundation for creative thinking. This could not be created in a single day just through brainstorming. THIS foundation had to be developed through learning together as a team.

8.4 WHAT THEY DID AT ARVIND
They ensured that the HR evolved into a new entity with a changed mindset as well as a deep understanding of the world beyond the current beliefs and paradigms - beyond what they knew today. Fundamental changes in the Human Resources Management (HRM) processes are down the horizon: (Ganesh Sormen)
1. **Hiring** - focus has changed from short/long term job related search to medium term, person specific appointments.

2. **Knowledge** – Corporate personnel are today stressed upon to acquire knowledge to appreciate the vision and business process than just profitability and bottom line.

3. **Motivational methods** - Changed for the average worker towards work through intellect and contribution.

4. **Retraining**, learning and on the job training to keep pace with performance objectives have become fundamentals for management development.

5. **Career** - context has significantly and permanently changed in the eyes of the individuals and the organization. Pyramidal growth is seen to be deceptive.

6. **Compensation** is now a function of business goals and individual contribution.

7. **Organization design at Arvind** emphasizes on team structures with pre defined role demands.

8. **Culture** - They are today bringing in pay, performance and productivity linkages.

9. **Unions** were receptive to performance orientation to the operative class.

10. **Rewards** and life style demands in the up market socio-economic world was in keeping with the developed world.
9 - PHASE III --- ARVIND’S IMMEDIATE GOAL

9.1 GAINING COMMITMENT FOR INITIATING THE CHANGE PROCESS

Like any change, BPR too was met with some resistance. Bringing about change at Arvind was no different and it had its moments of frustrations to say the least. What made change uncomfortable was that it was more like a roller coaster ride of fun and familiarity. Taking a Roller coaster ride is both traumatic as well as exciting -- just like reengineering. Anticipation of change brought about negative reactions in many people; these included denial, anger, anxiety, and withdrawal. At this stage the people’s imagination and company gossip often went wild. Some people kept holding on, refusing to change, smoldering in resentment at the changes in work setting or procedures and technology. The CORE team at Arvind was well aware of the changed behavior of the Unionized workers and suitably geared themselves for any eventuality.

They knew that any change that would be initiated would invariably generate anxiety:

It was evident that any CHANGE
WOULD CREATE anxiety in
* PROCESSES
* SYSTEMS
* INFORMATION FLOW
* CONTROLS/CONTROL
* TECHNOLOGY

Would press the TRIGGER for
1. ELEMINATION OF ACTIVITIES & JOBS
2. ELEMINATION OF CONTROLS
3. ELEMINATION OF UNECESSARY INFORMATION
4. LOSS OF INFORMATION
5. OBSEOLESENCE OF CURRENT COMPETIENCIES

9.2 TO OVERCOME THESE ANXIETY LEVELS IT WAS ESSENTIAL THAT:

During the implementation phase the processes would be affected, it was considered pertinent to educate the people about the new role that would be required of them. Non-value-adding activities were done away with and employees had to be enlightened. They tackled this phase very effectively through re-training and relocation.

With change in systems some old controls would naturally be eliminated – causing concern to hard liners who had enjoyed a lot of power and control. Now all of a sudden they were going to lose it. The Management took care of this unsavory issue by educating them, job enrichment and job rotation thus reducing anxiety all around. ALL THE ABOVE COULD HAPPEN ONLY IF THE TOP MANAGEMENT WAS COMMITED TO CHANGE.
9.3 GAINING TOP MANAGEMENT COMMITMENT
At Arvind, they were clear from the start that for BPR to be successful they had to have unflinching support from the Top Management. Without it, the whole exercise would be like a ship without a rudder - wondering aimlessly and without direction.

9.4 DEMONSTRATION OF TOP MANAGEMENT SUPPORT
The support of the CEO was most critical and this was there was in plenty in the form of Mr. Sanjay Lalbhai. This he did as the mandate and inspiration for reengineering had to come from the highest leadership in the company, to ensure things truly change.

9.5 MAKING THE CHANGE WELCOME
Strategic and tactical steering teams (Locational Core Groups) were formed to provide strategic guidance to the BPR process, help in managing, communicating the change and resolve organizational issues identified during the process. Reengineering Czars as Champions of Change are commonly known as, were appointed on the tactical steering team.

These persons played a vital role in coordinating the various projects and team efforts involved in the BPR process. They acted as keepers of the methodology and acted as contacts for outside consultants - in Arvind's case McKinsey. They ensured that all areas of the projects had adequate resources, be they, HR, IT, etc., and coordinated the efforts to ensure a synergistic effort towards the pre-determined goal.

The steering committee advocated to one and all that, Reality was recognizing that problems would arise during change, for that did not mean change was bad. To ensure change was made welcome across the organization members of the steering team:

♦ Spent time with co-workers who had positive attitudes
♦ Did one thing differently at a time - in order to break old habits
♦ They kept their sense of humor, using, good stress management techniques.

"It is my responsibility as a leader to create an environment where excellent people would like to come and give their best, to create a vision, to give freedom for excellence."

SANJAY LALBHAI
MANAGING DIRECTOR
10 - COMMUNICATION STRATEGIES

10.1 WHICH WERE: APPEALING TO THE MIND AS WELL AS TO THE HEART

10.1.1 INFORMATION SHARING

For the change process to be successful it was essential that information be shared throughout the organization. At Arvind’s it was envisaged that for following the BPR route, Information technology would help pave the way to radical improvements, in Cycle time reduction, information access, and paper trail elimination. This meant that employees had to develop new habits such as asking questions and sharing answers to various problems.

- Imagine what could happen to the BPR effort, if the executive committee does not project the new design - Employees will not understood nor recognize the need for change; organizational rumors would create anxiety affecting productivity.

- At Arvind, led by Sanjay Lalbhai, the top managers resisted the temptation to stick with the status quo and dedicated themselves and their best performers to the project; they had to take the final - and crucial - step. BY COMMUNICATING openly. They used a variety of methods of communication and encouraged frank discussion, built consensus and commitment.

- The clear commitment of Arvind’s Core Team was central to the development of the necessary depth of commitment throughout the organization.

- The managers across the organization used interpersonal skills to give employees sound reasons, explanations of the new design, a forum for voicing concerns and feedback to show that those concerns were being heard.
Vision was a critical success factor for the change effort. Communicating a picture of its future state along with specific plans of each step was also a fundamental element in the change management. According to Mr. Gansesh Sormen, the critical success factors for major change initiatives were:

1. Top management sponsorship 2. Compelling vision of the future, and 3. Change management

11.1 The BPR Champion

As a sequel to what the researcher has already described at length earlier:

To put BPR on the right tracks they had to develop select personnel to act as BPR Champions. These persons would be individuals with the spirit, enthusiasm, power and clout to make BPR an institutional dictum. This required an unwavering commitment to BPR, the desire, and ability to communicate and instill a sense of urgency & mission to all levels of the organization on a regular basis. Given below are a few terms, which describe in brief as to how this person works:

- Inspire
- Lead
- Motivate
- Encourage
- Communicate
- Dream
- Risk

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<th>CREATE CHAMPIONS FOR CHANGE</th>
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<tr>
<td>The SAP TEAM – LIVEWIRES</td>
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<tr>
<td>Nomination process by business / function heads</td>
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<tr>
<td>Positioning as a major opportunity</td>
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<td>Assuage career anxieties</td>
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<th>CHAMPIONS OF CHANGE</th>
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<td>Deep appreciation of the business processes</td>
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<td>Analytical mind</td>
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<td>Systems orientation</td>
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<td>Persuasive</td>
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- In order to achieve the desired results in the renewal process champions for BPR/change named – LIVEWIRES were formed comprising the SAP team. The nominations to this team was not biased nor sponsored - it was more so by business/function heads, who selected the right candidate after due deliberations and consultations amongst the group so that no person whatsoever would in future raise against the selection. It was a decision by consensus.

Other champions too were identified and signed up early on. They had to be opinion-makers and able to influence others besides helping shape opinion to support BPR implementation. They were the key players in the communicating the change process.
Then, through the course of the reengineering initiatives, a number of teams were formed. **ONE SUCH VITAL TEAM WAS SAPFIRE other name for LIVEWIRES.** Each such team was led by leader, facilitator, and had members who were committed and ready to do hard, creative work. The team leader managed the team's performance and was the focal point for communication with the rest of the organization.

At Arvind's various divisions, the facilitator supported the team leader and provided process direction for the team - making sure that the discussion stayed focused and all members were able to participate. Gradually many people in the organization became involved in making, helping the extensive changes that occurred. From the beginning an approach to communicate and gain required participation was established by the strategic steering team **(CORE TEAM)** and followed by all other teams.

It was important that the organization assuage the carrier anxieties of its employees. Mr. Ganesh Sormen was very categorical in stating that, "**Most of these changes could have been traumatic, but the pain was outweighed by the gains made in the move towards the goal. Change could occur only when the pain of change was less than the pain of staying the same.**" This in a major way helped in passing on the feelings of the management to the employees down the line, and in helping them view and accept change as a favorable outcome of the exercise.
12 - INFORMATION SHARING and ACTION PLAN

Arvind’s management at the onset understood that for BPR to be successful information must be shared at various levels - bringing about transparency in the overall functioning. This would allow them to meet pre-designated goals and to do so the first task entailed:

12.1 Presentation to top management - Joint teams of business heads and SAP team.

Joint teams of business heads and the SAP team made a presentation. This meant garnering support, infusing a spirit of partnership and above all a spirit of e’spirit de corps. This allowed the implementation of the action plan effectively.

12.2 SAP IMPLEMENTATION

In May 5, 1998 -- The Arvind Mills Limited went live with SAP R/3, in their new manufacturing units. The implementation was completed in just 7 months.

Arvind Mills has always been a pioneer in using modern methods and techniques in management and technologies. Early in 1997, the Company identified information technology as a catalyst for creating the infrastructure necessary to cope with the pressures of globalization. Consequently, Coopers & Lybrand, leading Information Technology Management Consultants, were commissioned to draw up an information strategy blueprint for Arvind Mills to adopt.

After evaluating the leading Enterprise Resource Planning (ERP) solution providers, Arvind Mills opted for SAP. SAP also agreed to assist Arvind Mills in addressing certain textile-industry-specific requirements through innovative process work-arounds and customization.

Arvind Mills commenced Project SAPFIRE towards the end of August 1997, with SAP India as the implementation service provider. SAP India selected Coopers & Lybrand to provide additional project management support. They used techniques from their state-of-the-art ASAP (Accelerated SAP) methodology to bring in project management tools to ensure rapid implementation. The Core Team was put through extensive SAP product training at the SAP facility at Bangalore, thus making the project effective from Day One. As required by SAP, Arvind Mills created "a war room" project facility, resulting in better focus and delivery. This approach ensured that Arvind Mills, SAP and Coopers & Lybrand worked as one team towards implementation of SAPFIRE.
Arvind Mills was all set to go live by mid-April 1998. Never before in India have functionality’s from SAP key modules been configured in such short span of time. Mr. Vijay Chabbra, Project Manager, Arvind Mills, says, "We have proved that SAP implementation can be successful in an aggressive time frame if only one follows the right methodology as we have done with SAP’s assistance." He goes on to add, "It is also important that senior management support is constant and their involvement unfaltering." They had excellent commitment right from their Chairman, Presidents, and Vice Presidents, down to their line managers. Human Resources rescheduling issues relating to the formation of any such team were taken into consideration and planned for. Especially, people, being pulled out of their regular assignments, created uncertainties. To address these issues, President, Human Resources, was made a member of the Project Steering Committee".

Today, Arvind Mills stands as perhaps the only one with end-to-end SAP R/3 installation in the textile industry in the region, and possibly the world. The Company has initiated the implementation of ERP to handle issues relating to Materials, Management, and Production Planning. The ERP implementation has helped it to consolidate across various units as well as get accurate project cost figures and reduce the time in supply chain management. It also helps the management to keep track of the delivery date, status of customer orders and improve support to customers.

By implementing a vast SAP Network they re-defined the information flow systems within the company. Change in the information flow system made a large number of people redundant as IT took care of most daily information requirements. This anxiety was taken care of by changing their job profile, training them and relocating them to other functions within the company. This reduced heartbreaks that would have had to been witnessed otherwise. Job profiles were redefined.
13 - REALIGNING IT WITH BUSINESS STRATEGIES

Much of its past decade at Arvind has been spent attempting to reengineer business processes and corporate infrastructures. Mergers, acquisitions and expanding markets outpaced the IT organization's ability to adapt to these changes. The Question arose -- Could executives and managers articulate business requirements to IT in a way that allowed the two organizations to work as a synchronized unit?

BPR at Arvind allowed management to realign organizational functions along more strategic lines. It examined the present processes supporting the business and redesigned those processes to reflect more efficient ways to achieve organizational goals. BPR is and was not an isolated phenomenon.

13.1 Challenges: The implementation has had its share of pitfalls and problems. Among them were - A Big need for training. One can hear in the realms of BPR that you can't teach old dogs new tricks, but you can teach techno-dogs how to use new systems.

13.1.1 Corporate office info miss-matches: With so many divisions of the company involved, there was a problem of different information formats. Home offices, which were educated as to why and what was being done ended up supporting the process and often incorporating what they could into their enterprise-wide procedures.

13.2 Desire for invisibility: They knew that a proactive system was: sharing of information amongst all parties, as keeping information close to the chest was an old human habit. By making data invisible, or inaccessible, people often felt they would not be questioned too deeply about it. An atmosphere of openness could be sustained only if each party understands that by sharing information they would eventually reap the benefits. Less paper, not paperless systems --- while the ultimate goal was to produce a paperless system, some paper would still be used where extremely necessary. However, administrative documents were reduced drastically. Further, as confidence in the new approach grew, "security blanket" requirements for hard copies evaporated.

13.2.1 Proactive systems are not for everyone as they required a great deal of teamwork to develop and worked best when applied to a complete process. A proactive system was considered, as an organization needed to:

Diagram source: SAP
✓ Improve customer service: Proactive systems logged customer requests and measured the time taken to respond to them.

✓ Reduce heavy administrative and coordination costs. Less paper movement all round

13.3 Lessons Learned

The major lessons learned centered on training and retraining - there just could not be enough. Users needed to un-learn or get de-programmed of whatever was obsolete in today’s terms and start learning afresh vis-à-vis new ways of thinking. A two-phased data representation process helped users overcome this. An interim step reduced the reluctance of some personnel to give up their old systems when users afraid that data didn't appear in the formats they were familiar with. As they grew to trust the accuracy of the data, they then moved to the new representations more comfortably.

BUSINESS DECISION SUPPORT SYSTEM

![Diagram of business decision support system]

Being the first system of its kind, users learned as it was developed which made retraining difficult. Subsequently actual screens were used where processes were visible and facilitated the re-learning process.

Well-engineered, Proactive systems, supported by top management and accompanied by requisite training, helped reap benefits. These benefits included consistency in management policies and procedures and greater productivity for managers, reducing both cost and risk. While the road to success was at times frustrating, the experience at Arvind indicates that the approach could really work.

13.4 COMMUNICATION CONTENT

➢ The next logical step in the Organizational Renewal Process was to decide on the future organization and how to prepare for the change. Investments were required.

➢ Costs had to be considered before deciding on the right strategy for the organization. A disruption in the status quo was expected if not, there would be no change.

➢ Individuals and departments were expected to sacrifice some ground. Additionally, investments would be incurred in training, assessment and implementation of various recommendations.
13.5 INFORMATION TECHNOLOGY AND ARVIND

13.5.1 LOTUS NOTES

An extremely forward-looking organization it embraced IT to take advantage of the tools it offered. They eliminated paper transactions by relaying on e-mail for normal inter-office and external communication.

The internal communication they used Lotus-cc-mail through a countrywide setup encompassing more than fifteen sites. **This was the beginning of creation of message flow lifeline for ARVIND.** According to B M Shah, Vice President Systems & Finance, "They, at Arvind had a vision of IT as a critical business tool and had brought about change in the work culture by bringing IT to everyone's desktop and integrating it completely with the work. Their destination was to finally use the web as a business tool."

To make this happen, what they looked for was not a mere messaging platform, but a suite, which in addition to mail could provide facilities like workflow, web-engine and integration with business database. After rigorous search and pilot runs, the choice zeroed to Lotus Notes DOMINO. It was installed across the country - migration from cc-mail was carried out successfully.

Today more than 500 plus users are on Notes spread across two sites with the servers replicating over WAN links with plans to install at other sites. Notes as the mail engine has stabilized with all users comfortable. **The bright side was, not experiencing single databases crash and thus zero loss of data, asserted their Manager Systems.** The current setup consisted of two Notes servers with users distributed amongst the sites at Naroda Road and Santez. The Naroda Road site has DOMINO Web server also installed along with SMTP gateway to a 64 KBPS link to Internet. There is a firewall in place at Naroda and the proxy server based on Lotus Go-web-server is configured for domain name resolution.

Users had the flexibility to access their mail database using standard Notes front-end, Web browser or even POP mail while on Internet. According to B M Shah, "This eased out lot of things, besides exploring the virtual office scenario. He further stated with great conviction that their ultimate aim was to have their management to be constantly connected where ever they were."

There were still a few users spread across the country using cc-mail and provision for their cohesive co-existence has been made in the system. Users were transparent to the fact that the sender is a cc-mail user or a Notes user.
A Company wide Internet was developed for productive use installed on the Notes DOMINO server with access to all users on the ARVIND network through the Web browser from their PC. The Internet was a completely collaborative medium with postings on HR, Systems and related topics. It even provided links for access to non-browser based applications thereby living up-to the expectation of making WEB as the de-facto desktop at ARVIND.

They plan to incorporate workflow based applications like leave requisition, performance appraisal, and hotel & travel related bookings on the same platform. Now Arvind Mills is moving towards using Lotus Notes as a front-end to SAP. According to B M Shah, “This would give them the facility of universal inbox, and help them move quickly and deploy e-commerce solutions.”

13.5.2 YEAR 2000 COMPLIANCE

The Management at Arvind Mills Limited was fully aware of the potential threat of Y2K issue and had put all efforts to make a smooth transition to next millennium. Efforts were started in early 1997 to implement the policy and guidelines to deal with the issue of Y2K bug redemption.

As part of their Year 2000 compliance program, all the IT equipment and systems like mini computers, Office-automation servers, networking equipment (for LAN and WAN), communication devices and related equipment were checklisted and made compliant where necessary. A total investment of Rs. 7.5 Crores was made for procuring the hardware and networking systems for the implementation. The total investment made in hardware, software, training and networking for the same was around Rs. 12.5 Crores. Legacy applications, which were made Y2K compliant as on 31st March 1999 without any additional cost.

On the software side, the Y2K issue has been managed through a company wide implementation of SAP R/3 in all major business areas. SAP R/3 is a fully integrated business application solution designed to meet the growing business requirements of the company arising out of the massive expansion and global business compulsions.

However, systems at their Telecommunications and garments divisions were made Y2K compliant by 31st March 1999. Their new service contracts, systems related procurements were done only because they knew that the deliverables were Y2K compliant. Hence, there were no processes, functions or operations likely to be affected.

13.6 Information Technology as an Enabler of BPR?

Hammer (1990) considers IT as the key enabler of BPR, which he considers as "radical change." He prescribes the use of IT to challenge the assumptions inherent in
the work processes that have existed since long before the advent of modern computer and communications technology.

Mr. Ganesh VP HR acknowledged that at the heart of BPR there is always a notion of "recognizing and breaking away from the outdated rules and fundamental assumptions underlying operations . discontinuous thinking."

Mr. Ganesh stressed that they at Arvind framed rules of work design based on the fact that, "assumptions on technology, people, and organizational goals no longer hold."

He pointed out that they

♦ Organized around outcomes, not tasks.
♦ Subsumed information processing work into the real work producing the information
♦ Treated geographically dispersed resources as though they were centralized
♦ Linked parallel activities instead of integrating their results
♦ Putting the decision point at source of and built control into the process
♦ Captured information at source.

AT ARVIND A NEW BUSINESS MODEL WAS REQUIRED
14 - IT AT ARVIND

Arvind has won accolades as one of the top twenty most competitive companies in Asia. In its quest to achieve global dominance, Arvind adopted the best business practices and leveraged IT as a strategic tool to achieve competitive edge. Today Santez and Naroda sites have gone live on SAP, while at other units, the implementation will be completed in over a nine-phase cycle.

Understanding Dynamic Demand Management

<table>
<thead>
<tr>
<th>Common Channel Participant Needs</th>
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<tr>
<td>Reduce the cost of the total product flow stream</td>
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<tr>
<td>From the point of origin to the point of sale (consumption) and</td>
</tr>
<tr>
<td>Accelerate channel response time to meet</td>
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<tr>
<td>Changing customer demand</td>
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SAP’s recognition came along. It has recognized Arvind’s contribution in building a SAP prototype for Process industry segment of Textiles, Paper, Pulp, under a title of SAP-Mill business. Arvind has been awarded Star implementation award for successful completion of project, by SAP-AG.

14.1 Full fledged Intranet for the organization

It has set up firewall, proxy, SMTP gateway and workflow based applications. EDI connects customers abroad such as customers in the US for electronic transactions and also later on among the branches within the country.

Groupware Applications - It deployed a groupware package developed in-house. It comprises of leave requisition, online tax query, loan / outstanding status for employees etc. Top-of-the-line products in IT are installed. The real charm is that all are amalgamated into a cohesive system being used to its fullest productive use. The selection of best products and their implementation in the most productive way and has given them leverage to take the vision of the company ahead of times.

According to B M SHAH – Vice President (Finance & Systems)

In a global arena where customers are quality conscious and technology savvy, deriving the best from technology is imperative for business successes. The Organization has identified IT as a catalyst to growth and has a well-crafted information strategy blueprint for them to adopt. As the third largest denim exporter in the world, and an extensive

Diagrams source: SAP
network of customers, partners and resellers, **communication and connectivity were the biggest issues** to be tackled. Prudently, the need of a robust IT setup was realized and appreciated from top-down and deployed as a business necessity. The FIGURE below is an indicator how they networked and aligned their various functions vis-à-vis customer demand.

![Optimization of Cross-Functional Processes](image)

Arvind is a prime example where all the IT tools are optimally used at lowest possible costs. Asserts B M Shah, "Money can buy any technology, but what has been our USP is its effective deployment and the cohesive coexistence, which makes Arvind Mills a prime example of cutting-edge technology implementation."

Their positive outlook has helped keep pace with the trends and embrace the right tools of technology to leverage business opportunities. This has not only given them a respectable corporate image but also projected them as a very adaptable and technologically savvy organization.

IT at ARVIND is not merely a computing process, its tentacles are spread across many functionalities like ERP, messaging, even process control and automation systems.

14.2 **IT Hardware and office automation**

Lalbhai Group has been always pioneered the use of latest technology. Starting with PUNCHING UNITS way back in 1969, to UNIT Record machines and onto UNIX boxes. Today ARVIND has some of the top of the line server and desktop systems, which run applications like ERP, based on SAP R/3, Messaging, Legacy applications etc. By
Optimizing the Supply Chain it was easy to offset the uncertainty that would crop up in case of an eventuality arising out of product flow failure FIG.

Collaborative Business Planning
Minimizing the Impact of Uncertainty through Supply Chain Optimization and Simulation

Optimal Flow Of Product To Meet Plan
Planned Demand

Source -- SAP

Bar codes are used extensively through in-house developed applications to track material till its final destination.

14.3 Customized applications: for Exports documentation helps reduce cycle time for material shipment. The shipment details are sent to the C&F agents electronically and this gives them time to prepare for other government formalities while the material is in transit. Even post shipment confirmations are received online and hence invoicing and other commercial processes begin utilizing the latent periods.

14a. PROCESS CONTROL AND AUTOMATION

BPR also extended its tentacles to the depths of the manufacturing systems so as to redesign the processes. Its impact is evident as it has greatly reduced the Cycle time, errors, waste in terms of Raw Material giving absolute control on production cycle, accuracy and consolidation of resources thereby optimization their use.

14a.1 AUTOMATION: A few examples are:

14a.1.1 A design simulation system, Emulates jazzy designs online and forwards to prospective buyers to choose from. Later these are transferred to the test looms for complete fidelity replications.

14a.1.2 A robotic material handling system where: The user keys in the material required and the robot picks it from nicely stacked bins and updates the stock too.

14a.1.3 A fully automated Dyeing system is based on the recipe (process configuration). Desired concentration of chemicals is fed in, necessary temperature and steam cycles are set automatically, giving a fine quality dyed yarn as output.
14a.1.4 Loom-monitoring systems give outputs in form of efficiency, time taken and history of operation. The data is fed online into SAP to arrive at the manufacturing costs. Inspection systems in the bottom Weights section analyze defects on the finished fabric and mark the points of defect. This helps cut long fabric rolls into desired pieces.

14a.1.5 A fully automated environment control system helps maintain control humidity and temperature, which is very critical for cotton, based textiles operations.

14a. 2 Conclusion: A team of highly dedicated professionals specifically groomed in use of IT to the fullest business advantage do all this. They were committed to achievement, skill, competence and contributed professionally towards organizational goals, profitability and with excellence. A concept of delegating responsibilities by the leader imbibed a sense of ownership amongst the staff and has worked wonders for the team.

In a nutshell, IT at ARVIND has attained a level of maturity and the backbone is fit to take on any new business initiative with fervor and spirits soar high to move ahead with E-commerce and video conferencing initiatives in the coming years.
15.1 THE ROLE OF THE LEADER AND THE MANAGER

For it to be successful BPR had to have the support of the Top Management and if resistance was encountered, the leader had be willing to "drive" change with conviction and force if required.

When the researcher questioned Mr. Ganesh on his views, he replied, "A leader must be Relentless in adherence to what is right; have the courage -- moral as well as physical to recognize that surface appearance is often an illusion. He must have a dogged determination to get at the deeper truth. Managers in the company undergoing BPR must work to quell the fears of employees and resistance to change (even though they may have their own apprehensions).

As one executive with BPR experience put it, "Once BPR plan is in place, you must pull out all stops and execute it. You cannot stand in the middle - between what you used to do and what you're going to do." If not, expected results will be sacrificed besides people will lose focus, and "BPR will slip into process improvement." Initially employees may be enthusiastic if they view it as a "win-win" situation but resistance will develop later when employees begin to doubt the impact of BPR. At this stage managers will be forced to adopt a more "insistent" policy.

Mr. Vinayak pointed that it was this lack of ambition that made BPR projects fail. "Companies that flirt with BPR suffer the pains without the gains." BPR urges management to go ahead full steam and implement change on a grand scale. After BPR Managers are compared to coaches and do not order; they guide, do not direct the work of others; they coordinate, facilitate and empower.

At Arvind they strongly believed that those who worked outside of the status quo would propel the organization to success. Mr. Ganesh said, "New Paradigms put everyone practicing the old paradigm at great risk. The higher one's position the greater the risk." So, along-with his core team they emphasized change in this reality if they were to have a role in the organization of the future. Next in the continuum was people with an analytical mind would eventually reap the fruit of the labour of the BPR process.

They strongly believed in inculcating a system orientation approach to achieve set goals. According to Ganesh and Vinayak, managerial accountability moves to the front line in a BPR process as whatever supervisory capacity middle managers had now passed to the people who worked in teams or had become increasingly self-managed.
Further Ganesh Sormen said, "This empowerment eventually forced the middle managers to redefine their traditional roles and activities - to a team based approach, which required the effective requirement of a project management framework for success."

<table>
<thead>
<tr>
<th>SYSTEMS</th>
<th>SKILLS</th>
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<tr>
<td>FROM</td>
<td>TO</td>
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<tr>
<td>- Ad-hoc historical practices in operations</td>
<td>- A few key meetings, decision oriented</td>
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<tr>
<td>- Too many meetings discussion oriented</td>
<td>- Proactive well developed mgmt. system</td>
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<tr>
<td>- Reactive / Underdeveloped Performance Mgmt. Systems</td>
<td>- Focussed information systems with key valuable reporting</td>
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<tr>
<td>- Defocussed info sys</td>
<td>- A few key meetings, decision oriented</td>
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<td></td>
<td>- Holistic managerial</td>
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<td>- Outward looking</td>
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<td></td>
<td>- Customer / market oriented</td>
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<td>- Cost and time focussed implementation</td>
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<th>STAFF</th>
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<td>FROM</td>
<td>TO</td>
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<tr>
<td>- A few managers at full stretch</td>
<td>- Critical mass of competent managers</td>
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<tr>
<td>- Sketchy HR processes</td>
<td>- Comprehensive HR management</td>
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<tr>
<td></td>
<td>- Leaders as coaches/ facilitators</td>
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<td></td>
<td>- Strong performance drive</td>
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<td></td>
<td>- Corporate teamwork</td>
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<td></td>
<td>- Aggressive entrepreneurial streak</td>
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15.2 SYSTEMS ORIENTATION

- The system could be used for any size organization, part or in full.
- The system incorporates comparison to benchmarks.
- The system was defined to the specific vision of the measured organization.
- The system quickly and visually portrayed progress over time, prime constraints, and overall health of the organization.

Finally, in order to ensure success of BPR it became essential to be persuasive meaning that people had to either to fall in or get out, but, this was very diplomatically put across.

15.3 CONCEPTUAL CONTINUITY

Though unpractical, it would have been ideal if every member of the organization could be involved. These members of the team are very valuable later as they can explain the thinking behind some of the conclusions, which might seem confusing or "dumb" when the entire context is not known. They become credible missionaries and
advocates for the new arrangement of things and the logic behind it. They are especially valuable as members of design teams that work on the detailed changes needed to implement the strategy with others from the organization who were not directly involved. **At this later phase in the process, they provided the conceptual continuity to allow the organization to involve more people in the process as changes were being detailed and implemented.**

People had to implement them without trying to do two things at once or worrying about "what if I had gone the other way." They had to realize that without making a decision about what was desired, it was impossible to envision a future and set themselves up in advance to capitalize on what they thought would come

Ganesh, **"Until all are committed there is hesitancy, the chance to draw back, shows ineffectiveness. There is one elementary truth concerning all acts of initiative: that the moment one commits oneself, then God moves too." With no commitment to a single strategy, the result - what one is currently living with.**

To stay focused they kept their options open and adopted a "wait and see" posture and reacted only to try and catch up after the act.

Vinayak (Manager HR) sited the example of a Hockey player. "A hockey player can only be in one place at one time, similarly it is equally impossible to set up an organization to be world class at one thing and at the same time, be "world class" at something opposed to it." **Even if it were possible, it would be too costly. This makes that "world class" service more expensive than customers can afford.**

To be able to be instantly responsive, they maintained some slack resources waiting to take the calls. To be cost efficient, they scheduled work to use the least number of people with specialized talents.
Ganesh Sermon put it in a very lucid manner and quoting from his vast knowledge on Reengineering he said, "A manager saw his earlier BPR process recommendations go up in smoke. The team had spent over six - nine months of unrelenting effort to redesign several of their core business operations. They developed many creative ideas to overcome known problems and roadblocks in the current environment. Some of these ideas had actually been piloted in one or two areas of the business and some were already being used successfully in other businesses."

The team had felt strongly that their design would catapult the company into a future growth environment. But, when the team delivered its recommendations, they were met with strong resistance from top management. No one believed the changes would be cost effective. Most rejected the recommendations as not right for their company and none of the recommendations were implemented.

What went wrong? "It wasn’t that our ideas were bad," said the project manager, "but, with hindsight, I believe we made a very bad mistake by ignoring communicating with the rest of the organization. When we presented, no one had any idea about what changes we were suggesting. Many people felt slapped in the face when we said that their operations should radically change." This manager and his team learned the hard way that communication was a critical ingredient to BPR success.

It begins when the project is first started and it ends only after the implementation is complete. Ganesh admitted that they had learned, through the experience of many organizations, that communication was most effective when it comes from the people who have credibility with the rest of the organization, when it addresses the needs of the audience and when it creates a dialog where people can get answers to their questions. They also learned that what you actually need is a basic people-to-people strategy that is executed by project team members, supervisors and managers.

During the BPR project, executives responsible spread awareness about the need for change within the management team, by talking directly with team members about the situations and problems driving the need to change. They discussed the
consequences for not doing so. Besides laying stress that incremental efforts were not enough to position the organization for the future.

Managers gave the supporting information and encouraged periodic leaks of the progress of the project to the outside so that the general public at large was aware of the activities going on inside. This in turn sent favorable signals to the stakeholders and other interested parties.

The managers spread the message of change throughout their own teams. The goal was to make people uncomfortable with the status quo. Leaders gave solution-based messages instead of telling people that they would be forced. Executives raised awareness for the need to change and laid out the risks of not changing.

Periodically the CORE TEAM made presentations to the senior management to appraise them of the developments & the progress made by each BPR team. This helped them to garner support and the much-needed direction and advice.

It became the job of the project team members to create a peer-to-peer dialog within the organization as they constructed their BPR blueprint for change. The project teams consisted of people from those divisions of the organization that were to be directly impacted by the change. These were people with organizational credibility and trust.

Reason for the need to change had to come from those directly impacted by the change process. Team members were assigned units, presented their cases and conducted sessions to answer people’s questions. To do this effectively, Teams were trained in basic facilitation skills, to arm them with knowledge on how people react to change.

A regular newsletter was published providing updates of the progress made by the various teams on BPR. Personnel heads were made to own the process and hence were accountable for the success or failure of the project. This was not surprising as Mr. Vinayak, a HR manager was a CORE member of the BPR activity and knew the processes from almost all angles

16.1 Management’s Failure to Change

According to Ganesh Sormen, "A fundamental source of difficulties during the struggle while implementing reengineering was that the process usually got reengineered and not the management. “ Reengineering changed all aspects of Arvind’s business. Besides changing jobs & skill requirements, it forced changes in management style too.

Reengineering forced managers to re-evaluate not only what they did, but who/what they were. It touched what they knew and how they thought.
As Tennyson wrote, “The old order changeth, giving way to new” so too the old ways of managing the organization and command-and-control techniques gave way as they no longer worked. The new organization structure required a new management philosophy. **Management did change** the way it thought, organized, planned, deployed, inspired and rewarded performance. **Managers were now required to learn to organize work in a holistically integrated way.** An environment was created to replace generalist with specialists. Preoccupations with internal activities were shifted to focusing on customers. They were forced to alter the existing rigid infrastructure of the organization to facilitate cooperation between various departments by using cross-functional teams instead of individuals working in isolation. The magnitude of implementing the reengineering process could have been a great problem without a paradigm shift in orientation, managers would have wound up being disappointed with their reengineering project.

### 16.2 IMPORTANCE OF PEOPLE IN BPR

Alone, the term “reengineering” sounds highly mechanistic devoid of human content. Looking back, the researcher has noted that many companies that attempted reengineering focused primarily on process design and ignored or underestimated the importance of people. **At Arvind the effort was led by Mr. Sanjay Lalbhai himself** who was well aware that without employee involvement in the reengineering effort, the implementation was guaranteed to fail. He was aware that BPR would eventually change their way of doing business. **When a process changed, the jobs of those who did the work in that process also changed.**

He personally laid stress that, the way in which employees’ thought, behaved, their attitudes and beliefs must also be realigned to fit the new process. Reengineering effort at Arvind did to a large extent affect almost everyone’s job profile in the organization causing employees at all levels to require new skills. Besides, reengineering involved the process of combining many job categories into one, which required extensive technical cross training. **Skills and abilities such as problem solving, communication, teamwork, and customer orientation became increasingly critical.**

**CREATING AN ENABLING ENVIRONMENT – INTERNAL**

- Compensate for loss of business / functional identity
- Create a strong team
- Workshop at outside locations
- Common working area
- De-emphasize designations, levels
- Emphasize contributions
- Emphasize the magnitude / importance of the task
Ganesh and his team stated that training in these critical areas was imperative, if reengineering was to succeed. He clarified saying that proper training prepared employees for their new roles and helped support the new values and behaviors that underlined the reengineering philosophy.

Further, for BPR to be successful required new approaches to training. A thorough skill assessment of the workforce was undertaken through job-analysis and needs-analysis. The analysis helped determine what skills were needed and what changes had to take place. Resources were committed to the training effort and support was be provided at all stages for those who were being trained. The training program was evaluated to assess if it was focused on what was to be learned. Finally, the training was implemented as an ongoing endeavor.

Along with BPR came enormous changes and along with it came the tendency to cause organizational anxiety. One challenge they faced and coped was the reaction of employees to the change process. Initially it did prove difficult in getting people follow the reengineering regime. Their fears about job displacement were alleviated and explained. This made them feel that they were a part of the BPR which helped improve their morale and soothe negative feelings. Failing to Recognize the Importance of People would have been catastrophic.

<table>
<thead>
<tr>
<th>MECHANISMS FOR ABSORBING HUMAN IMPACT</th>
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<tbody>
<tr>
<td>Early identification of:</td>
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<tr>
<td>• Jobs / processes likely to undergo a change</td>
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<tr>
<td>• Competencies likely to become obsolete</td>
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<tr>
<td>• New competencies required</td>
</tr>
<tr>
<td>• RETRAINING</td>
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<tr>
<td>• Redeployment to substitute hiring wherever possible</td>
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<tr>
<td>• Exit options</td>
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The management at Arvind in order to ensure the success of its BPR project conducted several workshops outside company premises. This was done keeping in view that the working area locale would be disturbing to proper learning. It would not, in other words, allow the building up of cohesive teams. Sessions were conducted at various outside locations and teams from other divisions were free to meet and share knowledge. This also led to building strong interdepartmental ties, which later helped in getting the projects at different sections on stream.

Though designations were important they were de-emphasized so that work and information could flow unhindered. During discussions with Mr. Vinayak, the researcher noted that levels were reduced, meaning that earlier where many was the rule now the same was changed to fewer the better. This led to anxieties but these were short-lived as the management instead of retrenching experienced people decided to re-locate them. This it did when as a result of its on-going expansion plans to go global it set up a State-of-the-art Plant at Santez to manufacture High-Value products.

Seminars were conducted so emphasize on the need to contribute in way of suggestions for improvements. Top management too conducted sessions to educate employees about the magnitude / importance of the task ahead. This led the employees to look upon the whole project as their own rather than a game plan of the management.

Employee Involvement and teams played an important role in Information sharing and implementation. Through functional and cross-functional teams, systems and processes were developed to address the end user requirements, while also adhering to the organization’s strategies. Each team was comprised of a cross-section of members who represented some specific part of the process under study. This included the individuals who worked within the process, the suppliers of services and materials brought into the process, and its beneficiaries, the customers.

For the project to be successful, it required commitment from various functional groups, including network, systems, database and applications. It was often very difficult for groups of diverse needs and interests to cooperate, but to achieve the best results, all involved parties had to agree on major issues and how the end result was connected to

Diagram source: PWC
the organization's goal. Personal commitment was achieved in exchange for individual and team rewards and recognition.
18 - INFERENCES:

It was felt by the researcher that it would be more effective to try and summarize major issues and themes from the interviews rather than focusing on who said what.

It was clear from the interviews that everyone had their own views on the value and integrity of BPR. Some asserted that BPR was the “answer” to all their business problems. Many thought that there was a Core Center to BPR that was worth taking seriously, but felt it was not necessary to dress it up in a language of processes. Still others were much more skeptical believing that BPR was just another management fad, that there is nothing new in it’s philosophy, and it ignored the significance of human and organizational issues.

At the very onset that at Arvind realized that it was essential that during the BPR activity adequate attention should be given to the human dimensions of organizing, emphasizing, "how employees, not just processes must be re-engineered or debugged if they were to run effectively on new systems."

18.1 THE ROLE OF SENIOR MANAGEMENT

It was realized that a strong leadership was necessary to prevent if BPR projects from being ruined by the “psychological and political disruptions that accompanied change.” They noted that change progressed more quickly with a different style of leadership which Arvind’s management style had the foresight to bring into effect.

All interviewed agreed that persons at senior levels with no experience in BPR had to be re-educated in terms of strategy, direction, future thinking and working as a team themselves.

According to Ganesh Sormen “...they had individual success driven people, with very good track records in each of their own disciplines and driven by lets get the year end results. Now they were required to do something very differently - looking at the present strategy of the company and taking the company forward.”

Some interviewed felt, however, that there was less change required at the senior level compared to that required at middle management or employee level. They argued that BPR changes the senior level conceptual map of things but it doesn't change what they do.
They unanimously agreed that the seniors must lead by example. In undertaking a fundamental transformation of business processes it had to be top down or otherwise it will not work. According to Ganesh, (quoting Hammer), "most of the reengineering failures stem from breakdowns in leadership." Further Ganesh cited that top management's commitment and support was of critical value in the move to a process focused organization.

All the interviewees stressed the need to have alignment and commitment from all board members making sure they are not just paying lip service to the change, but actually having roles in the process from the start to the finish. In enabling the workforce to respond positively to BPR, some of the interviewees referred to the new role as "liberating the employees"; "converting the work-force"; "energizing BPR pursuits", and "unleashing new values and beliefs".

This would have been impossible without credible communication from the top, to convert the hearts and minds. All of the interviewees agreed that open and focused communication was imperative in all senior management activities. It was for one to see that the senior management was using a number of communication channels to promote the change through a newsletter about the changes. The senior management abandoned the traditional managerial forums replacing them with new workshops that concentrated on keeping the focus on business problems and the new vision.

Responses were elicited from the interviewees in that they felt that senior management investment of their own time was a major motivating factor in the change process.

18.2 THE ROLE OF MIDDLE MANAGEMENT

The majority of the interviewees agreed that middle management faced the biggest challenge in the move to a process-based organization. The threat to management went beyond redundancies; the core importance of cross-functional, multi-disciplinary teams in BPR meant "managerial territory was severely reduced as responsibility devolved from individual roles to teams". As middle managers joined teams they lost the power base that they once had.

The role of middle management had now shifted from monitoring and control to collaborative, support functions, helping teams solve problems and creating space for operators/employees to work more flexibly as they take on more responsibility.
A few interviewees commented - "...in the previous culture middle management decided what employees should know, now we ask them, something that was totally unthinkable before..." According to the interviewee's experiences middle managers who were not in a position to or would not change left the company. As a process management became part of the team's job, there was little use for the layers of management that existed in the functional organization.

18.3 THE ROLE OF EMPLOYEES

The development of multidisciplinary/cross functional project teams were a major aspect of BPR, giving more responsibility, decision-making autonomy, and flexibility at source i.e. where it was needed. Therefore, more of the working of an organization was transparent to individual workers than was previously the case. For example, a number of the interviewees pointed out that because the new roles were part of the business process, employees were aware that the end result would have positive implications of "connectiveness" and "ownership" for the individual workers.

18.3.1 Ganesh: "Empowerment was an unavoidable consequence of the re-engineered process: processes can't be reengineered without empowering process workers", and that "work becomes more rewarding since people's jobs have a greater component of growth and learning".

Some of the interviewees pointed that employees were expected to agree and go along with goals and changes in working life that have been determined by senior management, and that they were the last to know about how change would effect them. As a result, many of the interviewees stressed the importance of getting the employees on board from the start. Some admitted that if they were do it all again they would involve them early in the change process as after all that is where "a lot of the process knowledge existed."

Some interviewees agreed that the transition period in the change process was most difficult because the management wanted the BPR to be as risk free as possible. And it is at this stage especially that managers had to keep the momentum for change going.
18.4 CULTURAL AND BEHAVIORAL ISSUES

According to Ganesh, changing values and beliefs was one of the most difficult and important aspects of BPR at Arvind. It was never overlooked. There was overwhelming consensus from all the interviewees that culture change was proving to be one of the most "intractable" aspects of successful business process management at Arvind.

The CORE TEAM at Arvind identified a number of cultural barriers, which required to be addressed. These included - trade unions affiliations, tradition built on quality and strength of product, hierarchical structure, vertical communication, command and control, distrust of management, functional expertise, individual work/accountability, low work discretion, accepting the status quo, status differentiated, thriving on fire-fighting and the treatment of IT as the "enemy".

Ganesh stressed that systems alone did not improve organizational performance or create business values; one had to create a culture wherein the people were motivated to want to use the new information systems. Getting people on the bandwagon was identified as a major cultural barrier especially when the introduction of technology was equated with redundancies.

Further it was very difficult to make people change their behavior, but there was agreement that if you did not measure changes in behavior during the change process, it would lead nowhere. This raised the question on how to successfully change behavior. It was very clear from the very beginning that cultural change had to become a core part of what a business measures itself on, f not appreciated from the very onset the IT and strategic plans would fail to meet their objectives.

18.5 NEW SKILLS AND COMPETENCIES

CORE team members identified a number of different and quite fundamental skills and competencies required in the changed work environment. These were problem solving, communication, team-working, customer orientation and initiative skills, risk management, stress management, counseling, multi-skilling, new technology skills, strategic thinking, planning processes and future thinking.

It was clear that the main skills and competencies required could be grouped under four broad categories - individual, strategic, team and technical. Inevitably there are different skills required at the varying levels. The findings from the interviews indicate that all levels required training for new individual and team skills.
18.5.1 Changes in promotion and career aspects caused a number of problems, particularly at middle management levels. The traditional advancement in managerial status no longer applied. So many managers had to be willing to accept their new roles with the prospect of no promotion or even increased salaries.

Vinayak and the production head were categorical in stating that moving from the "one man one task" practice at the working level to multi-skilling had also caused motivation problems in some spheres of the Organization.

18.6 RESISTANCE TO CHANGE

It was accepted as natural that "resistance to change" would prove to be a major barrier to its success. This was so because, people do not like change, they find it difficult and an implicit criticism of their own performance and behavior. BPR was perceived by some as a threat to their jobs, either directly to the existence or to the quality and content of their jobs. It was understandable that people would resist change, as they would want to hold on to their jobs. But according to the Core Group members at Arvind they did face this issue of resistance but on a lower scale. Interviewees unanimously agreed that resistance to change materialized in the middle management ranks much more than in senior management positions or at employee level, as this was where most radical changes took place.

THIS LED THE MANAGEMENT OF ARVIND TO REVIEW AND UNDERSTAND THE: 
THE PEOPLE ASPECT OF BUSINESS REENGINEERING

"According to Mr. Sanjay Lalbhai, it was important to understand that people should not be put on the anvil, but, it was more important to look at where the process failed."
"He (Sanjay Lalbhai) understood that, if there was a problem, it was because the process was broken. The people were doing their best to make it work."

"IT IS MY RESPONSIBILITY AS A LEADER TO CREATE AN ENVIRONMENT WHERE EXCELLENT PEOPLE WOULD LIKE TO COME AND GIVE THEIR BEST, TO CREATE A VISION, TO GIVE FREEDOM FOR EXCELLENCE."

SANJAY LALBHAI MANAGING DIRECTOR

This he could do only by CREATING A DREAM ORGANIZATION ---- whose

**CORE VALUES**
- OPENNESS AND TRANSPARENCY
- DIGNITY OF THE INDIVIDUAL AND THE INSTITUTION
- INTEGRITY
- TRUSTEESHIP

**THE WAY WORK WOULD BE REFLECTED**
- CUSTOMER ORIENTATION
- LEADERSHIP AND INNOVATION
- ENTREPRENEURSHIP
- GLOBAL MINDSET

The workers knew these things all along, and they were pleased that the management had finally figured that out!

According to Ganesh, if they were going to change the processes, they must first improve them, fix them, and only then the workforce would be happy. But, according to him, there was a catch --- The workforce comprised of people and BPR meant change --- and people usually had a lot of problems with change.

The Core team understood that if the reengineering project did not address the difficulties people would face with change and likewise address the change issues in a systematic, structured way, BPR was doomed to fail.
They understood that in order to be successful they had to realign attitudes and behavior of the workforce.

19.1 FUTURE STATE
Though change was at most times a welcome phenomenon, it was not necessary that there be changes in the plan. Each individual had his/her own ideas about change, and frequently it revolved around someone else changing, not them.

19.2 CURRENT STATE
The new way of working is much better, workers no longer say that there is that much wrong with the current way of working. They found ways to make things better by just adjusting and manipulating what they do today, not the drastic and tight changes according to plan.

Vinayak stated that, **Arvind and its people had no choice: they had to change to survive. They did have a choice, however, in how they changed.** To successful, the management started by applying an organized, structured methodology. This ensured that, changes were implemented faster, cheaper, and with a minimum of pain and disruption to people. Since the company aimed to make changes, those that helped do it successfully naturally helped the Company have a strong edge over their competitors. **At Arvind it was clear that Change management was a key factor in making the changes for business process reengineering to be successful.**

A major change was a new culture that emphasized accountability and customer orientation.

"In quality improvement projects, the visibility of senior management was important early on, but decreased in importance over time. In reengineering projects, the visibility was vital from the start and only needed to intensify as the project proceeds."

**Although personal, frequent involvement was needed from the top, ownership of the changes had to exist at all levels**, particularly in front-line personnel.

Field involvement built ownership from both the top and the bottom. A senior manager at Arvind remarked, "One has to carefully select the people for the transformation project. Those people either make or break the project."

"We must first create an environment that encourages employees to come up with innovative ideas in support of the goals that the management team has established."

19.3 Focus - most of all - on a mindset change
The most difficult challenge was the cultural change that typically accompanied BPR that was underway.
It was therefore important to acknowledge up front that all employees would have to change their mindset to enable the success of the BPR initiative.

TODAY IT IS THERE FOR ALL TO SEE WHAT FRUITS THE REENGINEERING EFFORT HAS BORNE OVER THE LAST FEW YEARS.

FURTHER before ending it would be pertinent to point out that today in the interest of the ongoing / continuous state of BPR —

Knowledgeable and future-thinking managers having respect for and influence with-their peers, superiors, and those below them in the organizational hierarchy fill in the champion’s role. The CEO appoints them to the project team and their performance objectives include measurable achievement of the reengineering project success.

19.3.1 The support of the CEO was essential. He helped by:
- Directing reluctant peers and subordinates to participate in the project
- Speaking at project team meetings and workshops
- "Walk the new vision" by leading education and awareness-building sessions
- Communicating to ensure organization-wide buy-in
- Demanding that line managers appoint project champions and realign job responsibilities so that they can attend all workshops
- Making the decision to implement
- Providing the funding for all project phases
- Modeling the behavior reflective of the new culture, politics, and beliefs
- Encouraging all employees to "let go of the past," no matter how successful it was
- Removing obstacles to change
- Resolving sensitive policy issues and making policy decisions
- Incorporating project implementation goals into executive performance plans
- Updating the project team on external events and situations that may affect the project

19.3.2 CORE group Leader helped by:
- Providing project team leadership
- Maintaining a balance between future and practical realities
- Communicating and negotiating with diverse interest groups
• Removing obstacles to project success
• Selling policy changes
• Helping champions gain and maintain power and credibility
• Maintaining project visibility by meeting regularly with CEO and CORE TEAM members.
• Coaching, developing, and supporting the core group
• Obtaining executive (CEO) sponsor funding and approvals
• Ensuring the core group members go back to line organizations after the project is complete

19.3.3 Champions carried out their roles successfully by:
• Participating in all design, planning, and implementation activities
• Approving after reviewing project designs, plans and products
• Identifying and resolving critical issues through discussions with managers concerned
• Marketing and selling the reengineering vision
• Creating and getting approval for new policies and practices.
• Identifying and accessing additional resources and expertise as required
• Directing implementation of solutions within the organization
• Keeping core group informed of progress and issues
• Working with their CORE group leaders to communicate, educate, and build awareness and openness to change

19.3.4 Core Group

These people "run" the BPR project. Theirs' was a support role providing support to champions, focusing their thinking, organizing the project events for them, and providing direction. They were not the project decision-makers. They are fully dedicated to the project for the duration. As the nerve center, they manage the project on a day-to-day basis, enforcing adherence to the project methodology and ensuring that tasks are assigned and coordinated, documented, knowledge is transferred, meetings and workshops are facilitated, issues are researched and escalated as needed. They provided ideas to the champions, and they challenged people to step "out of the box" and to make quantum leaps in creativity.
19.3.5 Subject experts

The core group was staffed with in-house people, by outside consultants, (SAP), Mackinsey, or, as recommend, a combination. The core group roles were filled by three to seven people, including project operations manager, project facilitator, business specialist, IS/IT specialist, financial specialist, and knowledge coordinator.

Champions and the CORE group members were not sufficient to create a high-quality reengineering plan. From time to time they took the help of other experts in a particular part of the business, industry, or technology. These experts SAP consultants and Mackinsey came from outside the organization, and participated in meetings and workshops on an as-needed basis. Their role was to provide expert advice and ideas for designs, plans, or products. They also validated the feasibility of blueprint concepts, supported project champions in specific functional areas of the business, and provided technology expertise.

Although the organization and membership of the project team alone could not ensure the success of a BPR project, they allowed the team to overcome some of the key hurdles to Project success by:

- Gaining cross-organizational commitment
- Providing the means to manage deliverable complexity
- Addressing strategies for transforming organizational culture
- Establishing realistic expectations and reinforcing a long-term focus

With the right team and the right techniques, tools, methodology, and decision-making processes, the BPR project led to dramatic improvements in productivity, service, customer satisfaction, and innovation.

19.3.6 Core group actions were

- Providing project strategy, structure, and management
- Providing drafts, proposals, and alternatives for champion analysis, design, and decision making
- Advising and counsel champions
- Coordinating all project-related communications and document distribution
- Managing issue research, follow-up, escalation, and resolution
- Planning and facilitating all project workshops and meetings
* Monitoring the project and provide feedback and support to champions and their organizations

19.3.7 Rollout BPR “teams” missions

<table>
<thead>
<tr>
<th>Mission</th>
<th>Description</th>
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<tbody>
<tr>
<td>Organization support</td>
<td>To assist business managers in implementing new business structure and job changes and to provide support and counseling to those impacted.</td>
</tr>
<tr>
<td>Technology installation</td>
<td>To install all technology -- including networks, hardware and software -- and ensures its correct functioning.</td>
</tr>
<tr>
<td>Post-installation support</td>
<td>To provide technical and operational support through the learning curve.</td>
</tr>
<tr>
<td>Transition to continuous</td>
<td>To ensure that the reengineered environment is full in place and performing as designed and to ensure that people have the skills needed to continue to improve their work.</td>
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4D RANBAXY LABS LTD
1 - RANBAXY - A PROFILE

Ranbaxy Laboratories Limited was established as Ranbaxy Pvt. Limited in the year 1947. It was come a long way since then to become the retail market leader in the pharmaceutical industry of the Country with the total sales turnover of Rs 876.6 crores this year, export sales Rs. 412.1 Crore (increase of 23%) and net profits amounting to Rs.135 Crore. It is not just the number one pharmaceutical company of India but is also one of the successful Multinationals of the Country. The Company’s strength lies in Research and Development, world class manufacturing facilities and dedication and serious employees which have helped smoothen the process of internationalization.

It has the second highest share in the domestic retail market. In the past ten years, the company has maintained an average growth rate of 25% per annum. Today it manufactures nearly 15% of India’s total pharmaceutical substances, and has three of its brands amongst the top 15 largest selling drugs.

1.1 Brief History

The Company is named after two of the founders, Ranjit Singh and Gurbax Singh who along with Bhai Mohan Singh had floated the Company in the late 40’s. In the 50’s it was engaged in importing finished drugs and medicines from well-known manufacturers abroad for distribution in India. With the gradual restriction on imports, the company shifted its business from imports to manufacturing of drugs and consequently it set up its own manufacturing unit at Okhla, New Delhi.

In 1961 the Company was incorporated as Lepetit Ranbaxy Laboratories Limited on account of a large number of its shares having been bought by the Italian firm Lepetit. However this collaboration was rescinded following a change in the government policies in the country. The name of the Company was changed and the word Lepetit was dropped from the name.

In 1973 Ranbaxy went public and in 1974 it established a new plant at Mohali. The period after this has been one of constant expansion for Ranbaxy. At present it has production facilities at five places in India besides a number of joint ventures and wholly owned subsidiaries abroad. In 1993 Dr. Parvinder Singh took over as Chairman of the Company. Since then a lot of structural changes have taken place in the organization in order to accelerate growth and to make a global impact on the pharmaceutical segment.
1.2 Corporate Philosophy
The philosophy of any company lays down the basic purpose of its existence and also gives a long-term direction to the business that it is in. The philosophy is determined by the mission of that company.

The mission of Ranbaxy is to become a research based International Pharmaceutical Company with the help of its competitive assets, namely people and technology and its competitive process - quality, customers' orientation and speed. It is also realized that the mission is achievable only through a collective process involving not only the employees of Ranbaxy but also other shareholders like the investors and the customers.

Liberalisation and Ranbaxy.
As an introduction to the firm it is also important to touch upon the topic of liberalization because this process, which started full swing from June 1991, has had far reaching implications on business in the country. There is an effort to integrate the Indian economy with other economies of the World. To this end the GATT Agreement can be termed as a watershed. These changes and their effects are closely tied with the Company's mission. For the pharmaceutical industry this means that the focus now has to shift on Research and Development. Infact with the Intellectual Rights regime only companies, which invest in R&D, will be able to meet the challenges and opportunities offered by a changed environment. Ranbaxy has one of the best R&D set-ups for encouraging innovations, which will go a long way in helping it, accomplish its mission.

1.3 International Operations
Even though Ranbaxy set up its first joint venture as far back as 1979, its full-fledged international initiative began only in the mid 80's. It started as an export drive with a long-term plan of creating a sustained presence in major markets. It has set up subsidiaries, joint ventures and marketing offices in many parts of the world. The worldwide business operations are divided into four regions:
* India and Middle East
* Europe
* CIS and Africa
* Asia Pacific and North and South America
Each area functions as an independent profit center.
Driven by a mission "To become a research based International Pharmaceutical Company," Ranbaxy has emerged as the single largest manufacturer and exporter, accounting for over 12% of the Indian pharmaceutical industry's exports.

The company’s strengths lie in applied research and development and world class manufacturing facilities. Its commitment to brand building and internationalization is spearheaded through strategic alliances and creation of subsidiaries and affiliates in major pharmaceutical markets of the world.

Ranbaxy has a vision. Being in the pharmaceutical business, perhaps more than in any other business, it must always keep the customer uppermost in its mind. Ranbaxy has articulated for itself the mission of becoming a research-driven company, a company that is at the frontiers of new product and process development continuously. Besides, it has given itself the mission of becoming an international research based pharmaceutical company; a company that has a global reaches but a local heart.

Today, over 60% of Ranbaxy's turnover come from overseas markets. Ranbaxy has revolutionized in its own thinking to grapple with the challenge of becoming an Indian multinational. It resisted change as long as its focus was the internal market. In the late 80s, as it began to export, it recognized that to be a global player it would have to abide by global rules of the game. It viewed the Uruguay Round not as a threat but as a challenge to its ingenuity and managerial skills. Its entire infrastructure for safety, ecology, manufacturing, testing and quality had to be global. This was the essence of total quality. It measured its progress not in relation to what it used to do in the past but in relation to what its competitors were doing today or were likely to do tomorrow. Going global also called for creative coalitions among Indian companies as in today's age, even competitors were collaborating with each other. But Indian companies as we know in many cases work against each other. In multilateral contracts, Japanese companies bid as a cartel to ensure that a Japanese company gets the contract. But Indian companies undercut each other. There are many opportunities or Indian companies to form consortia to enhance their individual global interests. (Dr.PS)1

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2 - SITUATION BEFORE THE ADVENT OF BPR
LACK OF CONNECTIVITY

- On fragmented / islands of systems not talking to one another – i.e. disconnected
- This led to having different processes and practices and practices being followed by the same cost center
- Uniformity in processes was lacking
- This further led to duplication of effort / work
- Decision making was more of judgmental type – as information sharing was incomplete
- e.g. not knowing the operating cycle due to presence of pockets
- No visibility of information. People with information were dis-inclined to part / share information. This led to paranoid power centers.
- There was no integration and the system lacked synergy
- All this led to lack of focus.
- This further led to a situation of counter-productivity.
- The above factors affected the speed to marketing, as no real time information was available to the internal as well as the external customers.
- All this had a negative impact on controls across the organization e.g., Credit Control - Inventory Planning
- There did not exist a custom-based check on customers – there was a lassie fare sort of systems in marketing.
- There was a lot of negative energy being spent in chasing – status of different sort of material needed by different people. There as a chase for information – which was not forthcoming ----. This led to a lot of frustration all around.
- On the HR side these measures proved to be counter-productive as:
  - There was very less avenue for self development
  - There was a lack of positive thinking
  - There was little to no motivation to forge ahead
  - The whole scenario was directionless.
3 - REENGINEERING AT RANBAXY
ENTERPRISE RESOURCE PLANNING

Two years back, Ranbaxy, launched a project that would provide it with an IT applications backbone. The project was christened DIAMOND, an acronym for Digitally Integrated Applications for Managing Operations and Networked Development. As a first step towards building a digital nervous system for the Company, project DIAMOND focused on implementing SAP across three critical locations - Mohali, Dewas and New Delhi. In a nutshell, this meant having an integrated data stream across these locations that covers key business processes that connected all of them. At this stage, most of the processes already offered the user ubiquity in terms of transactional information for monitoring progress. A few months of ‘running in’, and this transactional engine was ready to shift gears making strategic leverage possible. Information gathered over time allowed mining of trends and exploring patterns that proactively influenced business and operating decisions.

One should not consider Knowledge working, as something about bits and bytes alone. It is predominantly about people; and application backbones, or even a comprehensive digital nervous system, which are only enablers. Any informational value chain that runs parallel to the more familiar product value chain attempts to gather, organize, sequence, synthesize and disseminate information across the enterprise.

Getting people to go digital was an important first step in the race. Robust support systems encouraged this trend further in what was hopefully to become a virtual cycle of people building on the knowledge network, and the network enabling people themselves to grow.

4.1 THE EDGE - SAP

SAP was chosen as a medium in the Reengineering effort at Ranbaxy to reengineer its various functions. SAP was and is definitely one of the leading products of the all-pervasive digital revolution. Used expediently, it can outgrow its stature as mere software into a juggernaut that drives change in knowledge driven economy. This cataclysmic change, to paraphrase Lewis Carroll, - demands that one keeps "moving in order to be in the same place". So measuring up to its challenges is daunting.
To ensure that the supply side of management is on the optimal side, it is essential to have a free flow of information both to and fro between all entities concerned – thereby providing a healthy sharing amongst all concerned.
This was the beginning of a multi-part serial on the various dimensions of ERP. It was meant to serve as a primer and over several issues of ERP.

It was pertinent to Ranbaxy’s business context, to take a closer look at the promise of ERP and shift myth from reality to see what it could do for its enterprise. As it began to internationalize its operations, it began to feel an intense need to upgrade its business processes to international standards. To view the company’s supply chain as a combination of several hermetic compartments of functions (Sales order booking, Procurement, Production, Distribution etc.) did not hold water in the context of internationalization. In order to meet the demands of ruthlessly uncompromising global markets, a company’s supply chain had to become responsive across each component and synergise all elements of the chain to ensure optimum performance. This called for studying all critical processes covered by the supply chain, re-configuring and realigning the processes for optimum effectiveness and enabling the processes with information technology to deliver sustainable advantage. This was aimed at integrating all elements of the supply chain and a class of software called ERP applications significantly supports optimizing its responsiveness. ERP was therefore thought of as an applications backbone or computer applications infrastructure to support reengineering its key businesses.

The essence of ERP applications was that they provided integration of data, hence information, across the supply chain. Beginning with the sales order booking process that links to production planning that triggers material purchase / inventorying activity, production and finally logistics, the chain of processes covered essential activities of Ranbaxy’s business. Financial and cost accounting systems covered these transactions to reflect them in receivable, payable and all other accounting records. Till recently many legacy systems were used to carry out these transactions. In the ERP world, they would now all be dealt with, by one uniform backbone of applications. Therefore, a sales entry made in a remote branch, after ERP implementation would now impact inventories and receivable at Delhi, updated plan variances for production and procurement, reported these activities in executive information systems as required in a seamless and timely fashion.

In a relatively unstructured environment that was typical of an organization that has experienced very high growth led by entrepreneurial vision, systems were often outpaced by individual centric responses to market dynamics. When it reached a certain size
through rapid growth, it had to focus attention on systematizing its procedures and institutionalizing business processes to de-link them from individual biases. In such situations, ERP plus the added role of instilling systemic discipline in processes, forced individuals behind them to shed personal bias.

For several key business processes the best ERP solutions provided various alternatives based on best global practices. For example, **SAP R/3 (the solution Ranbaxy has chosen)** carries over a thousand ‘best practice’ templates which allowed it a choice from amongst practices established elsewhere around the globe and configure its processes in line with the best. This allowed Ranbaxy to draw from the knowledge SAP had gained over the last 26 years of their existence in building and maintaining applications backbones for several international giants.

Clearly, all of this implied a significant change in the way it did business. **When an organization decided to go for an ERP solution, it buys a new way of life.** In all, the re-configuring of processes, energizing the supply chain, eliminating personal biases, and adopting best global practices across a large area of influence, a juggernaut of change was set in motion. The success of this project rested squarely on the Ranbaxy’s ability to handle such a change.

**The project which was code named Project Diamond** was to act as a key catalyst of change in Ranbaxy. It delivered, among other things, the applications backbone for Ranbaxy. It was the first step towards building a **digital nervous system** for the enterprise. Ranbaxy began by choosing SAP as the vendor for the ERP software and engaging both SAP and Coopers & Lybrand to assist with the implementation. Over the past two years the applications backbone was built to enable optimal efficiencies of its supply chain worldwide. Thereafter, it continued to evolve this infrastructure in ways that could continue to give it a competitive edge on the supply chain.

For all to be implemented successfully it was essential to:

- **Aligning people behind changes in business processes & systems**

  Change Management / Reengineering at Ranbaxy focused at aligning the organization, people and culture with changes in business strategy, organization structure, and systems & processes which would eventually result in:

  - Ownership and commitment to change
  - Sustained and measurable improvement
  - Improve capability to manage future change
The management ardently believed that in order to bring about a complete transformation within the company, it was imperative that it undertook a path leading to a marked change. Across the organization there was a feeling for:

- The need to align people’s attitudes, behaviours and capabilities with changes in process recognised whereby —
- Value would be realised through people and new ways of working
- Interviews were conducted with members of the management team to understand the Ranbaxy Change Vision and drivers for change which
- Raised Project team awareness about change management principles and their functioning therein leading to the development of a
- Systematic framework for thinking and about how this could be applied which further led to
- Change readiness assessment and a more detailed consideration of how to manage this change was understood
5 - ANALYZING THE INCEDENCE OF CHANGE

In order to carry out an analysis, three different areas were taken and their profiles studied leading to an outcome such as this. Further this showed a trend as depicted in the chart given below:

- There was a significant difference in profile for 3 different areas which showed that no choice (compliance) led change usually succeeded

- Choice (commitment) based change was more difficult and greater risk was perceived by FI and MM but on the other hand Production Planning (PP) was more optimistic about ability to change showing that

- Corporate Strengths
  - It envisaged that Process, rules changed when appropriate
  - Managers when disciplined, get things done which allowed Sufficient time to implement ---- whereas on the other hand

- Corporate Weaknesses made
  - Leaders lose focus and People were not encouraged to be constructively critical –
  - This further meant that there would be No rewards for success, consequences for failure This led to Commitment forced rather than built in if Problems emerging during change were not solved quickly

Diagrams – SAP Exercise (Ranbaxy)
All this led to a state of transition shown below:

The change as viewed by the team was that it was:
A science, and no longer an art, and Must be done systematically so as to Focus on people as the common denominator. For this HRM required re-designing, planning & implementation which Could be measured besides, it Required skilled resources like any other project such as the

- ability to listen, ability to influence, ability to inspire, empathy and
- seeing things from other person's view point, etc.

To carry out the change effectively a Framework was worked out to shape the future:

The management at Ranbaxy was aware that for change to take place effectively it was essential that its business vision had to change to a change vision and for this it had to:
Besides the above it was essential that before embarking upon its journey of change they had to understand why change was desired. For this they had to further identify their current and anticipated problems & opportunities.

The management at Ranbaxy was aware that change would not be accepted without hindrance, as it would create some anxiety besides a lot of pain. This was so for most other organizations. Ranbaxy had to face its share of anxiety as it went through the process of change because people who were used to old habits would not give them up easily, as leaving them would cause them a lot of pain. This led to assessing:
From the discussions held with Mr. Ranjit, Director SCM, the researcher inferred that their desire for change was due to factors listed below:

<table>
<thead>
<tr>
<th>Problems</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td></td>
</tr>
<tr>
<td>Low profitability and asset</td>
<td>Scientific and technical strengths</td>
</tr>
<tr>
<td>productivity &amp; high operating cycle</td>
<td>10 year moratorium on process patents</td>
</tr>
<tr>
<td>Low success of new brand</td>
<td>Using India as a research base</td>
</tr>
<tr>
<td>launches</td>
<td>Strategic advantage through backward integration</td>
</tr>
<tr>
<td>Customer responsiveness not</td>
<td></td>
</tr>
<tr>
<td>up to international standards</td>
<td></td>
</tr>
<tr>
<td>Environmental constraints in</td>
<td></td>
</tr>
<tr>
<td>doing business out of India</td>
<td></td>
</tr>
<tr>
<td>Falling profitability of bulk</td>
<td></td>
</tr>
<tr>
<td>drugs</td>
<td></td>
</tr>
<tr>
<td><strong>Future</strong></td>
<td></td>
</tr>
<tr>
<td>Size is critical</td>
<td>Products coming off patent</td>
</tr>
<tr>
<td>Only companies with strong</td>
<td>Strongest R&amp;D base amongst Indian companies</td>
</tr>
<tr>
<td>basic research will be winners</td>
<td></td>
</tr>
<tr>
<td>Staying power</td>
<td>R&amp;D spend will go down as a % of sales but would</td>
</tr>
<tr>
<td>Increasing supply chain</td>
<td>need to be more effective</td>
</tr>
<tr>
<td>complexity</td>
<td></td>
</tr>
</tbody>
</table>

And besides the factors mentioned above, others concerning sales and logistics showed a similar trend, which indicated that a change in the system was desirable in order to optimize the sales front and improve the service function.
Marketing and demand generation

- Absence of clear definition and communication of product withdrawal strategies
- Disruptive effect of promotions due to poor advance planning and communication
- Comprehensive data and documentation in Master data in SAP R/3 maintained through the product life cycle.
- SAP R/3 will factor preplanned promotional offers to ensure inventory pre building

Demand visibility and management

- Delays in order communication
- Poor national and cross border visibility of stocks, production and order status
- System based order logging ensures process rigor and complete order information
- Enterprise wide order and production status and stock visibility

Sales and outbound logistics

Norms for safety stock not linked to demand patterns or replenishment methodology.
- Lack of self-correcting mechanisms in the distribution chain
- Scientific determination of service levels, safety stocks and reorder levels by product category for stock locations and CFAs
- Netting of stocks against baseline to control drift.

Manufacturing and Procurement

- Poor communication on status and delays to market
- Absence of daily finite capacity scheduling
- Multiplicity of material codes across location leading to sub-optimal planning
- Instantaneous visibility of plans
- Dynamic scheduling requires systems initiatives after SAP R/3 stabilizes (6 months)
- Centralization of materials functions

The above were but an indicator to what was to actually come that would eventually help Ranbaxy re-invent itself. If Ranbaxy of the morrow were to be built they had to incorporate changes cherished by top management. For this they had to define where they would like to be and what was required to be done, so that the skills of today would not stop them from moving ahead in the changed environment. On analysis it was discovered the following factors strongly influenced the change process:
It considered risk was one of the most critical areas of its BPR journey. What managing risk aims to do, is the ability of its BPR team to select a process for reengineering that has an associated risk level that is acceptable to the organization as a whole. For example, if one were to reengineer the Emergency Room in a hospital, one would (in the researcher’s humble opinion) be taking on a significant risk (the potential loss of human lives if you were to fail). However, if done appropriately with the involvement of the correct staff and resources, one could reduce ones risk of catastrophic failure. Also one should keep in mind that the level of risk involved is relative to the type of business undertaken.

Similarly a BPR effort sometime or the other would show up risk factors, but at Ranbaxy the very first obstacle that had to be overcome to eliminate some degree of risk at later stages was:

**THE OBSTACLE WAS MANAGEMENT**

As Dr. Parvinder Singh (CMD) has very aptly put – “The bottleneck is at the top of the bottle. It is here that the change has to be thought of and given shape before expecting others to follow suit. In order to reduce the risk factors it is essential that they have unflinching Top management support.”
To go about the change process they viewed five different role models that they at Ranbaxy thought would play a vital role during the process of change. These were:

**FIVE DISTINCT CHANGE ROLES WERE IDENTIFIED**

- **LEADER**
  - Demands and authorises change

- **AMBASSADOR**
  - Supports, influences and sometimes initiates change but cannot lead it

- **CHANGE AGENT**
  - Responsible for achieving change and has a contract with a change leader
  - Must change for benefits to be delivered

- **PARTICIPANT**
  - Target

Besides certain other levers too were required for implementing change effectively along with changed roles. These levers were identified and listed:

- **Change leadership**
  - In a recent independent survey of 444 organisations:
    - 93% stated: high calibre change leadership was a prerequisite of successful change
    - 37% stated: lack of it significantly impacted programme success
    - Only 24% stated: it was in place before the programme started
  - Effective change leadership means demonstrating personal resolve and support for change throughout its entire lifecycle

It was well acknowledged that for BPR to be successful it must have the full support of top management. At Ranbaxy they had unflinching support from its Top management. The understood that for an effective change environment it was imperative that there be absolute understanding between the change leader and the change agent. Both must understand their stand and be clear of the role each one of them had to play in the change process. Ranbaxy change management team gauged the depth of the responses to
negatively perceived change, to identify and cope with it effectively before the change process was sabotaged. To do this they studied responses to negatively perceived changes against emotional response.

![RESPONSE TO NEGATIVELY PERCEIVED CHANGE](image)

Managers at Ranbaxy who underwent re-organization worked to quell the fears of employees and resistance to change (despite the fact that they had their own apprehensions.) They even studied the positive response versus pessimism and the outcome was something like that given below:

![RESPONSE TO POSITIVELY PERCEIVED CHANGE](image)
Business process improvement is a continuous cycle of improvement at Ranbaxy. With the ever-changing business environment there continues to be new methods, programs, and equipment to be evaluated. Customers' expectation changes, which require businesses to continually, evaluate their products. People within the organization developed knowledge and newer capabilities that could be used for process improvements. It was well understood that unattended processes would degrade over time. Ranbaxy had to find ways to improve the performance on all fronts. As a result the employees had a clear choice – either understand the requirements or be compelled to do so. This sort of situation led to:

**Accepting Change -**

**Compulsion**
*"The system will force compliance"*
- System – driven process change
- Temporarily reduced headcount
- Changed organizational structure
- New meetings structure

**Benefits**
- Low-often superficial
- But compliance may be enough

**Investment**
- Low leadership investment
- Often high technical costs
- High cost of forcing change

**BY Choice**
*"I can choose how I engage / accept change"*
- Improved customer service
- Sustained reduction in headcount
- Cross functional co-operation
- Team working

**Benefits**
- High, fundamental change

**Investment**
- High in time, energy and change leadership

Because of lack of investment in building commitment, led to benefits being restricted to no-change.
Without a proper approach toward employees involved in the reengineering effort, the implementation was guaranteed to fail as all aspects of its business would change. When a process change, the jobs of those who do the work in that process must also be changed. The way in which employees thought and behaved, their attitudes and beliefs had to be realigned to fit the new process. Reengineering efforts changed almost everyone’s job in the organization causing employees at all levels to acquire new skills. Reengineering at Ranbaxy involved the process of combining many job categories into one leading to multi-skilling.

Training was imparted in areas such as problem solving, communication, teamwork, and customer orientation, which as a consequence became increasingly critical, to ensure the success of its reengineering exercise. Proper training prepared employees for their new roles and helped support the new values and behaviors that underlie the reengineering philosophy. Reengineering required new approaches to training leading to a thorough skill assessment of the workforce using job-analysis and needs-analysis. The analysis determined what skills were needed and what changes had to take place.

Reengineering caused enormous changes in the organization leading to the tendency to cause organizational anxiety. One of the challenges resulting from implementing reengineering was how to cope with the reaction of employees to the change. Employees’ resistance to change and their fears about job displacement needed alleviation and had to be explained. Making employees to feel that they are a part of the reengineering process can improve employee moral and soothe negative feelings.

An important aspect that could spell the success or doom of a change process was not communicating the reasons for change. Then one may very well ask -- why the need for change and why communicate at all and this (communication) was all the more essential.

- To reinforce the need to change
- To build awareness, involvement in and commitment to change
- To surface resistance to change so that it can be addressed
- To reduce uncertainty, misunderstandings and anxiety
- To strengthen the belief that something was really happening
- To help people understand what the change means for them and what they need to do in order to tackle it in the best possible manner
- This was considered a key factor in the management of change in the organization ...but it also needed to be focused, with specific messages delivered to the right constituencies at the right times by the right people in the right way to be effective!
Employee involvement — an employee must be made to understand that without his / everyone’s involvement it would not be possible to forge ahead. It’s the little things that you do that will have a big impact on the success of this project! Besides the people would definitely like to know where they are headed and hence the change leader must ask himself — What do people want to know? SO IT ESSENTIAL TO KNOW ----------------
6 - SUPPLY CHAIN MANAGEMENT -- AN OVERVIEW

Ranbaxy's supply chain operations used the Supply Chain Funnel framework.

- This framework exhibited the cumulative effect of the inefficiencies at each stage by the constituent operations on the overall supply chain.
- It showed the individual components of SCM and their overall impact on the inventories. These can be shown as:

Ranbaxy's Supply chain revealed inefficiencies at individual stages that had a multiplier effect on the supply pipeline.

Diagrams – Supply chain (Ranbaxy)
Heavy reductions in inventories were made possible by adopting world class standards.

Averaged on 10 products and six-month operating data the funnel showed that:

- Inventory buildup: 20% = (Production – Net sales)
- Demand transition: 80% = (100 – [Produced – Net sales])/Net sales
- Targeted sales attainment: 60% = (Net sales/RSP)
- Demand visibility: 76% = (Net sales / Gross sales)
- Plan adherence: 82% = (100 – [Planned – Produced]/Planned)

At the product pack level the variabilities were much higher:
- Returns were 30%
- Chain inventory increased by 10%
- Warehouse and CFA stocks were sufficient for 20 days of sale
- Tablet – X 200 mg 6'

The inaccuracies / non-compliance at various stages of the supply chain were attributed to the following:
- Poor demand visibility
- Inaccurate demand communication and demand translation
- Poor synchronization of demand and production
- Ineffective de-coupling of production
7 - THE MATERIALS MANAGEMENT MODULE

The reason the purchasing function found itself top at the top of the management agenda today was frequently driven by a need to slash costs. But, they understood that a purely cost reduction driven approach translated to limited advantage. For instance, statistics showed that contract negotiations could extract price discounts of only between 1 to 5 percent from suppliers, whereas today's cost pressures aimed for 10 to 30 percent increase in price efficiencies.

These pointers had driven the organization to understand and treat purchasing as part of a broader materials management business function, with its focus being the three key parameters of Service level in internal customers, Inventory holding as well as Price efficiencies. Increased out-sourcing, placed a premium on the skills needed to identify and distinguish between strategic and non-strategic suppliers, and to structure long-term supplier relationships. This move towards global sourcing created the challenge for managing geographically dispersed suppliers as a network, where quality and the logistics of on-time delivery were as important as cost.

7.1 Purchase Organization: This king of a materials management function achieved high levels of performance and contribution to business, showing that skill renewal is not the only change required. The purchasing organization also needed to gear up, with increased flexibility, centralization and scope.

The SAP system reflected this changed structure of business and its new best practices. The Materials Management, or MM, module in SAP enables a structuring which can be exploited in a decentralized environment that is imperatively on its way towards increased centralization. The organizational elements designated a group of buyers who could legally commit purchases on behalf of the company and were referred to as Purchase Organizations, for all major purchasing activities such as contracts, purchase orders etc. Even the analyses of purchased values and vendor evaluation were linked to the purchase organization. Buyers themselves were assigned Purchase Groups for the purpose of managing daily work-lists and making meaningful analyses of purchased values.

7.2 Requirement Generation: The restructured and re-skilled materials management function was tightly integrated with other components of the business’s supply chain. Material requirements and the highly dynamic nature of manufacturing and market

Diagrams: SAP
servicing were mirrored in the materials planning and subsequent purchasing activities in real time and with substantial automation.

The Materials Requirement Planning (MRP) system in SAP automatically created accurate purchase requisitions, based on established planning methodologies such as reorder levels and forecast data. Other elements of the Supply Chain, including Sales and Distribution as well as Production Planning also generate materials requirement through the MRP system.

Internal customers such as other departments communicate their requirements of items like capital goods and services by directly entering requisitions. All these purchase requisitions flowed immediately to purchasers, who initiate procurement activities.

**Purchasing:** The MM function renewed its role in business by systematizing and ultimately off-loading non-value added administrative activities like document processing and report generation. This, coupled with increased process effectiveness, transparency and control enabled the two major constituents of the MM function, purchasing and inventory management, to focus on key business imperatives.

To achieve this objective, the buyers in SAP had a wide array of sophisticated tools such as document referencing, special purchasing master data, requests for quotations and quotation comparison, long term contracts and daily task-lists. These ensure substantial automation of vendor and price determination, for mature, repetitive purchasing. Scheduling agreements, was directly linked to the MRP system, which combined the materials requirements with vendor and pricing information maintained in the masters, to directly create delivery schedules for the vendors.

These tools supported complex procurement environments by reducing data entry and improving information visibility as well as quality. For example, prices could now be compared during the procurement process and the subsequent order creation processes could be automated. The purchase orders and delivery schedules were then sent to the vendors either on paper or electronically through integrated Fax systems.

**7.3 Case:**

1st March 2000. The country manager of UK opens up his Internet browser and punches in www.ranbaxy.com/rsp. He sees a list of all Ranbaxy products for which he now updates the Sales Plan. Meanwhile, product requirements from the domestic business have also been consolidated from various Indian Branches, taking into account forecasts, closing stocks and sales variance in June.

These requirements drive the Formulations production plan for July, August and September established on July 5th. Raw material and packaging material requirements
are immediately determined by comparing BOM explosions and available stocks.

Parallel, a Quality Assurance executive at the laboratories in Dewas realizes the need for additional HPLCs to gear up for an expected increase in load on account of certain new products to be introduced in UK and China. He raises a requisition for 3 HPLCs for delivery in August 2000, after the requisite Capex approvals.

A contract with Kumar Printers had been set up in January for 2000 for printed cartons. Delivery schedules for the new requirements are automatically created by MRP, based on the contract. These are faxed electronically. Confirmations for a series of shipments arrive from Kumar Printers, which are punched in.

The August requirement of Cephalexin for Sporidex Capsules appears on the screens of the Supply Chain manager in Delhi. She has options of manufacturing it at Mohali, or procuring the material from a vendor. A check on available capacities on one hand and lead-time information of the vendor on the other shows her that service level achieved would be higher if the material is manufactured in-house. She creates a requirement in Mohali, which incorporates this for its own production and procurement plans drawn up the next day.

**Monitoring and Control:** Another key area that needs attention in the changed scenario that is driving the MM function today, is the increased level of supplier network monitoring and internal organizational control. The former strengthens the linkage of the business with its supplier base and aids supplier development, while the latter can contribute towards higher internal efficiencies and reduced internal lead times.

The vendor evaluation application in SAP enables purchasing to track and identify the best vendors using quality, quantity, pricing and service criteria, which are automatically monitored in the other integrated business processes of Inventory Management and Quality Management. The purchase order history enables activity level monitoring, so that subsequent actions taken on a purchase order such as deliveries and invoices already received are tracked.

*Internal control was boosted by codification* of the organizational rules for approval of purchasing documents. These formed an integral part of the electronic working environment that SAP provides, where authorized personnel approve purchasing activities using electronic approvals.

The vendor for Maize Starch BP had been fixed in April 2000. An analysis of the quality and quantity reliability for the vendor in June showed that standards were not being met.
In June itself, the purchase manager negotiated with another approved supplier. A requisition was created for the Maize Starch on this vendor and, the rate was automatically determined when the purchase order was created.

Meanwhile, the requisition for the HPLCs arrived in the mail in-box of the QA Manager for her approval. She decided to approve one in August, while she found out from another screen that the other two should be purchased in November to balance service level with cash outflows. The approved requisition for one HPLC was sent to the next level of approval, while a mail informed the executive of the rescheduled purchase.

### 7.4 INTEGRATED INVENTORY MANAGEMENT:

Managing the purchased material also needed to be viewed with a broader perspective. The rather traditional view of managing stock values and making stock checks was only one part of this broader perspective. Keeping an on-line check on inventory days held and ensuring a smooth flow of materials as well as payments after procurement was the other part.

In SAP, the stock of materials procured was managed, both in terms of value and quantity by Inventory Management business processes. These supported all the simple receipts, issues, and stock transfer activities and also manage special stocks such as batches, returnable transport packaging, or components provided to a subcontractor. Goods movement postings automatically resulted in an update of values in Financial Accounting and Controlling. Tight integration with the Quality Management processes was also automatic.

External physical inventory monitoring and reconciliation procedures ensured that book inventories tracked by SAP were synchronized periodically or continuously. Total stock counting, or use of sampling or cycle counting methods was supported with a number of convenient aids for entering data and with a variety of automatic evaluations.

The Warehouse Management (WM.) module, implemented at Ranbaxy's Dosage Form (DF) facility, at Dewas, provided flexible, automated support that enabled processing of goods movements and maintaining of current record of all materials stored in a complex warehousing structure. Using advanced placement and picking techniques based on customized strategies, WM. optimized material flow and capacity in the warehouse, storing goods in the most favorable locations so that they were easily retrievable when needed.

**E.g.,** The packaging material from Kumar Printers arrives at Dewas. The warehouse manager receives the LR and enters the truck number into the system, which proposes
the expected shipments in the Goods Receipt screen. These are accepted and inventory positions in the books of accounts are updated.

Additionally, the material is put into the under test stock, where QC clears it before the end of the day. The production for July is completed and the shipments are executed from Dewas.

The requisition for the HPLC, meanwhile, is transferred to the main in-box of the Divisional Head, who had entered into the system that he would be out travelling for the next two days. The requisition is moved to the General Manager, who knowing the importance of the timely delivery of the equipment, approved it immediately. This was then visible to the purchase manager in Delhi, who converted it into a PO. The Capex and the budget amounts were automatically updated after receipt.

7.5 INFORMATION SYSTEMS:

Finally, the MM function was also attempting to become more information oriented by not only capturing meaningful information and taking operational decisions along the way, but also distilling the larger picture out of the transactional activities and adjusting to future changes proactively.

In the Reengineered SAP environment, the Purchasing Information System consolidates all the facts and figures necessary for this level of analysis. It created visibility and transparency of the various purchasing activities, like value of purchases made by buyers, on-time in-full deliveries, frequency of receipts etc. And, with the Inventory Controlling information system, stock values determination, inventory turnover
rates, ABC analyses, dead stock monitoring and range of coverage information could be made real time and on-line. These information systems enabled identification of trends and developments, providing a sound basis for decision-making.

A month end review of the performance of the materials management function indicated improved service levels and satisfactory price efficiency.

However, simple range of coverage and slow moving inventory analyses also revealed that achieving the benchmarks for inventory holding were going to be under strain for August and September. The materials manager gears up to face the challenge.

THE MATERIALS MANAGEMENT MODULE - CONCLUSION

The starting point for the journey that Materials Management had ahead of it is to understand and internalize. That MM had a strategic role to play in the business's supply chain to powerfully enhance its economic performance and power to profit. For this successful transition, Ranbaxy needed to move away from it referred to as the "Serve the factory" model, where their job was to keep the factory running and its focus clerical, logistical or as an expediter to the "World-class supply management" model. Thus, as the area of operation expanded in scope from world-class factories to also include world-class material sourcing and flow, the arms of the Materials Manager changed as well. Project Diamond would definitely be a great step in this direction.
8 - THE EVOLVING ROLE OF FINANCE

Change: That one word sums up the multi-faceted conundrum confronting senior Ranbaxy executives today. Simply acknowledging it was not enough. In order to develop sound business strategies and lead others in their pursuit, they had to discern the advantages it held.

Still the very pace of change could be daunting. Swept along by relentless innovation in information management technology, its managers could no longer measure progress in years or months but had to do so in weeks or days, and sometimes in hours. In its manufacturing processes, these advances had compressed product life cycles. Investors were today keenly aware of heightened competition and they did not hesitate to shop around in pursuit of gaining optimum value for investments made.

Ironically, all this change gave financial managers a gift: the opportunity to re-arrange and strengthen human resources, processes and technology. Finance could no longer afford to spend inordinate talent, time and energy processing transactions and generating reports of little relevance. Finance today had to acquire new capabilities, whereby it could not only translate the financial implications of both strategic and tactical decisions, but also actually help share those decisions.

Not so long ago, the business world at Ranbaxy looked very different. Success was defined in terms of revenues, not shareholder value. Business invariably meant labor-intensive manufacturing, not technology-driven services. Customers were invisible and investors patient and polite. Over the past decade, an onslaught of powerful forces has rewritten the tenets of business competition. Today it is in many ways taking advantage of liberalized global trade and learning how to operate worldwide. More intense competition has forced Ranbaxy to recognize the fact that efficiency standards have to be raised considerably.

For many, the answer has been to de-layer and redesign business processes. Advances in information technology, particularly those involving systems that integrate financial and operational data, have pushed the process - redesign further along. The key to business survival today lay in ensuring that you and nobody else can make your intellectual capital obsolete. There is no gain saying the fact that the need to enhance core financial processes and improve quality of output through well-integrated systems is immense.

In essence, the idea was to consider how the information systems could bridge gaps between operating units. Some examples worthy of reference are cited below:

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Just to stress the fact the researcher has taken an example out of IBM’s BPR venture: Consider IBM’s successful financial re-engineering projects.

In 1996, small teams made up of experts from various finance disciplines examined processes that spanned traditional functional and organizational boundaries. One team, for example, looked at purchasing and accounts as one process. Another studied disbursements, specifically Travel and Entertainment (T&E) expense processing. The solution aimed at T&E expense processing is a good example of how "Change Agents" in the finance organization can come up with truly creative redesign.

Before re-engineering, T&E expenses were processed at 182 locations. Today the company has one T&E system, centralized expense reporting and just one travel agency. A corporate charge card and an electronic form ease the administrative burden for travelers. Controls have been removed from the front end of the accounting process and embedded in the T&E system. Employees are prompted to submit all required information along with their electronic expense report, including reasons for non-compliance. Time that was required to complete an expense report was reduced from 24 min to 10 min. Head count was brought down to nearly a third.

Today at Ranbaxy the Finance function, being a support function, spans across the entire value chain. In traditional accounting, any transaction that has an impact on financial accounting has to be routed through Accounts Department, for passing the required entries. In SAP, accounting entries were made not only in the accounting module, but also in the other modules. Sales posting is done in S&D and purchase related posting is done in Materials module automatically by the system. This was one of the many ways in which SAP has changed the way Finance function is organized. And this is only the beginning!

8.1 Elaborating further:
The key business imperatives that they faced were:

8.1.1 Productivity

- Improvement in ROCE and improved operating margin and operating cycle reduction, which would lead to improved asset utilization. The envisioned that competitive business conditions will lead to credit period increase.
- FG service levels had to be maintained while liberating cash
- To gain a larger share of the market they had to keep on increasing the product line as well expand its market -- Thrust towards advanced / emerging markets and value added products
8.2 Profitability

- Improving operating and net profit margins was another area of attack and this they tackled by increasing frequency of new product launches with higher margins. This in turn led to high service level requirements
- There was always and still remains -- the unclear demand patterns with many new players coming into the market with cheaper products.

8.3 Recommendations made by the expert committee to mitigate some constraints...

- Improve financial accounting and receivables and payables management
- Follow rigorous budgeting process, which will flow, from the Sales and Operation Plan.
- They were advised to go in for scenario modeling to simulate different top line options on bottom line and this could be done through the CO-PA module of SAP.
- Establishment of a cross-functional team for Medium and Long term planning to meet quarterly with Supply Chain Cell.
- Elimination of non-value adding functions like reconciliation and consolidation.
- Centralization of accounting and finance functions leading to reduction in manpower requirements across the enterprise and higher productivity.

All this resulted in sizing the prize and

Looking at it a little more differently, the researcher found that the Key performance indicators (KPI) for Finance at Ranbaxy were:

- Manpower Productivity
- Accounting Efficiency
- Idle cash and

8.4 Their Ultimate aim was

- To leverage information to create business value
- Value enhancement through improved services and significantly improving efficiencies
  
  Cash liberation
  Cost reduction

8.5 Action:

To attain this they analyzed their activities and they:

- Built an integrated financial system to support consolidation of accounting centers and tightened control on resources.

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• Cash Management: Cash position was to be quickly derived to facilitate efficient use of available cash resources and anticipated cash needs.

• Data is the currency of information age: They built a Quick and accurate financial retrieval system which provided a framework for tactical and strategic decision making and improved investor confidence.

8.6 **Financial Accounting and Receivables and Payables Management**
- Strategic analysis of data for proactive business decisions, which was negligible, has now been geared to meet the business requirement in the global scenario.
- Earlier Non-integrated forecasting and budgeting process has now given way to a well integrated system.
- The absence of strong links between financial and operational plans which led to disconnects between top-line and bottom-line planning, monitoring and achievement have been done away with and there is more transparency in the working giving rise to heightened efficiency.

8.7 **Purchasing efficiency**
- Centralized purchasing, material to person matching and economies of scale are factors that prompted them to have aggressive targets in this area.
- Improvements in this area led to direct additions to profits.

The three scenarios linked to the improvement levels of quantifiable Key Performance Indicators were analyzed.

The Project gave an IRR of:
- 44.6% - minimum
- 59.4% - maximum
- 71% - was subject to achievement of gold standards

The assumptions being that -
- Cash flows till year 2005 would be incorporated
- Depreciation tax shield would not be considered
- MTP figures taken till year 2001; beyond that 12% growth rate was assumed.

Today the financial services at Ranbaxy have been further reengineered to a situation quite similar to that of IBM. Its functions have been centralized with a Manager having a rank of Director heading it. This has brought down processing time and eliminated duplicity of work at various stages of transaction.
The Purchase Manager (Dewas) raises a Purchase order for Ranitidine, to be delivered by next month. This, based on payment terms and delivery date, automatically updates the Liquidity forecast on respective due date, for Cash Planning. At the same time, this gets updated as a Commitment in the system, which was then compared with Actual and one Budgeted.

Planning Cycle: >30 days to 7 days (a quantum improvement)

When the goods are received at the Stores, the Stores Manager creates the material document. The moving average price for the material is updated immediately, and stored in the Material Master, which is used for valuing Consumption. This was a shift from traditional accounting practice of derived consumption of material. Sufficient intelligence has been built into the system to ensure that Invoices cannot be raised unless the goods are received against a Purchase Order and approved by Quality Assurance. SAP's automatic payment program prints out the cheque and clears vendor liability, at a prefixed interval, based on selection criteria chosen.

Diagrams – Supply Chain (Ranbaxy)
PROCUREMENT

Purchase order and material receipt data for the period April ’97 - March ’98 was analysed for Paonta and Toansa plant locations.

- Supply reliability of raw and packaging materials with respect to timeliness, quantity and quality of supplies was assessed.
- The methodology adopted are detailed below:

**Timeliness of supplies**

- Weighted average delay was calculated for each plant location as:

\[
\frac{\text{[abs (material receipt date - due date) X Value of supplied quantity]}}{\text{Total value of supplied quantity}}
\]

**Note:** Large negative variations between material receipts date and due date i.e supplies delivered earlier than scheduled date were observed in the data but were not penalized for purpose of this analyses.

Since every stage of the procurement process (Purchase Order, Invoice, and Payment automatically updates liquidity forecast on-line, the manager of Working Capital need not wait for Plant Accounts Manager to send him the funds requirement. **If the local Purchase Manager does not want a particular payment to be made to a particular vendor, all he has to do is, to put a "payment block indicator" in the respective accounting document. Then, this is shown under a separate head in the Liquidity forecast, and not picked up by the "automatic payment program".**

**Reliability of supply quantity**

- Material receipts were compared against the quantities ordered for in the respective purchase orders.
- Qty synchronization offset was calculated for each PO - supply combination as:

\[
\frac{(\text{Qty received} - \text{Qty requested})}{\text{Qty requested}}
\]

- Adherence to scheduled Qty was calculated for each PO - Supply combination as:

\[
1 - \text{abs (qty synchronization offset)}
\]

**Note:** Adherence to scheduled qty = 0 if qty synchronization offset is more than 100% (on either side).

- Weighted average adherence to scheduled qty was calculated for each plant locations:

\[
\frac{\text{Adherence to scheduled qty X value of supply}}{\text{Total value purchase}}
\]
Reliability on quantity of delivery

- Weighted average quality reliability was calculated for each plant location as:
  \[ \frac{(\text{Approved qty} / \text{Supplied qty}) \times \text{value of supplied qty}}{\text{Total value of supplied qty}} \]

<table>
<thead>
<tr>
<th>Plant Location</th>
<th>Average weighted delay in supplies</th>
<th>Reliability of supplied quantity</th>
<th>Reliability of quality of delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toansa</td>
<td>5 days</td>
<td>45%</td>
<td>92%</td>
</tr>
<tr>
<td>Poanta</td>
<td>4 days</td>
<td>55%</td>
<td>95%</td>
</tr>
</tbody>
</table>

Interpretation of results

- The results indicated in the table for Poanta and Toansa are not indicative of existing supply reliability because:
  - The due date as mentioned in the purchase order is not altered when dispatch plan / material call off changes are communicated to the supplier. In several cases it was observed that material was delivered much before (as high as 133 days) the date indicated on the purchase order, because of changes in production plans.
  - The qty requested in the purchase order in several cases does not take into account the minimum vendor batch size; thereby causing significant variations between supplied qty and quantity requested.
  - In many cases additional demands are communicated to the suppliers informally and the quantity indicated on the purchase order is not amended in the records; thereby causing significant variations between the supplied quantity and the quantity requested.
10 - MANUFACTURING CYCLE

In the beginning of the year, the respective planning heads carry out an Annual Sales Plan exercise. On the basis of the sales plan the plant level planning is done. Then on the basis of data available in the system, the planning person comes to know the load on individual resources. Knowing the load on each resource and the variable activity dependent price, he can either decide to run the second shift or out-source the manufacturing, (maybe even dispose of the resource!), the decision is made keeping an eye on other strategic considerations.

Once the plant level planning is finalized, it is transferred to the cost centers. This will give the scheduled activity levels, based on available resource masters and master recipe of various products. This is then compared with the initial plan and the new activity level & final activity prices can be arrived at.

At the production shop floor the production supervisor confirms certain quantities of issues and output, the costs are updated on-line, automatically, thus avoiding manual intervention by the Costing Cell. This helped them in the following manner: (benefits)

1. On-line batch-wise cost capturing.
3. More informed ‘Make-Buy’ decisions at every stage of production (marginal cost vs. bought out cost)
5. Estimated cost of a product, if produced now (current costing) with the available stock of RM and activity prices.
6. The actual cost & variance analysis for a batch & its various combinations (e.g. all batches of a particular product in a particular module or plant/or for a given period (Order summarization).

10.1 MANUFACTURING OPERATIONS

There was a need to leverage the enhanced responsiveness of the manufacturing operations to support the supply chain

*The parameters used to identify manufacturing responsiveness were:*

- Processing lead times
- Plan adherence

Diagrams & Figures: SAP
Month-end skew both in production and dispatches

Flexibility through capacity utilization and batch sizes

Reliability of manufacturing processes was measured indirectly by measuring the following indicators: Manufacturing from different locations is also given.

A large degree of variability in processing times resulted in complexities of scheduling which hampered the responsiveness of the plant.

- For most products the sample released to QA --- The QA clearance time formed a large part of the cycle time.
- The cycle time varied in a very large band

Month end skew across the supply chain was analyzed for production, dispatch and sales functions and the

- Analysis - Skew for both production and dispatches made from Dewas was analyzed
- Data source - Production and Dispatch figures for July - December 97
- Production on a day of the month was averaged across months to arrive at the production profile
All the dispatches made during the month were aggregated for the same day and an average dispatch figure was obtained.

10.2 Synchronization of manufacturing was estimated by measuring –
- Production skew – analysis revealed that month end skew was more pronounced in API manufacturing locations as compared to Drug Formulation (DF) locations.

A measurement of synchronization of supplies from API manufacturing to Dewas (DF) indicated that --

- There were variations between the committed quantities and the actual receipts at Dewas (DF), and only 6 out of 30 orders were received on time.
There were significant variations in the purchase plans received both at API and DF locations
- Analysis was done only for API manufacturing from data from the previous year
- Products were classified as Regular or New according per the age
- The variations between third to second month and second to coming month were looked into
- Products for International Division and Indian operations were analyzed separately

Results -

<table>
<thead>
<tr>
<th>Division</th>
<th>Product Group</th>
<th>3rd-2nd</th>
<th>2nd-1st</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>New</td>
<td>70%</td>
<td>72%</td>
</tr>
<tr>
<td>Domestic</td>
<td>Regular</td>
<td>179%</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>New</td>
<td>68%</td>
<td>59%</td>
</tr>
<tr>
<td></td>
<td>Regular</td>
<td>90%</td>
<td>129%</td>
</tr>
</tbody>
</table>

DF - Dosage & Formulations

- Planned - Actual: Variation between planned and actual production is calculated
- Responsiveness of supply chains was determined to a great extent by the planning horizons used and the mechanisms to incorporate the latest market information
- Input to production and procurement planning processes are the RPPs and Dos received from the marketing divisions/regions. Variations in these have been analyzed for Chemicals manufacturing
- Plan changes occur at two levels
  - Changes in plans between third-second-first months - This impacts the material procurement process
  - Changes in current month’s requirement - This leads to mismatch of material inventory and non-adherence to production plans released in month beginning
- Further from receipt of firm RPPs performance on planned production is analyzed for Pharma manufacturing. Overall adherence has been broken down into two components
- Requested - Planned: Variation between RPPs sent to plant and production committed by the plant is calculated.
11 - DISTRIBUTION CYCLE

Next step was to look into the impact on supply chain performance of each of these parameters

Manufacturing issues like large batch sizes, breakdowns, absenteeism etc. Contributed 20%

Marketing requests caused 15% of plan changes

Bunching of production caused 44% of changes

Note - instances which had no reason against them are included in manufacturing related areas

Analysis of reasons of plan non-adherence revealed that planning process needed to be redesigned in line with forecasting requirements and RM procurement lead times

Diagram sources: Supply Chain Management (Ranbaxy)
Sales and Distribution (S&D) module in SAP generates the Sales Order, which is updated automatically in the Cash Management System, taking into consideration payment terms and base-line date. When the goods are shipped and the invoice is made, the Customer account and liquidity forecast are automatically updated. Now if the Manager-Treasury wants to view the amount to be received between, 20th October 2000, and 30th October 2000 from Customers of low risk category, so as to match them with payables during the same period, he can do so at the click of a button. Customer credit limit is updated automatically with invoicing, payment, and check bouncing, and whenever, a customer check bounces, the system automatically blocks the customer for further invoicing. SAP’s Powerful Receivable Management System provided sophisticated tools such as Overdue analysis, Due-date analysis, Days Sales Outstanding analysis, Aging analysis, etc. One could look at the payment history of the customer, & this could be used as input in devising credit policies, etc.

11.1 Treasury Management: The quintessence of Treasury Management was exploitation of market opportunities, availability of accurate and timely information on Cash inflow, outflow, and balance in various bank accounts. SAP Cash Management provides on-line information on Cash inflow/outflow due to various financial transactions. Already initiatives had been taken to ensure that all its banks provide the facility of dial-and-download of the bank statement information, so that the frequency of reconciliation could be increased to a daily basis. This enabled the Treasury Manager to utilize the float very effectively, thus resulting in increased return/reduced cost of borrowing.

Apart from the normal transaction management for various money markets, foreign exchange and derivative instruments, exhaustive risk analysis could be done using SAP’s Market Risk Management. This component provides various measurements for analyzing and assessing interest rates and currency risks. Mark-to-market effective rate and effective yield calculations were based on up-to-the-minute market data, uploaded via Reuters. By simultaneously accessing market data, they could determine the risk structure of “what-if” analyses (such as crash scenarios or worst case scenarios) and measure as well as compare the impact of alternative hedging strategies using simulated transaction.

11.1.1 Faster consolidation: By virtue of SAP’s on-line integration between financial accounting and other modules, and the fact that all the modules shared a common database, the consolidation was no more a mammoth effort. The era of frustrating inter-divisional reconciliation was over.

For example, payments by “Pharma Business Support” against material procured for “API Manufacturing” or Collection by “Corporate & Treasury” against supplies by
Pharmaceutical Marketing" is recorded at Company Code level, so that one could draw the Balance Sheet for "Ranbaxy Global Operations" as any time. At the month end, the effect of these inter-business area transactions, was adjusted by running the "Business Area Adjustment program", so that the Balance sheets for these individual Business Areas can be seen. On-line Data collection, validation, and reconciliation helped Ranbaxy to successfully get rid of 42 trial balances they currently ran. Re-classification of debit balance of Vendors / Credit balance of customers, and debtor classification based on aging analysis were all performed using specialized programs and updated in the balance sheet.

The CFO could review the digital Balance Sheet at any time on his desk using the unique drill down from balance Sheet head to schedules to accounts and from Balance Sheet of Ranbaxy Global Operations to Business Area to Accounts. In another window, he could also review the transactions related to a particular account.

CASE

11.2 INFORMATION TO SUPPORT STRATEGIC DECISIONS

To sell in the strategic generic markets like US it's very important that Ranbaxy's products are of high quality and cost competitive.

Six months down the line after implementation, the President picks up the profitability analysis reports and looks at various combinations of plant, market segment, customer group and distribution channel for Q1 '2000. He comes up with various conclusions:

1. Selling directly to the customers was less profitable than selling to institutions. (Distribution channel Profitability Analysis)
2. Southeast American states are more profitable. (Customer group Profitability Analysis)
3. Cefaclor is the most profitable product group for the US market. (Product group Profitability Analysis)
4. It was more profitable to sell goods made in Dewas plant to USA, than China plant. (Plant Profitability Segment)

He is not convinced with the finding number 4. He looks at the detailed cost sheet. He realizes that the China plant is costlier because the API (active pharmaceutical ingredient) transfer cost to China from India is more than that of the Dewas plant. Also, the China plant being newer, the depreciation costs were very high. Hence Dewas may be cheaper today, but may not be so in the future.

Also he does the territory level profitability analysis, which takes care of all expenses on actuals, like personnel costs, LTA, conveyance, promotional material provided etc. He realizes that Poanta territory is lowest in terms of profitability. In fact they were making losses for the last 8 months.
Accordingly he decides on imminent corrective actions and methods. Finance today is geared for significant changes in its role from transaction based routines to repository of information for effective decision making.

**11.3 THE SALES AND DISTRIBUTION MODULE**

Project DIAMOND, as the acronym describes, aims to digitally integrate applications for managing operations and networked development. The project sought to provide an applications backbone that would be the first step towards Ranbaxy's digital nervous system - a system of connected PCs to provide rich, rapid and accurate flow of timely information across the enterprise that would help faster and better informed business decisions. A critical focus area in all this was the systems support to the supply chain. As a first step it was useful to begin with the end customer in the chain and view the Branch as the first point of call. As they built the backbone for the future, they could reach the stockiest and the chemists if they so desired. The Sales and Distribution Module (SD) of SAP therefore became critical to systems support for the supply chain.

The SD module in SAP facilitated the building of a customer centric organization armed with reliable, real-time, integrated information. It enabled process orientation, knitting up various fragments from sales activities through to collections, in a meaningful and systematic fashion. They could now attempt to place in perspective the reach and limitations of the SD module, what had been done thus far with it and the impact it would have on the processes at Ranbaxy.

![Diagram of Sales and Distribution Process](image)

The SD module had been atomized into the following areas: Sales Activities, Sales Order Management, Shipping and transportation, Billing and Invoicing and Sales Information System.
11.3.1  **Sales activities/support** serve to capture information pertaining to a plethora of marketing and sales scenarios such as sales leads, sales calls, marketing campaigns, direct mailings and even competitor products.

11.3.2  **Sales order processing** built around simple user interfaces provided automation for determining pricing procedure, terms of payment, delivery plans etc. Entry of products in sales orders could be done either manually or proposed by the system based on past trends. Dynamic credit checks, availability check (in order to confirm when goods entered in the sales order can be serviced) with transfer of requirements (which works with Production Planning (PP) and Materials Management (MM) modules) were some of its noteworthy features.

11.3.3  **Delivery** offered rich functionality to support the physical movement of goods after a Sales Order had been successfully processed. During delivery processing, SAP provided a picking list, which gave a list of materials to be physically picked, along with the batch numbers and the storage location from where the materials need to be picked. After physically picking the materials based on the picking list, confirmation could be given that materials had been picked exactly as per the list. In cases of difference, the deviation would be reported.

11.3.4  **Transportation planning and processing** feature helped in the planning of multi-modal transportation chain. In the next version of the product (R/3 4.0), optimization of costs and time would be taken care of by Distribution Requirement Planning.

11.3.5  **Billing** process started by listing all sales transactions that were due for billing. Billing includes Invoices, Credit memos and Debit memos. EDI, Fax or e-mail can automatically send billing documents to the customer directly from the system, without taking a hard copy printout. Credit memos and debit memos could be generated only if authorized personnel cleared the request for credit/debit memo on the SAP system. The right receivables and revenue accounts were automatically updated on the system with each billing transaction.

11.3.6  **Sales Information Systems (SIS): Analysis** of the information with full-blown graphic features of SAP Graphics provided the icing on the cake. This was an underlying feature of SIS and was applicable for each of the above-mentioned processes. The features of the module are clear leading to its on Ranbaxy’s business.

11.4  **DISTRIBUTION LOGISTICS**

Reengineering the Logistics was a major thrust as it was this that would eventually define the proper channeling of the finished product from the manufacturing units to the customer or the end user. This led the Team to delve deep into the maladies of the system and
remove the root cause so that Inventory drift and misallocation was corrected. Defining stocking and distribution policies did this because:

♦ Inventory drift and misallocation was a consequence of
  ➢ Absence of well defined stocking norms at regional warehouses
  ➢ Absence of well defined reorder points at CFAs
  ➢ Inadequate stock tracking system
♦ Attainment of inventory in line with the desired service levels indicated inventory over-productivity for low and medium variability products implying service level trade-off and even lost sales besides poor inventory productivity for high variability products implying additional cost of inventory.

<table>
<thead>
<tr>
<th>Category</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITR Actual</td>
<td>1.59</td>
<td>1.45</td>
<td>.55</td>
</tr>
<tr>
<td>ITR New</td>
<td>1.3</td>
<td>1.37</td>
<td>1.05</td>
</tr>
<tr>
<td>Stock reduction</td>
<td>-3.3%</td>
<td>-1.45%</td>
<td>52%</td>
</tr>
</tbody>
</table>

At the core of the supply chain was the flow of products from plant to distributors - The band indicates the volume of that flow.

SUPPLY MANAGEMENT          DEMAND MANAGEMENT
On an average 30% of the month's production was actually invoiced out in the same month -
any increase in this percentage released a large amount of inventories (e.g., an increase to 35%
reduced the inventories by more than 8%).
12 - REAL LIFE CASES OF SALES AND DISTRIBUTION IN RANBAXY: THINGS TO COME...

Consider day-to-day scenarios like the ones below:

12.1 **Scenario I:** Country Manager of Ukraine is visiting a customer in Kiev. The customer indicates that there is a spurt in the demand for Cifran. The Country Manager hooks on his laptop computer to his mobile phone and through Internet dials into the main computer in Delhi. He notices that stocks are lying both at Dewas and Rotterdam. He negotiates a price with the customer and enters the order details in the system (with delivery from Rotterdam). Using his portable printer, he prints the order confirmation and hands it over to the customer. Simultaneously, the person in charge of the warehouse at Rotterdam sees on her screen that an order is due for delivery (as stocks are available). She arranges for the transport and ensures that the goods reach the customer next morning by first available flight. The customer makes payment electronically.

12.2 **Scenario II:** A stockiest does a stock count of Ranbaxy Brands on his shelf and computes his requirement of various products for the next 15-20 days. Using his PC, he connects into Ranbaxy’s computer through the Internet and places his order. The system indicates the likely date of availability and performs a credit check for the customer. It discovers that while the goods are available, the required credit limit is not. The customer gets a system prompt that payments against the invoice nos. xxx-x are awaited and the current order can be serviced on receipt of outstanding payments. The customer does an electronic transfer of funds and then places the order. He then tracks the status of his order on the system till receipt.

*These scenarios described are neither futuristic nor a figment of imagination. They are already a reality in some companies in the developed world and at Ranbaxy they envision to be one of them while moving into the next millennium and the ground work has already been started.*

Achieving these scenarios, however, were not a cakewalk. They sought to adopt many of the "best practices" around which SAP was structured. This meant bringing in discipline and transparency by altering their way of working - from planning through to billing and delivery. They had to centralize and standardize systems and procedures to a great extent. For instance, all the master data (like Customer Master, Vendor Master, Material Master etc.) will be maintained centrally, thereby eliminating duplicity of codes and other inaccuracies. Also, various policy changes in

*Diagram : Diamond Team*
response to market situations will be driven centrally to ensure uniform and simultaneous deployment. These could include aspects like credit management policies, price changes, bonus FRS policy etc. India specific issues like octroi, sales tax, cess, MODVAT along with foreign trade requirements from India like pre-shipment, post-shipment and license clearance will also be addressed.

Such process changes coupled with reconfiguration of the Supply Chain based on the study by Price Water Coopers has fundamentally altered the way we delivered value to our customers. The increased span of information will improve transparency and control across levels in the organization. Information will be unambiguously available and core-users will need to understand how to garner and use the information creative ways. Over rides will be based on authorizations and through systematic change control mechanisms. In addition, since data would be entered only once in the system, roles and jobs will change in content to analyses focused efforts from the current compilation focused approach. For sales personnel, this would mean higher productivity by reducing their time and effort in follow-up and co-ordination activities thereby freeing productive time for referral activities. This will lead to more calls at the Doctor, a focus on building brands and preparing to face, in some countries, the new patent regime where companies will seek to build large brands with relatively lesser but more powerful product introductions. In addition, project Diamond would enable tracking of costs, revenues and profitability at various levels viz. at the therapeutic segment, molecule, brand, dosage form, product pack, and territory levels. There would lay further emphasis on building privileged assets in brands and selling intelligently and profitably from selling only higher volumes.

Table - 2

<table>
<thead>
<tr>
<th>CURRENT BUSINESS PRACTICE</th>
<th>THE PROJECT DIAMOND IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual relationship management and paper based database of doctors, customers</td>
<td>System enabled database of doctors, customers and retailers for marketing and sales support</td>
</tr>
<tr>
<td>Supply chain performance measures for very few parameters tracked on monthly basis</td>
<td>Online analysis of Supply chain performance based on several key performance indicators</td>
</tr>
<tr>
<td>Profitability analysis only at brand and therapeutic segment levels done monthly, manually</td>
<td>Online profitability analysis at invoice, product peak, brand, molecule/molecular group, therapeutic segment and territory levels</td>
</tr>
<tr>
<td>Distribution planning not optimized</td>
<td>Distribution Requirements Planning (DRP) for route and transportation planning and cost optimization</td>
</tr>
<tr>
<td>Credit exposure monitoring only for marketing division</td>
<td>Online credit exposure monitoring, Common customer exposure monitoring across group companies and marketing divisions</td>
</tr>
<tr>
<td>Monthly reporting of inventory, sales, receivables, significant time/effort</td>
<td></td>
</tr>
</tbody>
</table>

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Table - 2 above attempts to capture some critical impact areas that implementation of the SD module will bring on completion of all rollouts across our operations worldwide.

Clearly, the effect of such change will be pervasive. They can not hope to achieve potential benefits of sophisticated systems unless they are open to change, in some ways - fundamental change was desired.  

*Today Ranbaxy was digitally assisted and SAP R/3 is indeed a harbinger of a new era for Sales & Distribution function of Ranbaxy. It offers the power of information technology to reinvent and revitalize business operations.*

One is reminded of the Wordsworthian reflection on the renaissance - *'bliss it was in that dawn to be alive'.* In many ways this project has revitalized the corporation and enabled a renaissance that anticipates radical performance improvement and comprehensive change in the equations of our business.

As the markets of the world coalesce and concepts of globalization move off cocktail conversations to planning and practice, a future 'that has already happened' drives the corporate quest for knowledge worldwide. Countries in the west seek to retain economic superiority essentially through competing on the 'knowledge' platform. There would be no single dominant world economic power in such a scenario - no long-term competitive advantage for any country, industry or company because neither money nor technology for any length of time can offset labor resource imbalances. Hence, there would be systematic work on productivity of knowledge and knowledge workers.

The convergence of telecommunications, computer hardware and software, and the consumer electronics industries set to grow to $3.4 trillion by 2001 is a harbinger of the knowledge economy. Clearly, leveraging information and making knowledge work for corporations of the future is an economic imperative!

In the end however, the location of the new economy is not in the technology, be it the microchip or global telecom networks - it is in the human mind. About a third of the cost of health care in the US - $300b - is the cost of capturing, storing and processing such information as patients' records, physicians' notes, test results and insurance claims. The nature of the pharmaceutical business makes it more intensely knowledge driven than most. Ranbaxy's vision at Project Diamond anticipates this opportunity just as it does the knowledge imperative. *"If Hewlett Packard knew what Hewlett Packard knows, we would be thrice as profitable" said one of HP's CEOs. The same is true for Ranbaxy.*

The stock of knowledge that exists scattered in the enterprise, across plants, locations, functions and people is vast. *This knowledge becomes a valuable corporate asset only if it is accessible, and its value increases with the level of accessibility.* If the company is able
to provide rich, rapid and accurate flow of timely information across the enterprise in a ubiquitous fashion, it could act faster and make more informed decisions - in short make knowledge work for it as a competitive tool. To do this, they had to start building a digital nervous system for Ranbaxy. It is not something that could be bought off the shelf, it has to be tailored to its unique and changing needs. *This in essence, is the raison d’être of Project Diamond.*

The project sought and has, in the minimum, provided an applications backbone that can, over time, evolve into its digital nervous system which relies on connected PCs and integrated software to make up a rich information flow. The name is therefore an acronym of Digitally Integrated Applications for managing Operations and Networked Development. The great end of knowledge is after all not knowledge itself but action. Project Diamond had sought to build that bias for action and has succeeded to a great extent!
13 - THE REENGINEERING EFFORT -- AT PLANT LEVEL

Ranbaxy - a Profile

- Its Businesses
- Its Strategic Intent
- Its Reengineering effort at its A-11 manufacturing facility at Mohali, Punjab

RANBAXY - ITS STRATEGIC INTENT

Mr. Ranjit and other members of the team DIAMOND put it a little classically, that the strategic intent of Ranbaxy in today's' competitive business environment is: To focus on its core competencies, shed non-value adding flab and emerge a trim company ready to take on the world. The vision of the organization is very clear regarding this MISSION. -----

Pharmaceutical company, with a turnover of $1 billion US by 2003.

Knowledge Management:

It was in line with this that the management team at the center has felt the need to focus on knowledge management. This brought out clearly where the organization is headed - more of knowledge workers across the company and less of .... Just workers. This eventually brought about a radical change - from the routine and helped streamline priorities across the organization, which would lead to fulfilling its desired objectives.

13.1 IT’S REENGINEERING EFFORT

Reengineering as the term indicates meant differently to different people. To some it meant starting from scratch, to some it meant restructuring or downsizing and yet to many it meant rethinking the way the organization functioned.

It all began in mid '99 when the management of chemical division met with Mr. K.L. Khurana (Sr. VP) at the chair. The agenda was multi-ferrous but to be precise and keeping it short only the subject in focus will be addressed.

The A-11 manufacturing facility, the parent plant set up in 1974, was in dire straits in many ways. It was not in line with the requirements of the day and the functioning was such that economics of scale were a dream and compliance to regulatory issues, which was a must for survival in the pharmaceutical industry, was practically non-existent. It was functioning more or less in a laissez-fare manner. It was necessary for it to be able to cater to the market globally with quality products – for this the facility had to be re-engineered in a like manner.
It was decided to place a person with the knowledge in areas such as production, personnel, safety and regulatory besides an ample exposure to the study of Business Process Reengineering.

It has besides other things helped in doing a complete turnaround. The support Sr. VP, Plant Manager -GM-Mr. RSB and all the employees of A-11 facility gave to the person assigned the job, were instrumental in seeing the project through. They all hope to make re-thinking a continuous process, a way of life, rather than patch up the work later.

The areas that required reengineering were:

1. Layout
2. Flow of RM & FG
3. HR - Change was affected from an attitude of indifference to an attitude of acceptance, and positive thinking.
4. IT --- Information technology played a pivotal role as an enabler of the reengineering effort at Mohali Location.

The uncertainty that existed and the manner in which the personnel looked at things gave a view, that all was not right. It was a pointer for the need to re-think issues and taking each one by one till a complete turn-around was achieved. It was important to understand the value of information and how it could help the organization to achieve competitive advantage over its rivals.

To come out with a plausible answer an analysis was done as ----

### Competitive Value of Business Information Systems

<table>
<thead>
<tr>
<th>Competencies:</th>
<th>Essential</th>
<th>Necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distinctive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Value</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Strategic</td>
<td>Mission Critical</td>
<td>Operational</td>
</tr>
<tr>
<td>Customer Information, Account Management, Service Management, Order Fulfillment</td>
<td>Production, Distribution, Inventory Management,</td>
<td>Finance, HR</td>
</tr>
<tr>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

Competencies:

- Strategic
  - Customer Information
  - Account Management
  - Service Management
  - Order Fulfillment

- Mission Critical
  - Production
  - Distribution
  - Inventory Management

- Operational
  - Finance
  - HR
After identifying the above it was pertinent to go deeper and think differently. It was felt that they had to give themselves some sense of cohesion, and for this they had to try to work out what the future was going to be like.

Point -- that is exactly what the team tried to do. They reasoned, and where the need arose persuaded and in extreme cases sought the help of higher-ups to enlighten people and press the point home - that there is, after all, some sense in what appears to be all nonsense around us.

At first glance the issues looked undoable and all were pessimistic about the future and the outcome there-of. This was so because they saw it as - an endless dark tunnel with no sight of light at its end. But, as the saying goes, there is always light at the end of the tunnel, their hope did not dwindle nor did the need arise to abandon the project at its very inception. They were actually very optimistic deep down, because they saw it as a thing of opportunity for a lot of people who never thought they could actually make a difference to the unit or to the organization as a whole. It was but in all sense a huge challenge.

In the beginning it was like learning to ride a sea-saw - because for the sea saw to move - there is a pattern of ups and downs - that both opposites are necessary to make it / process - work. So it was with the processes of A-11, because it was essential to understand that the key to progress was to be aware that contradictions could coexist and learn to live with them.

13.2 Re-thinking the future:

One has to understand that future is not a continuation of the past. They must see it as a series of discontinuities, and learn to take on these things head on. The s-shaped s-curve provides a description of the way things go on in life. First - the dip at the start and then, high fortitude and good management coupled with luck, the growth and consequent movement up the curve starts - but, these fizzle out - empires, corporations, products (lifecycles), relationships and more so, carving for sex or life itself.

Accordingly we have now reached the third of the three eras-each characterized by an S-shaped organizational learning curve-associated with the transformation of the traditional industrial economy by information technology (Fig). The focus was on leveraging engineers, financial analysts, and other professionals by employing computers to access, analyze, and present data. This was a period of "creative destruction." in which older infrastructures and management principles were shed as new sets evolved and employees were added, eliminated, and re-deployed at many different levels.
Figure 1. The three successive S-shaped waves of organizational learning resulting from advances in information technology. In the first era, characterized by the widespread introduction of data processing (DP), the focus was on automating manual-transaction processing systems. During the second (transitional) era, the focus was on leveraging engineers, financial analysts, and other professionals by employing computers to access, analyze and present data. Both the automation first wave and the informational second wave of information technology advances affected organizations internally—reassigning functions and restructuring departments. But in the current third wave, the era of networks, they were poised to reap the external rewards deriving from the new fusing of IT and telecommunications capabilities: more appropriate, customer-oriented operational processes. Adapted from Nolan and Croson.  

It was exactly what was happening at the A-11 unit. They had to get continued and stay in a continued state of growth in the future by building a new curve before the first fizzled out or descended. This was a must and they had to be constantly inventive and creative.

The organization for long had thought of itself as a problem solving organization. Though partially right it was more wrong because, by the time the problem was discovered and they started solving it others outside were way ahead - they had to think of ways to remain ahead of the problem. They had to re-think the organization / product line. A second curve had to be thought of.

In order to be able to create a second curve, it was important to remember the past - but surely enough it was more important to put it behind them. They had to ensure that it did not stand in the way of their future - as it was going to be different. They had to unlearn
so that they could learn to deal with the future. This is more so if they could put it more aptly as - You can't walk into the future looking over your shoulder.

13.3 Innovation: -

Today, the only way to have advantage was through innovation and upgrading of systems. In order to put their house in order an action plan was drawn up with target dates and persons responsible/accountable. Over the months that followed they faced an uphill task but they did achieve what they had set out to achieve and much more.

13.4 HR

It had been an accepted norm throughout the A-11 location that functioning the way they did was the best way. The feeling of know-all existed all around. This was not just mere talk but the outcome of the same people working in the same areas with the same bosses for the past 15-20 years ---- leading to complacency.

This in turn gave rise to too much familiarity, which over the passage of time led to contempt. Short cuts in documentation practices, in GMPs, bypassing laid down safely standards and so on. The issues were endless. The workmen, operating staff and supervisors took a casual approach while facing problems. This in turn led to insubordination amongst other things.

Other problems faced by the people were that there was little knowledge about who was responsible for what. Most took the easy way out pointing a finger at the other as a sure way out. But, on most occasions these tactics usually boomeranged. The outcome was stern action besides regulatory actions cropping up against individuals.

During the initial phases the going was such that they usually felt like ramming the person concerned into a brick wall. The start was more than frustrating. Sometimes it made the team want to give up and pack their bags. It wasn't till they had had a talk to each and every person on the shop floor and training them on the job regarding the changes that were on the anvil, that the idea started setting in that they meant business. Two operating Managers who deserve mention are one Mr. Kalra and Mr. Karan. They helped the team along the process by calling in their staff members and hammering in that though they had worked in manufacturing for over a decade – they were now facing regulatory and issues had to be dealt with accordingly. They were also informed during joint sessions that the role of the regulatory personnel besides being that of a compliance auditor was also that of a consultant or a guide. It was going to be a team effort to Re-design the unit to enable it to make a complete turnaround for it to remain viable in face of competition.
Training which had taken the back stage was once again taken up with vigor. The operating managers took sessions educating their staff about various guidelines, regulatory requirements and good documentation practices. Many a time they were invited to sit through such sessions conducted by regulatory department and were also made to provide inputs where necessary.

Besides the above, concerned HODs were always keen and attentive to feedback. The outcome was that it necessitated calling in the supervisory staff in batches to spend a week at the regulatory department. This whole exercise was done in order to train besides educating them on the various aspects of regulatory guidelines, rules, change control and validation practices. They were further trained how to make / write critical documents essential to the drug industry. The regulatory head personally devoted time to monitor their performance very closely. At the Plant level they were advised to ensure that all that was being taught was being implemented. Crosschecking was essential if they were to have these persons turn-around. During the whole one-week they were made to attend sessions and were impressed upon to re-think rather than follow the same old dusty trail. They were motivated to re-think what they were doing and find better ways to do so. This would help them to help in re-designing / reengineer the unit – making it viable for many more years.

13.5 Re-Thinking Business

All said and done they had to develop a sense of direction, a sense of working together as part of system, where each part of the system was affecting and being affected by others, and where the whole was greater than the sum of its parts.

Earlier they solved problems by breaking them to pieces. In Kaizen / fish bone diagram etc. but these don’t work all the time. So it was brought to light that in order to do things differently they had to first put the past behind and sense the need for change. This was by no means a Herculean task as most of them were used to old methods. People across the unit had to be educated.

They knew that they could not force people to change their thought process. Instead they had to pop up a few or a number of people and provide them the support and motivation desired. Thus pockets of people would start operating differently. They would be provided means to develop new skills so as to understand the complexity, in building shared aspirations, in learning how to reflect on their own assumptions and in challenging assumptions without involving defensiveness. It must be borne in mind that change, initially, cannot be started on a large scale just out of the blue. THESE enlightened few would then act as aggressive change agents or champions of change.
The above was borne to the last letter by the fact that it took the team over a year to re-design a major chunk of activities in the A-11 unit. The reason why it took so long was that, a basic change in how they thought involved tremendous uncertainty and tremendous risk. It had a touch of spice - the fear of the unknown, what will happen to my job, etc was the foremost thought in the minds of each employee.

As mentioned earlier, the supervisors were invited in-groups to spend a week of learning at regulatory department. Its HOD and his team had a common view on the issue - that you can never persuade people to change. You can take a horse to the water but you cannot force it to drink but at least, they thought, at the very best they could force them to think differently between "knowing about things" and knowing how".

After the week spent in learning to do things differently it occurred to all that - sharing of knowledge happens only when all are interested in helping each other to develop new capabilities for action - It dawned upon them that it was all about creating a new learning curve. A change in attitude had occurred.

13.6 To sum up it could well be said with confidence that turning around the HR in general was the most difficult task ever faced but it was worth-while. Today, they have reached a stage where they see a lot of examples. The mere survival of the unit is a good proof of possibility - it's pretty hard on anyone's part to argue that it is not possible anymore. But, this does not mean that the entire going was easy.

It was like when the first airplane took to the air successfully - only then did development in aviation take off in earnest. But, until then, every crash was one more piece of evidence for the cynics that it could not be done. But, once the first plane flew, it changed all that. Data from all the failures were now interpreted in a different mental frame. It provided with evidence on how it could be done. This was in essence the true learning process.

At the A-11 unit too, today they have seen through all the failures, ups and downs and that it can actually be done. It has been a great learning process over the months and the paradigm has shifted towards re-thinking to re-design the organization than remaining static with no sign of dynamics. Today, the HR in the unit and their level of morale is something, which is the envy of all other Chemical manufacturing locations.
14 - REENGINEERING THE FACILITIES LAYOUT

- Reviewing the design that was.
- Drawing up an action plan to Re-design.
- Facilitating improvement in RM and finished goods movement at A-11 unit.

Once the ball was set rolling in June’99, they set out in earnest and reviewed all that was presently in place i.e. they had a hard look at a situation like that shown in Exhibits set - I. It was more of a Rubik’s cube like structure and justifications were not forthcoming, but the regulatory head and his man in the location knew that it was but a compromise as attempts were made to cover up rather than straighten up.

Equipment (many) were placed at places which was OK accordingly to the first set of exhibits. But in order to understand the whole gimmick they needed a look at the second set of exhibits – which formed the basis of doable activities that were necessary to straighten out.

- Action Plan: - A good quote written somewhere says - that it is essential to plan, plan and plan but more important was the execution and follow-up - putting in stitches in time before things went out of hand once again.

So, the GM, operating managers and engineering managers in consultation with the compliance incharge of the location set up a tentative action plan which identified areas and which required being re-thought, re-designed or improved upon. Responsibilities and dates were fixed and so started the campaign.

The whole unit was studied and examined as under the microscope. It was no surprise that at every corner there was something undesirable, something unwanted or just placed there – just for convenience sake. The layout of equipment, the PID (Process and Instrumentation Diagram) and various other engineering aspects were re-looked into to come up with more issues requiring change.

A facility for each drug manufactured was audited in depth and a report was made. A signed copy was given to the process owner/operating manager and another was sent on e-mail to head regulatory and GM for information.

Initially the going was very, very tough as people with fixed mindsets and used to working in such a set up were unwilling to accept the changes suggested against abnormalities mentioned in the report. Tentative dates were given to each module.

On the said dates a follow up was conducted and those issues, which had been completed and complied to, were struck off besides writing in the changes undergone. The remaining issues were flashed over the e-mail to all concerned and his HOD.
On the said dates a follow up was conducted and those issues which had been completed and complied to were struck off besides writing in the changes undergone. The remaining issues were flashed over the e-mail to all concerned and his HOD.

If work did not comply after repeated reminders a warning letter was issued to the process owner, in the form of a FDA-483 ticket to the persons in concern. Once such a ticket (a warning cum observation ticket) was issued - the atmosphere was changed. It was the turn of the GM (A—11) to sit across the table with head regulatory with his operating managers. Issues leading to the issuance of the 483 were raised. It was then realized that a lot of un-learning had to be done and it was decided to call the Operating Managers and the supervisors for re-orientation to the regulatory department.

Commitment was had from them on various ranging from facilities to documentation practices.

14.1 Re-thinking to re-design the facility layout.

Exhibit II and I give a clear picture of what was and it is like today. Hence, with Exhibit I in mind the compliance incharge was more of a consultant than an auditor. Each step of the process was reviewed with the process owner.

Both parties looked at facilities from regulatory viewpoint. This being so, the facilities were subject to scrutiny any time by foreign agencies besides the CQA. Gradually, Exhibits – I gave way to II. Today baring one or two patches where the re-think process has been completed and only the implementation part remains unaccomplished.

Exhibit – Set - I

Exhibits – First set clearly show a very unprofessional layout and way of working. Material movement: - is constrained due to lack of proper gangways. Obstacles are present here and there. Further this could have a very negative impact on the cross- contamination issue. Movement due to poor layout was not in form and had to be re-thought to re-design the layout.

Exhibit – Set - II

This issue has now been sorted out by re-designing. The layout space in other parts of the factory lying idle has been made use of and equipment causing hindrance have been relocated. Some steps of Project – ST have been re-located. PIDs have been re-drawn eliminating congestion almost across the whole unit. The unwanted material in question has been taken care of with the help of materials department, thus, giving more free space and thereby improving working conditions. This in turn helped change the attitude of the people towards the re-engineering effort. They now saw how the whole exercise in positive light.
Exhibit-I

The whole layout was in disarray and moment of man material and machines was extremely difficult being hindered by obstacles in the path.

This laid to lowered productivity on all fronts, which in turn lead to lesser long-term gains. The bottom line was adversely affected.

Exhibit-II

After BPR at the plant level – the lay out was considerably improved with the bottlenecks removed. Disconnects were also done away within the equipment train and process flow. Gangways were decongested; process lines were rerouted and adequately identified to facilitate error-free operations. Housekeeping became easier, ventilation improved and working conditions enhanced.

Overall, the working conditions became such that the productivity improved on all fronts to such an extent unimagined before.
EXHIBIT - II

Space utilization optimized.
They were now re-thinking to re-design the unit towards this goal where in they will be able to achieve more productivity per person than ever before.

Final Drug processing areas as is seen the exhibits clearly indicate to what extent the whole exercise helped in putting the house in order.

Elimination of excess drum handling thus reducing the unnecessary use of manpower for unproductive activities. The whole issue has now been made systematic and easy.

Documentation:

Reengineering is not the prerogative of only the manufacturing systems, it can and is used to great advantage for deriving benefit by employing it elsewhere such as organizing to stay ahead in areas such as Documentation of data --- and data management.

A-11 - THIS WAS ONE AREA, WHICH WAS SIGNIFICANTLY RE-ENGINEERED - RE-THOUGHT AND RE-DESIGNED.

An in-depth audit into the documentation systems revealed that it was not just deficient but grossly out of tune as compared to other units of Ranbaxy. Even the basic necessities were bare of the thinnest fabric required under various essential guidelines for manufacturing of life saving drugs. Things were in severe doldrums and needed putting them right – like yesterday.

This gave the team a jolt, which made them, sit straight. The location compliance incharge carried out a detailed assessment of the systems. Along with the other team members a Problem management system was devised like the one given below:

Problem Management via Notifications

<table>
<thead>
<tr>
<th>Activities</th>
<th>Problem Notification</th>
</tr>
</thead>
<tbody>
<tr>
<td>tasks</td>
<td></td>
</tr>
<tr>
<td>results</td>
<td></td>
</tr>
<tr>
<td>Solutions</td>
<td>Analysis</td>
</tr>
<tr>
<td></td>
<td>defects</td>
</tr>
<tr>
<td></td>
<td>caused by...</td>
</tr>
</tbody>
</table>

14.2 **Identifying Gaps** - The audit led to findings, which were truly mind-boggling. The team realized that they would have to work very hard to get it straight as it required
going back as much as 4 years in time to make up for trails of the drugs produced. This was essential as Process Manuals, Development Reports (having the trail of Developments), Validation Documents, Deviation etc., had to be put in place before it could be all said and done. During the process of re-design the compliance incharge deputed to carry out the task did so slowly and steadily with the constant help from his team mates and turned the fledging ship around. The last of the documents were turned in exactly ten months from the beginning of the re-think exercise.

Today the A-11 unit can boast of two successful audits by CQA plus a successful visit by a Japanese and Turkey delegation. But, the compliance incharge and his HOD were not in the least satisfied. On various in-house audits it was realized that people usually tended to fall back on habits of old and required constant prompting and motivation. The going though a tough one has finally yield results and today acceptability is upwards of 90%.

Putting it in a nutshell, it can be said that manufacturing drugs without proper documentation and compliance to regulatory requirements is like trying to fly a plane without the joystick and rudders. Documents provided information about the history of the product manufactured, the trail of developments, the SOPs to be followed during manufacture, the specifications to be meet and so on. Besides, FDA and ICH time to time release new guidelines and regulations regarding the manufacturing of drugs and these have to be comply to or else the organization would not remain competitive in the international market.

Constant training and follow up has to be carried out and all loop hooks have to be plugged in time.

14.3 Information Need

For all the above to happen effectively it was important to analyze the information need –

14.3.1 LEVERAGING INFORMATION

INFORMATION, today, was set to re-write business economics, clearly leveraging it as the epitome of knowledge businesses. At Ranbaxy the thought process was very clear that Companies which build virtual value chains by capturing, organizing, synthesizing and distributing information will be distinctly different from the rest in the coming decades and derive significant competitive advantage.

In the pharmaceutical business, well-identified privileged assets such as drug regulatory filings and clinical research data would benefit from information technology judiciously applied along the value chain. However, the relatively less explored dimensions of electronic marketing (e-Commerce), deriving advantages from digital communities of
physicians, stockiest, patients and other relevant publics. Acquiring international competencies in the form of multi-cultural human resources through digital means - all emphasizing mind share over market share - will perhaps pay more dividends in the future.

14.3.1.1 Information services, in such a context, is purely Business-driven, demanding a shift in traditional mindsets that considered IT as a 'service' function, to one where Information Services charged, galvanized and enabled Business to change the rules of the game. Bringing information services together with Strategic Planning in the company reflects this altered paradigm. For Ranbaxy, all this translated into creating a core of integrated business information, building sound internal digital infrastructure, and seeding digital communities in its business space.

There was a need for creating, at the outset, a digital base for dependable and reliable information generated internally during the course of day-to-day business, instantly accessible across the enterprise. Such integrated information will build the foundation upon which any 'competitive advantage' architecture could rest. In order to fulfill this desire for integration, Ranbaxy implemented SAP R/3 - a tool for enterprise resource planning. This has greatly enabled the integration of data generated across geographic functions and business units.

14.1.1.2 Digital Nervous System Simultaneously, computing power was made accessible across the enterprise. It implied the building of a Digital Nervous System, which formed the internal backbone for leveraging information. Today, the company has 1.2 PCs for every member on its managerial staff. However, in order to achieve critical mass in computing power, it was important to measure and improve the ratio on an enterprise-wide basis rather than a segment of employees.

14.1.1.3 At Ranbaxy Good Information Practices (GIPs) for adoption across the enterprise included guidelines for building appropriately distributed computing infrastructure. Such GIPs were aimed at reducing the risk of obsolescence by standardizing, configuration and drawing synergies by building worldwide partnerships with IT vendors. To expand its digital space, Ranbaxy has built appropriate competencies in-house, and networked with the best in the business. Ranbaxy’s partnership is a step in that direction. Increasing interaction with such partners allowed it to keep in touch with developments in frontier technologies, particularly for the Internet, that enabled expansion of its digital space.
15 - THE ENABLING ROLE OF IT

"A Company that cannot change the way it thinks about information technology cannot reengineer". A Company that makes a search for problem areas first and then seeks out technological solutions for them cannot reengineer.

Information technology plays a crucial role in business reengineering. Today, state of the art information technology is part of any reengineering effort, an essential enabler, since by it they can reengineer business processes. In Ranbaxy too it was no exception - information technology helped to reengineer its Supply Chain Management (SCM), improve and increase transparency cutting across all functions.

It was aptly said that, on most occasions, executives and managers knew how to think deductively. Meaning that they were good at providing definitions to problems, later they sought and evaluated different solutions to it. But, applying IT to BPR demanded inductive thinking - the ability to first recognize a plausible solution and then seek the problems it might solve, problems that the company probably does not even know that they exist.

At Ranbaxy Thinkers at all levels thought that the problem was to find a method to enhance faster and better MMS, better QA services, faster production AND with fewer people. What they found instead was a solution that let them integrate all functions, right from identification of suppliers / vendors - though QA - production and finally sales and finally the feedback. The loop was complete what with all the functions linked to each other via SAP; some of whose functions were discussed in greater detail previous pages.

At Ranbaxy where the usual query used to be - How can they use these new technological capabilities to enhance or streamline or improve what they are already doing? Today, after having gone through the change process they have changed the query to - How can they use technology to help us to do things that they are already not doing.

<table>
<thead>
<tr>
<th>The system that was to be used had to be:</th>
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<tbody>
<tr>
<td>• Highly flexible, allowing users to tailor it to exact business requirements and adapt it to meet changes in processes.</td>
</tr>
<tr>
<td>• robust to integrate the vast flow of information among all members of the extended enterprise</td>
</tr>
<tr>
<td>• open so all participants can tap the power of shared information in ways that meet productivity, customer service, and other key strategic objectives</td>
</tr>
<tr>
<td>• dynamic and highly automated to react effectively to changing variables and ensure that changing business conditions trigger appropriate, coordinated responses across the chain.</td>
</tr>
</tbody>
</table>

ERP meets these criteria.
15.1 SAP

In the beginning, thinking deductively about IT not only caused people to ignore what was really important about it, it also got them excited about trivial and unimportant technologies and their applications.

At Ranbaxy, after going live on SAP, IT has enabled it and its suppliers and various other customers to operate as one company. By this, it has enabled them both to eliminate overheads on both sides, thus breaking one of the oldest rules in any organization rulebook. “Treat vendors as adversaries. Same is the case with our immediate customers around us.”

AN EXTENDED ENTERPRISE TODAY AT RANBAXY DEMANDS:

That the system be:

• Highly flexible, allowing users to tailor it to exact business requirements and adapt it to meet changes in processes
• Robust enough to integrate the vast flow of information among all members of the extended enterprise
• Open so all participants can tap the power of shared information in ways that meet productivity, customer service, and other key strategic objectives

Dynamic and highly automated to react effectively to changing variables and ensure that changing business conditions trigger appropriate coordinated responses across the chain.

15.2 INFORMATION ´AN ENABLER

It was well understood that information would henceforth drive all round growth. Information of - markets, of competitors, and of technologies.

A corporate vision seeded to the concept of core competence was essential for realizing Ranbaxy’s global gains. Core competence was not the ability to manipulate regulations or the ability to raise money from the public. It was seen as more intrinsic and has a technological underpinning. When an economy opens up, numerous growth opportunities manifest themselves. Let it not be forgotten that that standards of excellence are global not local. Sticking to the knitting may appear conservative but as one knows it is those companies that do so are the companies that you bet on in the long term.

A gap that was bridged at Ranbaxy was in the application of information technology. As with most technology, it was no longer a means of automation but a source of distinct competitive advantage. Technology today permitted effective utilization of data available at international offices, manufacturing locations, research and development centers.
15.3 TECHNOLOGY

Ranbaxy was of the view that in order to be and remain competitive it had to think of reengineering its processes.

Ranbaxy was aware that there are no all-curing panaceas for business problems or fixed recipes for its survival in the twenty-first century. The process of transformation /Reengineering was thus intrinsically perpetual. The gaps were assessed, both quantitatively and qualitatively, and were effectively bridged to meet such needs. This helped it focus on strategic choice in each area.

15.3.1 The challenge of technology

There was a progressive transformation of the marketplace to market space, where information technology was altering the way it produced, distributed and serviced its products. Quality was no longer a significant differentiating factor since a fiercely competitive market ensured that poor products die and all available products simply have to be good. The quality of information or ‘knowledge’ that it provided to its clientele was, therefore, emerging as a major differentiating factor.
Today Ranbaxy through SAP has integrated all functions of MMS, QMCS, PMCS, Production Planning, HRIS and so on. And analyzing the benefits of ERP as a tool used to reengineer the organization. A benefit analyzes tree has been drawn below to bring out the highlights of benefits emerging from the implementation of SAP in the organization:

A person authorized is given access to the SAP module. After accessing he enters his requirement of the desired material. If it is not a stock out situation the entries will be accepted, if not, it won’t. No signatures are involved. Everything is automatically updated. This has reduced running about by production personnel and saved them a lot of time. Material is today delivered by battery operated fork lifts.

Diagram - ERP
**Good Information Practices (GIP): IT in the 1990s**

Technology began supporting Ranbaxy’s business by increasing levels of automation and therefore efficiency of repetitive tasks like accounting, payroll, shares etc. The PC and development of PC based software made this possible in the 1980s.

They extended their thinking from simple automation to process redesign as technology advanced and became less risky and more accessible. Technology enabled optimized and integrated business processes like production planning, order processing etc. became the goal in the early 1990s.

Today, with new technology paradigms such as internet and ERP, they were seeing information technology become a competitiveness fundamental which companies are exploiting to deal with growth, globalization and organizational change. (Pharmaceutical companies are more susceptible to this trend because of industry-wide consolidation and heightened world-class competition.)

Source

![Diagram](chart.png)

To successfully implement such a shift in thinking they had to deal with two key questions. How to increase the flexibility and simplicity of their existing digital environment? And, how to build a business-smart IT organization and an IT-smart business organization, which can jointly deliver superior business value?

Dealing effectively with these questions in a technology environment, that was fast changing and volatile, required a policy led approach. These policies, in the form of GIP,
aimed to focus technology management in Ranbaxy towards IT leverage that is fundamental and not incremental to the way they did business.

**GIP – Principles and Objectives**

<table>
<thead>
<tr>
<th>GIP principle...</th>
<th>means these objectives...</th>
</tr>
</thead>
</table>
| Flexibility and simplicity of technology environment | • Establish standards for key components of their digital environment  
• Create basis for stringent cost and service expectations from IT  
• Routinely audit practices and incorporate the lessons learnt in future  
• Plan for reliable technology infrastructure to consistently support all line business applications  
• Incorporate strategic thinking into Ranbaxy’s technology environment to build capability to deal with issues like acquisitions |
| IT-smart business organization and business-smart IT organization | • Strong communication between IT and managers across departments, across geographies  
• Bring in business driven IT decisions, discipline and thoroughness  
• Create forum for debating, benchmarking and actuating emerging technology paradigms |

**Business Perspective: Office Information Systems**

**The IS sponsor**

Office computing infrastructure has evolved beyond desktops running elementary software, to span technologies such as multimedia, email, access to corporate networks etc. Productivity tools such as Ms office and groupware have also kept pace. This level and speed of innovation is continuing, and widening, with frontline business applications like SAP and data-warehouses becoming available right from the office desktop.

Obviously the office computing infrastructure and the processes that provide, support and manage it also need to keep up. Two issues are key here: asset management and change management. Assets such as PCs, printers, email accounts etc. need to be allocated and maintained. In addition, technology driven change needs to be managed in terms of deployment, user training etc.

Addressing both these issues requires close alignment with the business as well as resources and skills. This policy aims to achieve this by introducing the idea of IS sponsors across our departments / locations. They will leverage the core IS organization to augment its efforts in continuously deploying best-in-class office technologies enterprise wide.
### Business Objectives and Benefits

<table>
<thead>
<tr>
<th>To:</th>
<th>So that Ranbaxy moves towards:</th>
</tr>
</thead>
</table>
| 1. Create IT asset ownership with the IS sponsor in each department and location | • Simplified processes for procurement and maintenance of office computing infrastructure for end users  
• Organized, responsive and single-point mode of interaction between IS and other departments |
| 2. Establish change management responsibilities of the IS sponsor | • Business driven new technology initiatives, with improved delivery on time, budget, and business functionality  
• Distributed skill base on office computing technologies to improve acceptance and efficiency of new initiatives |
17 - THE RESPONSES TO THE BPR PROCESS (PART – I)

Every change process is associated with certain stimuli and response sequence and Ranbaxy was no exception to this situation. The external environment presented some stimuli that led the organization to think of going ahead with change because:

17.1 External Condition influenced the performance of the organization meaning that it must:
Increase global emphasis on innovation, as it would help lead to:
Fewer, stronger players across the market space. Competition would henceforth be focused towards
Knowledge based competition, requiring transition to external, competitive intelligence from analysis of historic, internal performance data.
Urgent need was felt, to build a virtual, highly flexible, responsive organization leading to
Transition from brands to customer ownership and
Significant competitive advantage would eventually come through differentiation in the supply chain, Pending change in the patent environment

For all this to happen the management at Ranbaxy was of the view that:
Strong idea management systems had to be put in place to spur innovation
➢ Management of ideas for enhancing the effectiveness of SAP implementations
➢ They had to create an ideas log for users in each site synchronized with the roll-out and further
Leveraging information and technology for competitive advantage – making a move from opinions to facts in decision making

1. Creative rules were devised to move from paper based culture to a digital culture
E.g. Bar print options on several SAP reports
2. For this compliance was enforced on select digital practices across the enterprise to make a move towards putting

3. Digital literacy into annual performance assessment so as to:
Targets were mandated to digitally enable current activities at department and individual level is monitored closely

What was missing was a service segmentation framework around which to develop business plans for internal services. To implement the paradigm, executives had to:

• Communicate the vision and commitment of top management and enlist cooperation
• Coordinate the participation of division level executives
• Keep everyone, especially functional business partners, focused on the
development of consensus or what would be the best practice
• Offer professional planning expertise to develop a blueprint for change
• Ensure that implementation was carried out reasonably, without favoritism and
according to plan.

In short, executives had to keep everyone honest, harnessed and pulling in the same
direction.

17.2 Service Segmentation helped service providers, such as human resources and
information technology, tailoring their efforts toward giving customers what they really
needed rather than what service providers presume customers need. Service segmentation
helped establish direction and ensure that internal services supported the company’s
primary business objectives.

As with external customers, the needs of internal customers ranged across the
spectrum, from generic needs applicable to all or large groups of employees, to problem-
solving or technically specialized services, to high-level managerial consulting and strategic
partnering.

At the generic end of the continuum were services for which most or all employees
had the same need and could be treated similarly, such as payroll check or medical claims
processing. Such services were needed continually and in large numbers, so they could be
standardized. They at Ranbaxy called this category “centers of scale” because
providers should do everything possible to reduce unit costs through volume processing.

In the middle of the continuum were the technically specialized services such as
environmental compliance monitoring or international tax planning. These services were
called “centers of expertise,” whose providers had to strive to put their knowledge at the
disposal of as many customers as possible.

So - Besides providing stimuli, the environment also provided the organization
with a number of responses such as:
  ➢ To seek innovative ways of reaching the customer and delivering customer value by
  ➢ Electronic conveyance of COA (Certificate of Analysis) and all export documentation to
customers by developing a
  ➢ Regular information database system based customer feedback on order status,
complaints, returns and other queries
  ➢ The secondary sales data were closely interfaced with SAP for focused analysis and
  ➢ Ultimately, electronic support for field force through
Call monitoring and tracking
Product promotion feedback and impact analyses
Product literature and electronic documentation
Computer aided selling

- This led to the creation of a regular forum to absorb expert views on recent digital trends, practices and business benefits and helped
- Set up ‘computer-zones’ across the enterprise to pursue digital literacy which
- Led to building up of system based scans for competitive intelligence. This helped in
- Reducing organizational levels between executives and the customer and
- Routinely envisioning the future based on intimate market knowledge
- This allowed differentiation through the supply chain by the
  - Deployment of statistical models for forecasting and baseline planning to improve forecast fidelity and
  - Self-correcting mechanisms like MRP at non-manufacturing locations to increase supply chain responsiveness besides
  - Differential planning strategies to respond to external market dynamics (volume, value, growth and variability)

Both stimuli & responses provided by the external environment helped leaders across Ranbaxy to develop some leadership stimuli: This included executives who provided overall direction & served, role models for the entire organization had to first undergo:

- Transition in role from ‘boss’ to ‘coach’ for effective leadership and to develop oneself

- This would lead to a growing need to lead by example and propagate leadership through role models, and motivating the empowered individual to work in teams would now be a rule and a critical challenge.

As an outcome of the stimuli, responses too developed which showed that:
- Leadership skills would emphasize inspiration and creation of a climate of trust and that a leader must have -- Strong communication skills by which he/she could communicate a compelling change vision and the urgency for change. He must be able to
  - Construct the ‘burning platform’ for change and
  - Develop and deploy change messages using various modes of communication based on a strategic communication plan He must be able to
- Identify and assess change leaders and change agents and map them to constituencies of users
17a - RESPONSE TO THE BPR PROCESS (PART – II)

17a.1 RESPONSES TO THE BPR EXERCISE ITSELF WERE--

- Emphasis on intense senior management participation in developing and articulating Operational vision across the company
- Emphasis on speed of decision making across functions
- Focusing on 3-4 key aspects of differentiation in each module (Sales & Distribution)
- Integrating (RSPs) with the planning process using the Internet by making it a Web enabled demand communication (RSP – regional sale point)
- Developing an EDI pilot for export documentation impacting customs, overseas exports and customers and a System based credit rating of customers to reduce credit exposure

17a.2 MEETING PRODUCTION PLANNING & QUALITY MANAGEMENT ISSUES:

- By introducing a system based quality management in Pharma manufacturing with Automatic vendor rating based on Quality of material.

This meant, Uniform quality systems across different locations, through effective use of Document management system (DMS) for storage of Specifications, STPs, SOPs, Validation protocols etc. *(Today the DMS of Ranbaxy is an area of pride as it has eliminated a lot of layers that were encountered before a particular document could be viewed. This in many ways has saved on time and man-hours. This has also led to transparency across the Organization)*

- This has further reduced development time for new product introduction through

  i) The introduction of document management systems for development of packaging materials

  ii) Ultimately moving towards digitally integrated documentation of product packages –comprehensive product dossier (manufacturing and packaging instructions, safety instructions in digital form) to shorten time from product development to production

  iii) A Pilot was developed and implemented for electronic BPR (Batch manufacturing Record) at Mohali for two products in anticipation of widespread deployment later Materials Mgt., and a Centralized purchasing module leading to price efficiencies through consolidation of demand and increases in productivity
Material-to-person mapping allowed comprehensive knowledge of material groups by moving the purchasing department closer to the users through workflow and purchase automation (procurement, capital expenditure monitoring and other admin. activities done by the system). This led to developing a Post purchase-order tracking of shipments, information on precise status for increasing internal visibility. Hence better planning and external visibility through linking with suppliers besides Intelligent tracking and monitoring of material flow through warehouse management.

For all this to happen Ranbaxy Partnered with SAP in a pioneering development effort for streamlining of import processes including statutory documentation and licensing.

17a.3 FINANCE & CONTROL ISSUES WERE DELT AS UNDER:
In order to have a controlling hand over the various aspects of business it was deemed necessary to develop a Centralized cash concentration account to monitor green balances resulting in optimal utilization of cash reserves. Further a workflow based payment approvals for employee payments was developed and Ultimately, the centralization of the Finance function across the enterprise resulting in quicker and better quality of financial decision making and higher people productivity was adequately implemented.
17b.1 AFFECT OF CERTAIN STIMULI DURING THE BPR EXERCISE

HAVING gained an insight, the important step was to study the effect of change on the culture within the organization:

The collection of covert and overt rules, values and principles that ensured and guided organizational behavior such as

- Aggressive, target oriented
- Supportive of risk-taking
- Few self-driven individuals design and drive the system
- Thought processes was not in tune with international ambitions across management levels as it was more (India-centric thinking) and they were
- Not digitally oriented, leading to Reporting and monitoring taking a functional, ‘audit’ approach peaking at year or month ends

Responses to cultural aspect was that there was a felt need:

- For supportive employees and a highly empowered work force
- Moving towards a learning organization, which constantly reinvented itself and moving the onus of transparency from individual domains to systems domain
- Masters relating to various functions were moved away from functional domain to a central domain and Planning outcomes became transparent across manufacturing and marketing
- This in turn allowed taking a balanced view of risk-taking behaviors and
  Inculcating a digital culture through differential levels of training from awareness to expertise across the enterprise

Many other aspects were also affected by the change brought in ---

17.b.2 MANAGEMENT STIMULI

- Moving from ‘audit’ of historic transactions to proactive and analytical approach of reporting and monitoring
  - SAP (ERP) enabled support through information systems which helped.
  - Focus SAP training sessions were conducted across identified constituencies
    - Emphasizes on was laid on KPI (Key Performance Indicators) driven performance management system
This provided a channel by which it would help in understanding what managers do to use human and material resources to carry out the strategy

- Idea management was neither systematic nor widely adhered and
- Product life cycle management not systematized. Further the
  - Support functions were not market focussed as they had
  - Little knowledge of how current business processes compared with the best in class.
  And
  - Decision-making was mainly personality driven. This created a powerful culture
    but it could become can become skewed
  - All across the emphasis was more on the end, rather than means as they followed
  - Distributed planning, procurement and distribution functions besides
  - Inconsistent/non-standard business practices

The above stimuli led the management to respond in the following manner:

- Optimize/realign key business processes in line with global best practices and design processes that would help meet international imperatives for business
- Generate value through
  - Innovation – and encourage an active flow of ideas across locations, functions and management levels and
  - Differentiating from competitors than doing the same better and
  - Provide Strategic clarity as to the drivers of growth which Led to a Continuous stream of innovations across all aspects of outputs and operations helping

In order to formalize explicit systems for idea management that people had to adhere to, they had to first:

- Standardize key business processes through SAP then
- Carry out a head hunt and identify managers who could challenge status quo besides
- Recognize managers who could involve others in converting ideas into action and derive advantages of centralizing critical planning / support activities besides Endeavoring consistency in business practices across the enterprise and
- To inculcate a continuous improvement culture backed with systems support for monitoring performance metrics Besides
- A very important factor that was considered was: To Design, develop and implement a Digital Cockpit to help monitor and improve shareholder wealth which could be an outcome of the following indicators:
Performance Improvement indicators (Process performance measures on operational effectiveness)
Financial metrics (historic financial data, analyst reports)
Market indicators (Competitive intelligence, IMS, ORG, Internet)
Human Development Indicators
Privileged assets indicators (intellectual capital, brand values, information networks etc.)

17.b.3 STRUCTURE STIMULI
Structure: It was the arrangement of people and functions into specific areas and levels of responsibility for decision making, authority etc. to ensure effective performance.
- It became understood at Ranbaxy that a fast pace of change in structure/system/process was not in line with growth and it was important to have a fully independent setup at each location
Some responses to structural stimuli were:
- To restructure around processes than on functions and Centralize service functions with peripheral support function at locations to enhance managerial productivity

17.b.4 SYSTEMS STIMULI
The standard policies and mechanisms that facilitated work were
- Islands of systems of varying characteristics and functionality. There was a Low intensity of formal communication flow as the data management systems were inconsistent/incompatible with each other.
- Business and technology were not in tune with each other and it was more intuition/personality driven decisions – and not information/systems driven.
- Redundant efforts at data collation/reconciliation leading to a high impact on productivity noticed as several systems were not Y2K compliant Besides this meant that there was an absence of clear definition and communication of product withdrawal strategies
RESPONSES – Some responses to Systems Stimuli were:
- A fully integrated digital nervous system, linking operations globally using the powerful knowledge management systems helping it to retain agility, responsiveness, entrepreneurial skills with growth and
- Building an infrastructure suited to new ways of working. All this had to be
- System driven working / processes to gain the maximum benefit.
Supply chain optimization and integration
- It was a Demand driven procurement with provision of comprehensive data and documentation in Master data in SAP R/3 maintained throughout the product life cycle.
- There were Pre-planned promotional offers to ensure inventory adequacy and
- System based order logging to ensure process rigor and complete order information leading to enterprise wide order, production status and stock visibility
- All this was based on scientific determination of service levels, safety stocks and reorder levels by product category for stock locations and CFAs which led to
- Netting of stocks against baseline to control drift as a consequence of the dynamic scheduling requires systems initiatives after SAP R/3 stabilizes

17.b.5 WORK CLIMATE - STIMULI
The collective current impressions, feelings and expectations of members that affected their relationship with each other, non-members and developing a demanding work environment led by strong, sound target orientation.
- There was a lack of pervasive empowerment and support - therefore trust.
- The environment was hierarchy conscious and was driven by a location /functional perspective
- This was due to the lack of development orientation for succession and careers

RESPONSES to the above were to:
- Develop a higher degree of management trust and critically examine how new ideas could be nurtured and harvested.
- Empower employees and support them through systems and personalities
- Address negative thinking and cynicism through counselling/communication and
- Encourage managers to delegate decision-making down the line while inculcating boundary-less/international thinking.
- Provide a wider/global perspective/increased job responsibilities, job enrichment/knowledge and promote process driven work ethic supported by people.

17.b.6 MOTIVATION STIMULI
The behavioral tendencies to move towards goals needed action and persisted until satisfaction was attained. This meant laying a strong
- Focus on results to the exclusion of processes and ensuring that performance measurement was focussed only on quantity, not quality for fear of failure or 'loss of face' which drove actions often.

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Some responses to these stimuli were:

- To move to a more comprehensive method of performance assessment like the 360 degrees appraisal, identify and reward those that were high on both performance and upholding company values.
- This would mean practicing formal and informal methods of public recognition of performance appraisal and intensify communication across constituencies on the benefits of the project and what the post BPR/ERP scenario would mean.

17.b.7 TASK & SKILLS REQUIRED – STIMULI
This required positive attitudinal traits and strong behavior to accomplish assigned tasks and responsibilities, which meant

- Absence of formal skills inventory across the organization and Training for new skills and competencies and renewing the skills portfolio as the goal setting processes were weak

RESPONSES to such stimuli were to:

- Conduct, record and update systematically the portfolio of skills
- Balance training needs with goals and objectives of the overall skills portfolio, individual aspirations and succession plans
- Coach, develop and nurture change agents with requisite skills across the enterprise
- Develop a cadre of international managers who are systematically exposed to the rigors of international business and coached in leadership skills.
- Develop stronger methods of goal setting and align it to performance for clarity

17.b.8 INDIVIDUAL NEEDS AND VALUES – STIMULI
The enduring thoughts and feelings employees determined the worth and satisfaction of their work. That:

- People were motivated by the ability to attain targets 'in spite' of the system
- Employees were used to working in a fire-fighting mode most of the time
- It was decided to provide a high degree of opportunity available to the independent, self-driven performers as they spent a lot of time on routine repetitive activities
- There were uncertainties and individual insecurities due to ongoing rationalization of workforce
- It was realized that there were a lot relatively low quality of personal with a non-professional life

RESPONSES to the above mentioned stimuli were to:

- Provide wider opportunities to learn new skills - Job enrichment / carrier advancement / increased employability
Develop and deploy a clear communications strategy to address insecurities in the workplace.

Encourage analysis and value added activities. Provide more time for personal development/skill upgrade, better personal life.

17.b.9 ORGANIZATIONAL AND INDIVIDUAL PERFORMANCE – STIMULI

The outcome or result, as well as an indicator of effort and achievement were:

- The Strong presence in India and a growing international ambition.
- Significant size built through sustained high levels of growth due to interesting risk profile.
- Low profitability and asset productivity & high operating cycle.
- Customer responsiveness not of international standards.
- Low success of new brand launches.
- Clear measurable criteria for organizational and individual performance required.
- Accountability/ hence retribution of mediocre performance not swift or stringent.

Responses to Organizational and individual performance stimuli -

- Made a strong presence in USA, UK, India and China.
- By bench-marking and monitoring performance at globally accepted levels and
- Increasing operational effectiveness and performance leading to cost reduction, cash liberation and value enhancement across the business system through clearly identified projects.

Employees may be enthusiastic about reengineering during the initial phases if they view it as a "win- win" situation. Some companies experienced resistance in later stages when employees began to harbor doubts about the impact of reengineering, and managers were forced to adopt a more "insistent" policy.

Putting it all together.

Business process improvement is a continuous cycle of improvement. The business environment continues to change. There continue to be new methods, programs, and equipment to be evaluated. Customers' expectations change which require businesses to continually evaluate their products. People within organizations develop knowledge and capabilities that can be used for process improvements. Unattended processes degrade over time. There are better ways to do things, we must find the way to improve.
BPR called for radical change, but dislocations could come from many sources. Most human beings don't seem to like change very much, especially rapid, radical change.

What made change so uncomfortable? Mr. Ranjit Kohli (Director supply chain) of Ranbaxy:

18.1 PHASE – I “In the first phase, anticipation of the change brings out negative reactions in many people. These include denial, anger, anxiety, and withdrawal. These feelings can be directed at management, and even co-workers positive about the change. Some people stay in this phase, holding on, refusing to change, and smoldering in resentment at the changes in work setting or procedures and technology.

18.2 PHASE – II, when "things really get going," says Ranjit and change accelerates, everything has to be done like yesterday. Reactions included continuing anger and anxiety plus a sense of confusion. "The confusion is rooted in being held up between two worlds - the old organization and culture and the new," he says. If phase one is panic, then phase two is bewilderment. Roles, relationships and responsibilities were changing. It is both unsettling and fascinating.

Many people in this phase picked up the language of the new environment. Yet, most people did not understand the new arrangements or their implications. "Intellectually, we understand the need to change, but emotionally, we are still tied to the past," most of them were heard to echo. Many a mid-level manager at organization was heard saying, "It took me almost a year to adjust to the last big change. I just couldn't get used to the new systems, people and ways of doing things."

18.3 PHASE – III was where people gained some experience in the new organization and began to make real commitments to it. "Positive feeling now began to emerge, such as anticipation while employees had a new frame of reference and sense of competence in the new environment," observes Ranjit.

Others were heard saying, "This is going to be bad for my career. I'd better start looking." As long as one's work attitude is good, looking for other opportunities was reasonable. He further went on to stress, people should not overlook his or her own organization. Management would be looking for people who knew the business, and who can work effectively in the new environment. You just need to be creative about the new work."

"Why fix something that isn't broken?" was often heard as an excuse. Organizational change on the scale of reengineering was not done lightly by anyone. It had to be well...
understood by one and all that if the organization was changing, then they probably needed to start doing some things differently themselves.

Once the people were convinced that reengineering change was a sure thing, they just had to be prepared and take advantage of the opportunities. Individuals had to and must do a self-assessment of where they were emotionally in the reengineering process. This usually meant answering questions about the organization and its people. A few examples are

- Expectations of me in my current position are unclear. 1 2 3
- I am clear about the new direction of the organization. 1 2 3
- I don't believe the reengineering will lead to fundamental changes 1 2 3
- I feel I'm adapting well to the changes. 1 2 3

An answer, for instance, of "all of the time (3)" to the first question put a person in the "holding-on phase" where strong emotions of anxiety often exist. The continuum showed that events and emotions were moving from one state to another, that progress and adaptation can occur.

At Ranbaxy it was well understood that, "Reality was recognizing that problems would arise during change, but that doesn't mean change was bad." Another reality was that management did not have all the answers and was on a discovery process as well. The most important reality was, taking personal responsibility for the change.

"Ranbaxy restructured to become more productive and responsive, but also to change from loyalty [what the employer expects] and security [what the employee expects] to a partnership of shared competencies, performance and rewards."

Some points followed by Ranbaxy during the transition were:

- Spending time with co-workers who have the most positive attitudes.
- Doing one thing differently each week. Breaking old habits.
- Reading trade and business publications to put reengineering in perspective.
19 - BENEFITS - I

As with all change processes a company will experience some positive and negative impact on its businesses. These impacts may in turn deliver benefits or push it so that the organization makes a loss. In Ranbaxy the management has over the past one year that it has gone through the reengineering exercise it has in some form or the other experienced the benefits given below.

19.1 QUANTITATIVE BENEFITS

Benefits derived as a result of redesigning / reengineering its processes were: ----

**Quantitative Benefits**

- The benefits were summarized through IRR projections

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>19.2%</td>
</tr>
<tr>
<td>Maximum</td>
<td>42.0%</td>
</tr>
<tr>
<td>Gold</td>
<td>49.8%</td>
</tr>
</tbody>
</table>

- Benefits were calculated under the following heads:
  - Value enhancement – this showed the trend in increase in sales
  - Cash liberation - reduction in working capital leading to improved treasury
  - Cost reduction – shows operating cost

Besides the above benefits it also used some calculations for Savings ---

**Quantitative Benefits**

<table>
<thead>
<tr>
<th>Calculations used for Savings</th>
<th>As-is</th>
<th>To-be Min</th>
<th>To-be Max</th>
<th>Gold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Liberation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts Receivable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved Debtor control - Credit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Month-end skew - Sales in last week of the</td>
<td>85%</td>
<td>60%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>FG Inventory - DF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forecast Fidelity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Despatch Time variability</td>
<td>50%</td>
<td>70%</td>
<td>80%</td>
<td>95%</td>
</tr>
<tr>
<td>Despatch Schedule adherence</td>
<td>60%</td>
<td>75%</td>
<td>95%</td>
<td>99%</td>
</tr>
<tr>
<td>Manufacturing Sched Adherence</td>
<td>60%</td>
<td>70%</td>
<td>95%</td>
<td>99%</td>
</tr>
<tr>
<td>QC Cycle time in parallel with</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RM/PM Inventory (days)</td>
<td>33</td>
<td>22</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>WIP Inventory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing Cycle Time - DF</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>Manufacturing Cycle Time - API days / step</td>
<td>3.5</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Centralised cash management</td>
<td>0.1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts Payable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diagram/Tables: SAP/ERP (Ranbaxy)
It is a given phenomenon in every organization that manpower be rationalized to obtain higher manpower productivity. At Ranbaxy this has been done on a very wide scale and the following benefits have been derived due to the with respect to rationalization were:

Cost reduction due to manpower reduction

<table>
<thead>
<tr>
<th>Cost Reduction</th>
<th>Finance</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>As-is ME Staff</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td>To-be ME Staff</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>To-be Minimum</td>
<td>25</td>
<td>14</td>
</tr>
</tbody>
</table>

Value enhancement benefits arose due to increase in service levels

Service level of FG in Supply

Chain saw an upward trend -- 94% 96% 98%

19.2 QUALITATIVE BENIFITS

It should not be thought that the benefits derived were always quantitative. The quantitative benefits were in most instances accompanied by qualitative benefits as a result. THESE QUALITATIVE BENEFITS accrued as under:

After reengineering and the implementation of SAP/ERP some non-quantifiable benefits, which accrued, were:

- Released human assets for more productive deployment
- More strategic analysis as opposed to ‘fighting fire’ responses and ultimately
- Lead to Reduction in order cycle time and Increase in perfect order completion rate
- All this gradually led to Improved schedule adherence
- Providing Better product freshness at point of sale and Improvement in MSR productivity
20 - BENEFITS - II
DERIVED AFTER IMPLEMENTATION OF BPR

- The synergy between staff and support functions was achieved to a great extent.
- Duplication of effort if any was almost negligible.
- Duplication of data – Eliminated as data is entered at source or the point of origin and does not have to pass through layers to reach the intended recipient.
- Today there exists a situation that one can aptly call a virtual organization wherein Global heads can access information about any function anywhere in the world.
- The material and finance departments situated at one location are in a position to serve the whole organization.
- Decision – making is today more fact based as considered to the judgmental ones before.
- Marketing organizations can find the situation at the manufacturing site at a given point of time and this enables them to plan their delivery schedule to various outlets in their area.
- This further allows for streamline material transfers and execute sales orders, etc.
- Today there is more digital flow of information, which has led it to reduce paper usage by more than 80% thus helping to move towards becoming a paperless organization.

SITUATION – B2B and B2C trade has increased throughout its operations with the customer guiding its path.

- Today they proudly say that they have a well-integrated information system.
- Today BPR has made it possible for them to segregate the core and non-core manufacturing activities thus allowing them to outsource these non-core products.
  - This has helped in increasing productivity on all fronts e.g.,
  - Cheques printing and payment to vendors is an activity that can be outsourced.
  - Visibility of data has become obvious for all purposes.
  - This can be aptly said for tangible assets
- The planning process e.g., Material planning is more visible across the organization around the world.
- They done away with the legacy systems leading to reduction in inventories
  - This has in turn led to release of much required cash.
The overall control systems have become more efficient
Such as credit management system
Transactions today are more system based
Audits too are today system based as compared to the earlier manual and time wasting audit exercises.

All the above improvements have led to the release of positive energy all round.
This has in turn enhanced productivity on all fronts
HR – The quality of work-life has improved
HR productivity has improved many-fold
The people have more time on their hands for indulging in self-development

All this has directly enriched the bottom line – Thus paving the way for Ranbaxy to tread towards becoming a world – class organization.

To make a concluding point it would be prudent to say ------

Blood is vital for existence. Not only because it supplies the vital nutrients that result in energy, but also it cleans and purifies the entire system. So is information integrated, uniform and relevant and up to date.

It is the power to make decision at the right time by the right person. This is only possible when the entire organisation shares the same information and view it in the same perspective.
1 - INTRODUCTION

1.1 HISTORY OF THERMAX

THERMAX Ltd. made a modest beginning in 1966, manufacturing a limited range of packaged boilers, and worked primarily in the field of Energy and Environment. Over the years Thermax diversified into fields like, Water treatment, Waste management, Process Heat, Absorption Chillers, Control and Automation, Heat Recovery, Electronics etc.

Today, Thermax has collaborations or Joint Ventures with some of the most Technologically advanced companies in the world, like Kawasaki Thermal Engineering, Japan (Vapor Absorption Machines), Fuji Electric Ltd., Japan (Process Control Systems), Culligan International Company, USA (Water Treatment), Babcock and Wilcox, USA (Boilers), to name a few.

The THERMAX Group has grown at a steady pace, in the last 31 years, and today has a turnover of 522 crores.

THERMAX GROUP

BUSINESS DIVISIONS
- Process Heat Division
- Energy Services & Systems
- Absorption Cooling
- Water Treatment
- Waste Management
- Air Pollution Control
- Chemicals
- Heat Recovery
- Co-generation

ASSOCIATE COMPANIES
- Thermax Capital Limited
- Thermax Electronics Limited
- Thermax Surface Coating Ltd.
- Thermax Systems & Software
- Thermax International

JOINT VENTURES
- Thermax Babcock & Wilcox Limited
- Thermax Fuji Electric Pvt. Ltd.
- Thermax Energy Performance Services Pvt. Ltd.
- Thermax Culligan Water Technologies Ltd.
1.2 STRENGTHS

1.2.1 ENGINEERING. This department not only comprises of Engineers of the engineering section per-say. This section involves those also those involved in Sales, Design, Procurement, Execution and Manufacturing. The total group strength of this section is at 60 heads.

1.2.2 DESIGN: The jobs taken up by TSCL involved the project job order type and to be able to execute this efficiently they had to have a very strong Design section. To take care of the intricate design requirements of these Projects, the design section was equipped with CAD Stations and the most advanced packages to support them, such as Auto CAD, Pro-Junior, Pro-Engineer, Structural Engineering (STAAD - III) etc.

1.2.3 EXPERIENCE – PEOPLE: Executing any project required only experienced technical persons at the works but also the Department Heads who had a lot of experience in the field of Surface Coating themselves. This was desirous, as they had to lead the team in the new reengineered environment. This was aptly met by restructuring to have people at the head with an average experience in the Business of Surface Coating of over 12 years. This is today well proved with Thermax having over 175 plants commissioned in India and abroad.
1.2.4 EPC SKILLS: As mentioned earlier the work at TSCL is more of Project Job Order based. In order to remain competitive and in business they had to ensure that the project met time schedules. The aim at TSCL has been to commission the projects well before time. To meet this objective the EPC Team had at its disposal a Predictive Time Management Program, which was more real time in effect. Besides they used MS Projects for Scheduling, Project Coordination and Cost Monitoring.

1.2.5 QUALITY: It is well understood by all those executing the projects that any customer whosoever he/she may be puts a lot of emphasis on the Quality issue of the job delivered. At TSCL this factor is well entrenched and its workforce highly committed to delivering quality service to their clients who range from amongst who’s who in the industry. To meet this challenge they went in and acquired the coveted ISO 9001. In the process they Trained their people about what was required under this. All this showed that in the changing environment the company would be able to remain committed to providing quality products and services to its customers.

1.2.6 PRODUCT RANGE: It is universal that to be able to remain competitive any company would have to spell out the range of products that it can provide to its customers. TSCL to do this has very clearly outlined the services (Mentioned under section 1.3) that it could provide. Most of the jobs were, as to the researcher by the DGM BPR, carried out at the customer’s works to be able to work in close tandem with the customer and improvise if necessary as per requirements.

1.2.7 PRODUCT SOLUTION: For it to project itself as a customer friendly company providing customized services it set up a single window approach for all Paint shop related products, from painting plant to paint applicators and Heating and Cooling systems to Pollution control products. This helped the project teams to be able to execute job orders much faster than it would be envisioned earlier.

1.2.8 STABILITY: Having a strong presence in the field of surface coating today Thermax Surface Coatings Ltd. is a Profitable and a Financially stable Organization.
1.3 PRODUCT AND SERVICE RANGE
SYSTEMS

A. PRE-TREATMENT:
   Dip Pretreatment
   Spray Pretreatment
   Spray cum Dip

B. HEATING SYSTEMS - FOR PRETREATMENT
   Coil - Hot Water/Thermal Fluid
   Plate Heat Exchanger
   Plate Coil Heat Exchanger
   Electric
   Heat Exchanger with Burner

C. HEATING SYSTEM - FOR OVENS
   Indirect - Burner with Heat Exchanger
   Direct - Gas
   Electric
   Hot Water Radiators
   Thermax Fluid Radiators

D. PAINTING
   Dip type (With Temperature Control)
     For Water Based Paints
   Spray Painting (Manual/Automatic)
     Pressurized/Non Pressurized Booths
       Side draft water wash Booth (Single/Double)
     Down Draft Water Wash Booth
     Dry Back Booth
   Powder Spray Booth (Manual/Automatic)
     Booth with Cyclone type Recovery
     Booth with Cartridge type Recovery
     Booth with Multi Cyclone type Recovery
     Booth with After Filters
     Booth from Wagner - ESB

E. AIR REPLACEMENT PLANTS
   (With Temperature/Humidity Control)
     Wet Type Plant
     Dry Type Plant

F. FLASH OFF ZONES/SETTING ZONES/FORCED COOLING ZONES
   Pressurized Type
   Non Pressurized Type

G. PAINT KITCHENS

H. MATERIAL HANDLING
   Overhead Conveyors
   Ground Conveyors
   Power and Free Conveyors
Slat Conveyors
Overhead Monorail and Hoist
Transporter
Any Special Material Handling System required for Paint Shop

I. SMART CONTROL PANELS
J. SUPPLEMENTARY PLANTS FROM THERMAX LTD
   Hot water Generators
   Thermal Fluid Heaters
   Effluent Treatment Plants
   Soft water/DM Plants
   Paint Sludge Incinerators
   Vapor Absorption Chillers
   Centrifugal Fans
   Instrumentation

ASSOCIATIONS
2. Electropaint Ltd. United Kingdom.
3. ITW Ransburg Ltd. United States of America.
4. Wagner Gmbh - Germany.
5. Saima Mecchanica - Italy.

REPEAT ORDERS
Customer satisfaction is of prime importance to Thermax. They judge their own performance on the basis of customer satisfaction. This they do so by executing the job orders most efficiently. This further ensures that the customer comes back to them for their future requirements.

1.4 MAJOR PLANTS FOR AUTOMOBILES
(IN FOUR WHEELERS (TRUCKS, CAR, TRACTORS) MARKETS)
   - EICHER MISUBISHI - TRUCK, CAB LINE
   - MAHINDRA & MAHINDRA - UTILITY VEHICLE NASIK
   - MAHINDRA & MAHINDRA - UTILITY VEHICLE, KANDIVALI
   - AUTOMOBILE CORPORATION OF GOA - BUS BODY
   - ESCORTS TRACTORS
   - FORD TRACTORS
   - HINDUSTAN MOTORS (DIP LINE) - CAR
   - EICHER TRACTORS
   - ASHOK LEYLAND
   - STANDARD ROVER - CAR PLANT
   - GREAVES LOMBARDINI - THREE WHEELERS
   - MARUTI - ZEN PROJECT
   - BAJAJ AUTO
   - DCM DAEWOO - CAR PLANT
   - TRACTOR AND FARM EQUIPMENT

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2 - REENGINEERING AT THERMAX

2.1 KNOWLEDGE BASE
It was one thing to reduce time here and there, but, all the more important was to sustain this process of improvement all through. The TSCL BPR Team headed by Mr. Vivek Deshpandey considered it important to generate a Product wise Knowledge base of the basic product and services that they were providing – the basic proposal philosophy. This, they acknowledged, would enable the Company to sustain growth, not only now but also over the years. It would besides fire the spirit down the line.

2.2 OBJECTIVES
The objectives for carrying out Reengineering at Thermax were in the form of a Qualitative and Quantitative Vision statement.

The Objectives included goals for Cost reduction, Cycle Time Reduction (CTR), Quality and customer satisfaction levels. These helped measure progress and constantly spurred ongoing action.

Besides the above-sited reasons, Thermax Ltd. had to reengineer as new competitive pressures were developing all around it and its desire to provide ever-greater levels of value to existing and future customers.

To set his pointers right Mr. Vivek Deshpandey put down a quote to exemplify what he was trying to press home:

1. Quote
"Those companies that wish to sail to the head of their markets must weigh anchor from a mooring secured to value”. “Leaders never pursue a diffused business strategy, but continually focus on running a tight ship where their business practices enhance the one special value that they can provide better than anyone else.” (Treacy and Wiersema 1995, 26)

During the discussions with researcher's, Vivek, impressed upon him that; unlike most organizations that focus on process improvements – Thermax constantly focused on radical change and avenues for experimenting with new methodologies on how to do the job better - and looked for individuals who could help them discover their future.
Vivek pointed out that they at Thermax considered People as the "Paradigm Shifters." To elaborate he explained that according to (Joel A. Barker, in Future Edge 1992, 32): paradigm, is a set of rules and regulations (written or unwritten) that (1) establishes or defines boundaries, and (2) tells you how to behave inside the boundaries in order to be successful.

With technology changing so rapidly, they at Thermax had to constantly reassess or re-evaluate barriers to see if they still existed or if new technology offered newer opportunities which would allow them to become more effective and efficient in meeting the needs of our customers. They had to remove such barriers to ensure achieving a process of continuous improvements, with the BPR effort leading to heighten organizational impact over a period of time.

With this started the BPR journey at Thermax (TSCL).
If anything has impacted industry as a whole in the 21st century, the researcher's guess would be the constant undercurrent of change. This undercurrent has reached levels of complexity, diversity and speed undreamed of twenty years ago.

3.1 BPR AT THERMAX

At Thermax, reengineering effort at different levels involved change by consensus. As Mr. Vivek put it, "it was deemed essential to communicate and disseminate change. Some of the basic items that in his opinion were critical to managing and shaping change in a reengineering context were:

♦ Be proactive in communicating change
♦ Explaining the reasons for this change
♦ Explaining who will be impacted by the change
♦ Discussed the anticipated changes and a timeframe
♦ Preparing to provide detail on anticipated changes
♦ Reiterate the changes as they come to pass
♦ Providing group forums for change discussion and feedback
♦ Providing support services for working with change.

When the researcher asked Vivek why he considered all this important, the reply was almost instantaneous. He said that, "It was essential to tell all concerned what you want to tell them, tell them, then tell them what you told them." In this way you can be amply sure that the message has been received correctly.

3.2 Mapping the process currently used

Vivek - They had first of all to understand how they were doing the process today, and it was not necessary to delve into a deep, detailed analysis. The primary reason was that they already knew that the process did not work. They had to comprehend two things about the current process - that it did not work and why it did not work. This reasoning was sufficient to derive enough knowledge to design a new process without duplicating the old process or repeating some of its shortcomings in their soon-to-be-reengineered process.
Next they documented the steps, put them down on paper in a flowchart form. It was important to do so, so that they could look back at it once or twice once they had started reengineering their processes.

3.3 OVERVIEW
To make all the above happen --- A small CORE GROUP was formed. This included persons selected at the senior management level and people at the plant level – the engineers involved. Besides the top executive was the leader provided all the support required to see the BPR effort through. The others besides teaming up also acted as champions of the change process, and helped set goals, assign resources and further - expedite progress. BUT the redesign and the implementation were the responsibility of the CORE group, which was in fact a cross-functional team.

The BPR CORE Team had to adequately prepare those who worked with them on a particular project so as to provide the basic and necessary services in their reengineering efforts. In addition, they had to be proactive in their efforts to anticipate. This led to the question of training the people and communicating fairly well the Organization’s vision on BPR.

3.4 TRAINING
According to Mr. Vivek Deshpandey – Leader BPR Team - TSCL, "I was assigned the job of "in-house coordinator" for the TSCL’s world-class service/manufacturing systems." Accordingly he spent time training and setting up teams, which has had a number of successes -- as well as some failures which are but natural in a working environment of great magnitude. These failures were in the form of delays only and not as one would think - production or service contract loss.

According to him, where they experienced failures they learned and a recurring lesson was that when teams were bossed instead of coached, or when they are left on their own instead of being provided a clear vision and measurable goals, their success is limited, if not nonexistent. The Reengineering Core team had to help these teams overcome many of the same negative patterns and habits they had been encouraged to lose.

According to Vijaywaidande, manager HR, the process was at times slow and frustrating. They wanted change to happen rapidly but this they could do at the risk of driving people away rather than fostering an environment of positive momentum. But, these had to be overcome rather than leave the exercise unattended altogether. And attend to it they did.
4 - BPR OBJECTIVE

The objective of the reengineering project was to look at functions being followed and to determine the best processes and systems using which their work could be completed. Important questions that were analyzed included –

What were we doing? How were we doing it? Why were we doing it? This re-engineering project was an opportunity to determine how the different functions of the organization could fit together in the most effective way and deal with the increasing work demands.

To function together better as a team, it was considered important to review all possible elements. Initially, they were concerned only with identifying what was happening, what work was done and what the process steps were those that needed to be reengineered. Project Scope and Scale "As-Is" Processes A draft version showing workflow Processes were developed such as those in the VPD and document management system. This took a lot of deliberations amongst the Cross-Functional Team and the BPR team. Initially the going was very tedious, but once it took hold it took off most wonderfully.

The researcher has tried to diagrams presented herein based upon interviews with the BPR group leader Mr. Vivek Deshpandey and with employees. The work flow diagrams were used to define and clarify the work to be done in the particular process and more precisely to define the boundaries of the process and provide a common vocabulary for the workflow processes. To highlight and project customer-driven processes the BPR team leader would have executive responsibility over all parts of the BPR effort in the Location (TSCL) that required change.

The BPR Project Team was composed of managers and employees from each of the potentially affected functional/divisional areas. The roles of the Project Team in simplifying the processes included Participate in the creation of the "As-Is" Process Model To Highlight major problems, issues and recommend areas, where improvements and "Quick Wins" could be made. These Quick Wins by and large served as an exciting trailer to what one could expect from the BPR exercise. This would without question assist in addressing the immediate workload distribution problems. The CORE team invited participation in recommendations on how work should be completed. With these in mind the BPR activity picked up as we shall see in the following chapters how they actually arrived at reengineering the VPD system and so on.
4.1 Identifying processes for improvements -- The current processes were analyzed to understand them and their underlying assumptions -- to remove any ambiguity what so ever. Broad performance parameters of the existing processes were determined and Process evaluation techniques from quality management such as fish-bone diagrams, and the quality function were used. They did not go in for elaborate documentation of the current process in detail since the goal was not to fix the current process, but through Reengineering the process -- create a new one altogether. This was done primarily through Observation and participation in the actual process, as opposed to data collection and interviewing, were immensely useful approaches that were used to understand the processes. However Mr. Deshpandey and his group tried not to over-study, as they had to move quickly on to redesign.

Vivek - After identifying which process to reengineer, they took a look at why they currently performed the process the way they did. Understand was the key. They as Mr. Vivek put it, did not need to scrutinize every detail of how they were performing the process -- this effort had the potential to go on indefinitely, referred to as analysis paralysis, which could weaken the momentum needed to carry the project all the way to implementation. What they needed to do was understand the underlying reasons why the existing process was carried out the way it was, so that they could question those assumptions during their reengineering sessions.

4.2 Prioritizing approaches -- Flow charts were made use of extensively to determine what is important and what is not. This eventually helped in sorting out the important "process streams" of the business from the non-important ones. --- Besides Fish-bone diagrams were used for fulfilling this activity effectively.

--- It was clearly understood by Management that for the Organization to be able to implement a successful BRP it was essential for them to develop a framework for placing the reengineering activity in context of other change initiatives that were to undertake. According to them, it should not be considered the once and for all "big fix." Thermax was well aware that integration and sequencing would help keep the different change initiatives' expectations, methods, results distinct from each other, thereby minimizing the confusion and cynicism that usually result from undertaking an assortment of management initiatives.

4.3 Training for the complete group -- One of the Core group members quoted from a work by Hatch (Eric K Hatch), -- Success has a price -- ultimately success was not achieved without struggle. Teams were formed despite business crises, terrible
uncertainty about job stability, cultural taboos against certain aspects of teamwork, time and budget constraints, limited leadership skills in some cases, conflicting interpersonal styles, total lack of experience in teamwork of any sort, and much, much more." This threw light on the issue of training the group so that they would be able to take up the responsibility of carrying of BPR. This in turn required that adequate training be imparted to the group as a whole or else the thought process would not be synchronous within the group.

This would in turn lead to disharmony and further to chaos. Ultimately there would be no BPR. So keeping this in mind the CORE Group decided upon training itself as a group and later they imparted the same sort of training to the rest of the people in the Division so as to update them constantly on the progress made.

4.4 Highlighting processes for improvement - (with examples) --- taking live examples from the past as well as the recent present - Mr. Deshpandey sought to highlight the various processes for improvement in the existing system. Such cases were:

4.4.1 Suggestions were invited from everybody --- so that improvement could be carried out in the prioritized areas without much delay. The group, which consisted of the Core group members, as well as other employees was constantly prodded to give their view so that the processes could be studied and newer routes found to do the same. This in turn would lead to removing delays and improve the overall productivity of TSCL. They were informed at the onstart of the sessions that the organization did not just want to improve processes, they had to think in terms of eliminating non-value-adding activities.

4.4.2 Formation of teams --- The CORE group under the guidance of Mr. Shirish Joshi was motivated to help the people down the line form teams to study the various suggestions made at various training sessions. Besides they were asked to make a plausible implementation plan.

4.5 The BPR Team
This comprised of people who would make it happen. They had to be an eclectic mix of people. The management at Thermax ensured that not all were from the process, which was chosen to undergo BPR. There had to be outsiders on the team. In addition, having people with IT experience and customer service/process orientation backgrounds was an
invaluable asset. The team was kept small, as in order to function properly, they would need as few encumbrances as possible. Mr. Vivek was the BPR leader of TSCL.

**Their role was as follows:**

* Mapping of current process
* Defining tasks from processes
* Determining customers – internal & external
* Design of reengineered process
* Benchmarking
* Appropriate application of technology
* Development of implementation plan
* Implementation of reengineered process
* The re-engineering team’s mission
* Abandoning fundamental assumptions
* Thinking "outside the box"
* Conducting Brainstorming Sessions
* Reaching for dramatic, radical results

**4.6 Review of the BPR activities*** Finally, the BPR activities were reviewed at scheduled Core Group meetings and also at meetings called in case an important issue arose during the implementation phase or any of the phases. This was crucial to the success of the BPR activity as it provided necessary feedback and suggestion which when further worked upon gave rise to solutions to many other problems --- This further led to a chain like response --- action system.
5 - THE BPR PROCESS – SETTING IT RIGHT

5.1 ISO CERTIFICATION:
The Company was awarded the BS EN ISO - 9001:1994 and IS/ISO 9001:1994 certification in 1997. As a prelude to the actual BPR exercise - these certifications helped define the strategy and shape that the reengineered processes were to take and the guidelines for achieving the said goal. These certifications were applicable to: Systems engineering, manufacture and supply of painting systems and their erection and commissioning at site and manufacture and supply of allied products.

5.2 INVOLVEMENT OF SENIOR MANAGEMENT
The researcher in the pages above has amply highlighted this. It has been aptly said that BPR is or can be successful only with the active support of the TOP management. Corporate director Mr. Girish Trivedi has played an active part in the whole BPR gamut.

5.3 STRUCTURING FOR BPR
The first step taken by the management at Thermax was to understand and assemble the key structural components of the BPR team. One would ask, Why? Well, without the proper structure, support and sustained commitment, BPR initiatives would quickly get ruined and sink to the bottom of the sea. BPR was not something that was simply going to happen without some resistance or guidance. People make reengineering happen, but in order for this to flow smoothly, they needed to structure to their efforts. As such, BPR teams served to provide the necessary infrastructure to initiate, commit, support and sustain BPR efforts.

5.4 The BPR Champion
At Thermax these were the managers and executives who were armed with the spirit, enthusiasm, power and clout to make BPR an institutional dictum. This position required an unwavering commitment to BPR and the desire and ability to communicate and instill a sense of urgency and mission to all levels of the institution on a regular basis. At Thermax, the prime champion amongst others, was, their HR manager Mr. Shirish Joshi who
* Inspired
* Led
* Motivated
* Encouraged and
* Communicated to all.
All these factors endeared him and the CORE team and to the people who saw light at the end of the tunnel as a ray of hope that would ultimately steer the organization towards the **ultimate - goal -- success**.

5.5 The BPR Steering Committee
This comprised of top-level management and key players. At TSCL it comprised of divisional managers (Mr. Vivek Deshpandey).

Mr. V. Deshpandey explained that the primary functions of the BPR Steering Committee’s were as follows:
* Slate Proposed BPR initiatives
* Prioritize initiatives
* Authorize initiatives
* Commit and ensure that appropriate resources were allocated were needed
* Communicate the need for and commitment to BPR
* Monitor BPR progress from an executive level

5.6 The BPR Leader
At TSCL their leader was in the person of Mr. Vivek Deshpandey (Div Manager). The BPR leader received his initiative from the CEO Mr. Anil Sarwade and corporate Director Mr. Girish Trivedi. As BPR Leader, he was responsible for:
* Assembly, development and guidance of the BPR Team
* Ensuring adequate direction of BPR Process Owner and Team
* Ensuring adequate allocation of resources to BPR Team
* Working with BPR Process Owner to structure BPR implementation plan so as not roll off the track.

5.7 The BPR Process Owner
This was in short the participation by individuals responsible for the processes. The Process Owner’s role comprised of:
* Day-to-day BPR operations
* Coordination of BPR team activity and efforts
* Oversight of the BPR Team under his direction.
* Education & orientation of BPR Team on the right nomenclature of BPR to be followed.
* Ensuring BPR deliverables were being met
5.8 Reviews by Corporate
In order to ensure that all was well on the BPR front it was essential that all activities be reviewed by the corporate management team. This would ensure their enduring support besides invaluable suggestions on some of the critical issues.

5.9 PROCESS SELECTED FOR REENGINEERING
Based on the above a few processes were selected –

- One time engineering
- Packaged Buying
- Accounts Payable
- Standardization
- Integrated IT software for EPC activities.

Approaches to achieve the desired results were —

- Proposal Engineering
- Detail engineering
- Procurement
- Project execution
6 - BPR

ONE TIME ENGINEERING

A Proposal software was put in place, which would allow the integration of data, collected and calculated by the software for individual equipment. All this data was first logged on to a data logger so that in case of any eventuality the origin of the fault may be analyzed.

- The next step was to generate a knowledge base (explained below), which in turn would lead to heightened awareness amongst the employees as well as an understanding of the processes.
- Using this software package it would now be possible to generate a long lead BOM or simply put BOM for major items could now be generated. *This would help in reducing the time required to eliminate time wastage.*
- The use of the said software would eventually lead to the *reduction of the proposal processing time from 15 days to 3 days.*

6.1 One time engineering

This helped them in integrating all design and estimation programmes prepared for different equipment. This was made possible, as most of what they required was standardized integrated data to reduce reworking the same designs repeatedly. This in turn reduced the processing Cycle-time for a new proposal from 3 weeks to 3 days. In case any revision was desired in the design specification, it would be done in 1 day rather than what used to take 4 days earlier. This meant more time for more productive work.

Besides the above, it all led to *reducing the processing Cycle time of OTM documents* too. The time reduced was mind boggling -- from 1 week it now took only 1 day.

6.2 KNOWLEDGE BASE

It was one thing to reduce time here and there but all the more important was to sustain this process of improvement all through. The *TSCL BPR Team headed by Mr. Vivek Deshpandey* considered it important to generate a Product wise Knowledge base of the basic proposal philosophy.
This they acknowledged would help the company not only now but also over the years to sustain growth and fire the spirit of development down the line.

Today there is a long lead BOM as opposite to what it had been earlier. The Raw Material and requirements and calculations are now ready at the OTM stage itself.
7 - PACKAGED BUYING: CUSTOMER - VENDOR FOCUS

7.1 Customer?

This term can be defined in many ways. **In essence, for Thermax a customer is someone to whom service is provided in exchange for compensation.** Their services are direct, but the compensation may not always be direct – e.g., earning goodwill. **In the truest sense, the management and the organization defines what a customer is.** For example, at Thermax, customers are generally external. Their **external customers** are the various companies having dealings with or are prospective customers. Their **internal customers** are the employees and the management that make up the basic infrastructure of the institution. In some way, directly or indirectly, they service internal and external customers. How should they define their customers in relation to their business?

Interestingly Thermax today includes customers in projects, in addition to involving users. **Thermax is a perfect example of a customer-centric project executioner.** Customers are involved from conception to implementation and also provide on-going inputs for continuous improvement initiatives. Thermax is never content in just focusing on the internal needs of the business, but orients the project around the **customer** throughout the project.

To compete successfully in the future, They knew that the focus must be on cross-functional processes that incorporated the extended enterprise. Customer service would be the single most critical factor. They found out that they could no longer sustain competitive advantage by relying on highly clerical, back-office, and business-as-usual approaches to customer service. Competitive business/IT strategies must service customers **whenever** and **wherever** customers most needed it and value support.

Developing solid, effective processes is and will remain the most critical success factor, transcending the decision to develop customer service applications. Management at Thermax concluded that it could derive substantial, tangible benefits by extending workflow-enabled customer support beyond business boundaries. To do so, senior management had the vision to drive customer-centric IT investments and it had to implement technology capable of delivering on-demand customer service.
7.2 DEVELOPING VENDORS-
FOR COMPLETE PACKAGE INCLUDING RM

To avoid aimless movement for various procurement issues they developed vendors for complete packaging including RM. They visioned that this would in turn save a lot of time and money in the process. Further this would reduce the number of detailed drawings required. This was so because larger the number of vendors larger the number of drawings needed for providing each with the necessary details. This in turn initiated a long string of twists and turns, which instead of hastening the work to completion, instead hampered and stretched the work to undesirable length of time.

7.2.1 Packaged Buying

By going in for a Packaged buying programme they were indirectly on the path to saving time for calculating the BOM and if necessary corrected it in time. This bore direct significance on the Supplier who was affected by the good will gesture of getting his orders processed well in time.

Scrap calculations were eliminated, as the company received only those materials, which met specifications. Besides, they received them from vendors who were validated and approved by the company. As there was no rework at the company’s side the question of scrap was in all theoretical terms eliminated.

Besides the above, Review and control became easier. This being the case the supplier supplied only those items as mentioned in the order and whose specifications he already had. This reduced re-testing on the Company’s side and further reduced QC checks and also reduces review. This as Mr. Vivek pointed was enabled by having a validated system to validate the suppliers on an ongoing basis. By going in for this they have been able to eliminate vendors, who over the passage of time had become complacent and were unable to supply material, which conform to specifications provided earlier.

Single point responsibility, was another issue that needed addressing as through this they could assign or say put the onus of the quality of the material on the supplier thereby reducing the time required for testing, approval, etc., at their own end.

After carrying out all the above the view now at the end of the tunnel was-- bright. They developed vendors to supply materials / supply items as per their specifications, such as Tanks, Oven doors, Jigs & fixtures, plastics, enclosures on a turnkey basis. No more hassles.
As mentioned in the above paragraphs the number of detailed drawing were reduced. This eliminated the man-hours for detailed drawing work. (For example -- A door needs 26 drawings for detailing, tank drawing without BOM).

*All this allowed the organization to cut down on the number of vendors, POs, and the effort required for coordinating all these activities.*
8 - ACCOUNTS PAYABLE

8.1 Account Managers

BPR - The Accounts manager played an important role just as the others. His was all the more important as he managed the financial resources of the company. He had to strike a balance as well as understand that the Principal business interface with internal customers responsible for managing the customer relationship.

He was responsible for conducting strategic and tactical planning, business analysis, and high-level requirement determination.

Represent the person to call in IS when the customer is unsure how to proceed, and be the voice of the customer throughout IS.

Prepare IS strategic plan and statements of work for projects.

Worked with delivery manager and estimated cost & schedule as part of statement of work.

Act as a planning and forecasting agent by conveying customer needs to the rest of IS.

Present new technology opportunities to customers.

Ensure that customer requirements were being met by IS and that issues and questions are being promptly resolved.

Oversee and communicate the overall status of activities and services to the customers.

Thus we can see that the role that the Accounts manager played was a key role-played in tandem with the other CORE group members.

This further led to --- Modifying the present process of accounts payable which included reducing the number of documents from 6 to 1. This did not mean that the other five were eliminated - they were instead combined after due modification to serve the needs better.

This further reduced red tapism, which hitherto delayed the process of payments to internal as well as external customers.

A payment to an external customer, which earlier took a whopping 54 days, was cut down to a negligible 4. This was a bonanza to the customers for whom the cycle time was reduced and their fund flow situation improved.

Further to this there was a considerable reduction in the number of activities from 34 to 15. This was a direct result of eliminating non-value-adding activities. As the non-value-adding activities were eliminated, the number of persons freed was 1 out of every 9 persons.
9 - STANDARDISATION

Earlier the situation was that when an order was placed they had to practically redo the whole work-up again. This led to rework as well as put strain on the people who had to it. In-order to eliminate this sort of ambiguity the BPR Team in consultation with other senior managers decided that a whole set of Standard drawings should be prepared and they went right ahead with this. As and when a proposal for a new project came up they would only be required to release part number if the item was on the standardized item list, if not, the design team would be assigned the job to see it through at the earliest.

In continuation to the above it was further decided to prepare Reference drawings for a standard part where dimensions were subject to change but the basic construction remained the same. Here too they would release only the part number with dimensions in tabular form.

It was emphasized that wherever the drawing did not fit in the above categories, the use of Auto-CAD software would be done to generate the required drawings. This would further help in providing accurate drawings with practically no error.

Once the improvements were incorporated in the system on account of standardization things became easier for all and people could now switch their attention onwards more value addition in their work sphere. Today the improvements are there for all to see.

9.1 ENGINEERING STANDARDISATION

Once they had decided who their customers were and how they had to define a task from a process things became a lot easier as traditional business usually made no attempt to define task from process, as everything they decided to do tended to be task-based and task-oriented. The processes usually had nothing to do with a true process in the BPR sense. On looking a further into the situation, it provided the BPR team with insight as well as some hindsight.

In the process of reengineering the various processes the BPR team went with: Pre-engineering of the standard and template type drawings required for fabricated components and equipment. These helped them in identifying the flaws at the design stage and avoid rework besides eliminating all non-value adding issues.
Further to the above issue it was envisaged that there would be **substantial reduction in the number of drawings** that needed to be released and this was *quantifiable*. It would reduce by 40%.

*This reduction in the number of drawings in turn led to a drastic reduction in the number of drafting hours --- by 25.*

### 9.2 ORDERING STANDARD POs

In order to harmonize the issue of materials procurement it became essential to Reinstate Part-numbering system. This was done with a view that whenever an order was placed a Standard part number would be used for ordering to avoid overlapping.

*By using the standard numbering system they were able to reduce the number of POs from 6 to 1 which in reengineering terms is a substantial gain.*

*Earlier the through put time for preparation of a purchase order (PO) was 6 Hrs but now this had been reduced to a negligible 1 Hr.*

*Looking at the above one can see that the gain from the reengineered processes ---- they had taken the right step. Yes, this true as they were now getting a better response as well as substantial discounts from their suppliers. This was a direct outcome of their efforts to reduce the number of suppliers and regularly validate the ones on their list.*

As mentioned earlier, the number of drawings got reduced as the suppliers were reduced and more so as an outcome of standardization of most of the items required on a routine basis. *This Vendor - Customer relationship helped eliminate ambiguity as regards quality and specifications.*

### 9.3 TDC --- SUPPLY OF RAW MATERIAL

In the on-going reengineering activity, the BPR Team decided to reorganize the RM stock system by checking on the re-order levels. *They also decided to reduce the number of stock item from 46 to 12.* This was a direct outcome of their well thought of BPR activity. This was possible as the supplier was provided with all the necessary data and details of the material required well in time so that stocking of item was reduced drastically.
It was more like the concept of JIT. It helped in improving the overall health of the company. They have now planned to bring the figure of 12 stocked items down to 8. Besides it was also noticed that the scrap calculation was eliminated for these items.

TDC -- TEMPORARY DELIVERY CHALLAN
If one looks at reengineering activities across the globe - one finds that the paper chase has usually resulted in utter frustration for most. Just as it has been and will always be the endeavor of the Thermax BPR team to reduce paper work to the barest minimum as this is what tends to hold up the smooth functioning of the enterprise.

At Thermax too they realized that if they were to function on an even keel they would have to reduce the amount of paper work and this they did:

They went ahead and combined -- The Inspection report, Delivery challan from the vendor, Dispatch advice and packing slip. This reduced handling besides reducing paper and thereby saved a lot of time and space.

This exercise eliminated mis-matches between the various documents involved as all relevant documents were now combined into one document and the question of ambiguity was eliminated.

This reduced the man-hours required from 2 Hrs per document to 30 minutes per document.

10.1 REDESIGN OF DOCUMENTS FOR PROCUREMENT

In the document handling section the number of activities were reduced from 41 to 21. Further they reduced the number of documents from 13 to 8 besides eliminating 9 manual registers. The scrap report was now available instantly as compared to the situation earlier where it had be demanded and it would be made available only after all the items had been checked & physically verified. This had led to time loss and excess use of human resources. This was made possible by the use of information technology to boost up the productivity on all fronts.
Before the researcher ventures to explain what they actually did one must understand why they did it. It was well understood by the BPR Team members that in-order to be flexible they had to have an Integrated Information system which would help them integrate most of the functions within as well as outside the company. For this they first sought to understand:

**11.1 The Enabling Role of IT**

It was important to understand what role does technology play in the BPR process. The CORE group looked into this matter and after giving it some serious thought they arrived at the conclusion that Information Technology could definitely help them increase their productivity significantly. They calculated the productivity gains/resource savings – upward of 30%-70% and they understood that this figure could not be achieved by simply reengineering the processes alone. This was where Information Technology stepped in. *Simply applying IT to their existing process was not reengineering. This was in the right sense automation.* It had no place in their BPR activity and in no way could it be associated with it. *Conversely, making their reengineered process to fit an existing technology was not BPR either.*

Vivek pointed out that at Thermax they were well aware that their BPR activity was focused and regarded IT as an enabler of the BPR process. In order for Information technology to enable BPR, it was selected appropriately and applied appropriately. They knew that if the processes were designed around the latest technological breakthroughs, they would miss several critical steps in BPR and would be taking a large risk. Further, they realized that they would be neglecting -- the customer. As they were not starting from a clean slate they therefore would be developing their processes from a specific point of view - that of the technology, not the customer. So in selecting the technology first, they knew that they might as well have chosen an unproven or unsupported platform that may quickly fade from the limelight.

It was more likely that the technology being used is inappropriate to the process from immediate identification by a BPR team. *In this instance, having MIS/IT resources (both internal to your institution and external) on your BPR team will be of significant value in ferreting out these technologies.* Concluding, he said that, reengineering the process from a blank slate and then seeking out technologies that were appropriate for their processes.
With this in mind the BPR Team Selected, Installed, and Customized besides Training & Implementation of VISIPAK.

11.2 REPORT GENERATION ON VISIPAK

The value of the service that Visipak provided to the organization was well evident from the following:

The billing schedule and balance invoicing was: 
*Now generated in 30 seconds instead of the earlier 15 minutes.* This as we can see is a saving of 95% of the time required.

The PO pending status:
Now took 10 seconds instead of the earlier 5 minutes. *This was a saving of 95% of the time required earlier.*

Today the customer wise accounts statement:
Took only 40 seconds as compared to the earlier 6 minutes. *This was a saving of 88% of the time required earlier.*
12 - THERMAX: SURFACE COATING LIMITED, PUNE

CASE STUDIES OF THE BPR AT TSCL
In order to substantiate the research study on the reengineering processes at Thermax Ltd. Pune it was deemed fit to study the processes in actual, so that a proper understanding could be arrived at.

The case that the researcher studied at their works was:

12.1 VERSATILE PURCHASE DOCUMENT (VDP)
TSCL was and is the First Company in the Thermax Group of Industries to attempt, achieve and implement this. By the use of VDP it has been possible to integrate completely the functions of Finance, Purchase and Excise.

To anyone, even the researcher, the following question would crop up and the answers important in understanding the issues contained therein.

a. What is VDP?
b. What is the procedure involved in its operation?
c. What are advantages that would flow from its implementation?
d. What is the information required for using VDP effectively?

12.2 WHAT IS VPD?
Versatile Purchase Document, as the name suggests, is a multi-functional document. It severs the functions of Goods Received Inspection Note, Purchase Voucher, Delivery challan for Rejected Material, TDS Debit note for Labor charges, Excise registers entry document, sales tax entry document. Diagram given below summarizes these aspects-

Diagram source: VPD Case Thermax
12.3 PROCEDURE INVOLVED IN ITS OPERATION

The procedure of VPD was similar to the existing procedure of buying goods. The only difference was that the integrated software has enabled them to post data from stores documents into finance records. Therefore, there was NO addition of activity to any of the people in the process. On the contrary, lot of manual records and registers were eliminated and duplication of activities in different departments is avoided.

As seen in the above diagram, what the buyers and stores functionaries did, got directly reflected in the Finance books. Hence buyers and stores functionaries became fully integrated with Finance. They exercised utmost care in transactions. Because what they did, changes affected to the balance sheet of the company was on-line and visible to all that had access.

Minimum PO amendments. They complicated the flow of transaction making amendments for changes in quantity, rates or description only. It was not necessary to make PO amendments for changes in rates of taxes or duties. Making PO self contained. Those in, filled up all the details of quantity, rates, taxes, duties, and other charges. What buyer entered in the PO got picked in the VPD. This made it highly versatile and transparent.
13 - INFORMATION NEEDS: FOR USING VPD EFFECTIVELY

Account codes, sales tax codes, item codes etc. Most of this information was made available on-line. Vivek told the researcher that one had just to press F2 in the appropriate field to get a pop-up list of required information. Frequently used Account Codes in VPD

<table>
<thead>
<tr>
<th>Account code</th>
<th>Description</th>
<th>Debit or Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>6010</td>
<td>Purchase - Product</td>
<td>D</td>
</tr>
<tr>
<td>6140</td>
<td>Sub-contracting with our material-Product</td>
<td>D</td>
</tr>
<tr>
<td>1801</td>
<td>Sundry Creditors (Suppliers)-Product</td>
<td>C</td>
</tr>
<tr>
<td>6011</td>
<td>Purchases-Project</td>
<td>D</td>
</tr>
<tr>
<td>6141</td>
<td>Sub-contracting with our material-Project</td>
<td>D</td>
</tr>
<tr>
<td>1800</td>
<td>Sundry Creditors (Suppliers)-Project</td>
<td>C</td>
</tr>
<tr>
<td>4640</td>
<td>RG 23 A Part II (Modvat on Raw Materials)</td>
<td>D</td>
</tr>
</tbody>
</table>

The software automatically gave debit or credit effects. *It was no more necessary to memorize the above.*

13.1 TDS

When sub-contractor’s account was credited, income tax had to be deducted at source. Because of the available integrated software, as soon as VPD was made, TDS as applicable was deducted. The amount of TDS got printed on the VPD. Thus, supplier/vendor came to know immediately what the TDS amount was. For the TDS amount, later on TDS certificates were given.
14 - ADVANTAGES / BENEFITS: THAT WOULD ACRUE BY IMPLEMENTING VPD

1. As soon as QC accepted the material, posting went to the supplier’s account, purchase account and inventory records.

2. Supplier/Vendor knew immediately what was the amount payable to him and what was the due date.

3. Stock status was available online.

4. Excise Modvat register was immediately updated and there was no chance of missing out Modvat credit.

5. If Modvat invoice was not available, the VPD was made for amount net of Modvat.

6. Elimination of bill passing activity by finance department.

7. Reduction in cycle time of payment to suppliers.

8. Duplication of data entry in stores and finance is avoided.

9. As soon as VPD was saved, AP (accounts payable) was updated. Supplier’s/Vendor’s credit balance could be seen on the screen.

10. There was now no need for GRN provisions and subsequent reversals. All VPDs automatically updated the purchase account.

11. Sales tax data was immediately available. Improved cash flow set off could be taken without any time lag.

12. Value of purchases as per stock records exactly matched the purchases booked in finance. In fact the same figures were posted in both records simultaneously.
12. Various manual records and registers were eliminated. 
   Theses included:
   - GRN register
   - Un-booked GRN provision register
   - Writing received quantity behind the purchase orders
   - Writing QC remarks manually on the GRN etc.

13. Various MIS reports were available such as, material pending with QC, rejection analysis etc. apart from the various stock reports.

14. Valuation of stock was to be net of Modvat for each item for each VPD.

15. Stock ledger would automatically reflect such valuation.

16. There was now no need to do estimated calculations for removing Modvat element from stock at year-end.
Abbreviations used -

PO - Purchase Order
MR - Material Requisition
TDC - Temporary Delivery Challan. Used for issuing raw material to vendor.
IR - Inspection Report
VPD - Versatile Purchase Document (GRR cum Purchase voucher cum rejection note cum excise entry document cum tax deduction at source document)
REENGINEERED FABRICATION DOCUMENTATION PROCESS

- Buyer / Rane
  - Bill of material & scrap allowance (ESTD - CE inputs) (ESTD - Rate input)
    - Scrap report

- Buyer / Rane
  - PO for Labour charges
    - Committed cost Report

- Buyer / Rane
  - Consumption sheet cum MR

- Stores
  - TDC
    - Debit/credit note for excess / short supply
      - Finance

- Excise
  - Excise entry

- QC
  - Inspection Report

- Vendor
  - Vendor Invoice
    - TDC Register
    - FG Register
    - A/P & Purchase Records
    - Project wise Cost Reports
    - All Excise records

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In the process of fabrication a large number of RM, semi-finished parts and other miscellaneous items were used. Various steps were involved in the processing of the entire Project. In order to carry out the project to completion more effectively they Reengineered their Fabrication Documentation Process.

15.1 The Contents of the said document were:

1. Scope of this document
2. MIS available in the redesigned process
3. Before and After
4. The breakthrough
5. Identifying and questioning the assumptions
6. Redesigned Process

15.2 Scope of this document
TSCL Project division does not have its own shop floor. The entire material fabrication is done through the sub-contractors. Therefore it assumes importance in the overall Procurement activity. As the business grew, there was more strain on the existing resources to cope with the expanding volumes. This made them re-look and do a re-think with respect to their existing process, redesign it and take help of Information Technology wherever appropriate.

This document did not cover planning and scheduling, monitoring the load with the vendors and negotiating the rates with vendors. Such activities, it was presumed, would be done manually or through some other system.

Reference:
Buyer includes Anant Pathak, T. Christopher
Store refers to Suryavamshi, Karadkar
Rane types POs and GRNs
Excise is handled by Manoj Salunke
Despatch is handled by Sachin Thite
16 - MIS AVAILABLE IN THE REDESIGNED PROCESS

The following information was made available on line:

- **Scrap report.** This gave a comparison between the quantity as per BQM and actual quantity issued to vendor. This could be sorted and stored in various ways such as by project, by item code, by vendor etc.

- **Committed cost report.** As soon as the PO and consumption list was ready, this report was made available. It gave a comparison with the budget. There was now no need to enter the same data again in CCM charts (Continuous cost monitoring charts).

- **Actual cost report.** As soon as VPD was made, the report was made available. They did not feel the necessity to maintain separate spreadsheets to enter the GRN data gain.

- **Raw material stock ledger.** This was now available on line. It would show up the minute to minute status of raw material stock considering the opening stock, purchases made and issues made by TDC. This report could be sorted and stored in various ways such as by item code, by location. Age analysis could also be generated besides being able to do an ABC analysis.

- **TDC register.** This was now also available on line. It would show the material received from vendors but not yet dispatched to the customers. It was of great help for planning of dispatches and taking action for slow moving and non-moving material.

- **Excise records.** These were now automatically updated when the transactions took place. There was no need to enter the same data in excise registers. After a month or so of rigorous testing, they were able to discontinue manual excise records. (Manoj would still need to obtain formal approval from the excise authorities simultaneously).

- **Vendor performance report for ISO.** This gave the vendor wise details of purchases, rejections and rejection percentage. It could also be used as the basis for vendor rating.

*Diagram source: Reengineering of fabrication Document (Case)*
17 - THE BREAKTHROUGH

The good news for the Thermax team was that the computer software to handle TDC transaction was now available and was being put to good use. Further to this good news was that it has been fully integrated in their Visipak ERP system. It helped them in many ways such as linking buyers, stores, dispatch, excise, finance and costing in one single database. Next, they could finally stop multiple entries of the same document, manual registers and records. And finally, their need for on-line information about cost status was now fulfilled.

EXISTING PROCESS - DETAILED DESCRIPTION

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>DONE BY</th>
<th>ACTIVITY DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Buyer</td>
<td>Decide labour charges and quantity of raw material to be issued based on the bill of material and scrap allowance. The scrap allowance is not formally written on any document. It is manually computed and the final quantity to be issued is entered on PO draft.</td>
</tr>
<tr>
<td>2.</td>
<td>Buyer</td>
<td>Prepare PO draft. Write details from bill of material. Hand over draft to Rane.</td>
</tr>
<tr>
<td>3.</td>
<td>Rane</td>
<td>Type PO as per draft given by buyer. (Raw material details are entered again. These are same as the bill of material)</td>
</tr>
<tr>
<td>4.</td>
<td>Rane</td>
<td>Enter details in PO register</td>
</tr>
<tr>
<td>5.</td>
<td>Rane, Signatories</td>
<td>Obtain signatures on PO. Segregate the copies and distribute to buyer, stores, vendor, finance and file.</td>
</tr>
<tr>
<td>6.</td>
<td>Buyer</td>
<td>Enter labour charges as per PO in cost monitoring chart. Enter material cost (based on certain assumptions) in the cost-monitoring chart.</td>
</tr>
<tr>
<td>7.</td>
<td>Costing</td>
<td>Enter details of PO and material cost in project wise costing</td>
</tr>
</tbody>
</table>
8. Stores
   Enter PO details in dbase file.

9. Stores
   Prepare MR by copying consumption list from PO

10. Stores
    Enter MR details in MR register.

11. Stores
    Check availability of raw material. This is checked by visual
    inspection in yard or based on most recent GRN. Stock cards are
    referred but mostly they do not tally.

12. Stores
    Load vehicle with raw material. Weigh the material and obtain
    weigh slip.

13. Stores
    Prepare TDC. This is prepared by typing the details of MR in a
    spreadsheet. Take a printout.

14. Stores
    Write details of TDC on the MR and MR Register. This helps in
    ascertaining the pending material to be issued to vendor
    subsequently.

15. Stores
    Enter details of TDC in dbase file used for tracking material with
    vendor. Ideally this should be done immediately upon preparation
    of TDC. In practice, this is neglected and done at the end of the
    month/year.

16. Excise
    Prepare 57 F 4 challan by copying details from TDC

17. Excise
    Make entry in excise PLA/modvat register

18. Excise
    Make entry in excise TDC register.

19. Stores
    Send material with TDC and excise challan to the vendor.

20. Stores
    Post the details of raw materials sent on the raw material stock
cards. Ideally this should be done immediately upon preparation of TDC. In practice, this is neglected and done at the end of the month/year.

21. **Excise**
   Manually keep track of TDCs which are going beyond the prescribed time limit by excise. In such cases, prepare documents showing receipt of material and reissue.

22. **QC**
   Inspect the fabricated material and prepare IR.

23. **Vendor**
   Make Delivery challan and give fabricated material to TSCL.

24. **Despatch**
   Arrange truck for picking the material from vendor if the material is likely to be immediately despatched to customer.

25. **Despatch/Stores**
   If the material is not likely to be immediately sent to customer, arrange local transport to pick the material from vendor and put it in TSCL premises.

26. **Rane**
   Prepare GRR based on IR and vendors delivery challan

27. **Rane**
   Enter GRR details in GRR register.

28. **Rane, Signatories**
   Obtain signatures on GRR. Segregate and distribute to buyer, vendor, excise, file, finance copy pending for invoice stack.

29. **QC**
   Enter GRR details on original copy of IR for cross reference.

30. **Vendor**
   Give invoice for the DCs given earlier.

31. **Rane**
   Attach vendor's invoice to GRR and hand over to finance

32. **Excise**
   Entry in excise modvat register, excise TDC register after checking.

33. **Finance**
   Bill passing based on PO, GRR, DC and Invoice

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34. Finance  
Deduct income tax at source. Make TDS debit note.

35. Finance  
Payment to supplier on due date.

36. Store  
Enter GRR details in database file containing details of stock with vendor. Ideally this should be done immediately upon preparation of GRR. In practice, this is neglected and done at the end of the month/year in database file, even if GRR is made for part quantity, the entry is made for full PO. This leads to errors in material accounting.

37. Costing  
Enter details of GRR in project wise cost accounting worksheets.

38. Stores  
Compute stock based on manual stock cards and database file containing TDC stock.

39. Stores  
Material reconciliation at the year end. Ascertail excess/short material given to vendor compared to the consumption sheet. Raise appropriate debit/credit notes. Generally this activity spills over to the next year. This results in delayed finalisation of the stock position and material consumption working.

40. Excise  
Pay excise duty on differences arising during reconciliation.
### 18 - IDENTIFYING AND QUESTIONING THE ASSUMPTIONS IN THE EXISTING TDC:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>ASSUMPTION</th>
<th>QUESTIONING THE ASSUMPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TDC is a complex process which can not be computerised. Manual stock keeping is a must</td>
<td>With proper software and part numbering the TDC process has been computerized. It gave better on line information about raw material stock, stock with vendor and finished goods stock.</td>
</tr>
<tr>
<td>2</td>
<td>We have to wait till the year end to do material reconciliation with the vendor</td>
<td>Annual Material reconciliation elimination has if each transaction is self-contained and complete No pending matters should be kept for solution at the year end</td>
</tr>
<tr>
<td>3</td>
<td>Excise is a specialized function and has to be kept independent of the material movement documents</td>
<td>Excise expertise can be captured in the computer system. This way, the duplication of documentation in excise can be eliminated.</td>
</tr>
<tr>
<td>4</td>
<td>Vendor can not give invoice along with the fabricated material</td>
<td>Vendor should give invoice along with fabricated material so that VPD can be made immediately (Refer VPD process document to know more about assumptions behind VPD)</td>
</tr>
<tr>
<td>5</td>
<td>It is necessary to prepare PO draft first and then another clerk should type PO</td>
<td>If the bill of material is available in computer, buyer can prepare PO himself. It will take the same time as preparing PO draft. Duplication and the time taken between the two can be avoided. (This is a desirable situation. The final decision has to be taken by the materials chief)</td>
</tr>
<tr>
<td>6</td>
<td>Manual PO register, GRR register and Stock cards are essential</td>
<td>The same reports can be easily generated on line from computer. No need to keep manual records in addition to computer reports.</td>
</tr>
<tr>
<td>7</td>
<td>In addition to the PO, it is necessary to prepare MR giving the same information as appearing on the consumption list in PO</td>
<td>Consumption list itself can be treated as MR.</td>
</tr>
</tbody>
</table>
### 19 - REDESIGNED PROCESS: DETAILED DESCRIPTION OF TDC

<table>
<thead>
<tr>
<th>S. No</th>
<th>TO BE DONE</th>
<th>ACTIVITY DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Buyer/Rane</td>
<td>Enter bill of material scrap allowance in Visipak and obtain quantity of raw material to be issued</td>
</tr>
<tr>
<td>2.</td>
<td>Buyer/Rane</td>
<td>Prepare PO for labor charges. (On line posting goes to cost monitoring report. No further entry in charts is required)</td>
</tr>
<tr>
<td>3.</td>
<td>Buyer/Rane</td>
<td>Prepare consumption sheet cum MR by pulling data from Bill of material</td>
</tr>
<tr>
<td>4.</td>
<td>Rane Signatories</td>
<td>Obtain signatures on PO. Segregate the copies and distribute to buyer, stores, vendor, finance and file</td>
</tr>
<tr>
<td>5.</td>
<td>Stores</td>
<td>Check availability of raw material. Information available on line. (This can be confirmed by visual inspection in yard)</td>
</tr>
<tr>
<td>6.</td>
<td>Stores</td>
<td>Load vehicle with raw material. Weigh the material and obtain weight slip</td>
</tr>
<tr>
<td>7.</td>
<td>Stores</td>
<td>Obtain TDC Number. Prepare TDC by pulling data from PO/BOM. Take a printout. (No need to write quantity again on MR or MR register. A computerized report is available on line to ascertain the balance quantity in consumption list cum MR. Automatic posting goes to raw materials stock and TDC stock. On line stock status available)</td>
</tr>
<tr>
<td>8.</td>
<td>Store/Finance</td>
<td>Raise debit/credit notes for excess/short material sent to (costing) vendor immediately. This will avoid the need for year-end reconciliation</td>
</tr>
<tr>
<td>9.</td>
<td>Excise</td>
<td>Enter Excise details in computer. (On line effect goes to all the excise registers and records. No need for manual entries again)</td>
</tr>
</tbody>
</table>
10. Stores  
   Send material with TDC cum excise challan to the vendor.

11. Excise  
   Check computerized report-showing outstanding TDCs for follow up.

12. QC  
   Inspect the material and prepare IR

13. Vendor  
   Prepare invoice and give fabricated material to TSCL.

14. Dispatch  
   Arrange truck for picking the material from vendor if the material is likely to be immediately dispatched to Customer.

15. Despatch/stores  
   If the material is not likely to be immediately sent to customer, arrange local transport to pick the material from vendor and put it in TSCL premises.

16. Rane  
   Prepare VPD based on IR and vendors invoice. (On line effect goes to TDC stock, FG stock, finance, excise, Tax deduction at source etc.)

17. QC  
   Write VPD number on IR for cross reference

18. Rane Signatories  
   Obtain signatures on VPD. Segregate and distribute to buyer, vendor, excise, file, finance

19. Finance  
   Payment to supplier on due date.

20. Costing  
   Obtain on line reports showing budgeted V. actual Costs and circulate to other departments with analysis.

21. Stores  
   Periodically obtain confirmation of stock from vendor.
### BPR Techniques

**Project Characteristics**  
- All projects ....  
- The more customer focused ....  
- The more structured  
- The process ....  
- The more IT enables process change ....  
- The more radical the project ....  

**Applicability**  
- require ....  
- need ....  
- the more important is ....  
- the more useful is ....  
- the more feasible is ....  
- the more applicable is ....  
- the more relevant is ....  
- the greater the reliance on ....  
- the higher the demand for ....  
- the more essential the ....  
- the greater the criticality of ....  

**Technique Category**  
- project management.  
- problem solving and diagnosis.  
- customer requirements analysis.  
- process capture and modeling.  
- process prototyping and simulation.  
- process measurement.  
- IS systems analysis and design.  
- business planning.  
- creative thinking.  
- organizational analysis & design.  
- change management.
This understanding of BPR has stood the organization in good stead. With all this in mind they were able to achieve the targeted results with the reengineering of the VPD system and the document management system.

The employee morale went up as a result and the work in the said areas got carried out at a faster pace.