

# ENTERPRISE RESOURCE PLANNING

## SYLLABUS

### UNIT-I

**Introduction:** Overview of enterprise systems – Evolution - Risks and benefits - Fundamental technology - Issues to be considered in planning design and implementation of cross functional integrated ERP systems.

### UNIT-II

**ERP Solutions and Functional Modules:** Overview of ERP software solutions- Small medium and large enterprise vendor solutions, BPR, Business Engineering and best Business practices - Business process Management. Overview of ERP modules -sales and Marketing, Accounting and Finance, Materials and Production management.

### UNIT-III

**ERP Implementation:** Planning Evaluation and selection of ERP systems-Implementation life cycle - ERP implementation, Methodology and Framework- Training – Data Migration. People Organization in implementation- Consultants, Vendors and Employees.

### UNIT-IV

**Post Implementation Maintenance of ERP:** Organizational and Industrial impact; Success and Failure factors of and ERP Implementation.

### UNIT-V

**Emerging Trends on ERP:** Extended ERP systems and ERP add-ons -CRM, SCM, Business analytics etc- Future trends in ERP systems-web enabled, Wireless technologies so on.

# ENTERPRISE RESOURCE PLANNING

## SCHEME OF LESSONS

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# UNIT I

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## LESSON 1 - INTRODUCTION TO ENTERPRISE RESOURCE PLANNING

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1.3 Implementation of Cross-functional Integrated ERP System

Summary

Keywords

Self-Assessment Questions

Further Readings

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### LEARNING OBJECTIVES

After studying this lesson, you should be able to:

- Understand the concepts of enterprise systems
- Describe the fundamental of technology

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### LEARNING OUTCOMES

Upon completion of the lesson, students are able to demonstrate a good understanding of:

- basics of enterprise resource planning
- analyzing objectives and evolution of enterprise resource planning

## Notes

- explain ERP fundamentals of technology
- list out issues to be consider in planning design
- implementation of cross-functional integrated ERP system

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## OVERVIEW

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The evolution of Enterprise Resource Planning (ERP) will be viewed as a watershed event in the application of information technology to manage business. It is a software-driven business management system that helps to integrate all functions of a business. It is complex and expensive and may call for major changes in the process. It is making significant improvement in the way companies are being managed. The potential benefit of using ERP is huge. However, some companies did not get the desired result.

In this lesson, you will learn about the enterprise systems and fundamental of technology. You will be introduced to the in-depth of ERP.

We advise you, that learn this lesson carefully it will give you a better understanding of the present scenario of the ERP in business environment.

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### 1.1 ENTERPRISE RESOURCE PLANNING (ERP)

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ERP may be defined as an enterprise-wide set of forecasting, planning and scheduling tools, which links customers and suppliers into a complete supply chain, employs proven process for decision making, and co-ordinates sales, marketing, operations, logistics, purchasing, finance, product development and human resources. In essence, ERP replicates and integrates business process, shares common data and practices across the entire enterprise and produces and accesses information in a real time environment. Organization is a combination of processes.

It may transcend organizational or functional boundaries. The material and information undergoes various transformations through these processes, until they are transformed into output(s) of value to customer.



**Example:** A process of ordering goods from supplier, typically involves multiple organizations/functional areas, including supplier organizations, purchasing, receiving, accounts payable and customers.

Traditional application systems were usually concerned with the transaction of tasks of a process in specific functional areas. They store data, process them and present them in the appropriate form whenever requested by the user. However, there is no link between the application systems being used by different functional areas.

An ERP system replicates or models flows through the process. As the material or information flows across the processes, a large number of data is generated as a result of diverse transactions. All information is recorded in a relational

database consisting of hundreds of tables. As such it presents a common, logically single database system for the whole organization. Thus, ERP promises the seamless integration of all the information pertaining to finance and accounting, human resource, customer etc., flowing through an organization. The recorded information is available for retrieval in real time. The information is used by the managers of various levels for the purpose of monitoring and control of production system.

### 1.1.1 Objectives of ERP

- Provide support for all variations of best business practices
- Enable implementation of these practices with a view towards enhancing productivity
- Empower the customer to modify the implemented business processes to suit their needs.

### 1.1.2 Evolution of ERP

ERP is an outcome of 40 years of trial and error. It has evolved as a strategic tool because of continuous improvement in the available techniques to manage business and the fast growth of information technology.

Prior to 1960s, business had to rely on the traditional ways of inventory management to ensure smooth functioning of the organization. These theories are called classical inventory management or scientific inventory control methods. The most popularly known amongst them is EOQ (Economic Order Quantity).

In this method, each item in the stock is analyzed for its ordering cost and the inventory carrying cost. A trade off is established on a phased out expected demand of one year, and this way the most economic ordering quantity can be decided. This technique in principle is a deterministic way of managing inventory.

Along with EOQ, various inventory models such as fixed order quantity, periodic order method, optional replenishment method, etc., were in practice earlier. These theories were very popular in pre-MRP era.

The evolution of ERP can be classified into four stages:

#### ***Material Requirement Planning (MRP)***

In 1960s, a new technique of Material Requirements Planning, popularly known as MRP, was evolved. This was a proactive manner of inventory management. This technique fundamentally explodes the end product demand obtained from the *Master Production Schedule (MPS)* for a specified product structure (which is taken from Bill of Material) into a detailed schedule of purchase orders or production orders, taking into account the inventory on hand.

**Notes**

MRP is a simple logic but the magnitude of data involved in a realistic situation makes it computationally cumbersome. If undertaken manually, the entire process is highly time-consuming.

It used master schedules (what are we going to make?), the bill of material (what does it take to make it and in what sequence?) and inventory records (what do we have?) to determine future requirements (what do we have to get and when?)

MRP successfully demonstrated its effectiveness in:

- Reduction in inventory
- Reduction in production
- Reduction in delivery lead-times by improving co-ordination and avoiding delays
- Making commitments more realistic



**CAUTION** MRP did not take into account other resources of an organization.

***Closed-loop MRP***

MRP proved to be a very good technique for managing inventory, but it did not take into account other resources of an organization. This led to the birth of a modified MRP logic, popularly known as closed loop MRP. It emerged in 1970s. In this technique, the capacity of the organization to produce a particular product is also taken into account by incorporating a module called Capacity Requirements Planning (CRP).

In this, additional planning functions of sales and operations (production planning and master production scheduling) were included. Also, a feedback loop is provided from CRP module to MPS to check if enough capacity is available to produce. Once the planning phase is complete and the plans have been accepted as realistic and attainable, the execution function comes into play.

***Manufacturing Resource Planning (MRP II)***

In 1980s, the need was felt to integrate the financial resource with the manufacturing activities. From this evolved an integrated manufacturing management system called Manufacturing Resource Planning (MRP II).

MRP II is known to be a direct growth and extension of closed-loop MRP. Some of the additional features are as follows:

- Business planning and execution support systems for capacity and materials, which include manufacturing control functions of input-output measurement, detailed scheduling and dispatching, as well as delay reports from both the plant and suppliers, supplier scheduling and so on.

**Notes**

- **Financial interface:** This translates the operating plan (in physical units) into financial terms.
- **Simulation capability:** The ability to ask "What if?" questions and to obtain actionable answers in both units and dollars.



MRP II did not address other functions like human resource management, marketing, logistics, etc. Also, it is not concerned with customers and suppliers.

### ***Enterprise Resource Planning***

Transition from MRPII to ERP happened during 1980-90. The basic MRP II system design was suffering from a few inherent drawbacks such as limited focus to manufacturing activities, assumption of the mass or repetitive production set ups, and poor budgetary and costing controls.

The shortcomings of MRP II and the need to integrate new techniques led to the development of a total integrated solution called ERP, which attempts to integrate the transactions of the organization to produce the best possible plan. Today there are further developments in the ERP concept and evolution web-based ERP. Its add-on features are:

- It includes all functional areas of an enterprise, including purchasing, product development, operations, logistics, finance, sales and marketing
- It also extends its coverage to customer and supplier, thus bringing the entire supply chain in its fold.

#### **1.1.3 Risks of ERP**

Important risks related with ERP include:

- How much standardization in business process?

For having a close fit between ERP system and the business process, we have the following options:

- (a) Change the business process
- (b) Change ERP system
- (c) Do both i.e., adopt a hybrid approach

With the option (a), the firm may not gain competitive advantage as the competitors may adopt the same. With the option (b), the opportunity to standardize processes and to use the best solutions offered by ERP is lost. Hence, experts suggest adopting option (c). However, there is some difficulty associated with this option. The firm faces the additional responsibility of updating the package whenever its newer version comes.

**Notes**

- Whether to adopt a single vendor's offering to cover the entire enterprise or to adopt a "best in breed" approach in which separate software packages are selected for each process area and integrate with one another?
- **Staffing model to be used for the project:** ERP implementation projects are long and intense. Projects need best people drawn from current business on full time basis for long period. This action may have negative effect on the current business. Also, there is another issue of reintegration of the employees back into the business after the implementation of the project. Both the issues are to be addressed beforehand.

**1.1.4 Benefits of ERP**

ERP systems offer many advantages:

- ERP system streamlines the information flow in large business organizations by integrating the flow and having a single database to achieve the following:
  - ❖ *Solve the problem of fragmentation of information:* Every big company collects, generates, and stores vast quantity of data. Data is kept in separate computer systems, each housed in separate locations. Each provides good support for a particular business activity. But in combination, they put a heavy drag on business productivity and performance.
  - ❖ *Integrate information across the organization:* Collects data from and feeds data into modular applications supporting various business activities. When new information is entered in one place, related information is automatically updated.
- Provide direct access to a wealth of real time operating information resulting in dramatic gain in productivity and speed.
- ERP helps to deliver product on time, quickly and economically and enables organizations to deal with constant change in the manufacturing world.
- They support customer relationship management, supplier relationship management, advanced planning system, business information warehousing, etc.



**Example:** Auto desk, leading maker of computer aided design software. Delivery of an order to customer reduced from 2 weeks to 24 hours in 98% of cases.



**Example:** IBM's storage system device, Replacement time of a part reduced from 22 days to 3 days and reduced the time to complete a credit check from 20 minutes to 3 seconds.



Business benefits of ERP system can be summarized as follows:

## Notes

- Improvement in operational efficiency lower cost (raw material, labour, maintenance), higher through put (improved delivery, reliability, reduced cycle time) and improved quality (improved reliability, reduced defects/errors).
- Reengineering of business process following best practices
- Easy and timely access to information to managers for better decision making
- Better organizational communication with customers and suppliers

From the above, it may be seen that ERP offers several benefits. However, it carries some risks.

Dell Computer found that its system would not fit the new, decentralized management.



Further, it has been identified two reasons for such debacles. These include: Improper implementation of ERP system, which is complex pieces of software and requires large sum of money, time and expertise, and establishing fit between system output and business need.



### ***Learning Activity***

Select any organisation of your choice, study its ERP systems and their activities and prepare a short report of your understanding about the ERP systems of that organization.

## **1.2 ERP FUNDAMENTALS OF TECHNOLOGY**

The new era of PC, advent of client server technology and relational database management system (RDBMS) have contributed to the ease of development of ERP system. Three-tier client/server configuration consists of the core, the application server and the front-end servers. The core of the system is a high-speed network of database server, designed to efficiently handle a large database. The application servers which consist of modules related with various processes are networked around database. The user communicates with the application servers through the front-end server, which are the PCs.

The companies, implementing ERP have multiple locations of operation and control and hence need online transfer of data across locations. Other enabling technologies including workflow, work group, groupware, Electronic Data

## Notes

Interchange (EDI), Internet, intranet, data warehousing, etc., facilitate this transfer.

The ERP field can be slow to change, but the last couple of years have unleashed forces which are fundamentally shifting the entire area. According to Enterprise Apps Today, the following new and continuing trends affect enterprise ERP software:

- **Mobile ERP:** Executives and employees want real-time access to information, regardless of where they are. It is expected that businesses will embrace mobile ERP for the reports, dashboards and to conduct key business processes.
- **Cloud ERP:** The cloud has been advancing steadily into the enterprise for some time, but many ERP users have been reluctant to place data cloud. Those reservations have gradually been evaporating, however, as the advantages of the cloud become apparent.
- **Social ERP:** There has been much hype around social media and how important – or not – it is to add to ERP systems. Certainly, vendors have been quick to seize the initiative, adding social media packages to their ERP systems with much fanfare. But some wonder if there is really much gain to be had by integrating social media with ERP.
- **Two-tier ERP:** Enterprises once attempted to build an all-encompassing ERP system to take care of every aspect of organizational systems. But some expensive failures have gradually brought about a change in strategy – adopting two tiers of ERP.

### **ERP Vendors**

Depending on your organization's size and needs there are a number of enterprise resource planning software vendors to choose from in the large enterprise, mid-market and the small business ERP market.

#### *Large Enterprise ERP (ERP Tier I)*

The ERP market for large enterprises is dominated by three companies: SAP, Oracle and Microsoft.

#### *Mid-market ERP (ERP Tier II)*

For the midmarket vendors include Infor, QAD, Lawson, Epicor, Sage and IFS.

#### *Small Business ERP (ERP Tier III)*

Exact Globe, Syspro, NetSuite, Visibility, Consona, CDC Software and Activant Solutions round out the ERP vendors for small businesses.

## Database Systems

## Notes

As data is a very significant resource, it requires tough, protected, and easily obtainable software that can collect and utilize it fast. A substantial and a consistent database is the solution to these requirements DBMS (database management system) as one software and a group of software applications that are used to manage the formation, preservation, and the utilization of a database. Establishments are permitted to formulate databases for different applications. DBMS provides permission to several users to make use of same database simultaneously. DBMS offers resources for handling the access of data and imposing data integrity. Also it allows database to recover after collapsing and the data is restored from backup. In addition, DBMS maintains the security of the database.



There are various ERP vendors available today. Some of them include: SAP, People soft, JD Edward, Geac and others. These vendors offer slightly differing features to their products; still major modules are the same in all of the products.

### 1.2.1 Issues to be Consider in Planning Design

The following issues should be considered in planning design:

- ***Emergence of a service oriented architecture:*** Here, individual components of application modules are called for specific jobs and once the job is complete, they are released.
- ***Data warehousing and data mining:*** Data from ERP systems are stored using a logic map. These data are explored using various analytical algorithms and tools for the purpose of analysis and decision-making.
- ***ERP vendors may incorporate*** additional functional niches such as customer's relationship management, supplier relationship management, etc.
- ***Product data management:*** This module deals with the storage of technical drawings of parts and their upgraded or modified versions. The relevant drawings can be retrieved quickly. This helps to develop new products.

## 1.3 IMPLEMENTATION OF CROSS-FUNCTIONAL INTEGRATED ERP SYSTEM

With the industrial revolution, the size of the organization grew and it was not possible for a single individual to carry out all the jobs. Job was divided into various categories execution, supervision, managerial, support (sales, marketing, maintenance, human resource, materials management and so on). In due course, the division of job led to specialization fictionalization. Functional

## Notes

departments took birth. Evolution of ERP followed the growth of the firm. Application module was created to cater to the needs of a functional department. These functional applications were extended and integrated over the years.

SAP R/3, a product of SAP AG, and the market leader in the segment offers the following four modules: financial accounting, human resources, manufacturing and logistics, and sales and distribution. The software is designed to operate in a three-tier client/server configuration. The R/3 application is fully integrated so that data is shared between all applications. The modules are designed around industry's best practice. In many cases, a firm wishing to use SAP needs to change its practices to suit the SAP system. The four modules of R/3 in terms of functionality are briefly discussed below:

### ***Financial Accounting***

This module includes three major categories of functionality needed to run the financial accounting for a company financial (FI), controlling (CO), and asset management. FI includes accounts payable, accounts receivable, general ledger and capital investment.

The controlling category includes costing: cost centre, profit centre, and enterprise accounting and planning, internal orders, open item management, posting and allocation, profitability analysis etc.

The asset management category includes the ability to manage all types of corporate assets, including fixed assets, leased assets and real assets etc.

### ***Human Resources (HR)***

This segment includes a full set of capabilities needed to manage, schedule, pay and hire the people who make a company run. It includes payroll, benefits administration, applicant data administration, personnel development planning, work force planning, schedule and shift plan, time management and travel expenses accounting.

### ***Manufacturing and Logistics***

It can be divided into five major segments:

- Materials Management (MM)
- Plant Maintenance (PM)
- Quality Management (QM)
- Project Management System (PS)
- Production Planning Control

Each segment is divided into a number of components.

**Cost and Sales Distribution (SD)****Notes**

This module provides customers' management, sales order management, configuration management, distribution, export control, shipping and transportation management, and billing, invoicing, and rebate processing.

**Learning Activity**

Select any organisation of your choice, study its ERP functions and ERP integration with other departments and prepare a short report of your understanding about it.

**Bolhoff Fastenings****Bolhoff Fastenings Takes Stock of its India Operations with Sage Accpac**

Bolhoff Fastenings India Pvt. Ltd. is a wholly owned subsidiary of Bolhoff Germany, a leading supplier of fastening, assembly and systems technology and products having presence in over 30 countries across the globe. While the company headquarters manufactures the products, the Indian subsidiary is involved in import and sale of fasteners and assembly products to automobile majors, automobile ancillary units and industrial machinery majors and vendors, through their head office in Delhi and their branch offices and representatives in Bangalore and Pune. Since their inception in India in February 2007, the company has been witnessing growth and expansion in its business and is now actively looking at making inroads into the industrial infrastructure and government sectors. “As our customer base grew in size and the orders became more complex and random, we needed robust, modular and scalable financial and operations software that could tightly bind the various aspects of our business together and evolve as per our requirements,” says Mr Jagdish Keswani Managing Director, Bolhoff Fastenings.

**Challenge**

Tracking of inventory status across multiple warehouses, Manual counting and valuation of large number of very small products, Visibility into credit history during repeat customer billing, Generation of monthly reports comprising of data from multiple databases in the prescribed International format.

**Solution**

Sage Accpac ERP, a highly scalable and modular application provides real time inventory control and visibility. It also supports multiple currencies

*Contd...*

**Notes**

and features a strong reporting tool. Modules are closely interlinked with each other so that a small change in one module results in a corresponding change in the related fields of the other modules as well.

**Result**

Real time view of stock availability and customer credit history has resulted in reduced errors and reorders during the sales process. Reports are generated automatically in the required format using predefined formulas. Consolidated view of company finances enables better budgetary estimations.

**Customer Summary**

Industry – Trading & Distribution

Users – 3 concurrent users

System – Sage Accpac

General Ledger

Accounts Payable

Accounts Receivable

Order Entry

Purchase Order

Transactional and Optional fields

Multicurrency

**Bolhoff and Sage – The Perfect Match**

The Managing Director of Bolhoff was very clear about the features he wanted in the ERP product to address his requirements and when he came across Sage Accpac through Across Domain, the solution implementation partner, he was immediately interested. Sage Accpac is a highly scalable and modular ERP application that provides robust financial & accounting support and real time inventory control and visibility. It also supports multiple currencies, features a strong reporting tool and comprises of modules that are very tightly integrated with each other so that a small change in one module results in a corresponding change in the related fields of the other modules as well. Guided by its strong product understanding and domain knowledge, Across Domain, the implementation partner for the project, was able to understand Bolhoff's unique requirements and then carry out a live system demonstration to highlight the strengths of Sage Accpac.

Bolhoff decided to implement a 3-user package of Sage Accpac comprising of System Manager, General Ledger, Accounts Receivable, Accounts

*Contd...*

Payable, Order Entry, Purchase Order, Transactional and optional fields, multicurrency as the major modules.

### **Real time Inventory Control**

Bolhoff's India operations are headquartered in New Delhi with branch offices in Bangalore and Pune. Products imported from the parent company arrive at the head office where the purchase order is generated, wherefrom they are allocated to multiple locations for warehousing and storage. "Since the variety of products is very large and some of the products have very small physical dimensions, manual counting and valuation of stock, tracking of inventory status and material movement across multiple warehouses would be near impossible leading to errors and delays in order fulfilment," opines Jagdish. "Sage Accpac offers us a real time view into stock availability so that we can accept sales orders only if the stock situation is satisfactory and reorder if the level is below economic order quantity. Once the order is booked it automatically moves to shipment wherein the ordered quantity is deducted from the stock and the invoice is generated." Sage Accpac also allows personnel to identify and distinguish slow moving goods and take a definite action such as sale or return with them and also maintain separate stock of samples and saleable products.

### **Complete View of Customer Details**

Since Bolhoff has quite a number of repeat customers, a complete view of the customer history, special rates offered and credit limit status is essential at the time of order processing and fulfilment. Featuring a concept of approval and sub approvals in the case of customers who have exceeded their credit limit, Sage Accpac requires the approval of the senior executive for such orders to proceed to shipment, thereby saving time and removing scope for errors and reorders. Sage Accpac also prevents sale of samples during stock crunch and helps in generating inventory turnover ratio report comprising of information on which items were stocked, what price it was sold at and which customer it was sold to. Sage Accpac also helps in supplier management and day-today profitability and margin calculation.

### **Easy Reporting at your Fingertips**

Being a global company, Bolhoff's India operations head needed to provide monthly reports comprising of balance sheet, profit and loss and budget analysis in the required International format to the parent company. "We needed a multi-currency, multi-language accounting software with a strong reporting tool that could be customized according to pre-set parameters, and which could generate reports in the required format automatically using predefined formulas," shared Jagdish. Financial reporter, the reporting tool in Sage Accpac, is capable of incorporating predefined formulas to dynamically extract data from the database to generate reports in the required format. This solves Bolhoff's MIS related issues of collating data from multiple sources and presenting reports on operating costs, net

**Notes**

*Contd...*

**Notes**

monthly sales, stock and total outstanding balance in predefined international formats. Easy to use and format, it also provides the Managing Director with instant visibility into the company's profit & loss and operating costs for any given month, on the basis of which he can estimate budgets for the future.

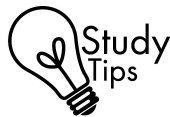
**Grows with your Business**

Describing his company's growth over the last year, Jagdish says, "In the beginning we were primarily catering to a small base of repeat customers. However with the growth of the company, the customer base expanded and the ratio of repeat billing came down. As the billing became more random and complex and the number of financial transactions increased, we needed a scalable and modular financial application that would grow with us. A sophisticated and robust operating and accounts system, Sage Accpac ERP has a modular structure, which allows you to implement only the modules and options you need today and build out your financial system by adding on more options later."

**Questions**

1. Comment on the problem faced by the Bolhoff. How the ERP solutions did have provided the solution for their problem?
2. If you were in Mr Jagdish's place, what strategies you would have adopted to cope up with the problem and strengthening the business?

*Source:* <http://www.sagesoftware.co.in/CaseStudyDetail.aspx?CaseStudyId=3>



1. A process is a set of logically related tasks that consumes one or more inputs and creates an output.
2. In case of single vendor strategy, functionality is well integrated. Best in breed potentially offers greater flexibility, but integration and vendor relationship become complex.

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**SUMMARY**

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- ERP may be defined as an enterprise-wide set of forecasting, planning and scheduling tools, which links customers and suppliers into a complete supply chain, employs proven process for decision making, and co-ordinates sales, marketing, operations, logistics, purchasing, finance, product development and human resources.
- In essence, ERP replicates and integrates business process, shares common data and practices across the entire enterprise and produces and accesses information in a real time environment. Organization is a combination of processes.



**Notes**

- A process is a set of logically related tasks that consumes one or more inputs and creates an output.
- It may transcend organizational or functional boundaries. The material and information undergoes various transformations through these processes, until they are transformed into output(s) of value to customer.
- Traditional application systems were usually concerned with the transaction of tasks of a process in specific functional areas.
- They store data, process them and present them in the appropriate form whenever requested by the user. However, there is no link between the application systems being used by different functional areas.
- An ERP system replicates or models flows through the process. As the material or information flows across the processes, a large number of data is generated as a result of diverse transactions.
- All information is recorded in a relational database consisting of hundreds of tables. As such it presents a common, logically single database system for the whole organization.
- ERP promises the seamless integration of all the information pertaining to finance and accounting, human resource, customer etc., flowing through an organization.
- The recorded information is available for retrieval in real time. The information is used by the managers of various levels for the purpose of monitoring and control of production system.

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**KEYWORDS**

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**Enterprise Resources Planning:** It may be defined as an enterprise-wide set of forecasting, planning and scheduling tools, which links customers and suppliers into a complete supply chain, employs proven process for decision making, and co-ordinates sales, marketing, operations, logistics, purchasing, finance, product development, and human resources.

**Process:** Process is a set of logically related tasks that consumes one or more inputs and creates an output.

**Material Requirement Planning (MRP):** The first phase of ERP was born in 1960s. It used master schedules, the bill of material and inventory records to determine future requirements.

**Closed-loop MRP:** Emerged in 1970s, in this, additional planning functions of sales and operations (production planning, master production scheduling and capacity requirement planning) were included.

**Feedback Loop:** Feedback loop is provided from CRP module to MPS to check if enough capacity is available to produce. Once the planning phase is complete and the plans have been accepted as realistic and attainable, the execution function comes into play.

**Notes**

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**SELF-ASSESSMENT QUESTIONS**

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**Short Answer Questions**

1. Describe the enterprise resources planning.
2. Explain the process.
3. What is material requirement planning?
4. Explain the closed-loop MRP.
5. Describe the feedback loop.
6. Explain the cross-functional integrated ERP system.
7. Explain the cross-functional integrated ERP system with financial accounting.
8. Explain the cross-functional integrated ERP system with human resources.
9. Explain the cross-functional integrated ERP system with manufacturing and logistics.
10. Explain the cross-functional integrated ERP system with Cost and Sales Distribution (SD).
11. Explain the emergence of a service oriented architecture.
12. Describe the data warehousing.
13. Explain the data mining.
14. Explain the data management.
15. Describe the product data management.
16. What is three-tier client/server configuration?
17. Explain how to solve the problem of fragmentation of information concept.
18. Describe the concept of integrate information across the organization.
19. ERP provide direct access to which kinds of information?
20. Explain the model flow of ERP.

**Long Answer Questions**

1. Explain the concepts of ERP in detail.
2. Describe the evolution of ERP in detail.
3. Explain the risk and benefits associated with ERP.
4. Explain the concepts of fundamental of technology and issues to be considered in planning design in detail.
5. Describe the implementation of cross-functional integrated ERP system with various departments of an organization.

6. Prepare a short note of your understanding about the concepts of ERP.
7. “At present scenario of the world economic environment companies are using the ERP in their business functions.” Explain this statement with the relevant company examples.
8. A business manager is asked to prepare an ERP planning for their organization, how would you assist him to prepare their ERP planning? Support your answer with the relevant company examples.
9. Analyse the risk, benefits associated with the ERP systems and prepare a short note on ERP that ERP is good for organization or not.
10. Prepare a detailed note on the cross-functional integrated ERP system of an organization. Your report must be based upon a company of your choice.

**Notes**

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## FURTHER READINGS

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# UNIT II

## Notes

## LESSON 2 - ERP SOFTWARE SOLUTIONS

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### LEARNING OBJECTIVES

After studying this lesson, you should be able to:

- Understand the concepts of ERP software solutions
- Describe the small, medium and large enterprise vendor solution

### LEARNING OUTCOMES

Upon completion of the lesson, students are able to demonstrate a good understanding of:

- basics of ERP systems
- determine solutions of ERP software
- explain small or medium and large enterprise vendor solution
- analyzing ERP and large organization

**Notes**

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**OVERVIEW**

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Let us first review the previous lesson where you studied about the concepts of Enterprise Systems and also learnt about the ERP fundamentals of technology.

In this lesson, you will understand the overview of ERP software solutions. At the end of the lesson, you will learn about the small, medium and large enterprise vendor solution.

We advise you, that learn this lesson carefully it will give you a better understanding of the present scenario of the ERP software solutions. This lesson will help you to understand the concepts of the small, medium and large enterprise vendor solution.

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**2.1 ERP SYSTEMS**

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Enterprise Resource Planning (ERP) systems which are coming into vogue are built with the vision to provide businesses with an integrated information system. These systems implement business processes within the organisation to achieve synergy in operation across various business units. The challenge for ERP systems is to set up and integrate information resources across geographically spread business units, to enable optimisation across the organisation. Even though a multitude of technologies is involved in building ERP systems, the implementation and post-implementation maintenance should be made simple. Towards this objective, it is imperative that the ERP systems satisfy some basic requirements of the customer.



ERP systems provide support for all variations of best business practices and enable implementation of these practices with a view towards enhancing productivity.

**2.1.1 Information System Technologies**

Information systems technologies are evolved from mainframe based computing through the client server era, to where we are now heading - the Internet era. These distinct phases are marked by parallel development in hardware technologies. Client server era began when computing power delivered at desktop machines increased manifold and matched mainframe-computing power. These technologies limited the availability of information services to users within an organisation. The Internet era has brought in the ability to deliver information around the globe. This is made possible with advancements in communication infrastructure.

With the arrival of the Internet, the biggest challenge facing ERP vendors is to address the global access issues and deployment of information systems that

**Notes**

will cater to intra-organisation and extra-organisation needs effectively. Over and above these challenges ERP systems need to leverage these technologies to deliver complete (best business practices), usable (high productivity) and adaptable (easy installation and post implementation maintenance) business systems.

The user interface implemented using graphical user interface techniques is deployed on client machines. Powerful server machines host the databases and business logic written as server procedures. The databases are built using relational database technology. Business logic is split depending on the product architecture to be executed on the client, server or both.

With suitable communication infrastructure, these systems could be deployed in a distributed environment and business processes may span across multiple geographical locations. As an example, a purchase request could be raised at a plant location to be processed by purchase department located miles away from the plant.

The technologies deployed have allowed the ERP vendors to meet the requisite objectives. Relational database systems have enabled the vendors to put in the necessary flexibility in terms of business logic and data structures to support parallel business practice implementations. Graphical user interfaces support the usability aspect of business systems by providing intuitive and consistent user interface. Object oriented development practice employed in building graphical user interfaces has enabled the vendors to provide for easy customisation and extension of interface components to accommodate additional data entry. These technologies in general have allowed the users to design the system in such a way that installation, customisation and extensions are possible in shorter periods.

### **2.1.2 ERP Software Solutions**

An Enterprise Resource Planning (ERP) system is an organizational and management solution based on information technology towards challenges and problems in the business environment.

The software solutions that apply ERP systems are: Database systems, Communication protocols and User interface framework. These are discussed as follows:

#### ***Database Systems***

The current generation of database systems are based on relational technology (RDBMS). These database systems support querying using standard query language known as Structured Query Language (SQL). Business logic which specifies the set of actions that need to be performed (such as check stock situation and update inventory) is written using SQL and is invoked when user performs an action. These database systems support access of multiple

**Notes**

distributed data sources and allow synchronising of data manipulation across these sources.

ERP systems built on this technology will support organisations with the need to setup distributed systems with less dependence on a central information resource location. Use of standard query language will enable organisations to perform post implementation maintenance with confidence since the systems in place are not tied to proprietary languages. The skill needed to do this activity will not be at a premium in the market place. Saleability issues are addressed since sizing of hardware may be done to cater to the business process activities performed at a specific location. Addition of new location(s) will not lead to disruption at other locations.

***Communication Protocols***

The clients and servers in an ERP are connected on a communication backbone. The protocols employed standardise the way data exchange takes place across the network. Database systems employed at servers and the processes on the client, use this protocol to send and receive data over the network. Database protocols are specific to the database management systems employed.



Since database systems employ common relation technology, the data exchange is based on a common Open Data Base Connectivity (ODBC) standard.

Most of the ERP systems use this to integrate client software with the business logic procedures present on the server. Since communication protocols are standardised, organisations can leverage advances in communication infrastructure without worrying about the information systems that are supported.

***User Interface Framework***

User interface component of an ERP generally follows Graphical User Interface (GUI) approach. Use of GUI-based user interface enhances the usability of ERP systems. GUI standards are derived to provide the best application ergonomics with proper design. Interface elements applied in a consistent manner greatly improves usability and helps in user training.

The operating systems environment of the client (such as Windows NT and Windows 95) provides the graphical user environment. User interface for ERP products conforms to the standards recommended by the operating system vendors. This ensures minimum discomfort for users when they move from a standard desktop application (such as MS Word and MS Excel) to the business system application.





### ***Learning Activity***

Select any organisation of your choice, study their working software which is based on the ERP and prepare a short report on your understanding about software solutions based on the ERP systems of that organization.

### **Notes**

## **2.2 SMALL OR MEDIUM AND LARGE ENTERPRISE VENDOR SOLUTION**

ERP is needed by all. One problem faced by Indian organisations is the mass exodus of trained IT professionals. The acutely affected ones are the small to medium enterprises most of which are left with one man ERP departments! This makes it necessary for such enterprises to go for an ERP production than attempt an in house development.

A misnomer that has gained acceptance in the recent past is that ERPs are meant for large organisations and small to medium companies cannot afford them. This statement is only partly true. The ERPs marketed are expensive and smaller organisations cannot afford them. However, this does not mean that the small and medium industries do not need an ERP. In fact, there is a greater need for information integration in small and medium sized organisations which lack the money power and business resilience of large enterprises. The need of the hour is to provide micro ERPs, i.e. near ERP capabilities build into a product and sold at an affordable price, including implementation.

In recent years, most ERP system suppliers have increased their focus on small or medium sized organizations. There are some reasons for this trend including a saturation of the market as most large organizations have already implemented an ERP solution, increasing possibilities and need for the integration of systems between organizations and the availability of relatively inexpensive hardware. Given this development, it seems necessary to understand the ways in which small or medium sized differ from large organizations and the resulting consequences for ERP system selection and implementation.



A major problem faced by Indian enterprises today is the lack of integration of data amongst different functions like finance, production, material and sales.

This can be attributed mainly to the fact that personal computers were installed by individual departments over a period of time to perform departmental task and no serious attempt was made to integrate them. It is common to find companies having computers in stores, but not connected to the finance department. As a result, finance will enter data again in their financial

**Notes**

accounting system and a host of people will be spending their time trying to reconcile the statements from the two departments!



In the early days when the enterprises were small, organisations had a customer focus. As they grew, they created different functions to manage the system more efficiently. Unknowingly, this created barriers amongst different functions and led to problems like: The CEO has to struggle hard through many review meetings to simply get to know the true status of key performance factors.

**2.2.1 ERP Solutions for Small and Medium Sized Businesses**

As sales of ERP systems to large manufacturing companies began to slow, some vendors changed their focus to smaller companies. The overall market for ERP systems grew 21 percent in 1998, despite the fact that sales to companies with greater than \$1 billion in revenues declined 14 percent during the same period. "ERP applications are no longer just the stuff of huge corporations,"

"While billion-dollar manufacturing companies are now completing their ERP implementations, mid-size customers—witness to the improved business processes of manufacturing market leaders—are beginning to refine their own operations. Invariably the most substantial reason for companies to implement ERP is that without it, staying competitive is a practical impossibility. The business world is moving ever closer toward a completely collaborative model, and that means companies must increasingly share with their suppliers, distributors, and customers the in-house information that they once so vigorously protected."

Of course, small and medium-sized companies—as well as those involved in service rather than manufacturing industries—have different resources, infrastructure, and needs than the large industrial corporations who provided the original market for ERP systems. Vendors had to create a new generation of ERP software that was easier to install, more manageable, required less implementation time, and entailed lower start-up costs.

Many of these new systems were more modular, which allowed installation to precede in smaller increments with less support from information technology professionals. Other small businesses elected to outsource their ERP needs to vendors. For a fixed amount of money, the vendor would supply the technology and the support staff needed to implement and maintain it. This option often proved easier and cheaper than buying and implementing a whole system, particularly when the software and technology seemed likely to become outdated within a few years.

## Notes

ERP is not only for large organizations. As SMB operations become more complex, it is essential for the software solutions to evolve and also become more complex, making the adoption of a comprehensive ERP system a necessity.

### 2.2.2 Criteria for Selection

Small and medium enterprises should look for and demand that they get a software package which meets the following criteria:

#### *Company Goals and Objectives*

The primary reason to change to a new ERP system is to support your company's goals. Every company has different objectives. Some examples might be:

- **Growth goals:** Can I double my business with the resources that I have?
- **Efficiency goals:** Can I task and process redundancy, so that each element needs to occur just once, and multiple tasks can be folded together?
- **Speed to market goals:** Can I bring my product to market faster, satisfying all regulatory requirements, and thereby gain market share faster?

#### *Functional Software Requirements*

Sure, all companies share general operations: accounting and marketing, for example. But in terms of function, your specific industry will dictate the details. The needs of your company will govern the features that are most important to you.



Be mindful of all the functions that occur in an average business day, and aim to review all the areas on the list even if your current processes are currently being done.

#### *Costs*

Be sure to include the following components:

- **Software cost.** It is widely considered to be a weak link in Software Project Management. It requires a significant amount of effort to perform it correctly.
- **Annual support cost.** Be sure to understand how the fee can escalate.
- **Implementation costs.** Be sure to ask for a detail statement of work so you can compare hours by phase and the hourly rate for the different. Consultant to be put on the project.
- **Hardware costs.** Include the servers, but also any infrastructure upgrade requirements, and any shop floor or mobile devices planned.

Always consider the costs affordability while selecting an ERP system.

**Notes*****Domain Knowledge of Suppliers***

It is important that the software developer or supplier knows your industry and is willing to implement the software for you. If you are a manufacturing enterprise, buy the software from people who have the experience in manufacturing industries.

***Local Support***

Low-end software packages developed abroad and sold in India are not likely to be adequately supported with regard to implementation. The buyers must know that an ERP or MRP is not the same as 'Window 95'. For effective implementation, such packages will need lot more support from vendors both in terms of IT expertise and domain knowledge.

***Technically Upgradeable***

Ensure that the suppliers undertake to upgrade the products to make best use of technologies which are likely to become available in the future. With the advent of internet, intranet, EDIs, ability to upgrade oneself is important. Obviously, no supplier will do it for free. But a contract that binds the supplier to do it for an annual cost of say 15% of the software is indeed worthwhile.

***Uses Latest Technology***

It is useful to choose a product which is designed based on object-oriented technology and graphic user interfaces. These are easy to implement, user friendly and amenable to modifications in future.

**2.2.3 ERP and Large Organization**

India is a country that boasts of five decades of domestic manufacturing, easy availability of skilled workers and English being the accepted business language. It is also a country where the first MRP-II, ERP systems made their entry over a decade ago. And yet, the market penetration of ERP is estimated at a piddling 6 per cent! And if it were not for the last two years, when the market is estimated to have grown by 75 per cent, this percentage would have been even smaller. And just how small it is, is indicated by the fact that in absolute value terms the market is expected to be around ` 1200 crore by year 2020.

***ERP and High Cost***

Certainly, ERP systems do not come cheap but the investment needs have to be weighed against benefits and the opportunity cost of not implementing. Most companies which have done this exercise say that without their ERP system their very competitiveness would be under threat. Unfortunately, ERP vendors, in their anxiety to create the largest possible market space for themselves, responded by slashing prices to correct this anomaly. In fact, a better part of 1997 and 1998 was spent by vendors trying to outdo each other by exploring new depths in product pricing. As a consequence, they are losing out on the

opportunity of educating Indian corporate on correctly evaluating the need for ERP.

## Notes

### ***ERP and Lack of Backup***

The feeling is that there are not enough people out there who know enough about these systems. So, the customers fear that there may not be adequate service and support both during and post implementation. However, over the years, ERP vendors have created a network of distributors and system integrators, while simultaneously increasing the number of consultants. Also, newer technologies and improvements in communications have given ERP vendor's unconventional yet effective methods of servicing customers.



**Example:** Most ERP vendors host a web site where software patches to the most oft reported problems are listed. Customers need only download the desired 'fix', install it and run it. In fact, most vendors are well geared to sell, implement and service customers. Yet even these capabilities have not brought a rush of new ERP customers.

### ***ERP and Benefits***

Recently in an ERP seminar, a company using an ERP system shared its experience. The presenter, the General Manager for materials, described the ERP system thus: "It is a damsel during evaluation, transforms into an elephant during implementation and finally a dinosaur after some time." Clearly, this organisation did not reap the benefits of the ERP system. Does it mean that this is the case rather than the exception? No, simply because in an implementation one has to go through a formal review, make out an accurate estimate of the cost and a list of realistic benefits.

Companies which fail to do all this often find their ERP implementation not succeeding. The above-mentioned company did not go through the above process and paid for it. Unfortunately, such misadventures are amplified and lead to wrong conclusions about ERP systems.



**Example:** Here it would be pertinent to look at the usage of ERP systems in America. There is much to learn from their experience. Organisations in America have used integrated software solutions for three decades. First they used timeshare systems for data processing jobs, e.g., trial balances, payroll, etc. Then they moved to host-based systems, running both batch and rudimentary online application, like material management, purchasing, financial accounting and distribution.

India, in contrast, is a first-time user market. Computer applications are not a pervasive way of doing business. Even today state excise authorities (with jurisdiction over liquor and tobacco) refuse to accept excise returns in any format other than manual registers. EDI is not an established data interchange

**Notes**

practice in trade. Electronic payments are not legal. One estimate puts India's PC penetration at 0.7 per one thousand people.

Historically organisations in India did not invest in commercial information systems. Rather, the in-house EDP team wrote applications to handle departmental functions like financial accounting, payroll and finished goods tracking. The cash outflow to acquire such systems was only the cost of development tools. The costs of labour, time overruns, poor quality, and multiple rewrites were not factored into the total cost. So when the ERP systems entered, companies made the mistake of comparing the cost of 'in-house' systems and the ERP systems.

**2.2.4 Real and Unreal**

The implementation of an ERP system is a project which means an appraisal should be done before management sign-off. The perceived benefits, commitment of management time, roles and responsibilities, are some aspects that need to be reviewed, agreed and communicated prior to the start of the project. The misconceptions about ERP systems and lack of awareness are another chief factor for the low penetration of ERP systems in India. On another plane, India is not integrated into global markets.



**Example:** Our currency is non-convertible, our stock exchanges are not in any global alliance, we do not have a patent regime, and our labour laws are archaic. Yes, the economy has been 'opened up' but not enough. Foreign investors still face daunting procedures for approvals. Few joint ventures are crafted to exploit any tangible business strengths of the Indian partner; instead foreign investors too often tie up with Indian promoters and let them handle the bureaucracy, labour, regulatory agencies and politicians. The playing field in India is slanted in favour of domestic industry. Companies continue to thrive on protectionist barriers-to-entry and labour-rate arbitrage. Only when faced with intense competition (the kind that throws people out of business) will organisations respond: with new products, with better distribution channels, with true customer service. And that is when organisations will need timely, accurate information to support the changes in business. So, the absence of a stimulus to change is another factor limiting wider acceptance of ERP systems in India.

It is not cost, availability, service-standard, or risk of ERP systems that limit its acceptance and hence level of penetration. Rather, it is the non-pervasive IT culture, the absence of external stimuli to change and the lack of awareness. Acceptance of ERP will raise once these factors change.

**Notes****Learning Activity**

Prepare a detailed note on your understanding about the ERP in small, medium and large organizations in India. Support your report with industries' examples.

**ABC Cellular**

**A**BC Cellular is a subsidiary of ABC Communications, a global wireless communications company serving 6.7 million customers worldwide in the areas of cellular, paging, Personal Communications Services (PCS) and Global star satellite system markets.

**Problem**

ABC financial analysts, located in different functional groups in five geographic regions, were missing access to the same data, as well as timely access to information. Dated budget and actual numbers for each business unit resided in seven different systems, separating critical components of the P&L and inhibiting analyst's ability to assess results. To further complicate matters, analysts in the field could not go to one universal place to retrieve the data themselves they relied on the home office to deliver it.

**Solution**

Set some critical financial objectives to help it to remain competitive in the increased market share. ABC chose Oracle Corporation's Online Analytical Processing (OLAP) tools to better control costs, analyse performance, evaluate opportunities and formulate future direction. And to improve the basis for making decisions quickly and accurately with real-time, consistent data; to improve cost control and to simplify and shorten the budgeting process.

**Implementation**

ABC Cellular looked at two other vendors before choosing Oracle, but could provide neither user with the hands-on ability to consolidate budgets, include actual in the process or do what-if scenarios online. Air Touch Cellular's parent company also had a proven, successful record of accomplishment with other Oracle applications and a corporate initiative to make Oracle the vendor of choice.

Oracle provided on-site expertise in the product, the concept and the business to create a user-friendly system. The project came in on time and within budget, with very few post-implementation issues. Completing the entire implementation in eight months was quite a feat, given the many

*Contd...*

**Notes**

changes that occurred in that period, according to the company. Not only did the company convert to a new system, it completely overhauled the budget process and the P&L reporting format amid departmental and company reorganisations.

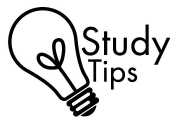
**Benefits**

More than \$8 million in hard and soft dollar savings reduced the length of the budgeting cycle and the number of people involved in the process, keeping the company financially competitive in a growing market. The system now provides online, real-time access to information.

Now, analysts can individually access the same data warehouse for current, real-time information for their analyses. This means the vice presidents from each business unit in the division now have the data they need budget or actual on a timely basis, thus, enabling business units to make better, faster business decisions based on more accurate information. Their increased understanding of the data helps them run their slices of the business more effectively, because they can now make real-time, online decisions that help them stay on budget or shift business direction.

**Questions**

1. Comment on the problem faced by the ABC Cellular. How the ERP solutions did have provided the solution for their problem?
2. Analyse the above case study in your own words and prepare a detailed note on it.



1. ERP systems that are currently available belong to the client server era. These systems are built with a clear separation of functional components.
2. As commercial systems evolved from material planning (MRP) to manufacturing planning (MRP-II), to finally enterprise planning (ERP), companies continued incremental investment to bring in newer system.

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**SUMMARY**

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- Enterprise Resource Planning (ERP) systems which are coming into vogue are built with the vision to provide businesses with an integrated information system.
- These systems implement business processes within the organisation to achieve synergy in operation across various business units.



**Notes**

- The challenge for ERP systems is to set up and integrate information resources across geographically spread business units, to enable optimisation across the organisation.
- Even though a multitude of technologies is involved in building ERP systems, the implementation and post-implementation maintenance should be made simple. Towards this objective, it is imperative that the ERP systems satisfy some basic requirements of the customer.
- Information systems technologies are evolved from mainframe based computing through the client server era, to where we are now heading - the Internet era. These distinct phases are marked by parallel development in hardware technologies.
- Client server era began when computing power delivered at desktop machines increased manifold and matched mainframe-computing power. These technologies limited the availability of information services to users within an organisation.
- The Internet era has brought in the ability to deliver information around the globe. This is made possible with advancements in communication infrastructure.
- With the arrival of the Internet, the biggest challenge facing ERP vendors is to address the global access issues and deployment of information systems that will cater to intra-organisation and extra-organisation needs effectively.
- Over and above these challenges ERP systems need to leverage these technologies to deliver complete (best business practices), usable (high productivity) and adaptable (easy installation and post implementation maintenance) business systems.

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**KEYWORDS**

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**Enterprise Resource Planning (ERP):** ERP systems are coming into vogue are built with the vision to provide businesses with an integrated information system.

**Information Systems Technologies:** These technologies are evolved from mainframe based computing through the client server era, to where we are now heading - the Internet era.

**Client Server Era:** It began when computing power delivered at desktop machines increased manifold and matched mainframe-computing power. These technologies limited the availability of information services to users within an organisation.

**Internet Era:** It has brought in the ability to deliver information around the globe. This is made possible with advancements in communication infrastructure.

## Notes

**Business Logic:** It specifies the set of actions that need to be performed (such as check stock situation and update inventory) is written using SQL and is invoked when user performs an action.

**Technically Upgradeable:** It ensures that the suppliers undertake to upgrade the products to make best use of technologies which are likely to become available in the future.

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## SELF-ASSESSMENT QUESTIONS

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### Short Answer Questions

1. Describe the enterprise resource planning (ERP) systems.
2. What is business processes?
3. What are the challenges for ERP systems?
4. What are the objectives of ERP systems?
5. Which support is provided by ERP systems?
6. Explain the ERP technologies.
7. Describe the information system.
8. What is client server era?
9. What is the internet era?
10. What is the internet?
11. What are the biggest challenges faced by the ERP vendors?
12. Explain the database.
13. What is business logic?
14. Explain the communication infrastructure.
15. What is relational database system?
16. What is graphical user interfaces?
17. What is structured query language (SQL)?
18. Explain the communication protocols.
19. What are the criteria for selection of ERP system?
20. Explain the domain knowledge of suppliers.

### Long Answer Questions

1. Explain the concepts of ERP software solutions in detail.
2. Describe the various ERP technologies in detail.

3. “ERP is needed by all”. Explain this statement with relevant example in detail.
4. What are the criteria for selection of ERP system in small and medium organizations? Describe it in detail.
5. Explain the concepts of ERP and large organization.
6. Explain how ERP is related to the high cost for large organization.
7. Describe the concepts of ERP and lack of backup.
8. Explain the various benefits offered by the ERP for large organization.
9. Describe the concepts of real and unreal ERP of large organization.
10. Suppose you are a manager of a company, you are asked to prepare an ERP requirement plan for the company. How you will prepare your report? What are the points you will consider while making an ERP plan for your organization?

**Notes**

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## FURTHER READINGS

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**Notes**

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## **LESSON 3 - BUSINESS PROCESS REENGINEERING**

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3.4 BPR Role in ERP Implementation

Summary

Keywords

Self-Assessment Questions

Further Readings

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### **LEARNING OBJECTIVES**

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After studying this lesson, you should be able to:

- Understand the concepts of Business Engineering
- Describe the Business Process Management
- Explain the concepts of Business Process Reengineering

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### **LEARNING OUTCOMES**

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Upon completion of the lesson, students are able to demonstrate a good understanding of:

- basics of business engineering
- analyzing best business practices

**Notes**

- concept of business process management
- explain business process management techniques
- identifying business process reengineering
- explain implementation of BPR
- determine change management and BPR
- explain BPR role in ERP implementation

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## OVERVIEW

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Let us first review the previous lesson. You have studied about the concepts of overview of ERP software solutions. At the end of the previous lesson, you have studied about the small, medium and large enterprise vendor solution.

In this lesson, you will understand the business engineering and the best business practices. At the end of the lesson, you will learn about the business process reengineering and business process management.

We advise you, that learn this lesson carefully it will give you a better understanding of the present scenario of the business engineering and process reengineering. This lesson will help you to understand the concepts of the business process management.

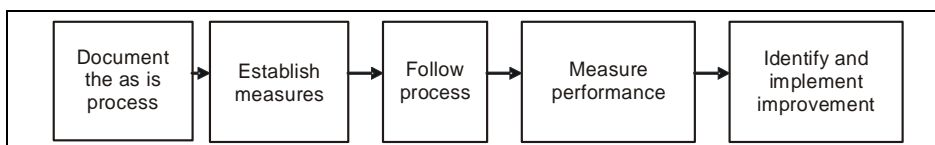
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## 3.1 BUSINESS ENGINEERING

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Engineering business processes is paramount for businesses to stay competitive in today's marketplace. Over the last 10 to 15 years, companies have been forced to improve their business processes because customers are demanding better and better products and services. There are a large number of suppliers in the marketplace to choose from (hence the competitive issue for businesses). Many companies began business engineering process improvement with a continuous improvement model. This model attempts to understand and measure the current process and make performance improvements accordingly.

Figure 3.1 illustrates the basic steps. You begin by documenting what you do today, establish some way to measure the process based on what your customers want, do the process, measure the results, and then identify improvement opportunities based on the data you collected. You then implement process improvements and measure the performance of the new process. This loop repeats over and over again, and is called continuous process improvement. You might also hear it called business process improvement, functional process improvement, etc.



**Figure 3.1: Continuous Improvement Model**

**Notes**

This method for improving business processes is effective to obtain gradual, incremental improvement. However, over the last 10 years several factors have accelerated the need to improve business processes. The most obvious is technology. New technologies (like the Internet) are rapidly bringing new capabilities to businesses, thereby raising the competitive bar and the need to improve business processes dramatically. Another apparent trend is the opening of world markets and increased free trade. Such changes bring more companies into the marketplace, and competing becomes harder and harder. In today's marketplace, major changes are required to just stay even. It has become a matter of survival for most companies.

As a result, companies have sought out methods for faster business process improvement. Moreover, companies are looking for breakthrough performance changes, not just incremental changes, as envisaged earlier. Because the rate of change has increased for everyone, few businesses can afford a slow change process. An approach for rapid change and dramatic improvement that has emerged is Business Process Reengineering (BPR).

In today's ever-changing world, the only thing that does not change is 'change' itself. In a world it is increasingly driven by the three Cs: Customer, Competition and Change. Companies are on the lookout for new solutions for their business problems. Recently, some of the more successful business corporations in the world seem to have hit upon an incredible solution.

**3.1.1 Best Business Practices**

The ERP packages come with a repository of options for various business processes. With hundreds of many year efforts and experience gained from studying organisations from almost all industries across the world, the ERP vendors have acquired the expertise to encode the 'best practices' for various business processes. The user organisation has the choice of selecting the most suitable option for each of their business processes.

The task of process selection is far trickier than it sounds. An organisation looking mainly to automate its processes would simply map its current processes on the package. Its approach would be quite different from an organisation which is aiming for process improvement. Such an organisation again has two options. It can undergo a process improvement or a BPR exercise first and go ahead with ERP implementation later.

***Pure BPR***

With pure BPR, business processes are reengineered into an ideal form. While standard packages are usually still chosen to support these new processors, inevitably they require modifications and some custom development to achieve the best fit.

Each modification of a package detracts from its value. Moreover, modifications cost time and money and are not usually supported by the

**Notes**

package vendor. Even worse, upgrades to the basic package are then often impossible to apply. As more upgrades become available, support for the original package eventually stops. The traditional approach to BPR is still valid as is the choice of packaged software, even if it is being used as a starting point for large-scale customisation. Pure BPR can produce excellent results.

***Channelled BPR***

Channelled BPR, in contrast, begins with a strategic choice of software package based on a high-level requirement and selection exercise, for example, a conference room pilot. Business processes are then designed around the known capabilities of the package. While businesses are inclined to believe that they have a greater understanding of their needs than any software vendor does, today's modern packages are the result of intensive research and development, drawing on experience of best business solutions in a wide range of industries. If carefully chosen, they cannot only fulfil most business requirements but also provide a broader view of what is possible.

The choice of package to support business processes, which by their nature run across different functions, in different departments, is relatively small. It is limited to those which are fully integrated. Even so, no two packages are identical in their capabilities.

Some initial work is necessary to choose the best package based on a company's vision and business needs. The BPR team can then use process models contained in the package as a tool to design business processes that exploit the strengths of the software and meet business needs.



**Example:** Leading software packages from SAP, Baan or SSA, already have well-developed business process options that are documented and modelled. They might support a centralised purchasing function as well as one with devolved responsibilities.

***Advantages of Channelled BPR***

The advantages of channelled BPR are as follows:

- It saves time and effort in modelling the new processes since they are already detailed and documented by the package supplier.
- This helps to maintain the momentum of a BPR exercise which is crucial.
- Too often traditional BPR projects flounder in the early stages because the ideal processes developed on high cannot be accommodated by the software. Then processes have to be reworked until a technical solution is at least feasible.
- Channelled BPR results in the implementation of standard facilities within the software package.

## Notes

- Even if the fit is not perfect, relatively few modifications or custom developments are needed. The benefits in terms of maintaining the software are obvious.

### ***Pure ERP***

Pure ERP approach implies mapping the organisation's current processes onto the package. The emphasis is not on arriving at a 'to-be' process model as a result of the business vision and strategy. The process selection exercise boils down to finding out the closest match to what the organisation is doing at that point in time. The willingness to change the processes is quite low. However, the sheer integration of work across the organisation that the package brings in can deliver certain benefits, although not substantial, to the organisation. The very fact that the enterprise wide data is available opens the possibility of better decision-making.

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## **3.2 BUSINESS PROCESS MANAGEMENT**

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Business process management is the ensemble of activities of planning and monitoring the performance of a process. Especially in the sense of business process, often confused with reengineering. Sometimes, process management includes reengineering or reengineering includes process management.

Business process management is the application of knowledge, skills, tools, techniques and systems to define, visualize, measure, control, report and improve processes with the goal to meet customer requirements profitably. It can be differentiated from program management in that program management is concerned with managing a group of inter-dependent projects. But from another viewpoint, process management includes program management. Process management is primarily about the prevention of errors. It provides a foundation for building quality into production by eliminating errors at source. This is a major criterion, covering a great deal of ground. It starts with the conversion of customer requirements into design features and then winds its way through process-quality assessment and control and the quality of support services and suppliers. Improving business processes is paramount for businesses to stay competitive in today's marketplace. Here are some arguments to justify the view:

- Over the last 10 to 15 years companies have been forced to improve their business processes because we, as customers are demanding better and better products and services and if we do not receive what we want from one supplier, we have many other to choose from.
- New technologies are rapidly bringing new capabilities to businesses, thereby raising the competitive bar and the need to improve business processes dramatically.



**Notes**

- Another apparent trend is the opening of world markets and increased trade. Such changes bring more companies into the market place and competing becomes harder and harder.
- In today's marketplace, major changes are required to just stay even. It has become a matter of survival for most companies. Moreover, companies want breakthrough performance changes, not just incremental changes and they want it now.

As a result, companies have sought out methods for faster business process management. Many companies have benefited by methods like process of reengineering. There is saving of time, effort and money along with increased efficiency.



**Example:** IBM Credit Corporation cut the process of financing IBM computers, software and services from seven days to four hours by rethinking the process. Originally, the process was designed to handle difficult applications and required four highly trained specialists and a series of hand offs. The actual work took only 1 to 5 hours; the rest of the time was spent in transit or delay. By questioning the assumption that every application was unique and difficult to process, IBM Credit Corporation was able to replace the specialist by a single individual supported by a user friendly, computer system that provided access to all the data and tools that the specialists would use.

### 3.2.1 Business Process Management Techniques

Process management should be a proactive task of management in a competitive world. The process management had started back in 1900s when Taylor announced his scientific management principles. One of the principles states: Science, not a rule of thumb. Science is a body of knowledge evolved by inquiry. Business process management techniques are many and some of them are given below.

#### 5W 2H Method

Questioning and old ways lead to new ideas. The simple approach to questioning is - 5W2H:

- What is being done?
- Why is this necessary?
- Where is it being done?
- When is it done?
- Who is doing it?
- How is it being done?
- How much does it cost now?

## **Notes**

On-the-job creativity is every body's property and many people have discovered it can pay to sit back and think of new methods of doing things.

### ***Work Simplification***

Work can be simplified by removing unnecessary elements in method and motions. Helpful tools are:

- Motion study
- Method study
- Gantt chart
- Efficiency principles

### ***Kaizen Method***

Kaizen focuses on small gradual and frequent improvements over the long term with minimum financial investment.

### ***Hoshin Kanri***

Hoshin Kanri is a process improvement technique that unites an organization to reach a single goal. There are four aspects that are tackled in this process improvement method. The first is that the organization must focus on achieving a single goal. When the goal is determined, it must be conveyed to all the leaders in the organization. The leaders are then going to plan and brainstorm different ways on how to achieve the goal that was set. The whole organization then joins in to help achieve their goal.

### ***Performance Improvement***

Process improvement or project improvement deals with the analysis of the output of an organizational process. The process quality is then changed in order for the output to increase and improve. This is similar to benchmarking, but instead of comparing the quality to society's norm, the quality of the output is compared to the previous output from the organization. By doing this, the organization is sure to achieve or know the best technique to use for maximum productivity.

### ***Theory of Constraints***

The Theory of Constraints is a method that helps organizations to achieve their objectives. This method is carried out with the help of five focusing steps. The first one is to identify the constraint or the factor that is preventing the organization from reaching its goal. The second is to think of ways to use the constraint to your advantage. The third is to unite the entire organization to be able to take advantage of the constraint. The fourth is to increase the constraint, and the fifth is to repeat the first focusing step if the constraint has changed.

**Stretch Goal (Six Sigma)****Notes**

The Six Sigma process improvement technique deals with improving the quality of the output. This is done by removing factors that may add to errors in the end product. Key people are then chosen to improve the process and eliminate the errors in production. The people chosen are experts in their field, so they are sure to eliminate the cause of error.



**Example:** Some companies like Motorola use defects per units as quality measure throughout the company.



A concept known as six sigma refers to allowing a maximum of 3.4 defects per million units produced.

For instance, the goals are set in different areas as follows:

- Improve product and service quality ten times by the end of next year.
- Improve product and service quality at least 100 times by the end of second year.
- Achieve a culture of continuous improvement to assure customer satisfaction.
- Achieve ultimate goal of zero defects in everything done.

**Learning Activity**

Select any organisation of your choice, study their functional aspects of organizational ERP system and their best business practices and management and prepare a short report on your understanding about it.

**3.3 BUSINESS PROCESS REENGINEERING**

Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance such as cost, quality, service and speed. The keywords in the preceding definition are the italicized ones.

BPR advocates that enterprises go back to the basics and re-examine their very roots. It does not believe in small improvements. Rather, it aims at total reinvention. As for results, BPR is clearly not for companies who want a 10% improvement. It is for the ones that need a tenfold increase.

BPR relies on a different school of thought than continuous process improvement. In the extreme, reengineering assumes the current process is irrelevant it does not work, it is broke, forget it. Start over. Such a clean slate

**Notes**

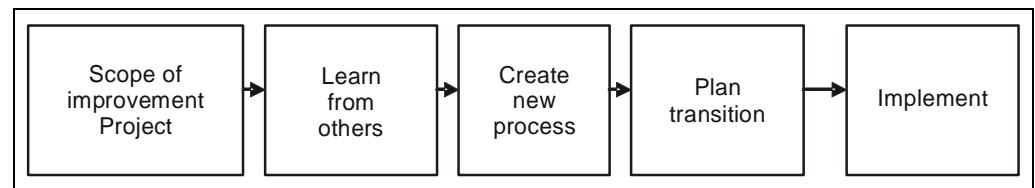
perspective enables the designers of business processes to disassociate themselves from today's process, and focus on a new process.



BPR focuses on processes and not on tasks, jobs or people. It endeavours to redesign the strategic and value-added processes that transcend organizational boundaries.

In a manner of speaking, it is like projecting yourself into the future and asking yourself: what should the process look like? What do my customers want it to look like? What do other employees want it to look like? How do best-in-class companies do it? What might we be able to do with new technology?

Such an approach is explained below. It begins with defining the scope and objectives of your reengineering project, then going through a learning process (with your customers, your employees, your competitors and non-competitors, and with new technology). Given this knowledge base, you can create a vision for the future and design new business processes. Given the definition of the "to be" state, you can then create a plan of action based on the gap between your current processes, technologies and structures, and where you want to go. It is then a matter of implementing your solution.



**Figure 3.2: BPR**

Thus, the extreme contrast between continuous process improvement and business process reengineering, lies in where you start (with today's process, or with a clean slate), and with the magnitude and rate of resulting changes.

Some areas where changes can be brought through BPR are:

- Organization Structure
- Management System
- Employee Responsibilities
- Performance Measurement
- Incentive System
- Skill Development
- Use of IT
- Process Change
- Technology

### 3.3.1 Implementation of BPR

### Notes

Implementation of BPR involves several steps and these steps can be explained under phases of implementation. Basically, there are four phases of BPRE namely, Preparation phase, Planning phase, Design phase and Evaluation phase. Each phase with steps involved in respective phases is explained below.

#### *Phase I: Preparing for Change*

- Top management explores the reengineering process
  - ❖ Educate management on the reengineering process and the needs to change
  - ❖ Create a reengineering steering committee
  - ❖ Develop an initial action plan.
- Prepare the workforce for involvement and change

#### *Phase II: Planning for Change*

- Create a vision, mission and guiding principles
  - ❖ Identify core competencies
  - ❖ Develop a vision statement
  - ❖ Develop a mission statement
  - ❖ Determine the guiding principles
- Develop a 3-5 year plan
  - ❖ Conduct a current business review
  - ❖ Determine the external environment factors
  - ❖ Conduct an internal health review
  - ❖ Complete business-as-usual forecasts
  - ❖ Conduct a gap analysis
  - ❖ Develop a 3-5 year strategic plan
- Develop yearly operational or breakthrough plans
  - ❖ Develop operational objectives
  - ❖ Organize resources
  - ❖ Rank potential changes in order of priority
  - ❖ Develop yearly operational plans and budgets
  - ❖ Apply and evaluate operational plans

## Notes

### *Phase III: Designing the Change*

- Identify the current business processes
  - ❖ Determine the critical organizational processes
  - ❖ Measure the critical processes
  - ❖ Rate the process performance
  - ❖ Identify opportunities and processes to be re-engineered.
- Establish the scope of the process-mapping project
  - ❖ Identify the process stakeholders
  - ❖ Create the project's mission and goals
  - ❖ Structure and select team members
  - ❖ Develop a work plan.
- Map and analyse the process
  - ❖ Depict the process in a flow chart
  - ❖ Depict the process in a an integrated flow chart
  - ❖ Complete the process mapping worksheet
  - ❖ Complete the process constraint analysis
  - ❖ Compete the cultural factor analysis
- Create the ideal process
  - ❖ Describe the ideal process on paper
  - ❖ Compare the current process to the ideal process
  - ❖ Assess the gaps.
- Test the new process
  - ❖ Develop the pilot objectives
  - ❖ Develop the pilot measures
  - ❖ Gain agreement and approval form stakeholders
  - ❖ Conduct a pilot test of the new process
  - ❖ Assess the impact of pilot test.
- Implement the new process
  - ❖ Develop the implementation action plan
  - ❖ Execute the plan.

**Phase IV: Evaluating the Change****Notes**

- Review and evaluate measures
  - ❖ Has the steering committee evaluated the results?
  - ❖ Revise the three to five-year strategic plan, if necessary.
- Repeat the yearly operational/breakthrough planning cycle.

**3.3.2 Reengineering Structure**

Organizations are human systems and their system structure includes the work culture, beliefs, and mental models of their leaders and members. Changing organizational behaviour requires changing the belief system of its personnel. Organizational performance ultimately rests on human behaviour and improving performance requires changing behaviour. Therefore, organizational restructuring should have as a fundamental goal the facilitation of clear, open communication that can enable organizational learning and clarify accountability for results.



Since the world is continuously changing, organizational restructuring and learning is necessary to stay up to date. Leaders should periodically examine the organizational structure of their enterprise to assure that it continues to provide an environment for organizational learning.

Symptoms indicating the need for reengineering structure are as follows:

- Accountability for results are not clearly communicated and measurable resulting in subjective and biased performance appraisals.
- Parts of the organization are significantly over or under staffed.
- Organizational communications are inconsistent, fragmented, and inefficient.
- Technology and/or innovation are creating changes in workflow and production processes.
- Significant staffing increases or decreases are contemplated.
- Personnel retention and turnover is a significant problem.
- Workforce productivity is stagnant or deteriorating.
- Morale is deteriorating.
- New skills and capabilities are needed to meet current or expected operational requirements.

**Notes**

Common Pitfalls of BPR are: BPR cannot solve all the problems and hence it can be considered as a solution for all the organizational problems; BPR may face many difficulties in implementation; Stiff resistance may come from staff as it involves radical changes in structure, processes, methods etc. and resistance to change is a common phenomenon in all organizations; BPR relies heavily on IT and it may need heavy investment in software and hardware.

**3.3.3 Change Management and BPR**

BPR involves bringing in radical changes in organizational processes, methods, structure, etc. Change makes people uncomfortable and thus any BPRE initiative in organizations will result in stiff resistance from its employees who may be influenced by change. Managing change usually requires a well-defined process. Change management process helps to define the steps necessary to achieve the desired changes and desired outcomes. The change management process is the sequence of steps or activities that a change management team or project leader would follow to apply change management to a project or change. The most effective and commonly applied change, most change management processes contain the following three phases:

- Phase 1 – Preparing for change (Preparation, assessment and strategy development)
- Phase 2 – Managing change (Detailed planning and change management implementation)
- Phase 3 – Reinforcing change (Data gathering, corrective action and recognition)

Thus, BPRE requires successful change management process and any BPRE failure may be due to lack of planning and failure to plan the change and implement it.

***Learning Activity***

Prepare a detailed note on your understanding about the BPR in an organization. Support your report with an industrial example.

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**3.4 BPR ROLE IN ERP IMPLEMENTATION**

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Processes, organization, structure and information technologies are the key components of BPR, which automates business processes across the enterprise and provides an organization with a well-designed and well-managed information system. While implementing ERP, the organizations have two options to consider.



**Notes**

Either the organization must reengineer business processes before implementing ERP or directly implement ERP and avoid reengineering.

In the first option of reengineering business processes, before implementing ERP, the organization needs to analyze current processes, identify non-value adding activities and redesign the process to create value for the customer, and then develop in-house applications or modify an ERP system package to suit the organizations requirements. In this case, employees will develop a good sense of process orientation and ownership.

This would also be a customized solution keeping with line of the organization's structure, culture, existing IT resources, employee needs and disruption to routine work during the change programmer likely to be the least. It could have a high probability of implementation. The drawback of this option is that the reengineered process may not be the best in the class, as the organization may not have access to world-class release and best practices. Moreover, this may be the only chance to radically improve in the near future and most attention should be paid while choosing the right ERP. Also, developing an in-house application or implementing a modified ERP is not advisable.

The second option of implementing ERP package is to adopt ERP with minimum deviation from the standard settings. All the processes in a company should conform to the ERP model and the organization has to change its current work practices and switch over to what the ERP system offers. This approach of implementation offers a world-class efficient and effective process with built-in measures and controls, and is likely to be quickly installed.

But if the employees do not have good understanding of their internal customer needs or current processes, or if these processes are not well defined and documented, then it is quite possible that while selecting the standard process from the ERP package, employees may not be able to perceive the difficulties likely to be encountered during the implementation stage. Employees would lack process ownership and orientation. Other than technical issues, issues like organization structure, culture, lack of involvement of people etc. can lead to major implementation difficulties, and full benefits of standard ERP package may not be achieved. It may lead to a situation where the organization may have to again reengineer its processes. This could be a very costly mistake.

There is also a third option of reengineering business process during implementation of ERP. But it does not considered to be a practical option and is likely to cause maximum disruption to existing work. It should not be forgotten that during BPR and ERP initiatives, routine work is still to be carried out and customers need to be served.

## Notes

**BPRE at Income Tax Department****Background and Need for the Project**

Collection of Direct Taxes which is administered by the Income Tax Department (ITD for short) has been growing at a very fast pace in recent years. Direct taxes collections in Financial Year 2007-08 stood at ₹ 3,14,468 crore as against ₹ 48,280 crore in the Financial Year 1997-98. Similarly, the taxpayer base has also expanded and the number of tax payers at the beginning of FY 2007-08 stood at 3 crore. This scenario coupled with globalization of the world economy, reduction of trade barriers and technology-enabled methods of conducting business has redefined the performance expectations from the ITD posing a challenge to its capacity and functioning as an efficient organization. A need was thus felt to critically review the existing functioning of the Income Tax Department. The Hon'ble Finance Minister in his budget speech of 2006 announced that IT Department will undergo business process re-engineering. A Directorate of BPR was accordingly created in May 2006 headed by an officer of the rank of Director General of Income Tax. Through a global tendering process, M/s PricewaterhouseCoopers was appointed as external consultant for the BPR project. The Business Process Re-engineering exercise was conducted by the BPR Directorate with the objective of enabling the ITD to deal with the challenges emerging from the new work environment.

**Objectives of the Project**

In recent years, the Income Tax Department has taken a number of initiatives and implemented projects aimed at providing better taxpayer service, reducing compliance burden on taxpayers and improving enforcement. While these initiatives have benefited the taxpayers, there remained severe operational bottlenecks and fundamental issues of aligning people, processes and technology. The BPR project was conceptualized with the prime objective of identifying the bottlenecks and providing solutions in the form of redesigned processes which are simpler, efficient and will harness the advantages of the upgraded information technology which is being acquired.

The main objectives of the BPR project can be summarized as under:

- Re-evaluation of all current processes to remove the redundant and obsolete processes and redesign or create new processes which are more efficient and maximize use of resources to produce the best results.
- Identification of stake holder's needs and the ways in which the organization can meet them especially taxpayer's needs for information,

*Contd...*

**Notes**

convenience of filing tax returns and documents, payment of taxes and speedier issue of refunds.

- Use best and leading practices of other organizations to develop milestones, objectives, targets to benchmark organizational performance.
- Increase alignment between people, processes and technology.
- Enhance employee involvement, skills and organizational creativity.

**Short Description of the Project**

The project commenced on 1st May, 2007 and was completed with finalization of 18 reports covering more than 2,000 pages within a timeframe of eight months.

As a preparatory exercise prior to the BPR project, awareness was created in the organization through several meetings held with employees as well as their associations/unions. The desire for change was clearly evident during these interactions. This exercise was aimed at creating a larger ownership thereby ensuring support and involvement an essential element for the success of such a mammoth exercise. Outreach initiatives also included setting up of Internet discussion forums/blogs to encourage participation and sharing of ideas. In all, approximately 840 departmental personnel from Chief Commissioners to Group C employees were consulted and participated in the exercise. Besides, a specially designed HR questionnaire was administered to 896 departmental persons to elicit their views. Further, voice of customer (VoC) survey was conducted at 12 stations in which a specifically designed questionnaire was administered to 754 taxpayers of different categories and tax consultants.

The study was focused on the key strategic areas of tax administration namely pre-assessment, assessment, and post-assessment and appellate/dispute avoidance as well as key enabling processes such as information technology, human resources, infrastructure, etc. The BPR project was undertaken in two phases 'As-is' study phase and 'To-be' model stage and was conducted at 15 locations which included metros (Delhi, Mumbai and Kolkata), mid-size cities (Hyderabad, Nagpur, Patna, Bhopal, Mysore, Lucknow, Guwahati, Ludhiana and Shillong) and moffusil areas (Hajipur, Mandya and Itarsi).

The success of the project depended on ensuring that correct facts were captured during the 'As-is' study as only then correct solutions could be found. To dispel any apprehensions in the minds of the employees about the aim of the exercise, it was made clear during the field study, that the exercise conducted was neither an inspection nor audit nor was it for individual fault-finding.

*Contd...*

**Notes**

The 'As is' processes study was conducted by using check-lists to gather factual data from study of files, registers and records as well as questionnaires to elicit responses from various stakeholders. These checklist and questionnaires were prepared and validated through participation of a large number of departmental officers from across the country. The 'As' is study phase included mapping of existing processes in the department and was followed by a gap analysis to identify problem areas and bottlenecks. The best global practices in the area of tax administration were also studied. All the above were incorporated in re-designing the processes and suggesting 'To-be' models. Detailed To-Be models and recommendations have been prepared in respect of the following:

- Bulk Operations Division including Regional Processing Centre
- Facilitation Centres and Receipt and Despatch Units
- Changes to PAN/TAN Issuance and Management
- Assesses Tax Credit Accounting System
- Core Processes Redesign – Assessment
- Core Processes Redesign – Post-assessment
- Core Processes Redesign – Appellate
- Risk Assessment System
- Knowledge Management System
- Record Management System
- Human Resources and Infrastructure
- Grievance Redressal Management
- Change Management

**Outcomes**

The business process re-engineering of the Income Tax Department is first such project initiated by the Government of India where a comprehensive study of such a large department has been undertaken and changes have been recommended taking a holistic view of the department that would fundamentally change the way the department functions in as much as all activities which do not require exercise of discretion in individual cases and are amenable to large scale automation will be dealt by Bulk Operation Division(BOD) where there will be no taxpayer interface. The creation of BOD would help in reducing the pressure on the inadequate manpower and infrastructure across various ITD offices by leveraging economies of scale and technology, thereby de-cluttering the office of the Assessing Officers and enabling them to better perform their compliance functions.

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**Notes**

Whereas all the recommendations made in the BPR report cannot be summarized here, some of the recommendations focused around taxpayers' services and revenue augmentation are highlighted here:

**Recommendations Focused on Taxpayer Services**

- Setting up a Directorate of Taxpayer Services to address the issues of taxpayer grievances and education
- Additional channel for filing tax returns/documents at Facilitation Centres
- Ensuring that correct details payments are recorded and credited to taxpayer's account
- Effective recording/tracking of all taxpayer communications
- Ease of payment of taxes through ATM for individuals
- Call-centres to deal with taxpayer queries
- Automatic updating of address from returns in PAN/TAN database
- Functional segregation-IT enabled processes to ensure quicker processing/issue of refunds
- Use of SMS for information dissemination to taxpayers
- Better infrastructure facilities for taxpayer in ITD offices like waiting lounge, drinking water, hygienic toilet, etc.

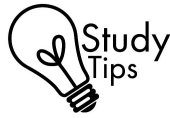
**Recommendations Focused on Revenue Augmentation**

- Detect stop filers and non-filers through use of 3rd party and TDS data
- Non-intrusive measures such as sending pre-populated returns to the taxpayer in cases of clear and apparent mismatch of information given in the return and those available with the ITD to be settled by accepting payment of tax plus penal amount. Similarly, for a limited number of cases falling in a small band below the risk score at which cases are selected for scrutiny
- Work-flow based system of working with no option at any level to work manually
- Robust risk profiling system for selection of cases for scrutiny

**Questions**

1. Study the above case carefully and prepare a short note on the organizational, multiple and complex functions performed by its judicial.
2. Analyse the above case study in your own words and prepare a detailed note on it.

## Notes



1. Reengineering is the radical redesign of the business process to achieve dramatic improvement in critical areas of performance.
2. An ERP implementation involves installing the software, moving your financial data over to the new system, configuring your users and processes, and training your users on the software.

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## SUMMARY

- Engineering business processes is paramount for businesses to stay competitive in today's marketplace.
- Over the last 10 to 15 years, companies have been forced to improve their business processes because customers are demanding better and better products and services.
- There are a large number of suppliers in the marketplace to choose from (hence the competitive issue for businesses). Many companies began business engineering process improvement with a continuous improvement model. This model attempts to understand and measure the current process and make performance improvements accordingly.
- New technologies (like the Internet) are rapidly bringing new capabilities to businesses, thereby raising the competitive bar and the need to improve business processes dramatically.
- Another apparent trend is the opening of world markets and increased free trade. Such changes bring more companies into the marketplace, and competing becomes harder and harder.
- In today's marketplace, major changes are required to just stay even. It has become a matter of survival for most companies.
- As a result, companies have sought out methods for faster business process improvement. Moreover, companies are looking for breakthrough performance changes, not just incremental changes, as envisaged earlier. Because the rate of change has increased for everyone, few businesses can afford a slow change process.
- An approach for rapid change and dramatic improvement that has emerged is Business Process Reengineering (BPR).
- In today's ever-changing world, the only thing that does not change is 'change' itself. In a world increasingly driven by the three Cs: Customer, Competition and Change.
- Companies are on the lookout for new solutions for their business problems. Recently, some of the more successful business corporations in the world seem to have hit upon an incredible solution.

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**KEYWORDS**

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**Notes**

**Process Management:** Process management is the application of knowledge, skills, tools, techniques and systems to define, visualize, measure, control, report and improve processes with the goal to meet customer requirements profitably

**Process Innovation:** A process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software

**Business Process Re-engineering:** The fundamental rethinking and radical design of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed.

**Reengineering:** It is the radical redesign of the business process to achieve dramatic improvement in critical areas of performance.

**Business Process Management:** It is the application of knowledge, skills, tools, techniques and systems to define, visualize, measure, control, report and improve processes with the goal to meet customer requirements profitably.

**Kaizen Method:** This method focuses on small gradual and frequent improvements over the long term with minimum financial investment.

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**SELF-ASSESSMENT QUESTIONS**

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**Short Answer Questions**

1. Explain the Kaizen method.
2. Describe the business process management.
3. What is reengineering?
4. Describe the concepts of business process re-engineering.
5. What is process innovation?
6. What is process management?
7. What is innovation?
8. Explain the three Cs concept.
9. Explain engineering the business processes.
10. What are the basic steps of the business engineering processes?
11. Explain the concepts of breakthrough performance.
12. Describe the pure BPR.
13. Explain the channelled BPR.
14. What are the advantages of channelled BPR?
15. What is pure ERP?

## Notes

16. Who provides a foundation for building quality into business?
17. Explain the 5W 2H method.
18. Describe the work simplification.
19. Write a short note on Hoshin Kanri.
20. What is the theory of constraints?

## Long Answer Questions

1. What is BPRE? Why is it needed?
2. What is the difference between continuous improvement and BPRE?
3. Explain the steps in implementing BPRE.
4. What are pitfalls of BPRE?
5. Explain the relation between BPRE and change management.
6. What is the meaning of restructuring an organization? Why is it needed?
7. Discuss different areas where BPRE can be used.
8. Discuss the symptoms of organization which indicates the need for reengineering its structure.
9. Explain the concepts of the business engineering in detail. Support your answer with the relevant examples.
10. Describe the concepts of best business practice in ERP and the business process management. Support your answer with the relevant examples.

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## FURTHER READINGS

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## LESSON 4 - MODULES OF ERP

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#### 4.1 ERP Modules

##### 4.1.1 Characteristics of ERP Modules

#### 4.2 Sales and Marketing in ERP System

##### 4.2.1 Subsystems of Sales and Marketing ERP System

##### 4.2.2 Advantages of Sales and Marketing ERP Software

#### 4.3 Accounting and Finance in ERP System

##### 4.3.1 Subsystems of Finance and Accounts in ERP Systems

##### 4.3.2 SAP ERP Benefits in Accounting and Finance

#### 4.4 Production Module in ERP System

##### 4.4.1 Sub-modules of Production

##### 4.4.2 Benefits of ERP in Production Module

#### 4.5 Material Management Module in ERP System

##### 4.5.1 Subsystems of Material Management

##### 4.5.2 Benefits of ERP in Material Management

#### 4.6 Purchase Module in ERP System

#### 4.7 Inventory Control Module

#### 4.8 Human Resources Module

##### 4.8.1 Subsystems of HR Module

Summary

Keywords

Self-Assessment Questions

Further Readings

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## LEARNING OBJECTIVES

After studying this lesson, you should be able to:

- Understand the various functional modules of ERP

**Notes**

- Recognize the inter-relationships among business process supporting sales and marketing, accounting and finance and production management

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## **LEARNING OUTCOMES**

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Upon completion of the lesson, students are able to demonstrate a good understanding of:

- basics of ERP modules and explain its characteristics
- analyzing subsystems of sales and marketing ERP system
- identifying subsystems of finance and accounts in ERP systems
- list out benefits of ERP in production module
- determine material management module in ERP system
- recall purchase module in ERP system
- analyzing inventory control module and human resources module

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## **OVERVIEW**

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The earlier lesson gave us learnings on business process reengineering. The different phases of BPR. How does it really help in business? The activities that takes place in reengineering process.

In this lesson, you will understand the various FRP modules available. A detailed explanation to Accounting and Finance module, Sales and Marketing module and Production module and their characteristics.

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## **4.1 ERP MODULES**

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ERP software is made up of multiple enterprise software modules that are individually purchased as per the specific needs and technical capabilities of the organization. Each ERP software presents the major functional module.

Common ERP modules include inventory control, product distribution, material purchasing, order tracking, finance, accounting, marketing and HR. Organizations generally implement ERP modules, as they are economical as well as technically feasible.

### **4.1.1 Characteristics of ERP Modules**

- It is efficient and easy to use.
- It is scalable.
- It is easily compatible with CRM working.
- It is common database that supports all the modules.

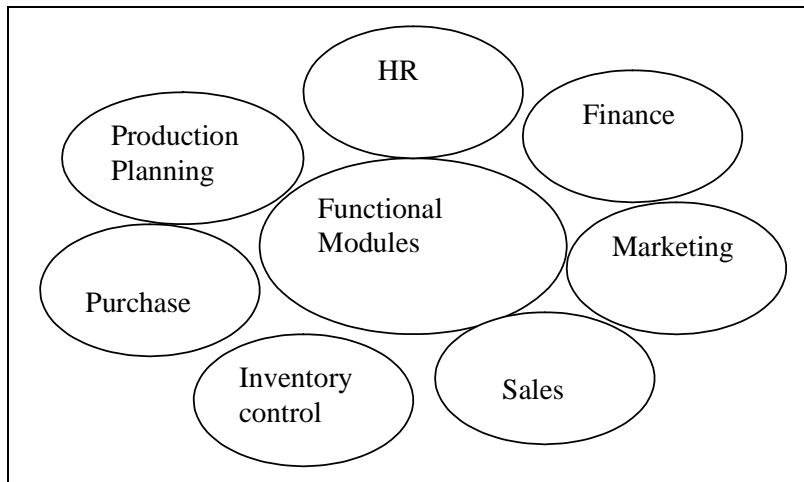


Figure 4.1: ERP Characteristics

## Notes



ERP is business management software that helps the companies to manage their data. It is an integrated view of core business activities.



Selecting an ERP system that is best for your organization and implementing and operating it in most efficient manner is a difficult task and chances of failure are very high.

## 4.2 SALES AND MARKETING IN ERP SYSTEM

Traditionally, sales and marketing software supports operational and management control processes including contract management, sales analysis, sales management and forecasting. The difference between the traditional and ERP sales and marketing system is that, ERP modules provide integrated marketing support systems which includes order files and sales files. It also consists of CRM, which gives information about the previous experiences of people and the payment details.

Within this ERP module, firstly a customer places an order and then the sales order is recorded. The system schedules shipping and works backward from the shipping date to reserve the materials to order parts from suppliers and to schedule manufacturing. The module checks the credit limit and creates the bill of materials. Then the commission of salesperson is updated and products cost and profits are calculated. After all these steps, the accounting data is updated which includes balance sheets, accounts and other financial information.

## Notes

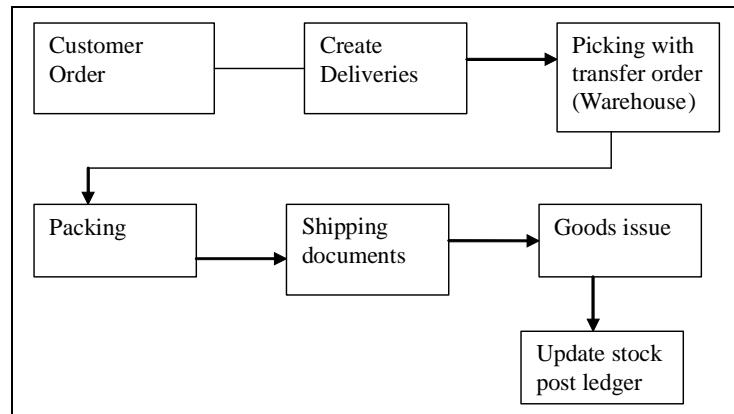


Figure 4.2: ERP Module

## 4.2.1 Subsystems of Sales and Marketing ERP System

- **Pre-sales:** Informing the customer about the price quote.
- **Sales order processing:** Determines the sales price, order quantities are recorded, checking the customer credit limit.
- **Inventory sourcing:** Checking the inventory to know whether it is available for delivery on time.
- **Delivery:** Goods are released from the warehouse, packed and shipped.
- **Billing:** uses sales order data to create invoice, increases accounts receivable and updates accounts.
- **Payment:** Takes in the payment, reduces the account receivable with the payment of amount.

The main aim is to signify sales process, manage inventory, and keep an access to payments. The sales and marketing provides the benefit of standard codes, a standard document, and audit trail and data integration.

## 4.2.2 Advantages of Sales and Marketing ERP Software

Table 4.1: ERP Software

| Features           | Benefits  |
|--------------------|---|
| Standard codes     | Each customer is allotted with a standard code.   |
| Common database    | There is a database that supports all the modules.  |
| Standard documents | A standard document number is maintained which is passed throughout the transaction process including shipping, accounts etc. |
| Audit trails       | To track a partial shipment, partial payment, returns, a standard document number helps.                                      |
| Data integration   | Helps in integrating data, i.e. sales record with accounting records.   |



Marketing resource management helps in analysing, planning, developing, implementing and measuring all marketing activities to maximize the efficiencies of your available resources and gain visibility and control into your marketing processes.

## Notes

### 4.3 ACCOUNTING AND FINANCE IN ERP SYSTEM

An ERP (Enterprise Resource Planning) finance module is a software program that helps gathering financial data and generates reports such as ledgers, trial balance data, overall balance sheets and quarterly financial statements.

ERP is a powerful tool that helps you to consume lesser time in accounting processes, manage complex finances and comply with regulations.

#### 4.3.1 Subsystems of Finance and Accounts in ERP Systems

- **Financial Accounting:** To control and integrate the financial information that is essential in decision making. It helps in tracking financial accounting with foreign companies, languages, currencies and accounts.



**Example:** When raw materials from inventory into manufacturing, the system reduces quantity values in inventory and simultaneously subtracts values for inventory accounts in balance sheet. Most financial accounting modules comply with international accounting standards such as GAAP and IAS.

| S No | Item Code | Item Description | Qty        | Rate      | Amount (a)              |
|------|-----------|------------------|------------|-----------|-------------------------|
| 1    | D11       | DJing            | 3.00       | 1320.00   | 3960.00                 |
| 2    | D2        | TL Audio C-1     | 5.00       | 250.00    | 1250.00                 |
| 3    | D7        | JBL T-45         | 6.00       | 357.00    | 2142.00                 |
| 4    | E1        | Flip Chip        | 4.00       | 1090.00   | 4360.00                 |
| 5    | E5        | PreSonus         | 8.00       | 600.00    | 4800.00                 |
| 6    | D8        | Phontex PH-5     | 4.00       | 200.00    | 800.00                  |
| 7    | E10       | Plastor PX-01    | 3.00       | 500.00    | 1500.00                 |
|      |           |                  | <b>Qty</b> | <b>33</b> | <b>Total : 18812.00</b> |

Memo : Order placed by Oliver.

| Tax Type          | BT    | Per        | Nature   | Amount (a) |
|-------------------|-------|------------|----------|------------|
| Central Sales Tax | 50.00 | Percentage | Additive | 940.60     |

Grand Total : 19752.60

- **General Ledger:** It plays a key role to financial accounting and strategic decision making. It has a feature that is designed to meet the budgeting and

## Notes

processing needs. It includes the flexible structuring of accounts chart for groups and companies.

The key factor is it helps to maximize the efficiency and accuracy of financial data.

| ID#      | Sp# | Date       | Memo  | Debit       | Credit      | Ending Balance |
|----------|-----|------------|---|-------------|-------------|----------------|
| 131100   |     |            | Beginning Balance                                     |             |             | \$20,959.14    |
| BS 567   | CD  | 5/11/2007  | Payment to VISA ANZ                                   | \$5,000.00  |             | \$65,959.14    |
| BS 567   | CD  | 5/11/2007  | Rubbly - for period 22nd to 26th Oct 2007             |             | \$254.00    | \$65,959.14    |
| BS 567   | CD  | 5/11/2007  | Sesena - for period 5th Jul to 10th Sep 2007          |             | \$1,864.50  | \$63,740.64    |
| Inv 5922 | CR  | 5/11/2007  | Estate Master (previously H8 PDs)                     | \$1,130.88  |             | \$66,871.52    |
| Inv 5915 | CR  | 5/11/2007  | Diamond Planetski, South Australia                    | \$413.05    |             | \$67,284.57    |
| BS 567   | CD  | 6/11/2007  | Inv 5909 and 5900 - Users' group for                  | \$289.27    |             | \$67,574.44    |
| BS 568   | CD  | 7/11/2007  | ANZ - Account Servicing Fee                           |             | \$39.60     | \$67,534.84    |
| BS 568   | CD  | 7/11/2007  | Rubbly - for period of 28th Oct. to 2nd Nov. 2007     |             | \$256.50    | \$67,278.34    |
| BS 568   | CD  | 7/11/2007  | Offshore Oil State Revenue - Nov 2007 - Payroll Tax   |             | \$4,434.36  | \$62,793.98    |
| Inv 5908 | CR  | 7/11/2007  | Wings Creative  | \$726.00    |             | \$63,509.98    |
| BS 568   | CD  | 8/11/2007  | Flatbed payment from Adam                             | \$490.00    |             | \$63,019.98    |
| Inv 5908 | CR  | 8/11/2007  | GLD Water Infrastructure                              | \$8,262.10  |             | \$72,281.46    |
| Inv 5908 | CR  | 8/11/2007  | GLD Water Infrastructure                              | \$5,582.50  |             | \$77,843.96    |
| Inv 5911 | CR  | 8/11/2007  | TheGlobe.com.au                                       | \$5,500.00  |             | \$83,343.96    |
| 2500     |     |            | 12/11/2007 CASH                                       |             | \$139.50    | \$83,144.46    |
| BS 568   | CD  | 12/11/2007 | Google rental received on behalf for Adam & Ana       | \$475.00    |             | \$82,669.46    |
| BS 568   | CD  | 12/11/2007 | Google rental received on behalf for Adam & Ana Cogan | \$5,767.51  |             | \$88,311.37    |
| Inv 5905 | CR  | 12/11/2007 | Dept. of Education, Science and Training              | \$514.25    |             | \$89,426.22    |
| Inv 5954 | CR  | 13/11/2007 | E-Law Technology Pty Ltd                              | \$11,749.50 |             | \$101,223.32   |
| Inv 5955 | CR  | 13/11/2007 | Logistics Systems International                       | \$16,517.88 |             | \$117,741.60   |
| Inv 5957 | CR  | 13/11/2007 | Logistics Systems International                       | \$1,670.57  |             | \$119,412.17   |
| BS 568   | CD  | 14/11/2007 | Telstra   | \$107.20    |             | \$119,304.97   |
| Inv 5926 | CR  | 14/11/2007 | Healthlink Consulting                                 | \$13,200.00 |             | \$132,504.97   |
| BS 568   | CD  | 15/11/2007 | Optus   | \$114.95    |             | \$132,390.02   |
| Inv 5960 | CR  | 15/11/2007 | Centre for Expertise for Environment, UTS             | \$3,799.16  |             | \$142,189.18   |
| Inv 5927 | CR  | 15/11/2007 | Centre for Expertise for Environment, UTS             | \$2,945.92  |             | \$145,035.10   |
| Inv 5983 | CR  | 15/11/2007 | Spatke Helmore - Spant Pty Ltd                        | \$1,860.38  |             | \$146,895.48   |
|          |     |            | Total   | \$88,842.57 | \$12,806.23 | \$146,895.48   |
|          |     |            | Grand Total   | \$88,842.57 | \$12,806.23 |                |

- **Accounts Relievable:** In Accounts receivable system you can easily get to know the customers sales information and their outstanding balances. Accounts Relievable allows to apply cash for outstanding invoices and create recurring charges for quick invoice every month. It also integrates with the general ledger, sales and distribution and cash management systems.

| Invoice       | Reference  | Type          | Item Date | Due Date | \$ Amount   | Balance      | Apply                               | Apply Amt  | Write Off |
|---------------|------------|---------------|-----------|----------|-------------|--------------|-------------------------------------|------------|-----------|
| 4-001000      |            | Sale          | 08/23/05  | 09/22/05 | \$40,781.80 | \$40,781.80  |                                     |            |           |
| 3-001151      | D3001039   | Sale          | 08/24/05  | 01/01/00 | \$1,351.59  | \$1,351.59   |                                     |            |           |
| 3-001152      | D3001040   | Sale          | 08/24/05  | 01/01/00 | \$1,351.59  | \$1,351.59   | <input checked="" type="checkbox"/> | \$1,351.59 |           |
| 3-001153      | D3001041   | Sale          | 08/24/05  | 09/23/05 | \$213.00    | \$213.00     |                                     |            |           |
| 3-001154      | D3001042   | Sale          | 08/24/05  | 01/01/00 | \$968.09    | \$968.09     |                                     |            |           |
| 3-001155      | D3001043   | Sale          | 08/24/05  | 01/01/00 | \$968.09    | \$968.09     |                                     |            |           |
| 4-001002      |            | Rental Return | 08/23/05  | 09/22/05 | \$719.10    | \$719.10     |                                     |            |           |
| 3-001160      |            | Sale          | 02/02/06  | 02/02/06 | \$879.00    | \$439.50     |                                     |            |           |
| 3-001161      |            | Sale          | 02/02/06  | 02/02/06 | \$879.00    | \$439.50     |                                     |            |           |
|               | SD-3001011 | Deposit       | 04/07/05  |          | \$2,411.31  | (\$2,176.85) |                                     |            |           |
| 10 Invoice(s) |            |               |           |          |             | \$45055.41   |                                     |            |           |

- **Accounts Payable:** The accounts payable includes accounting features that controls cash flow process and helps you save money. It consists of library where accounting and reporting features help in rapid entry of invoices flexible cash and full check of reconciliation. With this tool, it is easier to keep a track record of your payments and reduce the bad debts. Payment

programs in SAP let the payment of payables do by checks, EDI (electronic data transfer) or any other transfers.

## Notes

- **Asset Accounting:** It is a sub ledger to general ledger, which provides detail information on assets related transactions. SAP helps you to categorize the assets and calculate asset depreciations. It provides integration with plant maintenance for management of equipments and machinery. Management of assets on lease, assets under construction and interactive reporting.
- **Legal Consolidation:** This system is similar to financial accounting system allowing data transfer directly from individual statements to consolidate statements by law. This gives a view to financial statement of the company as whole.
- **Controlling:** This system holds the information required for effective internal costing. It is a versatile information system with standard reports and analysis path. If you want, you can create a custom report too.

### 4.3.2 SAP ERP Benefits in Accounting and Finance

- **Improves financial and managerial reporting:** SAP ERP gives you a flexibility to report performances of business.
- **Improves corporate performance:** It allows you to adapt quickly to the changing business conditions with accurate and timely financial data.
- **Improves cash flow and liquidity:** It helps in accelerating and managing cash flows.
- **Achieve faster closes:** It allows you to save time in accounting, consolidation, workflow and process scheduling.
- **Improves process integration between finance and treasury:** With this SAP, you can integrate the risks and treasury transactions operations.
- **Reduces overall finance costs:** Helps you to operate effective shared services and save operations time to reduce costs and resources demand.



#### Learning Activity

Finance is one of the most important function areas of an organization. Take a treasury department of any organization and study how ERP helps in easing their data and what all software can be used for it.

## 4.4 PRODUCTION MODULE IN ERP SYSTEM

Production includes inputs, outputs, by-products and overheads. It is designed of the needs of manufactures and industries. It helps in optimization of manufacturing capacity, components, parts and material resources using

**Notes**

historical production of data and sales forecasting. It helps in production planning, taking orders and delivery products to customers.

**4.4.1 Sub-modules of Production**

- **Materials and capacity planning:** The planning systems of ERP packages are designed to provide the responsiveness your company needs to meet those customer requirements. The planners can stimulate alternative plans; gaining the information they need for finding what is their requirement.
- **Shop floor control:** Process reengineering efforts and the elimination of waste have necessitated greater reliance upon powerful, user friendly, flexible shop floor planning and control systems. This feature also gives the shop scheduler, the ability to reprint the shop packet and to reflect new material allocations that correct previous shortages
- **Quality management:** This systems allow a wide variety of characteristics and parameters to be specified in a test and inspection operations and maintain an extensive history to improve product quality and identify recurring problems
- **Cost management** ERP packages provide extensive cost information at several levels that have businesses identify drivers and reduce product cost. As per your choice you can opt the costing method that best reflects your company's business. FILO (Last in First out) FIFO (First in first out), moving average unit or lot costing methods can be assigned by items. Many vendors all support Activity Based Costing (ABC) with activities visibility by cost object as well as cost for user defined groupings such as departments.
- **Engineering change control:** The first step to shorter product development activities. Engineering Data Management is designed to help your company trim data transfer time, reduce errors and increase design productivity and acts as a link to engineering and production information.
- **Engineering data management:** By using Engineering Change control, business can give effective control over engineering change orders.
- **Configuration management:** The Configuration management helps reducing order cycle time by elimination of the lengthy engineering review, typically associated to determine feasibility and the costs associated with the configured end item. This reduction is achieved by creating a flexible user-defined knowledge base that is accessed by a powerful analytic engine.
- **Tooling:** For many manufacturers, ensuring that proper tooling is available is difficult for production schedules as the availability of material.

The ERP system extends capacity and inventory management to include these valuable resources.



#### 4.4.2 Benefits of ERP in Production Module

#### Notes

- Operational level is systematic and easy to maintain.
- Implementation of this module makes planning of production easier.
- It is easy to monitor the shop floor activities.
- It helps in consumption of various resources accurately.

**Table 4.2: Benefits from ERP**

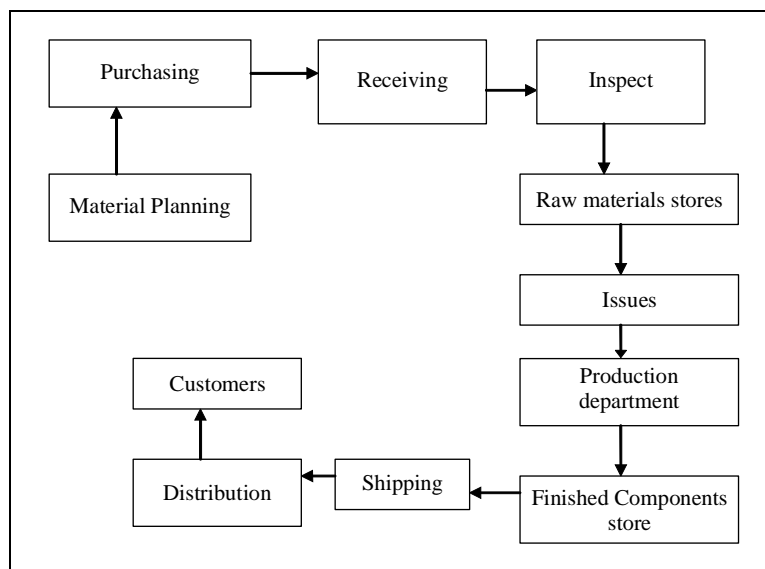
| Benefit from ERP                              | Best-in-Class | Industry Average | Laggard |
|---|---------------|------------------|---------|
| Reduction in operating costs                  | 20%           | 13%              | 5%      |
| Reduction in administrative costs             | 18%           | 10%              | 4%      |
| Reduction in inventory                        | 22%           | 11%              | 3%      |
| Improvement in internal schedule compliance   | 18%           | 12%              | 7%      |
| Improvement in complete and on-time shipments | 17%           | 13%              | 5%      |

Source: Aberdeen Group, June 2010

### 4.5 MATERIAL MANAGEMENT MODULE IN ERP SYSTEM

This module facilitates the process of maintaining the appropriate level of inventory in a warehouse. This helps in identifying the inventory requirements, reconciling the inventory balances and reporting inventory status. Its integration with other modules allows generating executive level reports.

The following figure shows the sequence in material management:



**Figure 4.3: Sequence in Material Management**

## Notes

## 4.5.1 Subsystems of Material Management

- **Prior Purchasing Activities:** Complete cycle of bid invitation, award contracts, acceptance of services.
- **Vendor Evaluation:** This helps in procurement and making the best use of material and service. Quality check (40%), reputation and service (35%) and price (25%)
- **Invoice and material verification:** It links the material management, financial accounting and controlling components. It does not handle the payments or invoices; just the information regarding material invoices is passed for further processing.
- **Purchasing:** Purchasing the materials in advance that meet the need of production and buying the optimum quantity of products.
- **Inventory Management:** To manage stocks on value, keep updating the inventory and carrying out physical inventory. Most inventory management system supports various inventory methods like inventory sampling, periodic inventory, cycling inventory etc.

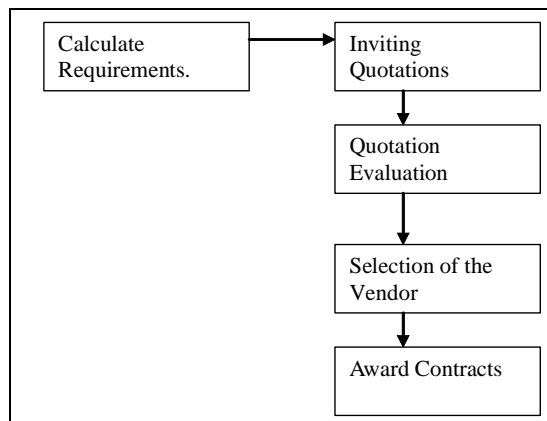


Figure 4.4: Cycle of Bid Invitation

## 4.5.2 Benefits of ERP in Material Management

- It has lowered the material cost.
- Indirect costs are controlled.
- Inventory loss risk is minimized.
- Control of manufacturing cycle.
- Improvement of delivery product.

**Learning Activity**

Try to find how the material management module of ERP is helping the publishing houses.

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## 4.6 PURCHASE MODULE IN ERP SYSTEM

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### Notes

ERP Purchasing module streamline procurement of required raw materials. It automates the processes of identifying potential suppliers, negotiating price, awarding purchase order to the supplier, and billing processes. Purchase module is tightly integrated with the inventory control and production planning modules. Purchasing module is often integrated with supply chain management software.

#### *Features of Purchasing Module*

- Streamlines purchase and process cycles
- Detailed Supplier/Subcontractor/Service Provider database
- Capturing materials requirement
- Automatic firing of purchase requisitions based on MRS
- Quotations from various suppliers
- Recording Payment terms in PO
- Excise consideration in Purchase and Process Orders
- PO authorization
- PO amendments with complete amendment history
- Order cancellation and order closing
- Multiple delivery schedules
- Quality inspection of goods
- Quotation validity
- MIS for vendor evaluation based on quality, price & delivery time
- Subcontracting – generation of process orders
- Multiple indents for multiple items in a single PO
- Purchase order processing
- Purchase order entry with item details and other details like taxes, discounts, extra charges like freight, P&F, octroi etc.
- Flexibility to generate Purchase Order in domestic and foreign currency
- Advance adjustments
- Purchase bill with updating of GL and purchase book
- Service contracts, Service Bills, Service indents and PO
- Value based approval of indents
- Bill of Entry

**Notes**

- Complete import functionality with handling of custom details - Purchase Bill for import, Excise consideration in imports
- Reports for Order tracking for complete control on the procurement cycle

ERP Purchasing module aims at making available the required materials of the right quality, in the right quantity, at the right time and at the right price, for the smooth functioning of the organization. All purchasing and subcontracting activities such as inviting quotations, supplier evaluation, placing purchase order, order scheduling and billing are covered in this module. Import of goods is also handled by the system.

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## **4.7 INVENTORY CONTROL MODULE**

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Efficient inventory management should be able to rapidly respond to customer requirements; at the same time should be flexible enough to undertake any corrections when required, and do the so without adversely affecting operational efficiencies. The e-resource ERP Inventory Management module offers effective features to minimize warehousing costs and to optimize storage needs in line with the requirements at hand.

The e-resource ERP inventory management modules offers a host of advanced warehousing features such as modification, balancing, transfer, and reverse operations. Many features including management of multiple storage centres and locations, specialised inventory management features (serial numbers, batch tracking, and special stock), which are part of a diverse capability in inventory management, are included as standard functionality within the e-resource ERP Inventory Management module.

Inventory management within the e-resource ERP system provides a high degree of flexibility for handling complex storage needs, and assures continuous update of warehouse inventory through multiple inventory methods and different types of auditing. All materials input and output transactions are fully automated due to the seamless integration with other associated modules within the system. This also enables efficient, prompt and trouble-free inventory transactions within enterprises.

### ***Keeping track of your stock***

The high level of integration found within the e-resource ERP system provides end-users with the highest level of visibility into materials transactions within their enterprise, and assures the accuracy of the data relating to the inventory within the warehouse.

Inventory management assumes significant importance in a highly integrated supply chain and the module facilitates accomplishment of organizational objectives including cost efficiency and enhanced customer loyalty by rendering superior visibility and streamlined processes. The activities of inventory control involves in identifying inventory requirements, setting

## Notes

targets, providing replenishment techniques and options, monitoring item usages, reconciling the inventory balances, and reporting inventory status. Integration of inventory control module with sales, purchase, finance modules allows ERP systems to generate vigilant executive level reports.

## 4.8 HUMAN RESOURCES MODULE

ERP contains the full set of capabilities needed to manage, schedule, pay and hire people who make the company run. It includes payroll, benefits administration, applicant data administration, personnel development planning, work-force planning, schedule and shift planning, time management and travel expense accounting.

Since the structure of most companies shifts frequently, one of the functions in the human resources category provides the ability to represent organisational charts and organ grams, including organisational units, jobs, positions, workplaces and tasks. Thus, you can represent and plan matrix organisations, split responsibilities and temporary project groups.

Capturing data from the human resource module, the ERP business workflow system provides management with the ability to define and manage the flow of work required in a cross-functional business process.

It provides support for a variety of HR tasks, including benefits, training, recruiting and compliance. The module offers a flexible design that lets users select their own database platform, including SQL or MSDE (Microsoft Desktop Engine). It includes powerful reporting and analysis tools that provide customized insight on almost any HR issue. Hundreds of standard report templates are included. An integrated database is designed to feed a steady flow of information to managers and staff.

Human resource management is an essential factor of any successful business.

### 4.8.1 Subsystems of HR Module

The various subsystems under HR module are:

- **Personnel management:** Personnel management includes numerous software components, which allow you to deal with human resources tasks more quickly, accurately and efficiently. These components can be used not only as part of the company wide ERP solution but also as stand alone systems.



**Example:** HR master data, personnel administration, information systems, recruitment, travel management, benefits administration and salary administration.

- **Organizational management:** This module will assist you in maintaining an accurate picture of your organizations structure, no matter how fast it

**Notes**

changes. In many cases, graphical environments make it easy to review any moves, additions, or changes in employee positions.



**Example:** Organizational structure, staffing, schedules, job descriptions, planning scenarios and personnel cost planning.

- **Payroll Accounting:** The payroll accounting system can fulfill the payroll requirements and provide you with the flexibility to respond to your changing needs. Most payroll accounting systems give you the options and capabilities to establish business rules without modifying the existing payroll.



**Example:** Gross/net accounting, history function dialogue capability, multi currency capability and international solutions.

- **Time management:** It is a flexible tool designed to handle complicated evaluation rules to fulfill regulatory requirements and determine overtime and other time related data. The time evaluation component stores your organizations business rules and automatically validates hours worked and wage types.



**Example:** Shift planning, work schedules, time recording and absence determination.

- **Personnel development:** Effective personnel development planning ensures that the goals of the organization and the goals of the employee are in harmony. The benefits of such planning include improvements in employee performance, employee potential, staff quality, working climate and employee morale.

**About the Case: ABC**

**A**BC is the international consumer-financing subsidiary of XYZ. It supplies credit cards, sales financing, personal loans, mortgages, insurance products and a host of other financing vehicles to customers across the world.

With assets approaching \$15 billion in 1998, ABC is also in the business of acquiring other companies, at the rate of nearly one, every quarter.

**Industry:** Financial Services

**Solution Area:** Assimilating its new businesses into its global financial accounting systems, standardising the financial practices and procedures in the process.

*Contd...*

## Notes

**Problem:** Acquiring business and integrating it effectively into the global family of ABC, so that they have a clear structure, common back-office operations. From a financial accounting and reporting standpoint, this means operations that are centralised, consolidated and managed in a unique manner, on a unique platform, with a standard set of policies and procedures that will meet the local regulatory requirements.

**Solution:** Implementing Oracle Financials as its central global financial accounting and reporting strategy. Oracle solution was chosen after its ability to support multicurrency capability, Euro functionality, Year 2000 compliance, OLAP capability and revaluation of non-US currencies to the US dollar was proven.

**Implementation:** ABC set off with a clear definition of what the customer wants to achieve. The project management team, supported by Price Waterhouse Coopers, applied rigorous review standards to ensure that the organisation respected strategic goals set at the project's inception. It made sure the right skills were available in-house, either through the IT group or through the finance group.

In addition to Oracle Consulting, ABC worked with Price Waterhouse Coopers to help understand some of the global challenges in financial accounting, reporting and business-decision support and to identify the critical functionality ABC required. The plan, as far as finance systems go, is to deploy Oracle Financials to its entire global finance businesses and where appropriate and desired, support colleagues in other XYZ Capital businesses in doing likewise. Part of the effort is to consolidate the back-office finance operations around the world.

ABC has given businesses active on Oracle General Ledger—in Norway, Denmark, Sweden, Germany and Australia. They are in the middle of the deployment phase of pulling people onto the General Ledger, Payables and Assets modules. Through the deployment, they are undergoing a major process improvement as well, so that they not only have a common platform but also have some homogeneity of process. Their deployment project will continue for the next 12 to 18 months, as they move the system out to all additional existing businesses in the UK, Japan, the Czech Republic, Hungary, Switzerland, France, Poland, etc.

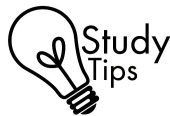
**Benefits:** As they deployed the applications in Norway and Denmark, they went from 55 days to 4 days. They just deployed the system in Sweden and have not done a close there with Oracle yet. ABC also deployed in Australia and went from a close cycle of about 14 days down to 6 days. The intent is to bring the closing cycle down at least to 3 days, with the future expectation of shortening the cycle even more.

*Contd...*

## Notes

### Questions

1. Analyse the case study and write down your observations in about 100 words.
2. What are the major issues faced by them? What benefits have they attained through ERP?



1. ERP software (or enterprise resource planning software) is an integrated system used by organizations to combine, organize and maintain the data necessary for operations.
2. SAP Materials Management (MM) is a component of the SAP ERP Central Component (ECC) that helps businesses support procurement and inventory functions.

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## SUMMARY

- ERP is software made up of many software modules. Common modules include inventory control (material management), sales and marketing, finance, order tracking, production distribution and HR.
- The difference between the traditional and ERP sales and marketing system is that, ERP modules provide integrated marketing support systems which includes order files and sales files. ERP marketing supports leads generation, campaigns, direct mailing and more.
- The first step is placing an order and then the sales order is recorded. The system schedules shipping and works backward from the shipping date to reserve the materials to order parts from suppliers and to schedule manufacturing. The module checks the credit limit and creates the bill of materials. Then the commission of salesperson is updated and products cost and profits are calculated. After all the steps followed accounting data is updated which includes balance sheets, accounts and other financial information
- Finance module can help in gathering financial data from various financial departments and generate valuable financial report of financial statements.
- Inventory module optimizes all purchasing processes with workflow driven processing functions, enables automated supplier evaluation, lowers warehousing costs with accurate inventory and integrates invoice verification.
- Production module helps in utilization of material capacity, components and material resources, historical production data and sales forecasting.



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## KEYWORDS

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## Notes

**CRM:** Customer relationship management is a system to manage company's interaction with their current and future customers.

**Legal Consolidation:** The finance department of a corporation uses legal consolidation to consolidate numbers from its subsidiaries and produce consolidated financial statements of this group of legal entities at the end of a financial period.

**Sales Forecasting:** This is the process of estimating what your business sales are in future.

**Audit Trails:** Most accounting systems and database management system use this component. It is useful for maintaining security and recovering lost transactions.

**SAP:** SAP is the enterprise software that helps to manage business operations and customer relations.

**ABC Costing:** An activity based costing (ABC) system recognizes the relationship between activities, costs and products, and through this relationship, it assigns indirect costs to products.

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## SELF-ASSESSMENT QUESTIONS

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### Short Answer Questions

1. Name the various ERP systems.
2. What is the function of finance ERP module?
3. What are the subsystems in material management module?
4. How does material management different from production management?
5. What are the steps that need to be followed for placing an order?
6. Write down the characteristics of ERP modules.
7. Explain the general ledger as a subset in ERP module.
8. What is the benefit of using production planning module?
9. How material management does helps in organization?
10. Mention HR module subsystems.
11. ERP is effective than the traditional methods. Justify.
12. What is the function of accounts payable in finance system of ERP?
13. What is the role of invoice and material verification in ERP software?
14. Explain purchasing module in ERP.
15. How is sales and marketing integrated with finance system?

## Notes

16. How is ERP significant in inventory management?
17. What are the various softwares for ERP modules?
18. What is the main aim of using sales and marketing module in ERP?
19. What do you understand by shop floor control?
20. How vendor evaluation does helps?

## Long Answer Questions

1. Explain the finance and accounts module.
2. Discuss the brief explanation of HR module in ERP.
3. What are the various steps to follow while ordering? Explain with the help of diagram.
4. Out of all the modules discussed which is the most important and why?
5. Do each of them is inter-linked with one another? Justify your answer with an example.
6. Explain the benefits of SAP in finance.
7. How is accounts payable different from accounts receivables?
8. Explain the production planning in ERP.
9. Why is it important to use ERP in today's time?
10. Do you think big organization uses this module? Find a company that incorporates them all.

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## FURTHER READINGS

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Carol A Ptak and Eli Schragenheim (2010), *ERP: Tools, Techniques, and Applications for Integrating the Supply Chain*, CRC Press.

V. Narayanan (2009), *Implementing SAP ERP Financials*, Tata McGraw-Hill Education.

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# UNIT III

## Notes

## LESSON 5 - ERP IMPLEMENTATION

### CONTENTS

Learning Objectives

Learning Outcomes

Overview

5.1 Software Selection of ERP

5.1.1 Selection of ERP

5.1.2 Planning of ERP

5.1.3 Criteria for Selecting ERP Software

5.2 Implementation Strategies

5.3 Implementation Lifecycle

5.4 Implementation Methodology

5.4.1 People Involved in the ERP Implementation

Summary

Keywords

Self-Assessment Questions

Further Readings

## LEARNING OBJECTIVES

After studying this lesson, you should be able to:

- Discuss the Selection Criteria for ERP
- Understand the Steps to be taken while its Implementation
- Know the Different Strategies and Methodology for Implementing ERP

## LEARNING OUTCOMES

Upon completion of the lesson, students are able to demonstrate a good understanding of:

- recall software selection of ERP
- analyzing criteria for selecting ERP software

## Notes

- determine implementation strategies
- design and explain implementation lifecycle
- explain people involved in the ERP implementation

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## OVERVIEW

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The earlier lesson was all about the various ERP modules. What all areas does ERP have eased our task for its management. The benefits it has provided in different aspects and what is the system that is followed under those modules.

In this lesson, you will understand how ERP is implemented. This lesson, also provide us the procedure of its selection and the steps taken to implement. The implementation strategies that is important to keep in mind. People who play a key role while implementation of ERP. Therefore, here we start with the leanings.

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## 5.1 SOFTWARE SELECTION OF ERP

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Software selection is a topic in which the process, methods and tools are applied by organizations in order to decide which software they should choose from the wide range of available solutions on the market. Such decisions should be taken very carefully, as the adoption of software solutions is having an important impact in the medium and long term. This is related to purchase and operating costs, and also the way the software is helping the company to build competitive advantage.

### 5.1.1 Selection of ERP

The selection of a software application can be understood as one of the steps to the process of software acquisition by the company. This wider process includes the stages of planning, information search, pre-selection, evaluation, choice and negotiation. During the planning process, the acquisition team is formed. This team takes issues that are related to the other stages. During the information search stage, information about technologies and vendors is found and screened and its sources are evaluated. During the pre-selection process, a shortlist of right vendors and technologies is created. The elements of the list are evaluated in the next stage, which incorporates vendor, functional and technical evaluation. The choice stage is the result of the evaluation process. A final recommendation is made, followed by a negotiation process, which is concluded by a final contract.

### 5.1.2 Planning of ERP

The planning activity involves the definition of requirements and the identification of selection/valuation criteria, both, which are relevant for the software selection process.

**Notes**

ERP software thus is a very complex and the most difficult software application to select. The acquisition of this type of software package is a high expenditure activity likely to consume a significant portion of an organization's budget.

Therefore, the definition of appropriate selection criteria plays a key role in the acquisition of ERP software.



Acquisitions have high-level risks and a wrong decision can affect the organization as a whole, in several different areas and on several different levels even to the point of endangering its existence.

### 5.1.3 Criteria for Selecting ERP Software

All evaluation methods rely on the application of evaluation criteria as basis for selection; based on the values obtained by the candidate software packages for each criterion, an aggregate score can be calculated, which is used for the ranking of candidates. The most used technique is AHP – Analytical Hierarchical Process, in which the criteria are structured as a hierarchy, and specific weights are defined for each level in the hierarchy.

The criteria used for ERP software selection are presented by following six categories:

- Functionality – the coverage of functional requirements,
- Technical architecture – technical requirements, including integration with existing systems
- Cost – both for implementation, maintenance and further adaptation/extension
- Service and support levels provided by the vendor
- Ability to execute
- Vision

While finding and selecting ERP software, the following main functions should be considered: Customer and Order Management, Purchasing Control, Production Schedule, Ingredient List, Inventory Management, Interface with CMMS system, Reporting and Analysis, Integration with Accounting System, Payroll and HR (Human Resources).

## Notes



The software evaluation process contains number of factors that can be considered in specifying the application software. These factors are: general requirements, administration and security, reporting, Web access and integration, vendor characterization and cost (of the software and associated support and services).

The general requirements are related to:

- Operating System – requirement for a particular operating system
- Database format – requirement for a particular database system
- Data import or export – the capabilities of export or import data in/from other software packages.
- Filtering and searching friendliness (this applies to database software) – existence of several optional ways of finding data that the users will need.
- User configurability of tags and labels
- Handling of links to ancillary information – the system should meet the requirements with respect to its handling of links and hyperlinks to external records and information.
- Graphical, hierarchical data structure database systems, which display a graphical representation of a hierarchical structure (parent/child relationships), are generally preferred.
- Regulatory compliance support, in user industry there are statutory standards to which the software must comply.
- Additional database software required. Some applications require that licenses are purchased for additional database software.

The administration and security requirements are related to:

- **Ease of use:** Administration of the security features of some software systems can be very complex. The application should have useable administration module.
- **Tabular selection:** Many security modules offer a table of functions for which permission can be granted to each user or group. This is done by checking or ticking the relevant permissions boxes for each user or group.
- **Password:** Users should be allocated passwords. This is not necessarily done on an individual basis.



**Example:** It may be enough for all people doing the same job and in the same section to have the same password.

## Notes

- Individuals and group settings it should be possible to set up individual users ID's as well as user groups. This allows users who require the same access level to be placed in the same group.
- **Audit trail:** An administration audit trail should be required, which can provide traceability to individuals for all changes to the administration and security module.
- **Customization:** Application customization should be easy for the administrator.



**Example:** Configuration of screens and user configurable data should be intuitive and not requiring a high level of IT knowledge.

Reporting requirements are related to:

- **Ease of access to reports:** It should be easy to access reports and find them on the system.
- **Data export capability:** Many systems provide a data export facility.



**Example:** To allow exporting data to MS Excel.

- **Customizable reports:** Customizable reports allow the user to change existing reports. This is much easier than creating reports from scratch.

### Web Access and Integration

- **Purchase or rent:** Who owns the software? This is an important factor as some web based systems can be purchased and installed on your own Intranet. Others are rented and installed on the vendor's servers.
- **Data ownership:** Is there any ambiguity with respect to the ownership of the data?
- **Functionality:** Due to limitations in the programming of web browser based systems some of these packages have limited functionality.
- **Cost analysis:** The cost of renting software and buying a web based package for installation on your Intranet should be compared.
- **Internet access:** Do all the PC's in a web based system already have Internet access, if not how much will it cost?

### Vendor Characterization

- **Stability:** Each vendor's stability must be assessed. How long have they been in business? How long have they been selling the software's? When this application was first developed
- **Professionalism:** To know each vendor for the professionalism displayed in dealing with the client's inquiry and in demonstrating their products.

**Notes**

- **Service level agreement:** They should be assessed on the basis of the level of future service and support that they offer. Do they provide telephone support at the times you require it?
- **Provision of customization:** If the application can be customized, each vendor should be assessed for the service they offer in this and costs involved.
- **Customer base:** Till now how many has been sold and knowing who his customers are?

**Costs**

- **Cost of software:** Assessing the application for total cost of the configuration and number of users required.
- **Cost of hardware:** The total cost of any additional hardware required to make the implementation work with the application.
- **Potential future costs:** Assessing potential for significant future costs.
- **Implementation cost:** Installation of the software and consultancy.
- **Training cost:** Training costs involved in implementing the application
- **Cost of customization:** Assessing the application for any costs involved in customizing it for your requirements.

**Learning Activity**

Using your search engine find about IBM that how and what factor they considered while selecting ERP software.

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**5.2 IMPLEMENTATION STRATEGIES**

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The most important factor that decides the success of an ERP implementation is the transition strategy.



**Example:** Big bang, Phased, Parallel, Process Line and Hybrid strategies. The three pillars of ERP implementation are People, Process and Technology.

- **Big Bang Implementation:** In this strategy industries layout a magnificent map for their ERP implementation. The installation of ERP systems of all modules happens across the entire organization at once. The big bang approach reduces the integration cost in the condition of thorough and careful execution. This method is dominated by ERP implementations and it partially contributed to the higher rate of failure in ERP implementation. All the business functions performed in the inheritance system across the entire enterprise are concurrently transferred to the new legacy system



during a period of one day or a weekend. But now a day's industries are wavering to use big bang approach as it consumes too many resources to support the go-live of the ERP system. Success in using the big bang approach comes with careful preparation and planning prior to using big bang. But many industries struggle to decide whether the big bang approach is the right selection or not.

## Notes

- Phased Transition Strategy:** The phased approach, implements one practical element at a time. Autonomous modules of ERP systems are installed in each unit, while integration of ERP modules is done at later stage of the project. This has been the most commonly used method of ERP implementation. Each business unit may have its own “instances” of ERP and database. Modular (phased) implementation reduces the risk of the installation, customization and operation of ERP systems by reducing the scope of the implementation. The unbeaten implementation of one module can help the overall success of an ERP project. The interface programs that are used in this strategy bridge the gap between the inheritance ERP system and the new ERP system until the new ERP system becomes fully purposeful. This strategy is often used in situations that not have strong centralized synchronization in the ERP project.
- Parallel Implementation:** The parallel approach keeps both the inheritance system and the new ERP system active concurrently for a length of time. The amount of time for which both the systems are in operation ranges from one day to several months and may be to years. Portions of the same functional business areas (including software) such as finance, manufacturing, marketing etc. are operating at the same time for both the legacy and ERP systems. An advantage to the parallel strategy is that it has good improvement options in case something goes off beam. Because both the inheritance ERP system and the new ERP system are in function at the same time for a particular module, the industry's business processes will not be broken up if the new ERP system breakdowns. The parallel approach also provides the most sensible number-to-number comparisons to authenticate that the new ERP system is performing the necessary business process flows. This strategy is best suited for mission critical situations that cannot survive a major break down of an ERP system.
- Process Line Transition Strategy:** The process line transition strategy breaks the implementation strategy to handle similar business process flows or product lines. Using the process line strategy, the first product line and related assets go first in making the transition from the inheritance system to the new ERP system. Once this transition is achieved successfully, the second product line is moved from the inheritance system to the new system. This success helps to build industrial faith in the new ERP system, increasing its overall prospect of success. Due to the achievement of the first process line, resources are loaned to the more complicated and challenging process lines.

**Notes**

- **Hybrid Transition Strategy:** It is the combination of the implementation strategy like process line, phasing and parallel implementation strategy. The complexity of a hybrid strategy varies tremendously depending upon the state. Small single-site ERP implementations tend to have simpler hybrid strategies than those used by large conglomerate corporations with many dissimilar environmental locations. Many implementations use hybrid strategies because they are flexible in adapting as per the specific needs of the situation. With the hybrid strategy, industries can exclusively adjust implementations for their needs.

### 5.3 IMPLEMENTATION LIFECYCLE

ERP implementation lifecycle focus on the ERP project which is carried out to make ERP up and running. ERP project is likely to go through different phases like any other project.

There is no clear line separating these phases and in many cases one phase begins before the previous phase is complete. Different phases of the ERP implementation are: pre-evaluation screening, package evaluation, project planning phase, gap analysis, re-engineering, customization, implementation team training, testing, going live, end user training and post implementation.

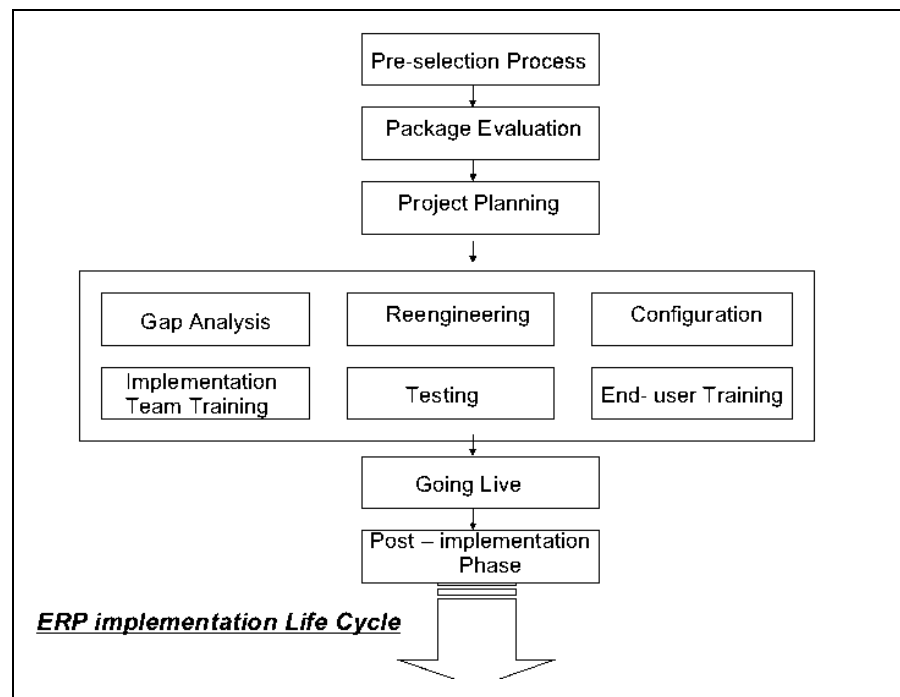


Figure 5.1: Phases of the ERP Implementation

- **Pre-evaluation screening:** When the company has decided to implement the ERP the search for the convenient and suitable ERP package begins. There are hundreds of ERP vendors of all sizes and shapes all claim to have a solution that is ideal for the organization. It is better to limit the number

## Notes

of packages that are evaluated to less than five. Getting help from external consultants and most importantly finding out what package is used by similar companies helps.

- **Package evaluation:** The objective of this phase is to find the package that is flexible enough to meet the company's need or in other words, software that could be customised to obtain a 'good fit'.
  - ❖ Important points to be kept in mind while evaluating ERP software includes: functional fit with the company's business process, degree of integration between the various components of the ERP system, flexibility and scalability, complexity, user friendly, quick implementation, ability to support multi-site planning and control, technology; client/ server capabilities, database independence, security.
  - ❖ Total costs, including cost of license, training, implementation, maintenance, customization and hardware requirements.
- **Project Planning Phase:** The implementation of team members leads to task allocation. This is the phase that designs the implementation process. Time schedules, deadlines, etc. for the project, are arrived at. The project plan is developed in this phase. In this phase, the details of how to go about the implementation are decided. The project plan is developed, roles are identified and responsibilities are assigned.

The organisational resources that will be used for the implementation are decided and the people who are supposed to head the implementation are identified. The implementation team members are selected and task allocation is done.

- ❖ The phase will decide when to begin the project, how to do it and when the project is supposed to be completed.
- ❖ The phase will also plan the 'What to do' in case of contingencies; how to monitor the progress of the implementation;
- ❖ The phase will plan what control measures should be installed and what corrective actions should be taken when things get out of control.
- ❖ The project planning is usually done by a committee constituted by the team leaders of each implementation group headed by CIO.
- **Gap analysis:** This is the most crucial phase in the success of the ERP implementation. In simple terms, this is the process through which companies create a complete model of where they are now and where they want to be. The trick is to design a model, which both anticipates and covers any functional gaps. It has been estimated that even the best ERP package, custom tailored to companies needs meet only 80% of the functional requirements. The remaining 20% of these requirements present a problematic issue for the company's BPO. One of the most affordable, albeit painful, solutions entails altering the business to "fit" the ERP

**Notes**

packageSome companies decide to live without a particular function. Other solutions include:

- ❖ Upgrade
- ❖ Identify the third party product that might fill the gap
- ❖ Design a custom program
- ❖ Altering the ERP source code, (the most expensive alternative; usually reserved for mission-critical installation)
- **Re-engineering:** In this phase that human factors are taken into account. This phase involves human factors. In ERP implementation settings, reengineering has two connotations. The first connotation is the controversial one, involving the use of ERP to aid in downsizing efforts. In this case ERP is purchased with aim of reducing the number of employees. The second use of the word 'reengineering' in the ERP field focuses on the Business Process Reengineering (BPR). The BPR approach to an ERP implementation implies that there are two separate, but closely linked implementations on an ERP site:
  - ❖ Technical Implementation
  - ❖ Business Process Implementation

The BPR approach emphasizes the human element of necessary change within organisations. This approach is more time consuming and has received a lot of criticism for creating a big budget and extended projects. But those who support it argue that you cannot ignore human element.

- **Customization/Configuration:** This is the main functional area of ERP implementation. The Company should know which processes to change in the process of implementation. In this case business process has to be understood and mapped in such a way that the incoming ERP solutions match up with the overall goals of the company. It is not required to shut down company operations while you do a mapping process. ERP vendors are constantly making efforts to lower configuration costs. Strategies that are currently being done include automation and pre-configuration.



**Example:** SAP for instance, has pre-configured industry specific templates that can be tweaked for each individual company (Accelerated SAP or ASAP solution). Sage MAS 500 ERP system provides a set of customization tools which includes a software development kit and customize

- **Implementation Team training:** Synchronously when the configuration is taking place, the implementation team is being trained. This is the phase where the company trains its employees to implement and later, run the system.

## Notes

How to implement it? For the company to be self-sufficient in running the ERP system, it should have a good in-house team that can handle the various situations. Select employees with the right attitude who are willing to change, learn new things, not afraid of technology and good functional knowledge.

- **Testing:** In this phase, we test real case scenarios. The system is configured and now you can come back with extreme case of system overloads, multiple users logging in at the same time with the same query, users entering invalid data, hackers trying to access restricted areas and so on. The test cases are designed specifically to find weak links in the system and these bugs should be fixed before going live.
- **Going Live:** This is the phase where all technicalities are over, and the system is officially declared operational.

This is the phase where ERP is made available to the entire organization. On the technical side the work is almost complete: data conversion is done, databases are up and running and on the functional side, the prototype is fully configured and tested and ready to go operational. Once the system is “live”, the old system is removed and the new system is used for doing business.

- **End User Training:** This is the phase where the actual users of the system will be trained on how to use the system. This is based on how to use the system. This phase starts much before the system goes live. The participants are given overall view of the system and how each person's action will affect the entire system.
  - ❖ In addition to these general topics, each employee is trained on the job or tasks that he/she is supposed to perform once the system goes live.
  - ❖ The employees who are going to use the new system are identified and their skills are noted.
  - ❖ Based on their skill levels are divided into groups.
  - ❖ Then each group is given training on the new system.
  - ❖ This training is very useful as the success of the ERP system is in the hands of end-users.
  - ❖ The end-user training is much more important and much more difficult than implementation team training since people are always reluctant to change.
- **Post Implementation (O&M):** Once the implementation is over the vendors and consultants are free to go. This is the very critical phase when the implementation phase is over.
  - ❖ There must be enough employees who are trained to handle the problem that might occur when the system is running.
  - ❖ There must be technical people in the company who have the ability to enhance the system when required.

**Notes**

- ❖ There should be people within the company who have the technical prowess to make the necessary enhancements to the system as and when required.
- ❖ Living with ERP systems will be different from installing them.
- ❖ Projects for implementing the ERP systems get a lot of resources and attention.
- ❖ However, an organisation can only get the maximum value of these inputs if it successfully adopts and effectively uses the system.
- **ERP implementation:** It is 'do-it-right-the-first-time' kind of project implementation methodology. This helps to change the way people have been doing things. It is natural to resist ERP because it is human nature to resist changes. Making people accept ERP and implementing it is a tough task because of the people around who believes that ERP causes additional work and more documentation. ERP project is complex and lengthy project that enquires a vast amount of resources (money, personnel, hardware, software, communications networked).



The ERP implementation steps are: pre-evaluation screening, package evaluation, project planning phase, gap analysis, re-engineering, customization, implementation team training, testing, going live, end user training, post implementation.

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## 5.4 IMPLEMENTATION METHODOLOGY

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**Strategy:** Option is available for those organizations having multiple sites to implement first at one site as pilot project. Implementing ERP in a pilot project is a good idea because it will give implementation team a feel for the issues in an actual implementation, the peculiarities of the organization, its work environment and so on. When incremental approach is used, all ERP modules are not implemented in one-step. The different modules are introduced one by one.

**Plan:** The implementation plan documents includes the who, what, why, where, when, and how of the project. The plan provides a guide to the project and is used to monitor progress. Special packages are available such as Microsoft Project. These hold lot of details about the project, enable different views of the project such as time scale or critical path, and facilitate the reporting of many different issues, e.g. costs, resource usage and overdue activities.

**Cost:** The total cost of ERP ownership includes the cost of packaged software, hardware, professional services (for ongoing maintenance, upgrades and optimization) and internal costs. The cost of packaged software depends on the implementation (the number of ERP modules and the number of end-users), complexity of software and ERP vendors. Implementation of ERP systems requires purchase of new computer hardware, systems software, network equipment and security software.

## Notes

Implementation enquires the services of professionals who would help in customization, integration, data conversion, data migration, testing and training. In areas where the costs are likely to arise, consideration should be given to hardware, operating system, database license fee, core software license fee, additional module license fee, additional seat license fee, third party software license fee, integration of third party software, software customization, project management, consultancy, training, living and travel expenses, software maintenance or warranty renewal and upgrades. For cost and it is common to provide yearly maintenance cost to be 10% of the initial cost outlay.



For cost, a long term perspective needs to be kept in mind, a time horizon about five years.

**Performance Measurement:** We know about three performance related measures costs; time and benefits, one more are deliverables. The use of deliverables provides the opportunity to assess the effectiveness.

**Problem resolution:** It is desirable that there is an agreed procedure for recording issues and their resolution.

**System Issues:** Tasks will be identified on the project plan but those involved will normally be the IT systems personnel.

**ERP implementation Methodology by Vendors and Consulting firms:** They range from vendor specific methodologies, such as “Accelerated SAP(ASAP)” to consulting firm product such as “The TotalSolutions” from Ernst & Young LLP and the “Fast track work plan” from Deloitte & Touche

**ERP Implementation – The Hidden Costs:** In addition to budgeting for software costs, financial executives should plan for consulting, process rework (BPR), integration testing, etc. underestimate the price of teaching users their new job processes. Fail to consider data warehouse integration requirements.

A successful training will account for a minimum 10-15% of the total budget. It will be a good idea to identify the trainers early while the implementation and make them part of implementation team, so that they will have an experience and will know the ‘big picture’. ERP implementation team members should not be sent back to their previous job as they are valuable. Just writing reports to pull information out of new ERP system will keep the project team busy for almost a year. And it is in the analysis and insight – that companies take their money back on an ERP implementation.



Strategy, Plan, Costs, Performance Measurement, Problem Resolutions, System Issues, ERP methodology by Vendors, Unexpected Costs. These together contributes to the methodology in ERP implementation.

## Notes

## 5.4.1 People Involved in the ERP Implementation

Every implementation project needs a **sponsor** say *CEO or MD*. The executive committee or steering committee formulates long term goals, objectives and strategies regarding their implementation of the ERP system in the company. The EC is headed by CEO and there are other senior level managers and departmental heads. The project manager is the person who is responsible for transmitting the vision and goals in reality. The implementation team or the work team selects employees from the company in addition to vendor representatives and consultants. Functional managers take care of day to day operations of their functional areas, they should have strong conceptual skills of understanding the ERP project and how it relates to the business. Functional participants have a limited role in the implementation of the project; they answer questions, and review the training programs and business process flows that are proposed in the new software. Consultants can act as project manager, team leader, team member, service representative and end user. Package vendor are responsible for fixing any problems in the software that the implementation team encounters and as trainer to end users/ key users. End users are the general mass of people who will use the new ERP system.

**Learning Activity**

Pick up an organization using SAP software and try to know how SAP has provided benefit to them since their traditional ways.



### **Premier Well-Being Firm Streamlines Processes Through Oracle**

**Client**

Herbalife is one of the largest premier health and well-being companies headquartered in Southern California, US, and has retail sales of over US\$ 1.3 billion.

**Business Need**

Herbalife had periodic new product releases and there was a need for an efficient tool to predict demand for new products. Herbalife also wanted to provide a single platform for supply chain planning across product categories, and enable system-driven accounting and booking from sub-ledgers to general ledger globally. They also sought to migrate to a cost-effective Linux operating system from the existing HP UNIX platform.

Herbalife already had Oracle ERP Release 11.0.3 Inventory and Planning Modules for its supply chain operations and Oracle ERP Release 11i

*Contd...*



financial modules of GL, AP and FA, implemented by Infosys earlier. Herbalife partnered with Infosys for implementing Oracle Applications R11.5.9.

### Infosys Solution

The Infosys approach to implement the Oracle Application R11.5.9 reduced process complexities and achieved process efficiencies for Herbalife. This resulted in better supply chain planning, which in turn reduced stock-outs and improved inventory turns. Infosys also improved the efficiencies of warehouse operations through automation by RF devices in key European warehouses.

Migration from HP UNIX to LINUX (for both applications and database) was a challenge, which was made simpler by our approach. The latter helped in reducing the system's maintenance cost for Herbalife. We upgraded existing interfaces in the Oracle 11.0.3 system to seamlessly integrate with legacy systems.

### Benefits

The Infosys solution helped Herbalife in adhering to uniform practices for supply chain planning and procurement. It also enabled system-driven accounting globally by setting up a multi-organization environment with each country having its own charts of accounts. Overall, we streamlined the manufacturing, distribution, procurement, and financial accounting processes for Herbalife.

### Questions

1. Do you think implementing Oracle application helped Infosys? How it can be?
2. What was the basic business need of herbal life?



1. Enterprise resource planning (ERP) systems are a valuable tool for any organization, and they can have an impact on every single part of your business. These highly sought after enterprise applications help manage activities including planning, research & development, purchasing, supply chain management, sales and marketing.
2. Once the ERP technology and ERP system software is ready, data must be entered and/or moved into the system's database.

### Notes

**Notes**

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**SUMMARY**

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- Software selection is a topic in which the process, methods and tools are applied by organizations in order to decide which software they should choose from the wide range of available solutions on the market.
- The selection of a software application is as one of the steps to the process of software acquisition by the company. This wider process includes the stages of: planning, information search, pre-selection, evaluation, choice and negotiation.
- While finding and selecting ERP software, the following main functions should be considered: Customer and Order Management, Purchasing Control, Production Schedule, Ingredient List, Inventory Management, Interface with CMMS system, Reporting and Analysis, Integration with Accounting System, Payroll and HR (Human Resources).
- Different phases of the ERP implementation are: pre-evaluation screening, package evaluation, project planning phase, gap analysis, re-engineering, customization, implementation team training, testing, going live, end user training, post-implementation.
- The most important factor that decides the success of an ERP implementation is the transition strategy. Some of them are Big bang or Phased or Parallel or Process Line or hybrid.
- An ERP implementation is a big project for any company to take ahead, whether it is a small business or a large global corporation. Every project has different challenges and requires a strategic approach. If managed properly, project will be well worth the time, money and resources you have invested.

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**KEYWORDS**

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**AHP – Analytical Hierarchical Process:** It is a process in which the criteria are structured as a hierarchy, and specific weights are defined for each level in the hierarchy.

**Phased implementation:** Independent modules of ERP are installed in each unit whereas; integration of ERP modules takes place at a later stage.

**Parallel Implementation:** This approach keeps new ERP system and legacy system both active simultaneously for a period of time.

**Gap Analysis:** This is the process through which company create a complete model of where they are now and where they want to be. The trick is to design a model, which both anticipates and covers any functional gaps.

**Re-engineering:** It aims to help organizations fundamentally rethink how they do their work in order to dramatically improve customer service, cut operational costs, and become excellent competitors.

**Accelerated SAP (ASAP):** It is a proven implementation methodology for mySAP.com. It was released in 1997 and has been used in more than 1,000 projects, and more than 18,000 SAP and partner consultants have been trained in ASAP.

**Notes**

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**SELF-ASSESSMENT QUESTIONS**

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**Short Answer Questions**

1. Why is planning important in ERP implementation?
2. Why is evaluation of ERP?
3. Why is it important to select an appropriate ERP?
4. Who are the people involved in selection?
5. What are the steps of lifecycle of ERP?
6. What contributes to the total costs?
7. What are the different phases of ERP implementation?
8. What are the implementation strategies?
9. On what basis would you decide to select ERP software?
10. What are the general requirements for ERP selection?
11. Is it important to choose the vendor wisely? Why?
12. What do you understand by ERP implementation?
13. What are the expected costs a company can expect in future?
14. Why is it important to train implementation team?
15. Which technique is most used in ERP?
16. How training the employees in ERP would be beneficial?
17. What are the factors affecting vendors characterization?
18. Define pre-evaluation screening.
19. Mention three pillars of implementation.
20. Explain gap analysis.

**Long Answer Questions**

1. Explain the lifecycle process of implementation.
2. Discuss the implementation methodology.
3. Explain how planning, selection and evaluation of ERP software are done with the help of an example.
4. What are the strategies to be kept in mind for ERP implementation?

## Notes

5. Describe Package Evaluation.
6. Why is it necessary to evaluate the ERP system?
7. What are the administration and security requirements and reporting requirements for selecting ERP software? Explain with examples.
8. Do you think people play a key role implementation? Explain.
9. Describe the criteria for selecting ERP software.
10. What are the general requirements of selecting ERP software? Explain with the help of examples.

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## FURTHER READINGS

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## LESSON 6 - ERP FRAMEWORK: PROCESS AND PEOPLE

Notes

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6.2 Training

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6.4.3 Employees – The End Users

6.5 Suggested Framework

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6.5.2 Pressures to Perform

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Keywords

Self-Assessment Questions

Further Readings

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### LEARNING OBJECTIVES

After studying this lesson, you should be able to:

- Understand the ERP Hidden Costs
- Describe the Common Costs that Overruns the Budget

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### LEARNING OUTCOMES

Upon completion of the lesson, students are able to demonstrate a good understanding of:

- basics of ERP implementation
- determine training and data migration

## Notes

- analyzing people organization in implementation
- how to use suggested framework

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## OVERVIEW

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The earlier lesson gave us the learning's ERP, planning, evaluation and selection of ERP systems. What way can we implement the ERP software, what are the types of strategies of implementation.

In this lesson, you will learn about the details of the ERP implementation hidden costs details. The earlier lesson introduced to implantation methodologies. The lesson continues to discuss the extended version of hidden costs.

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### 6.1 ERP IMPLEMENTATION: THE HIDDEN COST

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ERP software promises great benefits. However, there are cases in ERP even though you plan well but the budget is exceeded. In this lesson, we will study the areas the managers miss to account for in their budgets. On the other hand, we can say the hidden costs of implementation.

Some companies purchase ERP software to reduce their costs. The objective is to integrate company wide information.

There is cost that is being ignored while budgeting for the ERP software. But, following are the eight areas, which are most likely to overrun the budget:

- Training
- Customization
- Integration and testing
- Data Conversion
- Data Analysis
- Consultants
- Brain Drain (employee turnover)
- Continuing Maintenance

No, we will be discussing training, data migration, vendors and consultant in details as they are the most common factors that exceed the ERP budget.

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### 6.2 TRAINING

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Training is the unanimous choice of experienced ERP implementation as the most elusive budget. Training costs is not overlooked but yes, it is underestimated. It is expensive, as workers have to learn new set of processes.

## Notes



**Example:** A receiving clerk who accepts shipment of raw materials. With ERP package like SAP clerks now becomes an accountant because clerk now knows how to enter inventory in live system.

Training is the first thing from which budgets are squeezed, a mistake most implementers make. The training budget can be 10% or more of the total cost of the project. Users are trained how to use an ERP system is a mix of technology, processes and domain area content in order to provide a context for the system. It is always better to train on the concepts first and then show the end users how to use the system. Other formats used include training over the internet, computer based training, and self-study. One approach that is consistently used involves designating a member (or group of members) of the organization as “super user or champions” who can then be responsible for training others. The variety of training formats available is amazing – on site training, web based virtual classrooms, computer-based training, knowledge warehouses, video courses, self-study books, context sensitive help screens etc. Pre implementation training is organized for the project team and the system administrators. The focus of the project team will be on understanding the functionality of the software. Training on such subjects as best practices, process mapping, training skills and documentation may be provided by the vendor. The end users and managers are trained during implementation and after implementation. Some areas that will be relevant to everyone are ERP basics, business processes, changed business procedures, automation of tasks by ERP, and fundamentals of computer usage like passwords, encryption, security etc.



“Scrimp on training expenses, pay the price later.”

## 6.3 DATA MIGRATION

Shifting data from the old ERP system to new ERP system costs money. For doing this new ERP packages are requires. So, as a result they underestimate the costs of the move.

Data migration is the process of translating data from one format to another. Data migration is the process of moving required (and most often very large) volumes of data from existing systems to new systems. Existing systems can be anything from custom built IT infrastructures to spreadsheets and standalone databases. Extracting and cleansing data from existing system can be the single largest task in the project. The wizards in data migration tools make tasks like loading the data from the existing system, reviewing for quality, accuracy and completeness and then importing the data directly into ERP database. Two primary methods are used for migrating data from the legacy systems to the

**Notes**

new ERP, which are database manual and electronic method. In electronic method, some type of database conversion process is used.

This process can range anywhere from true source code development to complex copy utilities. We start with raw data in a legacy system such as inventory item master file. Using data migration tools and programs, we come up with a migration strategy to export data to the new ERP system.

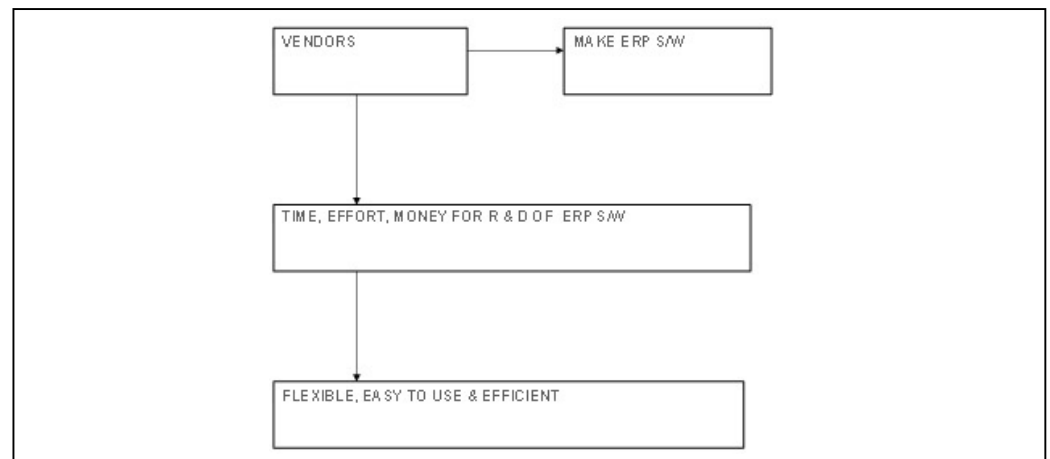


If the existing legacy data is uploaded to the new ERP system with inaccurate, inconsistent and missing information, users will experience significant inefficiency and will not reap maximum return from the ERP investment.

## 6.4 PEOPLE ORGANIZATION IN IMPLEMENTATION

### 6.4.1 Vendors

Vendors are the people who develop the ERP packages, they spend a large amount of time and effort in research & development to create the package solution that is flexible, efficient and easy to use. However, now-a-days the ERP have all features and function, which can satisfy the need of all the business data. The ERP vendors spent a huge amount of money also so that they can become experts and develop a flexible, efficient and user-friendly ERP package. The model for developing ERP package by vendors is illustrated in Figure 6.1.



Source: Enterprise resource planning, by Parag Diwan and Sunil Sharma

**Figure 6.1: Vendors Model of ERP**

### *Roles of Vendors*

They are as follows:

- The vendor should supply the product and its documentation immediately after the contract has been signed.



**Notes**

- The vendor is responsible to repair the errors, which are found during the implementation process, so it becomes necessary that the vendor should be constantly in touch with the implementation team.
- The vendor has to provide the training to the company's users or employees and the people who are involved in the implementation process of the software.
- The vendors training should be able to explain how the package works, what are major components, how the data and information flows across the system, etc.
- The vendor has to give the project support function and has to take care of the quality control factor with respect to how the product is implemented.
- The vendors have to participate in all the phases of the implementation process in which he gives advices, answers to technical questions about the product and technology.
- In case, there is a gap between the package and the actual business process then it is the job of a vendor to customize the software and make necessary modifications.

***Learning Activity***

Consult a vendor of ERP and find out the various marketing and sales domain ERP system popular in the industry.

**6.4.2 Consultants**

The primary role of an ERP consultant is to guide an organization through transition to an ERP system. An ERP consultant represents a contractor, firm or team of consultants that include project management, technical and functional resources.

They have a lot of experience of implementation and know various methods that will ensure successful implementation. The only limitation with consultant is they are very expensive. They have to make a plan to carry the activities in the proper direction during the implementation process.

***Category of Consultants***

- **Management consultants:** Business consultants are professional people who develop the different methods and techniques to deal with the implementation process and with the various problems that will be produced during implementation. They focus primarily on function of management as it relates to the organization of resources and business process flows. They are experts in the area of the administration, management and control activities.

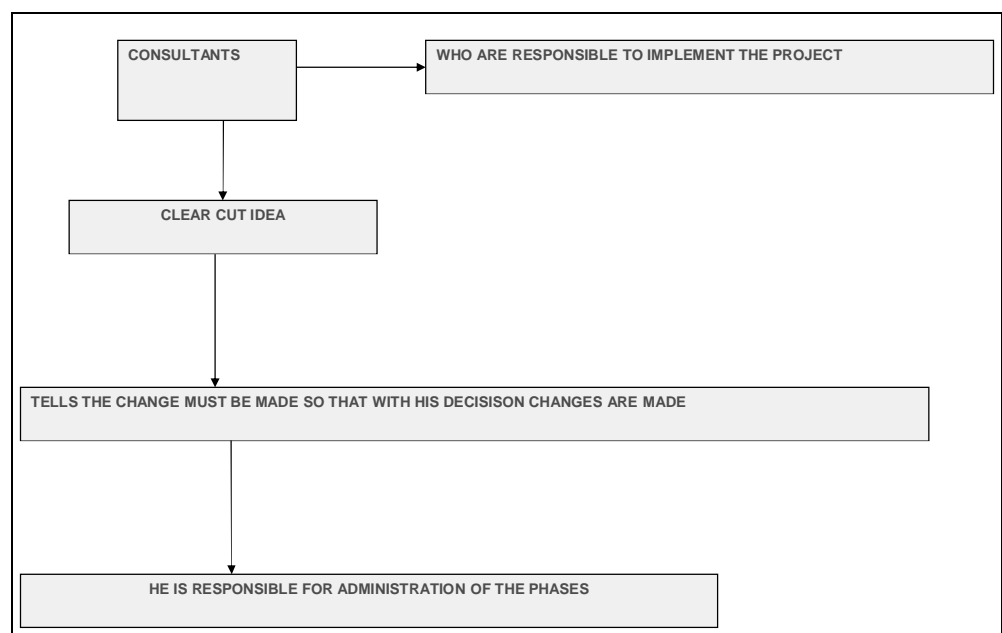
## Notes

- **Application consultant:** They are people who focus on the process of communicating, teaching, demonstrating, and configuring software for the business process flows.
- **Technical consultants:** They are consultants who deal with technical issues such as database conversions, source code modifications, operating systems, software installations.

As the consultants are expensive, the company should formulate a plan regarding optimum utilization of the money spent on consultants.



**Example:** A specified number of the company's staff should be trained for a certain specific level.



Source: Enterprise resource planning, by Parag Diwan and Sunil Sharma

**Figure 6.2: Model for Consultants in ERP**

### Role of Consultants

It is described as follows:

- They alert the companies' management about the actions and decisions to be taken.
- They consultant have to guarantee the success of the project and should be able to show the results like reduction in cycle time, increased response time, improved productivity, etc. so that the customer is satisfied.
- They are responsible for the administration of all the phases of the implementation so that all the activities are occurring at the scheduled time and the desired level of quality is achieved with effective participation of all the personnel.

**Notes**

- They add value to the project as they provide knowledge about the packages and the implementation process, which in turn provides the practical experience to the employees.
- The consultants should create a knowledge base and train the people so that the knowledge stays in the organization when the consultants leave the project
- They should strive to improve the company's business processes so that the software package can be used as it was originally intended by its developers.
- There are other tasks performed by the ERP consultants. They:
  - ❖ Maintain technical documents on the projects.
  - ❖ Analyze business requirements.
  - ❖ Prepare the functional specifications for ERP program development.
  - ❖ Perform Gap analysis and related studies.
  - ❖ Assess the competence level of the users of the ERP system.
  - ❖ Perform Product design and operations review.
  - ❖ Identify requirements of the users of the ERP system.
  - ❖ Interact with other modules consultants



Choosing a lesser known ERP package to avoid premium priced consultant will not help.

#### **6.4.3 Employees – The End Users**

- Employees are the people who use the ERP system once it has been developed.
- Employees perform the functions, which are automated by the ERP system.
- The employees should be given the training as to how use the various functions that are automated in the software.
- There is a fear among the employees of unemployment if they are not trained properly on all the upcoming software.
- The end users who are the employees are provided with the skills set and more opportunities to work in a challenging environment using the modern technologies.
- They also analyse and provide the suggestion where they can perform customization.

**Notes**

- They should be able to balance their loyalty to the client and the project.
- They should have a clear context and scope of the work so that they can provide the management with the decisions taken for implementation process.



**Example:** The recent research on SAP end-user training suggested that enterprises should allocate 17 percent of the total cost of an ERP project to training. Gartner research recognized training as the top priority, and suggested that companies that budget less than 13 percent of the implementation costs for training are three times more likely than companies that spend 17 percent or more to see their ERP projects run over time and over budget.

**Learning Activity**

Visit an ERP solution company and find out how relevant are the advancements taking place in the upgradation of these systems.

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## 6.5 SUGGESTED FRAMEWORK

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Based on this study, a framework can be suggested to assist an organisation as to whether ERP, BPR or just an IT solution aimed at automation is the most suitable option for it. The framework proposes that an organisation can map itself on a grid of 'pressures to perform' on 'Y' axis and 'organisational readiness to change' on 'X' axis. Then the resulting location of an organisation on this grid will point to the most logical choice.

### 6.5.1 Readiness to Change

Both ERP and BPR basically lead to changes, albeit of varying degree, in an organisation. Therefore, an organisation's readiness to change becomes the most important criteria on this grid. Organisations, like people, like to work in the universe they are comfortable. Unless, an organisation on its own feels the need to change, prescribing a strong dose of BPR or ERP would only result in strong side reactions. The organisation's readiness to change can be measured in terms of various parameters.

- **Top Management Initiative:** Is the top management pro-change or anti-change, does it encourage innovation?
- **Organisation Culture and Management Style:** Is it a family-run business with old traditions or is it managed on professional terms, are the employees empowered and is the decision-making participative or authoritative?

## Notes

- **Organisational Structure:** Is the communication across the hierarchy or is it up and down the hierarchy? Does the organisation believe in team approach and how is the performance of employees measured?
- **Relationship with Workforce:** What is the level of job motivation, what are the current skill-sets possessed by the employees and what are the new ones required?
- **Financial Health:** How is the profitability, i.e., cash position of an organisation? A cash-strapped company can hardly dream of expensive solutions like ERP or BPR?
- **Legal Shackles:** They are mostly valid for governmental or semi-governmental organisations.

### 6.5.2 Pressures to Perform

Any business decision should be justified by a relevant need. Sometimes the decisions are forced on an organisation because of outside pressures on it. Business is always defined from 'outside in'—by customers, competitors and complementors. If the business environment is in a flux, an organisation must respond and change in order to maintain or elevate its performance level. The pressures to perform can both be external or internal.

- **External:** These include factors like competitive positioning, structural changes in the industry, changes in regulatory structure, threat of ending special privileges, shortened product and technology life cycles. There is also a danger of oversupply or challenge to create demand.
- **Internal:** These include factors like increase in business complexity, changes in strategic aspects like product portfolio and market segment and increase in workforce turnover and other labor problems.

The parameters for 'pressures to perform' can be evaluated in terms of market share/value leadership, share price, industry trends like mergers and acquisitions, profitability, product obsolescence rate, manpower attrition rate and so on. 'Pressures to perform' lead to need for change. So, the grid translates into cross-matching the need and willingness to change for an organisation.

If both are low or moderate, the organisation can afford to work with custom-developed systems for its various functions. The main thrust is automation of work and the organisation can think in terms of linking these localized systems as a step towards better performance. If both the need and willingness are high for an organisation, then BPR, in its true radical sense, is the most logical option. Quite a few governmental organisations are facing sudden increase in pressure to perform as a result of economic liberalisation and drying up of subsidies. But unless they rate high enough on the readiness scale, they cannot think in terms of a BPR solution.

**Notes**

Organisations facing high pressures should opt for an ERP solution with strategic focus on cost-cutting, if they are not yet ready for change. The ERP package will help them to cut wasteful expenditure and inefficient buffers built in their supply chains. The package will enable them to maximise out of their current resources and thus become 'lean' to compete.

On the other hand, organisations, which are willing to change, can strategically use the ERP package to widen the competitive gap between them and their competitors. The ERP package helps them to have better control over their business activities and endows them anticipatory skills via proactive decision-making capabilities. Organisations can establish a solid information infrastructure and can focus on elevating their performance. The benefits can be better relationship with suppliers and customers leading to sharing of production plans to reduce lead times to minimal levels or preparing the organisation to rapidly expand the business or even go for related diversification of business. An organisation can focus on its core capabilities and can groom them more.

The rating of parameters on this grid is a tricky issue. A lot of work needs to be done in this regard. Apart from some readily quantifiable parameters like market share or profitability or share price, others have to be looked at in more qualitative terms. The mapping exercise should be done in close consultation with the top management of an organisation, with individual perceptions playing an important role. But again, the outside consultants can be of vital importance in arriving at a more realistic picture.



The parameters for 'pressures to perform' can be evaluated in terms of market share/value leadership, share price, industry trends like mergers and acquisitions, profitability, product obsolescence rate, manpower attrition rate and so on. 'Pressures to perform' lead to need for change.



### **Fujitsu's Timely Delivery and High-quality Service Enable Us to Have Faster ROI from SAP Implementation**

#### **Customer**

Ciracasindo Perdana has been dedicated to beverage system business for the last 20 years, dealing with the production and distribution of high-end beverages brands such as SUNFRESH Natural Fruit Juices, DOUWE EGBERTS Coffee and EQUAL Sweetener to entertain hospitality industry, including star hotels, restaurants, cafés, industrial catering, retail outlets like

*Contd...*

Hypermart, Carrefour, Ranch Market, Kem Chicks, etc. In addition, it supports beverages companies such as Arnott's, Garuda Food, Tang Mas, Orang Tua, etc. The company has wide-ranging products and packaging with about 150 items in total, and currently operates sales offices in 6 different regions from Jakarta to Ujung Pandang.

### Challenge

Ciracasindo has been applying business software system since 2003. As the company's business grows, the need for a more comprehensive set of enterprise resources planning (ERP) system increases. The current system cannot handle high capacity and the company's growing expectation due to it is limited capacity and non-integrated nature.

Furthermore, overcapacity in the current database system results in loss of valuable data. Adding more resources to operate and manage existing system has caused inefficiency and high cost. In overall, Ciracasindo has faced the risk of business disruption that will potentially hamper the company's effort to achieve goals and objectives. Then, a project was initiated with strategic objective to provide speedy and on-time reporting, increase data accuracy, and reduce resources. Ciracasindo opted for SAP to help it achieve these objectives. The company also expected an experienced partner to realize business improvement from SAP implementation in faster manner.

### Solution

Fujitsu provides Ciracasindo with SAP consultation and implementation services. Fujitsu Indonesia was selected amongst two other local vendors and a Singapore-based system integrator. "We take Fujitsu's vast experience and customer reference in implementing SAP projects into account. As a company, Ciracasindo and Fujitsu have a similar business, which will help understand our challenges and requirements," said Syarief Hubeis, Director PT Ciracasindo Perdana. "It turned out that Fujitsu's services have exceeded our expectation, as they have a solid, dedicated team, active participation, high curiosity and persistence to complete the job".

### Benefit Products and Services

- SAP implementation project was delivered in just six months, resulting in faster return-on-investment (ROI) from SAP implementation.
- Accurate data and speedy reporting that is really helping business users.
- SAP helps to reduce resource usage significantly up to 30%.
- Financial reports are ready at any time since the first day of the month.
- SAP Business One
- Fujitsu Consultation and Implementation Services

### Notes

*Contd...*

**Notes****Benefit**

Ciracasindo began the project with selection process in which it took no involvement from independent consultant. Hubeis noted that the spread and in-depth operation were really challenging during the selection of software system to support the overall management of the company.

“The speed, the accuracy and the cost of information become an essence.” The selection process took over one year, before management decided to embark on SAP Business One. “There were three candidates, but we selected SAP because it has already had many customer references and deep experience in the food industry,” explained Hubeis. “Considering the importance of SAP to our business, we need someone to implement the system as quickly as possible so we can soon experience the benefit.”

Several challenges during the project includes requirement to change coding on item codes and group, restructure the Chart of Account and improve business operation flow. Moreover, the project team has to deal with multi-location coordination. “With help from Fujitsu team, we succeed in managing these challenges and deliver the project quickly,” said Hubeis.

With the close collaboration between Ciracasindo and Fujitsu team, the SAP implementation project was delivered in just six months, from head office to branch offices. Hubeis noted the delivery time help Ciracasindo experience the benefit of SAP implementation sooner. “We now have accurate data and speedy reporting process that is really helping our business users. Additionally, we can also reduce resource usage significantly up to 30% and financial reports are ready since the first day of the month, every time.” In the future, Hubeis said Ciracasindo is planning to expand its SAP implementation to Inventory Management, particularly production scheduling, transportation between warehouse, control distribution and product expiration rate (shelf time) per lot. “We are looking forward to have Fujitsu as our reliable partner in this SAP journey. Fujitsu’s timely and quality service enables us to have faster ROI (return-on-investment) from SAP implementation.”

**Conclusion**

Ciracasindo’s business is growing faster than their existing system can handle. To cope with more complex operations and future business direction, the company requires major overhaul in their system and the more modern SAP was selected as Ciracasindo’s new business enabler. The company needed to implement complete range of SAP modules as quickly as possible to experience the business benefits sooner. As SAP Global Partner, Fujitsu was brought in to assist Ciracasindo with consultation and implementation services. Fujitsu’s deep expertise and vast experience help the project completed on time resulting in lower resources usage, better reporting and most important of all, faster ROI.

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“We are looking forward to have Fujitsu as our reliable partner in this sap journey”

Fujitsu will continue to support Ciracasindo in implementation of future.

### About Fujitsu

Fujitsu Indonesia was established in 1995 under the name of PT. Fujitsu Systems Indonesia. Headquartered in Jakarta and a number of service centers in Jakarta & Surabaya also more than 20 authorized service providers across Indonesia, Fujitsu Indonesia has a vision to become a leading provider in IT, communications and customer-focused business solutions.

### Questions

1. Analyse the case. What was the need for ERP?
2. How has it helped them?



1. The price of ERP implementation cannot be calculated on a flat rate basis like any other software available in the market.
2. Data migration is categorized as storage migration, database migration, application migration and business process migration. These scenarios are routine IT activities, and most organizations migrate data on a quarterly basis.

## SUMMARY

- The areas which are most likely to overrun the ERP budget are Training, Customization, Integration and testing, Data Conversion, Data Analysis, Consultants, Brain Drain (employee turnover), and Continuing Maintenance.
- Users are trained how to use an ERP system is a mix of technology, processes and domain area content in order to provide a context for the system. It is always better to train on the concepts first and then show the end users how to use the system.
- Data migration is the process of translating data from one format to another. Data migration is the process of moving required (and most often very large) volumes of data from existing systems to new systems.
- Vendors are the people who develop the ERP packages, they spend a large amount of time and effort in research and development to create the package solution that is flexible, efficient and easy to use.

## Notes

## Notes

- Business consultants are professional people who develop the different methods and techniques to deal with the implementation process and with the various problems that will be produced during implementation.
- Employees are the people who use the ERP system once it has been developed. Employees perform the functions, which are automated by the ERP system.

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## KEYWORDS

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**Data Migration:** Data migration is the process of translating data from one format to another. Data migration is the process of moving required (and most often very large) volumes of data from existing systems to new systems

**Customization:** Customization of ERP happens when one or more business process are easily not supported by ERP, and then you decide to make your own.

**Integration and Testing:** Integrating ERP with other enterprise software for making their potential use.

**Brain Drain:** ERP best used when staff supports. But there are chances it leaves due to change technology.

**Legacy Data:** It is a collection of the documents drawings and artefacts, which relates to historical background.

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## SELF-ASSESSMENT QUESTIONS

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### Short Answer Questions

1. What are the areas, which overrun the budget of ERP?
2. What is training?
3. Why is training important for ERP systems?
4. What are different types of training format available?
5. What is data migration?
6. Define vendors.
7. Define consultants.
8. What are the roles of vendors?
9. What are the roles of consultants?
10. Who are the end users of ERP packages?
11. Describe briefly vendor model of ERP.
12. Describe briefly consultant model of ERP.
13. What is the limitation of using consultants in ERP systems?
14. What is the most important task of data migration?
15. What are the two primary methods used for migrating data?
16. What should the training of the ERP module include first for better implementation of the processes?

**Notes**

17. How can we make migration strategy to export data to the new ERP system?
18. What does a vendor do if there is a gap between ERP package and actual business?
19. How can ERP consultants add value to the project?
20. What are the roles of employees in an automated ERP system?

**Long Answer Questions**

1. Some companies purchase ERP software to reduce their costs. But still they generally overrun with their budget. Explain the areas in detail where do the companies lack.
2. Explain the importance and process of training required in companies using ERP systems.
3. Why is ERP system important in migrating data from old to new systems? Explain the process.
4. Explain the vendor's model process with the help of diagram and examples.
5. Explain the consultant model diagram with the help of examples.
6. Differentiate between consultants and vendors.
7. Differentiate between vendors and end users.
8. Explain the relationship between consultants and the end users of ERP system.
9. Discuss the framework of ERP.
10. Discuss the people who are involved in implementation of ERP.

**FURTHER READINGS**

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# UNIT IV

## Notes

## LESSON 7 - POST-IMPLEMENTATION OF ERP

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7.2.8 Industrial Impact of ERP

Summary

Keywords

Self-Assessment Questions

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### LEARNING OBJECTIVES

After studying this lesson, you should be able to:

- Know how maintenance of ERP takes place
- Understand the Organizational and Industrial Impact of ERP

### LEARNING OUTCOMES

Upon completion of the lesson, students are able to demonstrate a good understanding of:

- how to do maintenance of ERP
- determine organizational and industrial impact of ERP

## Notes

- recall large organizations impact of ERP
- how to assign responsibility matrix
- explain crafting the project crew
- analyzing industrial impact of ERP

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## OVERVIEW

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In the previous lesson, you had studied about the ERP implementation, methodology and framework, training, data migration, people organization in implementation – Consultants, Vendors and Employees.

Maintenance is about changes which are to be made to the existing business processes. Such changes can be enhancements or improvements in functionalities of the processes in modern times; back-office automation has been revolutionized through ERP systems, inter-linking each and every operation of the company. Diversity and complexity of tasks can be reduced through the integration of ERP with several processes. In this way, management officials can monitor the significant performance of business concern and can check whatever updates have been made to the system. Organizations and industries installing ERP systems have made their functioning much easier as it reduces time and effort in handling huge volumes of multiple tasks.

In this lesson, you will learn about the maintenance of ERP and the organizational and industrial impact of ERP.

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## 7.1 MAINTENANCE OF ERP

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For smooth functioning, ERP system regularly needs maintenance. As per the changing situations in the organization, ERP plan needs thorough revision and update.

The review comments and recommendations should be included into the system. Also, ERP system requires effective tuning as the employees become familiar with it. When an ERP system reaches a stable state, considerable action should be taken for improving the performance.

Other areas which need maintenance are ERP tools. Regular contact is to be built by the project manager with the vendors in order to inspect whether any upgrades or updates are available. All patches and upgrades need installation in order to make sure that the tools are working at their maximum efficiency.

Maintenance of ERP systems involves the following:

- **Customization:** It means changes which are being made on ERP functionality in comparison to configuration switches.
- **Extension:** The changes which have been made through ERP system is present in

**Notes**

- ❖ *Custom-code “add ons”* – Sometimes, it is coded in a vendor based language such as SAP’s ABAP/4.
- ❖ *Third-party vendor “bolt-ons”*
- ❖ *Systems of legacy*
- **Modification:** Changes that have been made to the code of ERP itself either by the vendor or the user.



**Example:** Data maintenance through ERP with software to manage product, pricing and vendor data helps the companies in:

- ❖ Reducing business risk with the increase in accuracy and authenticity of business data.
- ❖ Strengthening the norms with constant, updated data and an audit trail for easy reporting.
- ❖ It is easy and quick to view and update price, costs, and margins for products to purchase, bought and sold.
- ❖ It arranges and view the requirements of customer and vendor data instead of IT requirements.



New fresher courses should be given time-to-time to employees on the new functionality that gets added with each new upgraded. The training documentation should be updated so that it should be in proper coordination with the procedures and processes.



### **Learning Activity**

Analyse the maintenance of ERP systems in Indian railways.

## **7.2 ORGANIZATIONAL AND INDUSTRIAL IMPACT OF ERP**

### **7.2.1 Large Organizations Impact of ERP**

Though there is no formal data available, going by market feel, there are as many (if not more) small and mid-sized companies that invest in ERP solutions as large corporations. More to the point is the fact that the investment in ERP systems as a percentage of annual sales is more or less constant, showing that smaller companies invest fewer rupees in installing ERP systems. The mid-sized customers have varied reasons for investing in ERP. Some of them are:

**Notes**

- Need to crash the 'order-to-cash' cycle time
- Need to optimise finished goods distribution
- Need to close the books in a stipulated time
- Need to give sales people accurate despatch information.

The common denominator there was that an ERP system linked the organisation and provided the capabilities to achieve business objectives. So, in actuality, there is no correlation between the size of an organisation and its readiness for an ERP system. Hence, it is not truly an impeding factor in so far as ERP systems penetration is concerned.

**7.2.2 Business Realization**

The pilot of the organisation i.e., the CEO, must insist upon benefits from the ERP team that would be felt as a onetime measure and those on a recurring basis. The costs of the entire initiative must also be calculated— on a capital and a revenue basis. The system must be positioned as a tool and an enabler to achieve organisational mission and objectives. These desired outcomes, in turn, should be articulated in a business case.



**Example:** A CEO should ask, during the course of project appraisal, the following questions for a clear understanding and communication of needs and expectations from the new proposed system:

1. Create a base case of annual savings from cost cuts that could be made without the ERP system in place.
2. Create an ERP case of annual savings that could be made with the ERP. This should include savings that do not depend on ERP.
3. Subtract the base case savings from the ERP case savings on an annual basis, (i.e., step 1 savings from step 2 savings) and calculate the NPV of the residual cash flow. A positive NPV will indicate that you should proceed with the deployment of the ERP.
4. If step 3 produces a positive NPV, conduct a sensitivity analysis to ensure that the business case is strong enough to withstand time overruns and cost overruns.
5. Back allocate all ERP system deployment costs to individual business units so that they can factor them into their planning. Ensure that each unit is held responsible for producing the promised results.

**7.2.3 Assigning Responsibility Matrix**

Getting an enterprise system up and running is only the beginning. To ensure that the system will meet the organisation's business objectives, the CEO and the apex management must establish key matrices and assign key process owners specific responsibility for achieving the benefits. The top management



## Notes

must also assign individual responsibilities for achieving the benefits. An organisation's motive could be achieving better quality (less scrap, fewer returns, lower warranty costs etc.). Others may set faster product development times, improved customer satisfaction, more accurate order fulfilment or faster delivery times as benefit goals.

|                                   |            |     |     |              |     |            |     |           |     |           |     |           |     |
|-----------------------------------|------------|-----|-----|--------------|-----|------------|-----|-----------|-----|-----------|-----|-----------|-----|
| 1. Government                     | Government |     |     |              |     |            |     |           |     |           |     |           |     |
| 1.1                               | 1.1        | 1.2 | 1.3 |              |     |            |     |           |     |           |     |           |     |
| 1.2                               |            |     |     |              |     |            |     |           |     |           |     |           |     |
| 1.3                               |            |     |     | Shareholders |     |            |     |           |     |           |     |           |     |
| 2. Shareholders                   |            |     |     | 2.1          | 2.2 |            |     |           |     |           |     |           |     |
| 2.1 Regular dividends             |            |     |     |              |     |            |     |           |     |           |     |           |     |
| 2.2 Long-term growth              |            |     |     |              |     | Executives |     |           |     |           |     |           |     |
| 3. Executives                     |            |     |     |              |     | 3.1        | 3.2 |           |     |           |     |           |     |
| 3.1 Low-cost/high-volume strategy |            |     |     |              |     |            |     |           |     |           |     |           |     |
| 3.2                               |            |     |     |              |     |            |     | Customers |     |           |     |           |     |
| 4. Customers                      |            |     |     |              |     |            |     | 4.2       | 4.3 |           |     |           |     |
| 4.1 Customers orders              |            |     |     |              |     | 3          |     |           | 2   |           |     |           |     |
| 4.2 Interchangeability            |            |     |     |              |     |            |     | 2         |     | Employees |     |           |     |
| 5. Employees                      |            |     |     |              |     |            |     |           |     | 5.1       | 5.2 |           |     |
| 5.1 Avoid last-minute scrambling  |            |     |     |              |     |            |     |           |     |           | 1   |           |     |
| 5.2 Overtime                      |            |     |     |              |     |            |     |           |     | 1         |     | Suppliers |     |
| 6. Suppliers                      |            |     |     |              |     |            |     |           |     |           |     | 6.1       | 6.2 |
| 6.1 Stable market for components  |            |     |     |              |     |            |     | 3         |     |           |     |           |     |
| 6.2 Low inventory requirements    |            |     |     |              |     |            |     | 2         |     |           |     |           |     |

Identify the stakeholders and their requirements. Use the genetic stakeholders' list and their requirements to help you think through the specific requirement areas of your specific stakeholders. This is just a starter list and is not intended to be all inclusive. Discuss these requirements with the members of your organization who face these issues in their own jobs. Compile and list all requirements in the vertical column of the matrix. Expand the list of requirements as needed.

Applying the matrix to hierarchy of stakeholder problems... the matrix will allow you to identify if, in a given situation, there are conflicts between the requirements of the various stakeholders. You can use the center section to evaluate each requirement against every other requirement and identify the severity of that conflict at the intersection of the two requirements. In the example, note that the customers' need for customized orders (4.1) conflicts strongly with the supplier's requirement for stable component orders (6.1); the three at the intersection of these requirements indicates a high level of conflict.

**Figure 7.1: Assignment Responsibility Matrix of a Company**

Apart from the hard benefits that he is likely to earn and a case for ROI, the top management should also look at the security of the investments and the rate of obsolescence. One cannot expect to be technology proof in the current state of technological boom, but, all the same one should ensure that it does not become a losing proposition either. One way to do it is by ensuring that the product in a few years will be supported by evolving standards, the technology upgradation and change management.



**Example:** A case in point is the argument on proprietary versus open systems. Selection of the IT framework, though highly technical and subjective must be delved into by the top management for a comfort on future investments (in the long-term). The CIO of the organisation should provide a clear IT strategy for the organisation to the top management.

**Notes****7.2.4 Approach Selection**

A very critical decision here is whether one should go the big-bang way or the incremental route. In weighing this, a lot has to do with culture and politics of the organisation. In some organisations, lots of small success is needed to build up the case. Here, the organisation might opt for the incremental approach. The consensus between the top management and the middle management is of utmost importance.

An issue that should be addressed early in the stages of the ERP initiative is the approach to BPR. The top team must understand that enterprise packages are customisable, but only within limits. The ERP applications already have a gamut of standard and best-practices incorporated by design. They also assume standardisation of business processes across the enterprise. A sound approach is to develop a philosophy at the outset of the project about the level of reengineering and package changes needed and then communicate that philosophy to the project team. The best known method is to reengineer processes concurrently with implementation, up to a point.

**7.2.5 Communication, Communication, Communication**

Deployment of the ERP is a tricky job as it involves a whole variety of people with different attitudes, all interacting or rather trying to communicate at the same time. A whole lot of personal goals surface during this period—



**Example:** For instance, operational and tactical staff, whose interests were earlier trampled by the IT staff, tries to settle scores. Hence, it becomes imperative that the key stakeholders in the initiative agree upon the project plan at the beginning of the project. The project plan should also clearly mention dates for steering committee meetings, etc. and these meetings must be used by the top management as a platform to communicate the original vision, the mission, the strategies and objectives of the project. Continuously re-emphasising the message helps in reducing the chances of “straying off” from the target objectives, as well as the target dates.

The success of the ERP initiative, on the softer side, can be attributed to two things. First, in all communications about the project, there is need of a practice of tying central messages and specific department objectives and needs back to the overall organisation. Second, a regular mix of efforts to include everything from conducting workshops, publishing newsletters and holding focus groups to organising lunch time discussions and traveling road shows; each designed to suit different stages across the implementation life cycle.

We should explicitly, candidly and constantly communicate the business case and realities, including goals, timetable and expectations. An organisation which implements ERP should have a well-laid out communications plan, even when the initial project charter is being discussed. The communications plan

**Notes**

should mention the message that needs to be transpired in a one-to-many matrix. A message can have more than one audience to be impacted. An audience could reap a set of benefits and a benefit could involve multiple risks. The time frame of the message to transpire should also be established in the matrix. This includes top down as well as bottom up information flow and communication channels.



Steering committee meetings are usually the starting point for the top down approach whereas brain storming sessions are of the bottom up approach. The execution and the timing of the communications plan are extremely important.

### 7.2.6 Crafting the Project Crew

Selecting the right project leader is as important as selecting the right product. Core team leadership is a full time assignment. Team leader is like an engine of the train who should know the business well and have across functional experience. He should also be politically savvy, have credibility within the organisation and be a good communicator and of course, be from the functional side of the business and not the hard-core IT manager.

The members must have some cross-functional knowledge. Creative thinking must be an integral part of the member's thinking curriculum. The member must have some benchmarking experience and above all, must be a team player and participant who know the rules of the game.

A lot of good and creative people don't like to be pulled out of their jobs to serve on an ERP team. The challenge is to convey not only how important the team's work is to the company but the invaluable career enhancement benefits that accrue to each member as a result of his involvement. If attracting the best and brightest people in the organisation to the team is important to successful implementation, so are their motivation and their retention.

### 7.2.7 Change Management

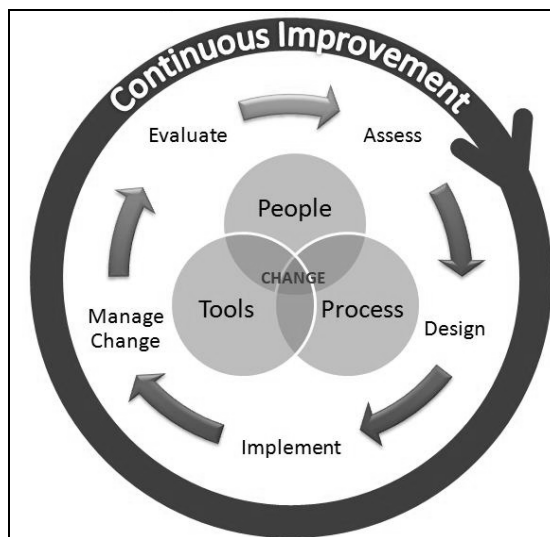
The enterprise systems are all about the enterprise and not about systems. So, a top management leader can play a critical role in effective change management and implementation of an enterprise system. However, a lot of people feel that the chief executive officer isn't always the best choice.



The higher up the organisation we go, the more risk we run that the champion's involvement will be delegated.

## Notes

An executive who delegates leader's role won't be seen as a winner. The support of a leader doesn't replace the need to sell to other members of top management the benefits of the system. It has to be done early and often by using multiple approaches. All senior managers in the organisation should be able; not only to support the enterprise system project, but also to pass what one executive dubbed 'the elevator test'. In the time it would take to reach the 10th floor, every manager should be able to clearly explain to any employee who asks (as they enter the elevator on the ground floor) why the organisation is doing what it is doing. The explanation provided must be reasonably consistent across the organisation. Every employee in an organization needs to evaluate, assess, design, implement and manage the changes made in people, processes and systems tools in every department.



**Figure 7.2: Change Management Model of an IT Company**

Because of the large range and magnitude of alterations that are required, ERP demands fundamental shifts in assumptions, beliefs, day-to-day behaviours and positive attitudes throughout the organisation. For many organisations, the level of centralisation required to standardise operations comes as a surprise. For others, the biggest leap is the necessity for each person to have a basic understanding of the overall organisational system rather than just their piece of it. In each case, organisations find that just as they begin to address the demands they anticipated, they are engulfed by a second wave of implications that they had not anticipated.

Unless the organisation is prepared to come to a dead stop while putting the new system in place, people must maintain performance levels while preparing to shift to the new system. The level of effort required continues to escalate throughout the process and typically does not diminish for a substantial period after the conversion.



When the demands are placed on top of an already-high workload, the resulting strain leads to decreased output, increased turnover, delays in work in process and negative attitudes towards the organisation

## Notes

If issues related to increased workload are not managed effectively and resistance is driven underground, the resulting problems can be very costly to the organisation in terms of quality and productivity.

### 7.2.8 Industrial Impact of ERP

It's the company that can partner with the customer to determine what to offer and then use its manufacturing and operational strengths to offer it better and faster than its rivals.

#### *Customer Focus*

Four elements compose customer synchronised resource planning (CSRP). Optimise Operations: CSRP begins with efficient execution of Enterprise Resource Planning (ERP), particularly in two critical areas.

First, ERP is a framework and proven set of tools that tightly integrates the core execution operations of the enterprise. It establishes a systematic, measurable methodology. This is critical and powerful to CSRP, because once a business methodology is defined; process improvements can be identified, executed and repeated on a predictable basis.

Second, if ERP make-to-order manufacturing applications are implemented, the required procedures are in place to manufacture customised products. Providing cost-effective, customised solutions is a critical component of CSRP.

#### *Customer Organisation Relationship*

This is the heart and breakthrough element of CSRP. Synchronising an organisation's customers and customer-centric departments with its resource planning and execution provides the ability to achieve long-term competitive differentiation. It allows manufacturers to move beyond how to manufacture, to understanding what products to make, what services to offer and how to provide customised product offerings. Why are manufacturers not currently customer-synchronised or customer-focused? Customer information and knowledge is not integrated with mainstream business planning systems. There is no concrete and actionable way to move customer knowledge effectively throughout the organisation.

The judgement on what is truly required — what works and what doesn't — exists with the customer.

Coupling this information tightly with production and fulfilment is paramount.

**Notes*****Open Technologies***

Fifteen years ago, mainframe and host-based technologies were in their prime. Machine requirements drove software development. In 1980s, application developers began using new operating systems that could scan multiple hardware environments. The age of UNIX and open solutions began. Today, with the proliferation of PCs, manufacturers can quickly and costs effectively introduce new technologies and applications to satisfy broad based needs.

The obvious next step is to open systems and latest technologies to integrate and combine departmental information so that the development of strategic initiatives like CSRP is actionable, repeatable and affordable. This necessitates a move away from proprietary systems, including proprietary ERP solutions.

***Matching Customer Needs***

This is the payoff! Once the organisation has optimised operations, integrated the customer, implemented open technology architecture and refocused on customer driven operations, a virtual organisation exists. Answering the customer-focused questions posed earlier becomes easy now. What products do my most profitable markets want? I know this, so I track it, act on it and focus on it in every department.

How do I make products and services more profitable? My customer service, marketing, sales, R&D, finance and field service departments know what the customers want the most. They design, build, reengineer or partner with suppliers to offer profitable, customised offerings. My infrastructure makes this possible.

***Learning Activity***

Analyse the ERP implications of any IT industry of your own choice.

**Impact of ERP Software at a renowned International Food Products Company in India****Client Introduction**

The Client is an Indian subsidiary of a renowned international Food Products Manufacturer Company. The company has focused to serve the new generation with its varied range of food products. Company uses the technology of its parent company for manufacturing of its products. They are solely responsible for Sales & distribution of their Products across India through a C&F set up.

*Contd...*

### Need for an ERP

Earlier the Client was using an outsourced network for Sales and Distribution of their Products in India. They always had a great control over the quality of their products but had little control over their distribution network. That was the reason behind their strong willingness and objective to start their own sales and distribution channel and manage it using an integrated ERP system. With its own Sales network, they would have better control on Sales related information based on which better forecasts and fulfilment can be achieved. However to manage this vast distribution network they needed an ERP with complete integration of back-end processes.

Before ebizframe was implemented they were using well-known software for Accounts and Sales related activities to maintain their own records. But the software was not able to meet their needs. The Procurement, HR/Payroll, Production planning and Control and some of the other activities were mostly manual. It was a tedious job for them to perform month end related all activities such as Sales analysis, Sales closing, Salary processing etc. Even the material procurement to meet on-time requirements of the production department was getting increasingly difficult with the growth in Business.

### Benefits Achieved

After implementation of ERP Software in India, Client has got very good control on its Sales and Distribution operation along with the Backend operation at Plants and offices. The Servers are hosted at their Head office and their entire distribution channel and their other offices access the software over a secure VPN. This helps provide completely online information on their Sales and Distribution operations at any point of time. The system is also accessed online by the factory resulting in increased coordination between the Sales and the Manufacturing operations. The Stock Transfer cycle has been completely automated. Definition of Credit Controls have helped control receivables and helped achieve better Credit management. Now the Receipts of Leakage and Damaged (L&D) stocks are well controlled so as to have accountability of even single unit of product.

Overall ERP Software has helped company in India to streamline its operations and manage it from a Central Location. The information from Operations required by the decision makers was available to them at their fingertips. The software helped the company manage their Sales and Distribution operations better by quickly providing the vital information and analytics to the Senior and Top Management. Better control on the inventory, purchase and production processes helped the client improve the coordination between the Sales and Manufacturing and also helped cut down the inventory and order processing significantly.

### Notes

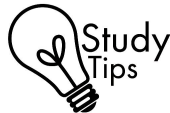
*Contd...*

## Notes

### Questions

1. Discuss the problems faced by the client before the installation of ERP systems.
2. Explain the after-effects of ERP on the client's functioning system.

**Source:** <http://www.essindia.com/about-us/resources/181-implementation-of-ebizframe-erp-at-a-renowned-international-food-products-company-in-india->



1. Customer synchronised resource planning integrates this critical customer information directly into the manufacturer's planning and delivery processes, shifting the focus of the enterprise from production planning to customer planning.
2. Change management is the process, tools and techniques to manage the people side of change to achieve the required business outcome.

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## SUMMARY

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- For smooth functioning, ERP system regularly needs maintenance. As per the changing situations in the organization, ERP plan needs thorough revision and update.
- Maintenance of ERP systems consists: customization, extension and modification.
- The investment in ERP systems as a percentage of annual sales is more or less constant, showing that smaller companies invest fewer rupees in installing ERP systems.
- The pilot of the organisation i.e., the CEO must insist upon benefits from the ERP team that would be felt as a onetime measure and those on a recurring basis. The costs of the entire initiative must also be calculated—on a capital and a revenue basis. The system must be positioned as a tool and an enabler to achieve organisational mission and objectives. These desired outcomes, in turn, should be articulated in a business case.
- To ensure that the system will meet the organisation's business objectives, the CEO and the apex management must establish key matrices and assign key process owners specific responsibility for achieving the benefits. The top management must also assign individual responsibilities for achieving the benefits. An organisation's motive could be achieving better quality (less scrap, fewer returns, lower warranty costs etc.).
- The enterprise systems are all about the enterprise and not about systems. So, a top management leader can play a critical role in effective change management and implementation of an enterprise system.



**Notes**

- It's the company that can partner with the customer to determine what to offer and then use its manufacturing and operational strengths to offer it better and faster than its rivals.
- Synchronising an organisation's customers and customer-centric departments with its resource planning and execution provides the ability to achieve long-term competitive differentiation.

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**KEYWORDS**


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**Maintenance of ERP:** For smooth functioning, ERP system regularly needs maintenance. As per the changing situations in the organization, ERP plan needs thorough revision and update.

**Steps in maintenance of ERP:** Maintenance of ERP Systems consists: customization, extension and modification.

**Large organization impact of ERP:** The investment in ERP systems as a percentage of annual sales is more or less constant, showing that smaller companies invest fewer rupees in installing ERP systems.

**Business Realization:** The pilot of the organisation i.e., the CEO must insist upon benefits from the ERP team that would be felt as a onetime measure and those on a recurring basis. The costs of the entire initiative must also be calculated— on a capital and a revenue basis. The system must be positioned as a tool and an enabler to achieve organisational mission and objectives. These desired outcomes, in turn, should be articulated in a business case.

**Assigning Responsibility Matrix:** To ensure that the system will meet the organisation's business objectives, the CEO and the apex management must establish key matrices and assign key process owners specific responsibility for achieving the benefits. The top management must also assign individual responsibilities for achieving the benefits. An organisation's motive could be achieving better quality (less scrap, fewer returns, lower warranty costs etc.).

**Change Management:** The enterprise systems are all about the enterprise and not about systems. So, a top management leader can play a critical role in effective change management and implementation of an enterprise system.

**Industrial Impact of ERP:** It's the company that can partner with the customer to determine what to offer and then use its manufacturing and operational strengths to offer it better and faster than its rivals.

**Customer-Organizational Relationship:** Synchronising an organisation's customers and customer-centric departments with its resource planning and execution provides the ability to achieve long-term competitive differentiation.

**Notes**

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**SELF-ASSESSMENT QUESTIONS**

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**Short Answer Questions**

1. “For smooth functioning ERP system regularly needs maintenance”. Discuss.
2. Describe the steps for maintenance of ERP systems.
3. What is customization?
4. Define ‘extension’ as a maintenance part of ERP.
5. Define ‘modification’ as a maintenance part of ERP.
6. State an example of maintenance of ERP.
7. Explain the large organization impact of ERP.
8. What is business realization in context to ERP?
9. Give one example of business realization in relevance to ERP.
10. How responsibility matrix is assigned in context to organizational impact of ERP?
11. What is the approach selection of organization for ERP?
12. State the impact on communication through ERP.
13. “Selecting the right project leader is as importance as selecting the right product”. How it can be done through ERP?
14. How change management takes place through ERP?
15. What do you mean by industrial impact of ERP?
16. How do industries focus on customers with the help of ERP?
17. State the customer-organization relationship in context to ERP.
18. Describe open-technologies in context to ERP.
19. How customer needs are matched with the help of ERP?
20. Define customer synchronized resource planning (CSRP).

**Long Answer Questions**

1. How maintenance of ERP takes place? Explain the steps involved with examples.
2. “Though there is no formal data available, going by market feel, there are as many (if not more) small and mid-sized companies that invest in ERP solutions as large corporations”. Discuss the organizational impact of ERP.

**Notes**

3. “The pilot of the organisation i.e., the CEO must insist upon benefits from the ERP team that would be felt as a onetime measure and those on a recurring basis”. Explain business realization with examples.
4. How assignment of responsibility matrix takes place with the help of ERP?
5. What kind of approach selection do the organizations use for ERP?
6. “Deployment of the ERP is a tricky job as it involves a whole variety of people with different attitudes, all interacting or rather trying to communicate at the same time”. How communication takes place in the organization with the help of ERP?
7. How project crew is selected in organizations with the help of ERP?
8. “The enterprise systems are all about the enterprise and not about systems”. Explain change management in organizations in context to ERP?
9. Describe the role of open technologies in context to ERP.
10. Explain the industrial impact in context to ERP with examples.

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**Notes**

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## **LESSON 8 - SUCCESS AND FAILURE OF ERP IMPLEMENTATION**

### **CONTENTS**

Learning Objectives

Learning Outcomes

Overview

8.1 Successful Factors of ERP Implementation

8.1.1 Integration is the Key to ERP

8.1.2 ERP Improves Productivity

8.1.3 Services Provided at the Time of Implementing ERP System

8.1.4 Advantages of ERP Systems

8.1.5 Benefits of an ERP System in an Organization

8.1.6 Industry-wise Advantages

8.1.7 Advantages in Different Departments of a Corporate Entity

8.1.8 Other Benefits of the ERP System

8.1.9 ROI and Cost Savings

8.2 Failure Factors of ERP Implementation

Summary

Keywords

Self-Assessment Questions

Further Readings

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### **LEARNING OBJECTIVES**

After studying this lesson, you should be able to:

- Gain knowledge about the Successful Factors of ERP Implementation
- Understand the Failure Factors of ERP Implementation

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### **LEARNING OUTCOMES**

Upon completion of the lesson, students are able to demonstrate a good understanding of:

**Notes**

- explain successful factors of ERP implementation
- list out advantages of ERP systems
- identifying benefits of an ERP system in an organization
- determine advantages in different departments of a corporate entity
- explain failure factors of ERP implementation

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**OVERVIEW**

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In the previous lesson, you had studied about the maintenance of ERP, organizational and industrial impact relating to ERP.

Success of any organization or corporate entity depends on the proper integration of all the business processes. Timely flow of necessary information at required destination is a sure shot way of achieving success. Productivity will only be improved when business processes are streamlined as well as corporate employees in effectively handling it. In absence of any factor of ERP implementation, leads to failure of any processes involved.

In this lesson, you will learn about successful factors of ERP implementation and failure factors of ERP implementation.

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**8.1 SUCCESSFUL FACTORS OF ERP IMPLEMENTATION**

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Here, we will be discussing several factors determining success of ERP implementation.

**8.1.1 Integration is the Key to ERP**

Integration is an extremely important part to ERPs. ERPs main goal is to integrate data and processes from all areas of an organisation and unify it for easy access and work flow. ERP usually accomplishes integration by creating one single database that employs multiple software modules providing different areas of an organisation with various business functions.

***Ideal ERP System***

An ideal ERP system is when a single database is utilized and contains all data for various software modules.

These software modules can include:

- **Manufacturing:** Some of the functions include; engineering, capacity, workflow management, quality control, bills of material, manufacturing process, etc.
- **Financials:** Accounts payable, accounts receivable, fixed assets, general ledger and cash management, etc.
- **Human Resources:** Benefits, training, payroll, time and attendance, etc.

**Notes**

- **Supply Chain Management:** Inventory, supply chain planning, supplier scheduling, claim processing, order entry, purchasing, etc.
- **Projects:** Costing, billing, activity management, time and expense, etc.
- **Customer Relationship Management:** Sales and marketing, service, commissions, customer contact, calls centre support, etc.
- **Data Warehouse:** Usually, this is a module that can be accessed by an organisation's customers, suppliers and employees.

**8.1.2 ERP Improves Productivity**

Before ERP systems, each department in an organisation would most likely have their own computer system, data and database.

Unfortunately, many of these systems would not be able to communicate with one another or need to store or rewrite data to make it possible for cross computer system communication. For instance, the financials of a company were on a separate computer system than the HR system, making it more intensive and complicated to process certain functions.



With the ERP system in place, all the aspects of an organisation work in harmony instead of every single system needing to be compatible with each other. For large organisations, increased productivity and less types of software are a result.

**8.1.3 Services Provided at the Time of Implementing ERP System**

There are three types of professional services that are provided when implementing an ERP system; they are Consulting, Customization and Support.

- **Consulting Services:** Usually consulting services are responsible for the initial stages of ERP implementation, they help an organisation go live with their new system, with product training, workflow, improve ERP's use in the specific organisation, etc.
- **Customization Services:** Customization services work by extending the use of the new ERP system or changing its use by creating customized interfaces and/or underlying application code.

While ERP systems are made for many core routines, there are still some needs that need to be built or customized for an organisation.

- **Support Services:** Support services include both support and maintenance of ERP systems.



**Example:** Troubleshooting and assistance with ERP issues

## Notes

### 8.1.4 Advantages of ERP Systems

There are many advantages of implementing an ERP system; here are a few of them:

- A totally integrated system
- The ability to streamline different processes and workflows
- The ability to easily share data across various departments in an organisation
- Improved efficiency and productivity levels
- Better tracking and forecasting
- Lower costs
- Improved customer service

### 8.1.5 Benefits of an ERP System in an Organization

- It can reach more vendors, producing more competitive bids and widening participation in government contracts, lowering the cost of products and services purchased.
- Significant paper and postage cost reductions as part of the yearly savings.
- Faster product/service look-up and ordering, saving time and money.
- Automated ordering and payment, lowering payment processing and paper costs
- Fast access to detailed account histories, providing more abundant information and improved planning and analysis
- Ability to distribute, receive an award contracts out for bid much faster.



Wider participation by city purchasing entities, multiplying cost savings and management improvements, and offsetting system operation costs are also the benefit of an ERP System in an organization.

### 8.1.6 Industry-wise Advantages

Manufacturing Sector ————— Speeding up the whole process.

Distribution and retail Stores ————— Accessing the status of the goods

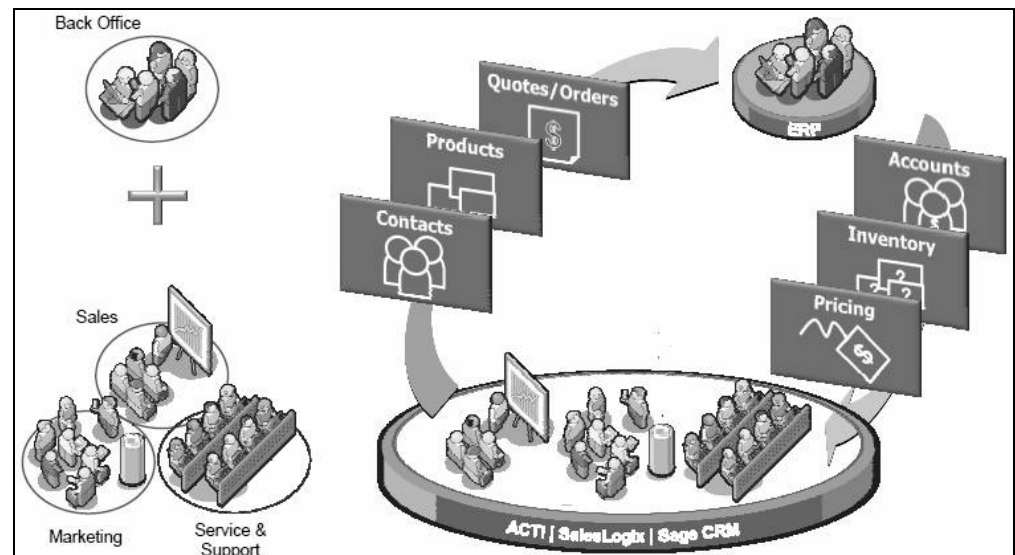
Transport Sector ————— Transmit commodities through online transactions.

Project Service industry ————— Fastens the compilation of reports.

## Notes

**8.1.7 Advantages in Different Departments of a Corporate Entity**

- The accounts department personnel can act independently. They don't have to be behind the technical persons every time to record the financial transactions.
- Ensures quicker processing of information and reduces the burden of paperwork.
- Serving the customers efficiently by way of prompt response and follow up.
- Disposing queries immediately and facilitating the payments from customers with ease and well ahead of the stipulated deadline.



**Figure 8.1: CRM-Front Office and Back Office Integration**

- It helps in having a say over your competitor and adapting to the whims and fancies of the market and business fluctuations.
- The swift movement of goods to rural areas and in lesser known places has now become a reality with the use of ERP.
- The database not only becomes user-friendly but also helps to do away with unwanted ambiguity.
- In short, it is the perfect commercial and scientific epitome of the verse "Think Local. Act Global".
- ERP helps to control data and facilitates the necessary contacts to acquire the same.



### 8.1.8 Other Benefits of the ERP System

### Notes

- Real time information throughout entire company.
- Better visibility into the performance of operational areas.
- Data standardization and accuracy across the enterprise. Single version of “The Truth!”
- Best-practices or proven methodologies are included in the applications.
- Creates organisational efficiencies.
- Allows for analysis and reporting for long-term planning.

### 8.1.9 ROI and Cost Savings

Here are some areas to look for possible ROI:

- Reduce Inventory through better visibility and efficiency.
- Savings through the reduction in duplicated efforts.
- Reduction in non-value added activities (lean processing).
- Higher utilization of employees (less transactional, more analytical).
- Improvement in decision-making through more accurate and real-time data.



**Example:** Following are some successful cases of ERP implementation:

#### ***FedEx Air Company (FedEx)***

##### *Company Profile*

FedEx air company (FedEx Express), is known as the world’s largest Express company, located in 220 countries and regions for providing fast, reliable and timely Express transportation service. The package delivery of FedEx on each working day accounts to more than 3.2 million in the world with more than 138000 employees and 50000 delivery points, 671 aircraft and 41000 vehicles. The company is operated globally through the FedEx Ship Manager at Fedex.com for making close proximity with its more than 100 customers via electronics communications link. The total turnover turns out to be US \$ 29 billion in 2004.

##### *ERP Implementation Situation of FedEx Air Company*

The provision of already used modules by the Oracle of ERP products includes PeopleSoft asset management, accounting general ledger management, financial management, human resources management, electronic procurement, spending report, inventory management, project cost accounting and many other. The company began implementing the PeopleSoft accounting general ledger and asset management module in the year 1997. There was a major upgradation after two years and in 2004, there were 12 PeopleSoft modules in the whole system. Similar examples were to be seen at FedEx’s domestic and international operations, cooperation services and transportation. At present there are more than 20000 users of Fedex.

**Notes*****Del Monte Foods Company******Company Profile***

Del Monte Foods, headquartered in San Francisco is a famous canned fruits and vegetables enterprise distributors. It operates through 8500 full-time employees and has more than 9800 seasonal part-time employees in its locations at America, South America, Canada, Mexico and the Philippines. It recorded its total turnover of US \$3 billion in 2004.

***ERP Implementation Situation of Del Monte Foods Company***

The company is an adopter of SSA Provider of ERP products. Since 2003, Del combined itself with the food companies when after several small companies started implementing their ERP Systems based on IBM AS / 400 server and DB2 database of the first instances. It then replaces the in different operating platform systems before the operation of the old system. The number of users accounts to more than 1200 in today's times.

***DaimlerChrysler (DaimlerChrysler)******Company Profile***

In July 1998, the merger of companies with the German Daimler Chrysler came into existence. In November 1997, the merged company of New York's stock got listed in Frankfurt, Germany. Pre-merger was seen as Daimler company to be a manufacturer of the world's senior cars and the market leader of supplying 6 tons trucks. The three large car company of Chrysler in the United States were ranked third, in the minivan market leading position. Employing 384723 people, the combined company is considered to be the world's third largest car manufacturer in the world. The total turnover of 142.1 billion euros were recorded in 2004.

***ERP Implementation Situation of DaimlerChrysler***

With the adoption of SAP ERP products, the company proposes for the implementation of other modules including finance, manufacturing and logistics management. Before and after 1998, the German Daimler Chrysler before its merger have implemented R / 3 financial management module. Post-merger, this module is still in use independently. In 2002, the Mercedes started separating the implementation of SAP manufacturing and logistics module and the division of the 100 a SAP module which accounts to more than 320 installation points, including 11 countries of Asia with a SAP. Afterwards, they are still in the promotion of their ERP SAP modules in 15 European countries, in which many of them are using SAP R / 3 module. The number of users, at presents accounts to more than 50000 worldwide

## Colgate-palm Company (Colgate-Palmolive)

## Notes

### Company Profile

Colgate-palm is one of the world's top consumer products company situated at New York, USA,. It has a wide presence in more than 200 countries with regions setting up their branch companies or offices. It comprises of a total of 40000 employees. The company has a wide presence in oral care, personal care, household care and pet food service providers ensuring a high quality for its consumers. Some of the most familiar global famous brands to the consumers are Colgate, palm, clean teeth white, Ajax, Protex, Fab, Irish Spring, Mennen and Science Diet, and so on. Since, 1930s the company has its presence in several European countries and the seeks for continuously to foreign business expansion. By the end of 2003, it proposed to file for its operations in 70 countries around the world. An annual turnover of US \$10.6 billion was recorded in 2004.

### ERP Implementation Situation of Colgate-palm Company

An adopter of SAP ERP Systems, Colgate company has implemented successfully its modules including supply chain management, customer relationship management, supplier relationship management, human resources management, financial management, integrated application, order processing procedure management, materials management, production management list, self-service and other employees. The company's ERP implementation which was started in 1996 had already completed 2 times overall upgradation. Currently, it includes the SAP R / 3 series, mySAP senior schedule plans and optimization, CRM, SAP portal and mySAP Business Warehouse (Business Warehouse). They are in Europe, North America, South America, South Asia Pacific with its branches. The Hill Science Diet brands have implemented the R / 3 series. Further, the global human resources management got implemented and SAP business warehouse at present holds more than 6 TB storage (note: 1 TB is equivalent to 1024 GB) customer data. Currently, there are more than 15000 customers using ERP systems.



### Learning Activity

Analyse the successful factors of ERP implementation in any organization of your choice.

## 8.2 FAILURE FACTORS OF ERP IMPLEMENTATION

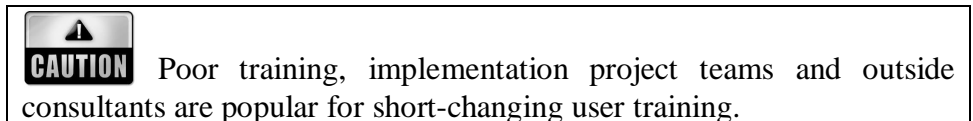
ERP implementation fails to meet the business objectives.

1. Failure in cross-representation agreement on enterprise based business processes. For working on a common information system across the organization, all users across the organization must adopt, abide and support common work methods backed up by the application. Any

**Notes**

departmental line of business which prefers not to conform, stress politics over process or get involved in sub-optimization becoming the weak line which in turn break the chain and delivering the enterprise-wide system ineffective.

2. Shortfall of visible, vocal and meaningful executive sponsorship. While there aren't many projects without executive sponsors anymore, there are ineffective executive sponsors in abundant. Executive sponsors cannot side-line themselves; they must surely, vocally and actively describe leadership, dedicated to the project and support of project team members at every step. They must quickly involve themselves to resolve troubles and master the projects for taking it forward.
3. Lack of formal and disciplined project management. The execution of a mission critical business system is not the time for pointing out the project management for the first time. Experienced project managers pulling their skills, their experience and a proven project management discipline in order to lead projects as per the plan and towards predicted success.
4. Estimating team-turnover of core staff. Losing an executive sponsor or project manager can obstruct the progress of a project. Losing these roles multiple times or replacing lost roles with less capable replacements lead to increase in risk and disrupt loss on the project.
5. Inability to identify and lowering the risks or remedy incidents which in turn expand. Project risks and red flags normally result throughout the project, however, if the project manager or project team don't notice or act upon these issues until last of the project duration. The obstacles often surmount and become ever more difficult to resolve.



6. At the time of cost cutting sessions, training is one of the first tasks to do. No one should fall into these traps. Training is essential to pull the system capabilities and realize the potentials. Training updates in at least short bursts are suggested after every new session upgrade.
7. Perturbed user adoption. There are few systems that advocates with the execution of a new information system and getting users who accept a new system is a big challenge. Clubbing the normal anxiety linked with change along with an ignorance for the new system and a nervousness from only finishing a minimal training program and user fears can heighten if not proactively grounded. Not only there are user fears to change in but at times the new system doesn't get tuned to mature like the previous system so users sometimes feel as though they are initially taking a step backward. Proactive change management is the best instrument to direct user adoption challenges.



There is too much customization of software. For many companies the ERP software is seen as too rigid or restrictive.

## Notes

8. For answering to a lack of anticipated flexibility by customizing the software before thorough investigating re-configuration options, business process work around or an interim trial period before dedicating to customization can breach the integrity of the software, delay project progress, resulting in heavy costs and levy significant risk for success of the project.
9. Project is seen in terms of "IT" project. Business system implementations should be initiated and driven by business leaders. While IT resources are, in clear terms, core participants, ERP systems should not be seen as IT projects.
10. Not a main cause for project failure, delays in project also happens due to dirty data. Many organizations do not set ample of time for data cleaning and are not receptive of their poor data quality until they extract that data for import into the new system. There is a delay that happens close to the beginning of the implementation project, many a times lies on a serious path and therefore many a times pushes back all other tasks for the remainder of the project.



**Example:** Following are some failure cases of ERP implementation:

### ***Hershey's Blunder***

#### ***Company Background***

The chocolate business which was started by Mr. Milton S. Hershey in 1876 and the Hershey Company got established in 1894. It is known to be one of the leading manufacturers of chocolates in North America. It's sales accounts to roughly 80% chocolates and 20% non-chocolates and its competitors include Mars, Nestle, Russell Stover, Palmer and Nabisco.

#### ***ERP Implementation***

- Hershey's management gave approval to a project named Enterprise 21 during late 1996.
- For managing integration among three systems, Hershey selected SAP's R/3 ERP software, Manugistic's SCM Software and Seibel's CRM Software and IBM Global Service.
- The costing for overall projects were US 410 Million.
- The implementation time was recommended for the project was 4 years and Hershey requested for 2.5 years because of impending Y2K problem.

## Notes

- Instead of phased approach, Hershey decided to go with Big Bang Approach

### *Impact of Hershey's ERP Failure*

- As Hershey could not be able to fulfil its committed date of delivery, problems relating to order fulfilment, processing and shipping started occurring.
- Several distributors of Hershey who had ordered the products could not supply them to the retailers in time thereby, losing their credibility in the market.
- Product inventory lot had got accumulated and by the end of September 2000, the inventories were 25% more than the inventories during previous year.
- After Hershey's announcement in the market relating to problems occurred due to breakdown of the newly installed computer systems, Hershey's stock price got plunged by 8% within a single day.
- Failure of Hershey for implementing the ERP Software in time costed the company US \$ 150 million in sales. In 1999 annual report, it was shown that the profits for the third quarter 1999 dropped by 19% and sales declined by 12%.

### *Reasons of Hershey's ERP Failure*

- Implementation schedules were over-squeezing
- Big-Bang Approach was selected instead of Phased Approach
- It committed mistake to sacrifice systems testing for the sake of expediency.
- There were cut-over activities and Going-Lines were scheduled in course of the busiest business periods of Hershey.

### *Nike's Supply Chain Issues*

#### *Company Background*

Nike is an American multinational corporation that is involved in the design, development, manufacturing and worldwide marketing and selling of footwear, apparel, equipment, accessories and services. It was founded in January 25, 1964 as "Blue Ribbon Sports" by Bill Bowerman and Phil Knight with its headquarters situated near Beaverton Oregon, in the Portland metropolitan area. The company is known as one of the world's largest suppliers of athletic shoes and apparel and is a major sports equipment manufacturer with revenue in excess of US \$24.1 billion in its fiscal year 2012(ending May 31, 2012).

**Notes*****Implementation of Nike's ERP***

Nike had implemented a new demand-planning software solution without testing it and everything went wrong.

***Reasons for Nike's ERP Failure***

- Nike had spent \$400 million dollars for updating their supply chain system and ERP implementation dated back in 2000 and 2001.
- They got 20 percent dip in their stock, \$100 million dollars in lost revenues and a countless of class action lawsuits which came out to be a sudden shock for the Nike company.

***Impact for Nike's ERP Supply-chain Failure***

- Instead of helping Nike to match their supply with demand and contracting their sneaker manufacturing cycle. The resultant was that they ended up ordering low-selling sneakers rather than high demand ones leading to collapse of their supply chain.

***Hewlett Packard's Disaster******Company Background***

Hewlett-Packard company or HP is an American multinational information technology corporation having its headquarters in Palo Alto, California, United States. It was founded in January 1, 1939 by William Bill Redington Hewlett and Dave Packard. It offers hardware, software and services to consumers, small & medium sized businesses (SMBs) and large enterprises including customers in the government, health and education sectors.

***Implementation and Reason for Failure of Hewlett Packard's ERP Systems***

The company had installed smaller ERP systems integrating other systems across North American divisions into a single centralized ERP Systems.

***Impact for Failure of Hewlett Packard's ERP Systems***

Integrating all the North American divisions into a single centralized system costed heavily to the company \$160 million dollars in backlogged orders and lost revenues which stood out to be more than five times what the project was estimated to cost in 2004.

***The US Navy's \$1 Billion Dollar Blunder******Implementation of the Navy's ERP Systems***

The company had installed four different ERP pilot projects since 1998 and these were based on SAP AG Software.

**Notes***Reasons for Failure of United States Navy ERP Systems*

The incompatibility and redundancy of all the four systems installed by the company failed to fulfil the requirements of the Navy.

*Impact of Failure of United States Navy ERP Systems*

Major investment of \$1 billion dollars into four different ERP pilot project systems got wasted. The only cost of money spent on purchasing the programs came under the history of ERP implementation failures.

**Learning Activity**

Analyse the failure factors of ERP implementation in any organization of your choice. Discuss the improvement strategy in their processes.

**HP ERP Failure****Introduction**

- When HP announced that their revenue for 3rd quarter from its Enterprise Servers and Storage (ESS) segment had gone down by 5% to \$3 bn.
- Reasons stated for the downfall was due to migrating to a centralized ERP in one NA division.
- Total financial impact of the failure was around \$160 million
- This loss was more than 5 times the cost of implementing ERP.

**Background**

- HP is an American multinational corporation headquartered in Palo Alto, California, US.
- Provides products, technologies, software, solutions and services to consumers including government, health and education sectors.
- Stanford engineers Bill Hewlett and David Packard started HP in California in 1938 as an electronic instruments company
- First product was a resistance-capacity audio oscillator, an electronic instrument used to test sound equipment.

**ERP Implementation**

- HP implemented mySAP ERP
- HP started their migration of data with SAP into mySAP ERP.

*Contd...*



**Notes**

- After two months, the result of the migration had decreased revenues
- SAP had already roll out the application 4 times and this roll out was number 5
- Gilles Bouchard became the CIO and Executive Vice-president (EVP) of global operations at HP. He was made responsible for both the supply chain and ERP software implementations.

**Reasons of Failure**

- HP revealed that there was execution problem and there was no fault of SAP in it.
- There were small technical glitches but the main issue was contingency planning, which was not addresses properly.
- The other issues were like:
  - ❖ Data Integration Issues
  - ❖ Demand Forecasting Problems
  - ❖ Poor planning and Improper Testing

**Impact of ERP Failure**

- The ESS divisions order system became unstable due to problems with data integrity and a simultaneous increase in demand for HPs Standard Servers.
- This technical glitch led to improper routing of orders and caused backlogs to escalate
- Analysts commented that the Companies culture did not support the much active involvement of employees also Co. ignored valuable suggestion from employees.
- Many Vice-President had joined the rival Co. and also many employees had a fear of been laid off.

**Questions**

1. What learning you could derive from HP's failure of ERP implementation?
2. According to you, how can HP solve its problem of execution and technical issues relating to ERP?

Source: <http://www.slideshare.net/TarvinderSingh5/case-study-on-erp-failures>



1. ERP is suitable for global operations as it encompasses all the domestic jargons, currency conversions, diverse accounting standards, and multilingual facilities.
2. More efficient operations allow for increase in ability to process transactions (added capacity) in order to improve cost savings.

## Notes

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### SUMMARY

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- Integration is an extremely important part to ERPs. ERPs main goal is to integrate data and processes from all areas of an organisation and unify it for easy access and work flow.
- An ideal ERP system is when a single database is utilized and contains all data for various software modules.
- With the ERP system in place, all the aspects of an organisation work in harmony instead of every single system needing to be compatible with each other. For large organisations, increased productivity and less types of software are a result.
- There are three types of professional services that are provided when implementing an ERP system; they are Consulting, Customization and Support.
- It can reach more vendors, producing more competitive bids and widening participation in government contracts, lowering the cost of products and services purchased
- ERP is suitable for global operations as it encompasses all the domestic jargons, currency conversions, diverse accounting standards, and multilingual facilities.
- Savings through the reduction in duplicated efforts by using ERP.
- ERP implementation fails to meet the business objectives in terms of failure in cross-representation agreement on enterprise based business processes.

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### KEYWORDS

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**Integration:** Integration is an extremely important part to ERPs. ERPs main goal is to integrate data and processes from all areas of an organisation and unify it for easy access and work flow.

**Ideal ERP System:** An ideal ERP system is when a single database is utilized and contains all data for various software modules.

**ERP Improves Productivity:** With the ERP system in place, all the aspects of an organisation work in harmony instead of every single system needing to be compatible with each other. For large organisations, increased productivity and less types of software are a result.

**Services provided at the time of implementing ERP System:** There are three types of professional services that are provided when implementing an ERP system; they are Consulting, Customization and Support.

**Notes**

**Benefit of an ERP in an Organization:** It can reach more vendors, producing more competitive bids and widening participation in government contracts, lowering the cost of products and services purchased

**ERP Suitable for Global corporations:** ERP is suitable for global operations as it encompasses all the domestic jargons, currency conversions, diverse accounting standards, and multilingual facilities.

**Cost Savings through ERP:** Savings through the reduction in duplicated efforts by using ERP.

**Failure factor of ERP Implementation:** ERP implementation fails to meet the business objectives in terms of failure in cross-representation agreement on enterprise based business processes.

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**SELF-ASSESSMENT QUESTIONS**

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**Short Answer Questions**

1. State any two successful factors of ERP implementation.
2. “Integration is an extremely important part to ERP”. Discuss the statement.
3. What is an ideal ERP system?
4. How ERP improves productivity?
5. What kind of services is provided at the time of implementing ERP system?
6. What are the benefits of an ERP system in an organization?
7. Discuss advantages of implementing ERP on industry basis.
8. State the advantages of ERP implementation of a corporate entity.
9. What are the other benefits of ERP system?
10. Discuss ROI and cost saving approach of implementing ERP which have been built up by several organizations.
11. Discuss at least five failure factors of ERP implementation.
12. What is consulting service?
13. Define customization service.
14. What is the support services provided at the time of ERP implementation?
15. Discuss software modules which can be included in manufacturing concern.
16. Discuss software modules which can be included in financial concern.
17. Discuss software modules which can be included in human resources concern.

### Notes

18. Discuss software modules which can be included in supply chain management concern.
19. In what sense software modules get implemented in projects, customer relationship management and data warehouse of business organization?
20. State any four failure factors of ERP implementation.

### Long Answer Questions

1. “Integration is the key to ERP”. Discuss. What is an ideal ERP system?
2. Discuss the successful factors of ERP implementation.
3. “ERP improves productivity”. How? What kinds of services are provided at the time of implementing ERP systems?
4. Differentiate between consulting services and customization services. Also, describe support services.
5. Discuss the benefits of an ERP system to organization and industry.
6. Explain the advantages in different departments of a corporate entity,
7. Explain other benefits of ERP system. What are the possible areas to look for improving ROI in an organization?
8. “Lack of formal and disciplined project management is one of the failures of ERP implementation”. Discuss the statement.
9. “Perturbed user adoption is one of the failures of ERP implementation”. Discuss the statement.
10. What are the failure factors of ERP implementation?

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### FURTHER READINGS

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# UNIT V

## Notes

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## LESSON 9 - EMERGING TRENDS IN ERP

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Learning Objectives

Learning Outcomes

Overview

9.1 Extended ERP Systems

9.2 ERP Add ONS-CRM and SCM

9.2.1 ERP on CRM

9.2.2 Advantages of ERP on CRM

9.2.3 CRM Software in India

9.2.4 ERP on SCM

Summary

Keywords

Self-Assessment Questions

Further Readings

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## LEARNING OBJECTIVES

After studying this lesson, you should be able to:

- Understand the extended ERP Systems
- Explain ERP add ons-CRM and SCM

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## LEARNING OUTCOMES

Upon completion of the lesson, students are able to demonstrate a good understanding of:

- concept of extended ERP systems
- explain ERP add ons-CRM and SCM
- analyzing advantages of ERP on CRM
- determine CRM software in India

**Notes**

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**OVERVIEW**

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In the previous lesson, you had studied about success factors of ERP Implementation and failure factors of ERP Implementation.

Market requires the pressures of cost and quality control as well as differentiation which are core factors in pushing companies re-examine organizational processes through the latest technological solutions.

With the implementation of extended ERP systems a company not only achieves several competitive advantages, it also accommodates its organizational objectives in real time for responding quickly to market variations and the needs of customers and suppliers.

In this lesson, you will learn about the extended ERP systems and ERP add ons-CRM, SCM.

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**9.1 EXTENDED ERP SYSTEMS**

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ERP or enterprise resource planning is a software that allows business processes in finance, manufacturing, distribution, sales and other fields. Extended ERP comprises of other software and business processes.

1. **Customer Relationship Management:** CRM involves software linked with business processes for automating sales force and call centres. Minimal integration is required in ERP and CRM.
2. **Product Lifecycle Management:** Product Lifecycle management software deals with design, regulation, production, distribution and field service activities that focus on the changes in a product throughout its life cycle. On the basis of the industry, PLM software covers more business processes or confined to design and engineering functions.
3. **Supply Chain Management:** Supply chain management software involves the software for planning and controlling the steps in manufacturing and distribution process which includes tracking outside companies' handling of products. SCM also involves logistics and warehousing business processes.
4. **Integration Requirements:** On the basis of the industry and operating requirements, ERP, CRM, PLM and SCM will need different degrees of integration. If the software is obtained in an integrated way, these costs get reduced. If extensive, there will be an issue on integration costs when any one software area is upgraded by the original vendor. Depending on the industry they serve, extended ERP involves more software and processes.
5. **ERP for Pharmaceuticals:** With the launch of eGMP compliant ERP solution, enterprise ERP has been equipped with highly regulated ERP solution for Pharmaceuticals industry. Pharmaceutical ERP, compliance with GMP & FDA requirement are considered as majorly important.

**Notes**

Companies are yet to tackle the practical implementation of 21 CFR Part II, since its launch. Eresource ERP is a user friendly compliant to all statutory regulation and is quickly to implement.

Pharmaceutical Industry comes under the category of Batch Process Manufacturing. Forecasting becomes simpler with the help of eresource ERP. It is an effective end-to-end business integration solution. Eresource ERP is designed keeping in view operational efficiency of the industry. Operational efficiency needs a system that directs every aspect of business. It helps in cost cutting, allow quick market presence of the product, improving customer relation and complying with regulations.

Quality control section with its integrated refined Quality Control/Module which not only supervise quality by control plans in purchasing and production but also gives real-time process capability index for quick review.

6. **ERP for Fleet Management:** With the introduction of eresource's Fleet Management ERP, this user-friendly business application has helped many small and medium sized fleet management organizations for achieving a lot of benefits and to grow into full-fledged, profit-making enterprises.

It is such elaborated and well integrated software for Fleet and Transport Industry. Eresource ERP for fleet management helps in the growth of business with a surety on return on investment.

In terms of operational mode, with the help of eresource ERP one can manage their Fleet and Transport business with efficiency. Regardless of fleet's strength, it offers solution for all the vehicle operations, trucks, cars or any other commercial vehicles.

Through eresource ERP one can overcome overhead expenses, unexpected break-fix situations and downtime due to failed fleet vehicles and equipment. It also serves as a handy resource for fleet maintenance history, fuel usage, and driver details also and one can easily manage areas like insurance, asset management, tire management, inventory management, LR management as well as expenses correlating with functioning for the fleet of motor vehicles and other mechanical assets.

Eresource ERP for fleet management is a strong configuration management system that is built on master configuration, which enables one to easily create individual vehicle configurations and maintenance plans.

7. **ERP for SMEs:** For running smooth course of operations of small businesses customers, eresource ERP has come up with an ERP solution specially for its Indian manufacturers. Eresource ERP iSE, an ERP for Small and Medium Enterprises is affordable, easy to implement and allowing the SME to concentrate on growth and improving their business instead of worrying about software.

**Notes**

For the growth of small and medium enterprise businesses and to earn a better return on investment, eresource ERP for SME is designed for implementing an appropriate resource planning systems.

Eresource Infotech by far has implemented eresource ERP for SME module for 25 customer locations. The core operational factor for SME is to increase operational efficiency, reduce cost of production, supply chain management and to deliver products to its customers. Therefore, the cheaper rate of eresource ERP provides convenience even to very small industrial units to afford. The modules for eresources ERP includes – sales and distribution module, purchase and supplier module, inventory and material management module, production and shop floor management module, total quality management, excise management, accounts and finance management and human resource management.

8. ***ERP for Printing and Packaging Industry:*** The challenges occurring in this industry are: managing the cost, optimum allocation of machine, indefinite delivery time, shorter fluctuating demand cycles, high raw material costs and low-price competition, last but not the least is the complex production processes. In order to meet those challenges, eresource ERP came into existence, hence, providing Printing and Packaging ERP software solutions.

Eresource's Industry-specific ERP solution for Printing industry looks after the production processes including Master Plate Making, Cutting, Printing, Varnish, Powdering, Punching, Wrapping, Pre Lamination, Stamping, Efluting, Embossing, Pasting and many other dynamics.

Being a web based ERP solution provider, the major benefits of eresource ERP lies in with its real time capabilities and its ability to see the happenings going on in the company and all its branches across different geographical locations. For Printing and Packaging business, eresource is a ready tool that helps in visibility of all the company's information at just one central screen.

Eresource ERP is the solid operational backbone provider of these businesses. The system allows the businesses to function effectively that will able to improve their volume of production and fulfillment of orders while reducing costs.

9. ***ERP for Plastic Industry:*** Requirement of scalability and flexibility in the ERP system would allow plastic manufacturing companies to adapt to different business dynamics which can correctly and successfully be charted out through eresource ERP. It is specially designed for Plastic Manufacturing Industry. Eresource understands the distinctive challenges plastic manufacturers confronts routinely either from fluctuating raw material, availability of raw material for production purpose, proper management of Plastic waste and to make available skilled and trained labourers.



**Notes**

For meeting out the equal number of challenges faced by every plastic industry, eresource industry solution is being developed for national and international use that maps all the business processes.

Eresource's Industry-specific ERP solution for Plastic Industry takes care of the production processes including Injection molding , extruders, film and bag processors, blow molders, thermoforming, and compounder. The main focus is in defining products as per the plastic specific relevant processes that are truly structured efficiently for determination of extrusion specific Bill of material and all the production parameters and cost elements. Eresource ERP needs to be designed as per specific industry needs keeping its functioning in mind.

10. **ERP for Trading:** Eresource ERP system allows predictable business performance by enabling actionable information to every decision maker in the enterprise. The technology offers a novel range of monitoring, trending, forecasting, reporting, and analyzing capabilities within a single architecture to allow everyone to make better business decisions every day, and drive business performance goals. Eresource ERP provides an end-to-end solution which organizes every phase of businesses from order management, operations, supply-chain and logistics, to documentation, accounting and business intelligence reporting.

Eresource Trading ERP systems comprises of Sales (Order Processing, Invoicing, Accounts Receivable), Purchase (Order Processing, Invoicing, Accounts Payable), Inventory (Goods Receipt, Warehouse Movement, Dispatch) and Excise for Traders Financial Accounting etc. eresource ERP has equipped many customers across the world by providing excellence, building and delivering enterprise solutions. The primary purposes of eresource ERP is to provide strategic insight, to inculcate the ability of differentiation, increasing productivity and providing necessary flexibility in attaining success.



Integration with ERP is usually necessary to eliminate redundant information and processes. Integrated software sold and supported may reduce proceeding maintenance costs.

**Learning Activity**

Analyse the extended ERP systems in Banking sector.

## Notes

## 9.2 ERP ADD ONS-CRM AND SCM

Customer relationship management is concerned with the relationship between the organization and its customers. Customers are the lifeblood of any organization be it a global corporation with thousands of employees having a multi-billion turnover, or a sole trader with a handful of regular customer base. Customer relationship Management (CRM) is an essential part of the modern business management. Customer Relationship Management is the process of managing detailed information about individual customers and carefully managing all customer 'touch points' to maximize customer loyalty.



CRM technologies are enabled by systems architecture with three distinct pieces of software functionality: operational, analytical and collaborative.

Operational functionality includes integration of front and back office products and activities. Analytical functionality relies on a CRM implementation that keeps data in consolidated databases, making data collection and analysis much easier. Collaborative functionality: CRM creates multiple customer touch point opportunities by enabling various communications channels.

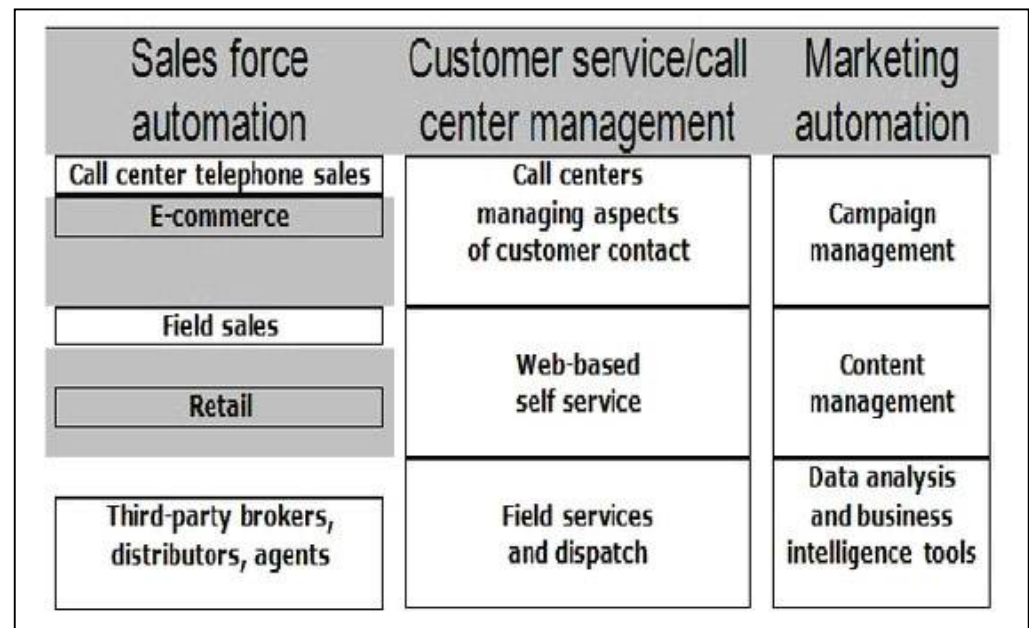


Figure 9.1: Elements of CRM

### 9.2.1 ERP on CRM

For attaining desired success, organizations attempt to achieve increased sales performance, superior customer service and improved customer relationship management. For achieving objectives, solutions which provide rapid access to

**Notes**

centralized customer information are highly needed. Accessibility of detailed, up-to-date communication history is also needed to encourage customer and client relationships, close sales and streamline all customer contact activities.

**9.2.2 Advantages of ERP on CRM**

1. Communication with other areas of the system provides you with clear insight about the customer.
2. To maximize opportunities and to maintain high value customers advances revenue and profits.
3. It provides value added services which allows you to stay ahead of your competitors.
4. It prepares your employees with a deep insight of the customer's needs.
5. Customer experience gets organized through quick problem resolution
6. Repeated access of customer information over and over again is being provided.



**Example:** Eresource ERP CRM Software for successful customer interaction.

The module of eresource ERP CRM software in India provides better information about your customers and incorporates several features such as activities, history, related contacts, addresses of your customers and their relations with your competitors. The database structures are flexible enough that allow you whatever information you would like to keep on your customer and maintains such kind of information for future reference.

The eresource ERP Module also provides control and organization of overall sales process, from offer to invoice or bill. It motivates your sales force by giving details such as status of inventory, predicted costs and delivery time, risk status, habits and special demands and trades during previous periods at the time of offer stage.

The eresource ERP CRM module also provides an effective and efficient complaint management tool which includes repairs processing and document management.

**9.2.3 CRM Software in India**

The module of CRM in ERP or CRM Software has numerous potential benefits to offer.

- CRM software is useful for targeting customers, retention of better customers and increase in sales.
- CRM Software modifies the business processes by focusing on sales, marketing and better customer service. For deriving full benefits from

## Notes

CRM Software, the application should be used as a combination of people processes instead a narrowly define IT application. When with combined with rest of the modules, CRM software becomes more powerful in a full-fledged ERP system.

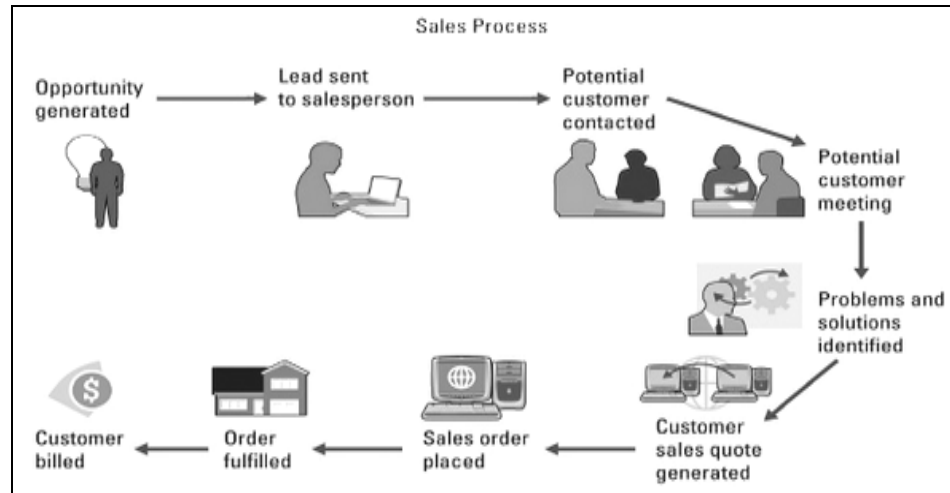


Figure 9.2: Sales and Operational CRM through ERP



**Example:** Sales and Operational CRM Technologies through ERP

- ❖ *Sales management ERP CRM System:* It automates each phase of the sales process which helps individual sales representatives for coordinating and organizing all of their accounts.
- ❖ *Contact management ERP CRM System:* Customer contact information is being maintained by this system which identifies prospective customers for future sales.
- ❖ *Opportunity management ERP CRM System:* Sales opportunities are targeted by this system which includes finding new customers or companies for future sales.
- When web and web-based business applications (such as eresource ERP) started becoming popular, organization in all industrial segments was able to truly personalize their relationships with customers. With the integration of CRM software in an ERP system, it allows the companies to strengthen their relationships with customers, who will then achieve lifetime value from present customers and to keep strategic plans in place for going after lifetime value for new customers in new markets.
- The focus of customer is always the first rank among the basic principles of eresource's CRM software. It can bring multiple advantages to the user by using eresource ERP systems with its CRM Module. By integrating eresource ERP with an effective CRM software helps the ability of the organization to give due care to what the customer is communicating in a

systematic way. CRM software allows faster response to customer requests, and increases the service quality offered to the customers.

## Notes

- Without the integration of CRM software with ERP system, is not sufficient for catering the present needs of any organization. There arises a need for CRM software's integration with ERP systems for a continuous improvement. An ERP system after its implementation should be flexible and should have the basic infrastructure like CRM Software that enables you to keep pace with the revisions made in the business processes through a healthy customer relationship. In addition, working with ERP system integrated with CRM software is one of the core factors for the success of a business process.
- The top priority of the organizations should be to make their customers happy and satisfied and consider them as the biggest asset for focusing on their needs further. In order to carry out this prime objective, there must be the existence of an efficient CRM software in their ERP systems and resource ERP outstand the top ERP Software available in India that meet all your requirements.

### 9.2.4 ERP on SCM

#### *Effective Business Control*

Enterprise Resource Planning (ERP) is an effective and powerful tool for management and controlling business processes. ERP vendors talk about the tangible and intangible benefits that can be achieved by using ERP, but fall short to emphasise on the key advantages i.e., effective monitoring and control by adapting to the changing environment rapidly using ERP.

When we talk about effective monitoring and control, it refers not to the employee but to the process. If you review our history, it is evident that early businesses used to survive primarily due to effective monitoring and control of key parameters of business i.e., sales, cost of production, inventory and profitability.



Due to diversification, complexity in business and inability to control and coordinate various cost functions manually, the focus was lost somewhere down the line.

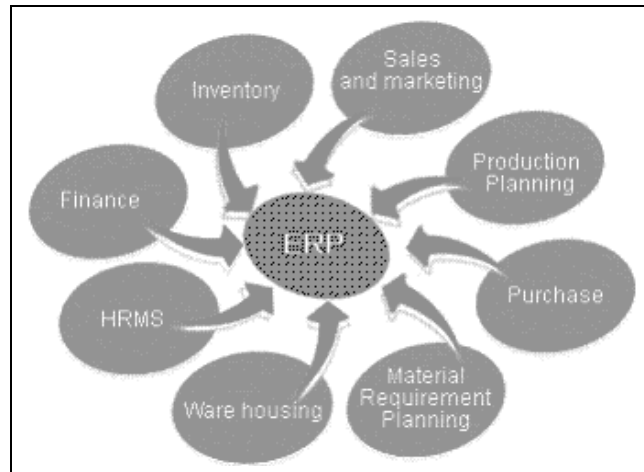
Now that we are facing intense competition, the same philosophy is being endorsed. But this time the difference is that technology is being used as an enabler to focus on these parameters and various tools and philosophies are being adapted to focus on the basic requirements of a profitable organisation.

Early business organisations were fundamentally family business units. The small amount of manufacturing carried on was primarily done by artisans

**Notes**

working alone. Key management positions were held by family members. The business used to work well and the key to success was daily control on:

- Sale of what was produced
- Procurement of what was required
- Payable and receivables
- Daily profits



**Figure 9.3: ERP on Supply-Chain Management**

In today's business parlance, it could be termed as daily sales target, minimum inventory of finished goods and raw material, daily cash flow management and daily profits.

As the demand of goods started increasing, these organisations started to expand and diversify to meet the customer needs. It became more and more difficult to manage and control. Then the concept of scientific management spread throughout industry which resulted in a modified and enlarged bureaucracy form. Businesses were still owned by family members and the focus was still the same, i.e., daily control on sales, cost of production, inventory and profitability.



**Example:** PARTA system was the controlling factor for any Birla organisation in India.

The parta system was developed with the concept of setting the yearly and monthly budgets and the performance of the company was measured daily, based on the standards established in the parta system. It was an effective and powerful tool for controlling and managing the business as all the vital information regarding costs of production, sales and inventory was available to make strategic decisions.

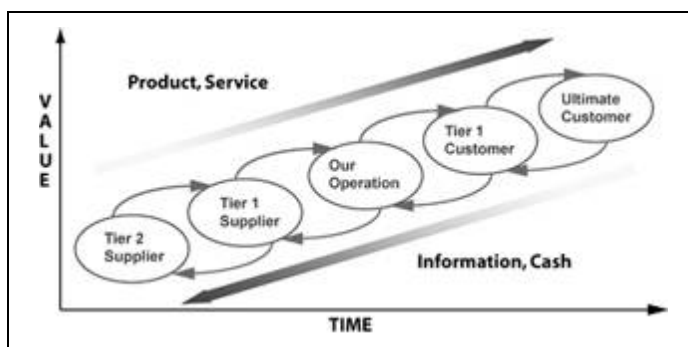
Then businesses started diversifying and processes and products started getting more and more complex. Organisations started setting annual and monthly

## Notes

targets and performance was being measured on a monthly basis. This resulted in hockey-stick phenomena where the focus was to meet the targets at the end of the month. As a result, companies ended with maximum sales, maximum production, maximum overtimes and maximum collections during the last week of the month. The effect of this phenomenon was increased work in process inventory, lower machine and resource utilisation, poor on-time deliveries, premium freights, erratic cash flow and so on.

### ***Demand-Supply Gap Filling***

The definition and usage of the term, supply chain, depends on the practical scope of the parties using it.



**Figure 9.4: Supply-Chain Flows**

**Supply Chain:** For automotive suppliers, the supply chain horizon reaches the end customer, but in practice this is limited to the point of prime customer – the assembler. For suppliers, the chain between factory and dealer/customer cannot be a real supply chain issue because, when the assembly parts are delivered, suppliers can be influenced by the following steps in the chain.

**Demand Chain:** For importers and dealers, it is essential to fulfil customer requirements regarding reliable and short delivery dates, while the head-office role is to control and optimise the vehicle stock in the chain (i.e., keep it as low as possible). Tier one and two suppliers are not part of this area of the demand chain. For these reasons, it becomes necessary to make a distinction between demand chain and supply chain.

**Scope:** The focus areas for the two chains are different. The supply chain focuses on tier one and lower suppliers up to the assembler. The demand chain focuses on all parties between the assembler and customer/dealer.

### ***Basic Principles: Delivery Date and Order Volume***

The basic principles between both the chains are different. While the supply chain is very much focused on lean production (efficiency) and flexibility up to the assembler, based on fixed, large amount schedules, the demand chain is focused on lean distribution and flexibility to the end customer, based on variable individual schedules.

**Notes**

In the demand chain, the delivery data to the end customer is not defined by the end customer, but based on constraints in the production plan and distribution network by the head office organisation. Via a forward calculation the delivery date for an end customer can be calculated. Achieving delivery dates of few days for a new vehicle customer order will be very difficult to achieve. Therefore, it is common that the car seller will calculate for himself what a possible delivery date could be and give that information to the end customer.

***Decoupling Demand and Supply***

In the automotive industry, supply chain and demand chain will be de-coupled. This is because a mechanism is needed to balance the volumes required in the demand chain and the volumes planned and available in the supply chain. When volumes have been allocated, an order slotting process will take place at the individual car level. Based on the position of the customer order in this slotting process, (in factory stock, on ship at importer or at dealer), a delivery date can be given.

Of course, it would be for the benefit of the industry to work on fluent mechanisms between demand chain and supply chain, but as long as factories have capacity restrictions and end customer demand is unpredictable, the mentioned allocation mechanism should be in place.

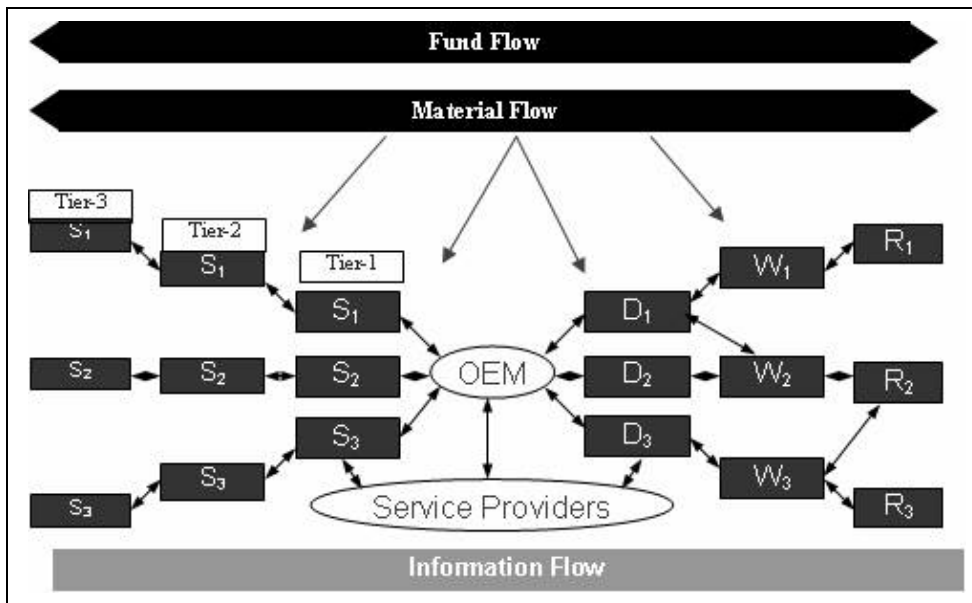
In practice, the supply chain view is limited in area so only a very few people can really oversee the total chain head quarter function. This means that discussions in general can only be held for parts of the chain. To ensure that one of the areas is not forgotten or under emphasised, it becomes useful to split the two. At certain moments in time, it will be necessary to discuss the mechanism of how to link supply chain and demand chain as effectively as possible for the volume allocation — the basic principle for the assembler.

In this process, it will also be necessary to set up a mechanism to support the end customer orders, so that every party, especially in the demand chain, knows about the given commitment to the customer and will operate in line with this commitment.

***What is Supply Chain?***

By following the explanation above, it is possible to see that the following should be included in this area: tier 3 suppliers, tier 2 suppliers, tier 1 suppliers, assemblers, headquarters and logistic service providers.





## Notes

**Figure 9.5: Conceptual Diagram of Supply-Chain**

The targets that these parties strive for can be defined as follows:

- Improve efficiency (stock and labour reduction)
- Deliver the large volume components just in time to the next party in the chain.

Some characteristics in this automotive supply chain are as follows:

- Assembler takes the lead
- Flexibility expected from suppliers is growing
- Long term relationships between assemblers and suppliers become more intensive
- Continuous pressure on cost reduction
- Reduction of number of tier one suppliers
- Increase of value added logistics functions.

### ***What is Demand Chain?***

In the demand chain, the parties playing a role between factory and consumer dealers are assemblers, distribution centres, headquarters, importer, dealer and consumer. Targets in the demand chain can be described as follows:

- Reduce vehicle stock
- Provide reliable lead times
- Provide short lead times.

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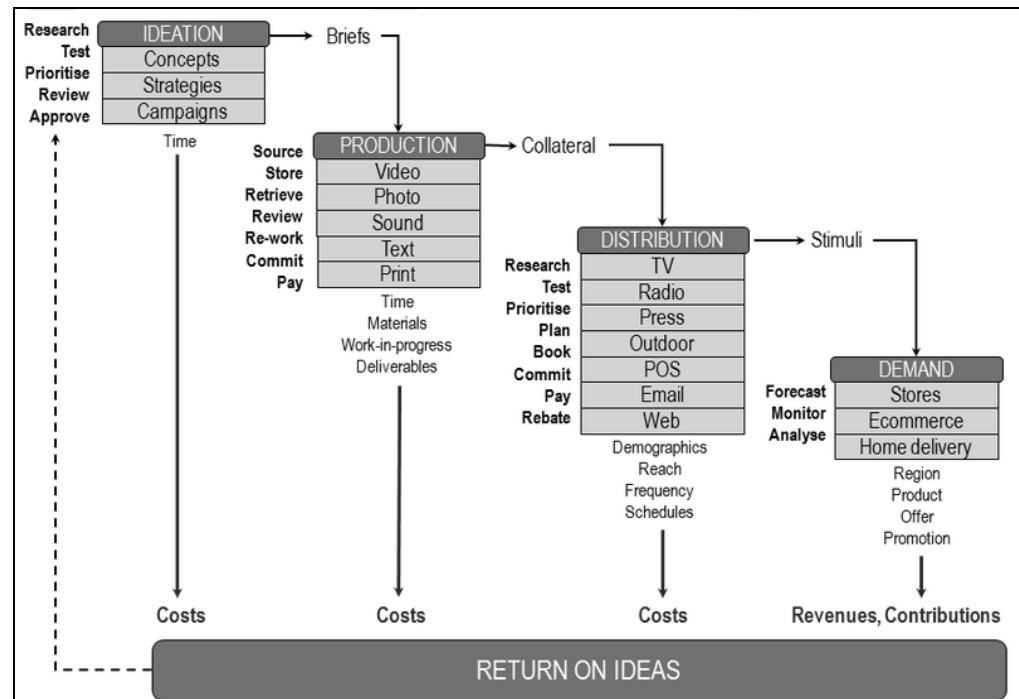


Figure 9.6: Demand-Chain of a Company

Some characteristics of the automotive demand chain are as follows:

- The Internet provides customer influence transparently on the chain
- Balance between flexibility, responsiveness and low inventory is a major challenge
- OEM headquarter takes the lead
- Country/continental specific logistics are needed to take advantages of local factories
- IT solution for transparency over the chain is challenging operation.

### *Demand and Supply Chain Coordination*

To be competitive in lead times and accurate about delivery dates of vehicles to the end customer, it is important to have the mechanisms in place to balance demand and supply. The following functions must be created in the headquarter organisation to balance these two chains:

- A mechanism is needed to allocate forecast sales volumes within the defined production capacities.
- A capacity check for volumes and critical components should take place on line for a dealer to provide a reliable delivery date to the customer when he visits the showroom.

**Notes**

- Based on the confirmed delivery dates promised to the end customer, all parties in the logistic pipeline (from assembler to dealer) must be informed about which orders need to reach the next stage at which moment.
- All parties in the logistic pipeline must have transparency regarding the status and the number of vehicles available in different statuses.
- All parties must be able to inform the central pipeline when vehicles come into a delayed condition due to damage, hold or delayed shipments.
- All parties must have the chance to recognise delayed vehicles and must have a mechanism in place to take action to give priority to these vehicles.
- Headquarters must have a function to inform dealers/customers about customer orders which will be delivered later than promised.
- All logistics parties must have a performance indicator programme in place so that continuous improvement can be made.

***Transparency: The Starting Point***

As a first step in getting control over the chains, it is essential to achieve transparency over the chain. Which goods and how many are where and at which moment? Does everyone measure the same way? Do the right measuring points exist to follow the goods? Are hands over points in operations and systems in line?

All of these questions need to be answered internally before this information can be shown to external parties, such as customers.



At present, there are often inconsistencies in the required data and providing reliable lead times/delivery dates is impossible.

It is essential that one party in the chain is responsible for the chain organisation. A critical success factor is to set up a strategy to convince other parties in the chain that a win-win scenario becomes likely if all parties become involved in getting the supply and demand chain up and running.

In the automotive industry, the supply chain is mainly in the hands of the assembler who decides the production volumes for the supply chain. Whereas in the automotive demand chain, the headquarters organisation is responsible for the coordination between sales and production, becomes the best party to take this initiative. However, in industries where there is less integration between parties in the demand and supply chain, it will be even harder to implement the chains.

## Notes

**Learning Activity**

Analyse the supply chain management through ERP by Mother dairy.



**Emil Pharmaceuticals Pvt. Ltd. Improves Capacity Planning and Increases Production with Integrated ERP System**

“We are into Manufacturing and marketing of allopathic formulations in various dosage forms viz., Tablets, Capsules, Oral liquids, Dry powders, Creams, Ointments & Gels.

The new ERP system implemented in your organization is much more accurate providing what we need that too when we needed. For Emil, the eresource ERP system has proved to be an ideal solution in meeting its specific batch manufacturing requirement, more importantly the GMP standards that eresource has in their system. Since the introduction of eresource ERP, jobs are carried smoothly and extremely satisfying way. The best part is the after sales support module included in the system. ”

**Tushar Korday**

What is Emil Pharmaceuticals Pvt. Ltd.

Founded in 1989-90, Emil's principal business is developing, manufacturing and marketing of allopathic formulations in various dosage forms viz., Tablets, Capsules, Oral liquids, Dry powders, Creams, Ointments & Gels. Headquartered in Mumbai, the financial capital and hub of pharmaceutical industry in India, Emil markets products in India as well as in African markets. In the last 15 years, Emil has also established itself as a reliable and cost-efficient contract manufacturer of integrity for leading multinational and Indian companies to produce quality products for their Indian and international markets. EMIL also manufactures ayurvedic/herbal and veterinary formulations.

**Challenge**

The Client being a leading manufacturer and exporter of Pharmaceutical Products and has a wide span of Departments and different processes which though functioned under the best Management and Supervision but due to improper integration of Resources and poor correlation it often suffered disruption in work processes and produced difficulties in maintaining the statutory requirements. Lack of co-ordination also lead to unusual problems in smooth functioning between manufacturing processes and amongst various departments. There were separate channels of separate processes

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that caused increased input of work with reduced efficiency in functioning and prolonged functioning of normal processes that prevented the optimum utilization of resources.

They were faced with the challenge of surviving and succeeding in an environment that has become more complicated and uncertain, and one that is characterised by rapid developments in science and technology, and organisational change. From the standpoint of the pharmaceutical industry, the impetus for change is the result of a combination of political, economic, technological and social factors; all of which have helped redefine the dynamics of this particular industry.

Over the past number of years, the growth of the worldwide pharmaceutical industry has been slower than the increases in Research (R) and Development (D) costs, and this has led to a cost-earnings differential that cannot be sustained indefinitely. Firms have found it increasingly difficult to sustain historical levels of growth principally because of two converging factors. First, the earnings of the pharmaceutical industry are being increasingly squeezed between pricing constraints due to government policies and generic competition; and second, through the rising costs of R and D due to increasing legislative requirements and growing technological sophistication. As a consequence of these pressures on pharmaceutical earnings, combined with that of rising R and D costs, pharmaceutical firms have been forced to adopt a number of cost containment measures in addition to those pertaining to the safety and efficacy of drugs. The need to demonstrate 'value' to the consumer has now become imperative.

Traditionally, the pricing methods adopted in the former producer-driven environment for pharmaceuticals was essentially based on what was considered to be 'fair returns' for the high costs and risks associated with innovation. Today however, much of that has changed. The deregulation of generic products has helped to bring about a much greater acceptance of product substitution, which in turn has led to changes in consumer choice--an event that has acted as a catalyst for change within the marketplace. Therefore rather than being producer-driven, the market for pharmaceuticals today is essentially customer-led. Price has become the key indicator of how the marketplace truly values the products that are discovered, marketed and sold. Consequently the price that a company charges for a product is the culmination of every decision made along the chain of discovery from discovery through to marketing. Therefore in order to be able to survive this challenging environment, pharmaceutical companies can no longer permit their internal processes to determine price levels, as this has now become the privilege of the customer.

The demand for innovation in an increasingly complex, global business environment has necessitated new approaches to organization because the requirements for success in the marketplace have changed in a number of profound ways. In addition to demands for efficiency, quality and

## Notes

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**Notes**

flexibility, pharmaceutical companies are also required to simultaneously cut costs, improve standards of quality, shorten product development times, and introduce innovative products that customer's value. As a result, companies have been forced to re-examine every aspect of how their businesses are implemented and conducted, and this has given rise to a number of important issues that question the long-held and accepted ways of managing pharmaceuticals. It also raises a number of critical questions that are pertinent to five key areas of business.

The discovery, development and marketing of new pharmaceutical products are the essence of the research-based pharmaceutical industry. As a result of the transformation toward a customer-led marketplace, important issues have been raised which present a number of challenges for many pharmaceutical companies. Of greater significance is the issue of cost.

The total cost of bringing a new product to market from discovery through to launch, including the cost of capital with a risk premium and the cost associated with failures, is estimated to be approximately \$500 million, over a 10-12 year period. Of this total, around 30 per cent of the costs are concentrated in exploratory research while the remaining 70 per cent are invested in subsequent development phases. At the same time, the percentage of money spent on innovation has been increasing steadily from around 6 per cent in the 1960s to approximately 20 per cent by the late 1990s.

Both the increased cost together with the growing quantity of resources being invested in pharmaceutical innovation is due to a combination of factors other than inflation. Traditionally, the rate of growth of the firm has been linked to new product introductions, as it was believed that increased investment in innovation generally guaranteed more novel products. Furthermore, the shift from acute to chronic therapy has increased the complexity of research as well as the regulatory approval process. Demands for regulatory data have almost doubled since the mid-1980s thus increasing the time it takes to get a product to market. In addition, companies with low levels of new product innovation have spent vast amounts of capital in an effort to secure future sources of revenue.

**The Solution "eresource"**

Eresource, proved to be the best possible ERP solution to overcome the challenges faced by this client. The client was provided with an application, through which under a single point, there was integration of all its resource to improve and optimize their utility.

Eresource ERP provided a platform where at a single juncture all the processes and essential functional activities were taken care of.

A clear advantage to the web-based eresource ERP is that remote users like executives and sales reps can access the company system with any browser,

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which is much more convenient than going through standalone computer configured for Terminal Services. It also eliminates the need of upgrading of your network and other computer peripherals. Eresource ERP's fast and quick on-time implementation method helps the client commence their business operation through the system as per planned time schedule which ultimately helps all their business operations.

eresource, ERP is a next-generation enterprise resource planning solution that powers your core business functions, including analytics, human capital management, financials, operations, and corporate services. It delivers industry-specific capabilities that let you seamlessly integrate key business processes from end to end. And because it's highly scalable and adaptable, it gives you the option to incrementally add the right mix of customer relationship management, supply chain management, or product life-cycle management solutions as your business evolves over time.

### **Why eresource ERP?**

Web-based eresource ERP solution, simplifies back-office process automation for mid-sized and growing business. It provides real-time information about finance, order management, purchase, inventory, employee management, e-commerce and much more. With web-based eresource ERP solution, you can accelerate business cycles, improve productivity and reliability, and provide higher levels of service to customers, suppliers and partners. This web-based ERP solution improves business among customers, suppliers and partners through self-service portals, providing for lead management, shipment tracking, bill payment and more. Eresource ERP for Pharmaceuticals provides a wide range of information technology solutions for pharmaceuticals, insurance, manufacturing, retail and distribution. The process of eresource solutions is SEI CMM Level 5 compliant.

Eresource ERP for Pharmaceuticals is a powerful end-to-end collaborative business integration solution for the pharmaceuticals business. Pharmaceutical industry is highly regulated. Good Automated Manufacturing Practice (GAMP), Code of Federal Regulatory (CFR) of US – FDA, ICH, MCA and other such regulatory bodies impose guidelines from time to time. eresource ERP for Pharmaceuticals increases the effectiveness and improves the efficiency of the processes and streamline internal operations. Whether you need to increase your market share or be more profitable, eresource ERP for Pharmaceuticals solution can help you achieve your goals and bring significant return on your investment. With eresource ERP for pharmaceuticals, you get years of domain expertise built into our solution from the insights of experts who have worked with leading names in the pharmaceuticals business. Eresource ERP for Pharmaceuticals addresses all aspects of the pharmaceuticals process.

### **Notes**

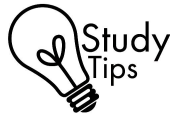
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## Notes

### Questions

1. Analyse the challenges faced by the company and solutions that have been undertaken.
2. How far implementing eresource ERP stands successful? Discuss.

Source: <http://www.eresourceerp.com/Pharmaceutical-erp.pdf>



1. Eresource ERP provides constant and readily available customer and prospect data, which allows you to manage pre-sales activities, perform computerized sales process, deliver constant customer service, assess sales and service successes and to determine trends, problems and opportunities.
2. In the supply chain, the delivery date demanded by the assembler is fixed and based on just-in-time principles. Via backward calculation the delivery dates can be calculated for the suppliers in the chain, assuming that suppliers in most cases do not have restrictions on flexibility. This calculation will be done in general for large volume orders, based on determined production volumes for a month, week or day.

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## SUMMARY

- ERP or enterprise resource planning is software that allows business processes in finance, manufacturing, distribution, sales and other fields. Extended ERP comprises of other software and business processes-CRM, PLM, SCM, Integration requirements, Pharmaceuticals and Fleet Industry.
- Customer Relationship Management is the process of managing detailed information about individual customers and carefully managing all customer 'touch points' to maximize customer loyalty.
- In ERP on CRM, for attaining desired success, organizations attempt to achieve increased sales performance, superior customer service and improved customer relationship management. For achieving objectives, solutions which provide rapid access to centralized customer information are highly needed. Accessibility of detailed, up-to-date communication history is also needed to encourage customer and client relationships, close sales and streamline all customer contact activities.
- CRM software in India is useful for targeting customers, retention of better customers and increase in sales.
- Enterprise Resource Planning (ERP) is an effective and powerful tool for management and controlling business processes. ERP vendors talk about the tangible and intangible benefits that can be achieved by using ERP, but



**Notes**

fall short to emphasise on the key advantages i.e., effective monitoring and control by adapting to the changing environment rapidly using ERP.

- The basic principles between both the chains are different. While the supply chain is very much focused on lean production (efficiency) and flexibility up to the assembler, based on fixed, large amount schedules, the demand chain is focused on lean distribution and flexibility to the end customer, based on variable individual schedules.
- In the automotive industry, supply chain and demand chain will be decoupled. This is because a mechanism is needed to balance the volumes required in the demand chain and the volumes planned and available in the supply chain.
- In Demand and Supply Chain Coordination in order to be competitive in lead times and accurate about delivery dates of vehicles to the end customer, it is important to have the mechanisms in place to balance demand and supply.

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**KEYWORDS**


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**Extended ERP Systems:** ERP or enterprise resource planning is software that allows business processes in finance, manufacturing, distribution, sales and other fields. Extended ERP comprises of other software and business processes – CRM, PLM, SCM, Integration requirements, Pharmaceuticals and Fleet Industry.

**Customer Relationship Management:** Customer Relationship Management is the process of managing detailed information about individual customers and carefully managing all customer ‘touch points’ to maximize customer loyalty.

**ERP on CRM:** For attaining desired success, organizations attempt to achieve increased sales performance, superior customer service and improved customer relationship management. For achieving objectives, solutions which provide rapid access to centralized customer information are highly needed. Accessibility of detailed, up-to-date communication history is also needed to encourage customer and client relationships, close sales and streamline all customer contact activities.

**CRM Software in India:** CRM software is useful for targeting customers, retention of better customers and increase in sales.

**Effective Business Control of ERP on SCM:** Enterprise Resource Planning (ERP) is an effective and powerful tool for management and controlling business processes. ERP vendors talk about the tangible and intangible benefits that can be achieved by using ERP, but fall short to emphasise on the key advantages i.e., effective monitoring and control by adapting to the changing environment rapidly using ERP.

**Notes**

**Basic Principles - Delivery Date and Order Volume:** The basic principles between both the chains are different. While the supply chain is very much focused on lean production (efficiency) and flexibility up to the assembler, based on fixed, large amount schedules, the demand chain is focused on lean distribution and flexibility to the end customer, based on variable individual schedules.

**Decoupling Demand and Supply:** In the automotive industry, supply chain and demand chain will be de-coupled. This is because a mechanism is needed to balance the volumes required in the demand chain and the volumes planned and available in the supply chain.

**Demand and Supply Chain Coordination:** To be competitive in lead times and accurate about delivery dates of vehicles to the end customer, it is important to have the mechanisms in place to balance demand and supply.

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**SELF-ASSESSMENT QUESTIONS**

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**Short Answer Questions**

1. What do you mean by extended ERP Systems?
2. Define Product Life-Cycle Management.
3. Write short note on ERP for pharmaceuticals.
4. Write a short note on ERP for fleet management.
5. "CRM technologies are enabled by systems architecture with three distinct pieces of software functionality". What are they?
6. Write a short note on ERP on CRM.
7. Discuss the advantages of ERP on CRM.
8. What are the numerous potential benefits of CRM software in India?
9. "ERP is an effective and powerful tool for management and controlling business processes". How it takes place? Give example.
10. Discuss the demand-supply gap filling in context to ERP on SCM.
11. What are the three tiers involved in Supply Chain?
12. What is demand chain?
13. What do you mean by demand and supply chain coordination?
14. "As a first step in getting control over the chains, it is essential to archive transparency over the chain". Discuss the statement.
15. How demand and supply gets de-coupled?
16. State the basic principles of delivery data and order volume in SCM.
17. Define CRM.

**Notes**

18. Define SCM.
19. What kind of integration requirements takes place in extended ERP systems?
20. Give an example of ERP on SCM.

**Long Answer Questions**

1. “ERP or enterprise resource planning is software that allows business processes in finance, manufacturing, distribution, sales and other fields. Extended ERP comprises of other software and business processes”. Discuss the statement with extended ERP systems.
2. What are the extended ERP systems that are built on pharmaceuticals and fleet management?
3. “For attaining desired success, organizations attempt to achieve increased sales performance, superior customer service and improved customer relationship management”. Explain this statement with ERP on CRM. Give suitable examples.
4. “The module of CRM in ERP or CRM software has numerous potential benefits to offer”. Explain.
5. “Enterprise Resource Planning (ERP) is an effective and powerful tool for management and controlling business processes. ERP vendors talk about the tangible and intangible benefits that can be achieved by using ERP, but fall short to emphasise on the key advantages i.e., effective monitoring and control by adapting to the changing environment rapidly using ERP”. Discuss with effective business control of ERP on CRM.
6. Explain the demand and supply gap filling and basic principles of delivery date and order volume in relevance to ERP on SCM.
7. Differentiate between demand and supply chain. What are the demand and supply considerations?
8. Explain the extended ERP systems on CRM and SCM.
9. Explain the integration requirements in context to extended ERP systems.
10. Explain the de-coupling of demand and supply in relevance to ERP on SCM.

## Notes

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## FURTHER READINGS

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Ray, Rajesh (2011), *Enterprise Resource Planning*, Tata McGraw Hill Education.

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## **LESSON 10 - BUSINESS ANALYTICS AND FUTURE TRENDS IN ERP**

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### **LEARNING OBJECTIVES**

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After studying this lesson, you should be able to:

- Understand the Business Analytics of ERP
- Know about the Future Trends in ERP Systems
- Identify the Future Trends in Wireless Technologies of ERP

## Notes

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### LEARNING OUTCOMES

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Upon completion of the lesson, students are able to demonstrate a good understanding of:

- recall business analytics through ERP
- design ERP system architecture
- explain correction and transport system
- determine web enabled future trends in ERP
- analyzing future trends in wireless technologies of ERP
- identifying convergence of Internet and other wireless technologies

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### OVERVIEW

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In the previous lesson, you had studied about the extended ERP Systems and ERP add ons-CRM, SCM.

Business analytics makes widely use of data, statistical and quantitative analysis, explanatory and predictive modelling and fact-based management to propel decision making. It is closely interlinked with management science. It is useful as an input for decision making or may operate fully as automated decisions. It is dependent on adequate volumes of high quality data. The tedious task in assuring data quality lies in integrating and reconciling data across various systems and then to decide what subsets of data to make available. The future trends of ERP web enabled systems leads to different business analytics at variable times.

In this lesson, you will learn about the business analytics through ERP, future trends in ERP Systems-web enabled, wireless technologies and so on.

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### 10.1 BUSINESS ANALYTICS THROUGH ERP

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Let us first understand what is business analytics?

Business Analytics means the skills, technologies, applications and practices for constant repeated exploration and investigation of past business performance for achieving new insight and drive business planning. Business analytics aims in developing new ideas and understanding of business performance based on data and statistical methods. It answers the questions such as:

1. Why did it happen?
2. Is there any possibility of happening again?
3. What will happen if we change x?
4. What extra data tell us which never came into our mind?

**Notes****Example:** Business Analytics:

1. Using data mining – exploration of data for finding new patterns and relationships.
2. Using statistical analysis, quantitative analysis – it explains the reasons for the occurrence of certain kind of result
3. A/B testing, Multivariate testing – These methods are used to experiment for testing previous decisions.
4. Predictive modelling, Predictive analytics – These methods are used to forecast future results.



Companies prefer to use business analytics which are committed in making data-driven decisions.

Using ERP in Business Analytics is directed to facilitate the business with the following services:

- To understand the most profitable customers
- To understand the company's inventory worth
- To estimate which items are left in the inventory
- For identifying the type of products and services which have the best margin growth.
- To understand the performance of the company at all business levels.

**10.1.1 Streamlining Business Process through ERP**

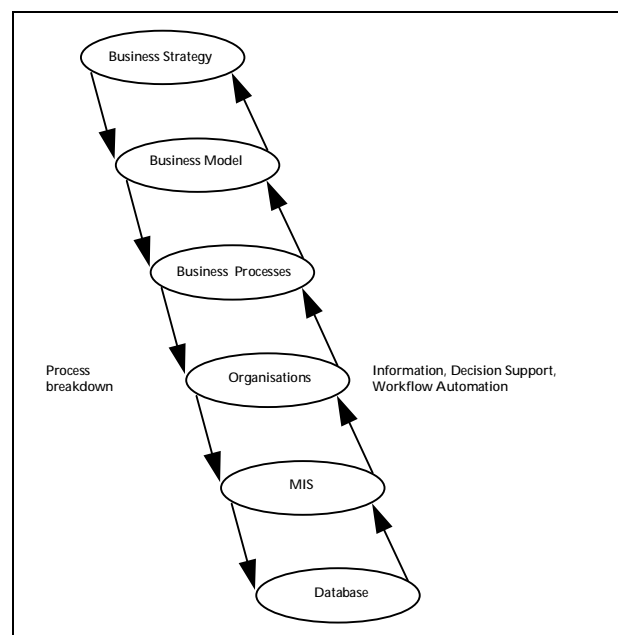
The approach to going for an ERP solution is linked with overall business analytics planning and requires the development first of a business model comprising the core business processes or activities of the business. This is a diagrammatic representation of the business as one large system showing the interconnection and sequence of the business subsystems or processes that it comprises. The approach to accomplish this is depicted in Figure 10.1. The arrows denote that the planning to arrive at the process is accomplished from the top down while the business analytics implementation is from the bottom up. Based on the long-range plans of the business, its strategy and objectives, a business model comprising its business processes is developed. These processes are managed and controlled by various individuals and the groups in various organisations.

## Notes



The ERP is developed to provide the required logistic support to the organisation to manage the processes that are part of the business model. The database supports and drives the ERP.

Thus, we can model a business as an integrated system making the processes managing its facilities and materials as its resources. Information, though not described as a resource, is vital in managing all other resources and can, therefore, be added as a resource while showing the concept of a business as a system.



**Figure 10.1: Building on Business Analytics**

### 10.1.2 How to Model?

The easiest way to understand the processes that underline a business management information system is to use a generalised example. The example we use here is a typical company in the manufacturing business. The type of company is relatively unimportant as the general principles of business process analysis and classification and the methodology of looking at a company's information system to support a series of interlocking subsystems are universally applicable. We now build a business model of generalised manufacturing company at the highest level of abstraction.

The business model actually consists of two major elements:

- A blueprint describing various business processes and their interactions and
- An underlying data model.



## Notes

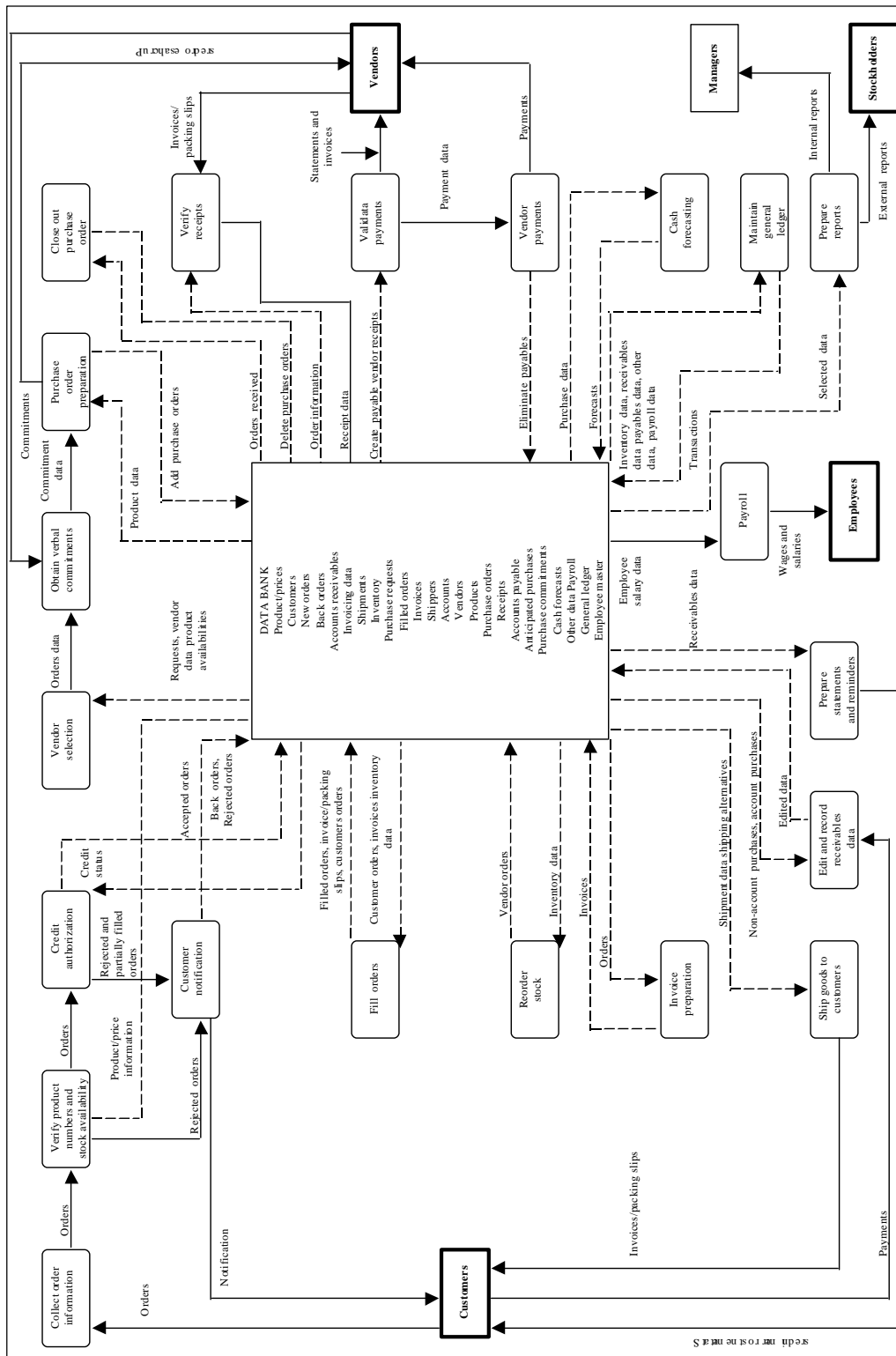


Figure 10.2: Working of Business Analytics

**Notes**

An example of the blueprint of the business model is shown in Figure 10.2. This diagram could provide an illustration of the interrelationships between various processes carried out by a firm.

The blueprint shows how the various processes interchange information with each other as well as with the underlying data model. This representative blueprint along with Table 10.1 giving details of processes and Table 10.2 giving details of entities in the data model forms the input to various implementation methodologies such as enterprise modelling of Baan and ASAP of SAP. The representative blueprint explained in Tables 10.1 and 10.2 can be used as a 'template' or reference model by various companies to list their processes and data entities and then subsequently modified to suit their specific nature and requirements.

**Table 10.1: Representative List of Various Core Processes in a Manufacturing Company**

| Process                            | Description   |
|------------------------------------|---|
| Forecasting                        | Normally shows sales, fund flows, etc. over a long period of time, like say, the next ten years.  |
| Fund management                    | Determines the necessity of funds and the way to raise these funds. May also consider the uncertainty and risk factors. Often, some type of simulation along with 'what if' type of analysis is also undertaken.  |
| Auditing                           | Inspection that determines whether things are working according to the organisational guidelines.   |
| Product planning                   | Decides the product line, a complicated and unstructured process and charts the product growth cycle.   |
| Place planning                     | Concerns decisions about how the product is distributed. Also includes examining the impact of technology such as EDI. Sets procedures for determining effectiveness of the distribution channel.   |
| Promotional planning               | Consists of personnel, selling and advertising. Includes selling a product with a sales force.  |
| Price planning                     | Determines the prices at which products are offered. Involves application of technology to pricing support such as commercial database services. Also includes feedback and sensitivity analyses.   |
| Budget allocation                  | Using computerised algorithms to estimate desirable mix of the funds allocated to various functions.  |
| Product design                     | This process finalises the design and technical specifications of the product using approaches such as CAD and CAE.   |
| Facilities design                  | Includes plant layout, assembly line planning and working out facilities to manufacture the product.  |
| Production scheduling MRP          | This is the process of making new products from   |
| Material requirement determination | raw materials and generally includes production scheduling and requirement planning. Also includes a wide variety of activities in monitoring and planning of actual production.  |
| Quality control                    | This process takes care of activities that ensure that the final product is of a satisfactory quality. It is concerned with identifying the existing quality gaps as well as preventing future quality problems. It involves the use of Statistical Quality Control (SQC) as well as Statistical Process Control (SPC). |

*Contd...*

**Notes**

|                              |  |
|------------------------------|--|
| Order information collection | This process deals with the collection of order information from customers by various means such as mail, phone, fax or on regular-demand and time-period bases.   |
| Verification of orders       | Includes verification of product number and descriptions for accuracy. Also determines whether an order can be filled or not and advises the customer regarding order acceptability.   |
| Credit authentication        | Depending upon order value, method of payment and credit status of customer, the order is approved or otherwise even though accepted as valid.   |
| Customer notification        | Informs customers about order status, integrating customers into order-processing systems and the use of EDI, etc.   |
| Filling orders               | Involves filling of new orders, as well as back orders from available stock. Deals with various procedures regarding 'how' and 'what' of matching order quantity and stock levels. Generation of packing slips.  |
| Reordering stock             | Optimises inventory-holding stocks. Decides when to order and how. It is very crucial from the point of view of integrating suppliers into the inventory system.   |
| Invoice preparation          | Creates invoice. Also includes preparation of statement for accounts receivable.   |
| Shipping goods to customers  | Deals with activities starting from packing of goods in inventory to final loading for transportation. It should provide for a proper shipping method and suitable shipping instructions.  |
| Receivable data              | Editing and recording of this process consists of editing customer's purchase transactions including packing slips, invoices, statements, etc. It also credits payments. Preparing outstanding statements and reminders. Consists of producing information on current and past due accounts and analysing sales patterns. Keeps track of outstanding balances. |
| Selecting vendors            | Researches for vendors and is mainly concerned with selection of vendors based on cost, quality and other advantages.  |
| Obtaining order commitments  | Deals with floating of requests for purchases to obtain customer quotation. The most important aspect of this process is negotiations with vendors to arrive at mutually agreed terms and conditions.  |
| Preparing purchase orders    | Includes carrying out of all necessary documentation for purchases. Increasing trend to use document management and image processing systems and EDI.  |
| Receiving shipments          | Main activities in this process are to receive and to accept or reject goods that vendor's ship.   |
| Validate payments            | Deals with validating invoices and statements against actual receipt of goods and agreed terms and conditions.   |
| Payments to vendor           | Includes preparation of payment schedules based on cash forecasting. Optimisation of this function may have a dramatic effect on the company.  |
| Cash forecasting             | Posting of transactions from various other processes. Ensures proper recording of revenues and expenses.   |
| Payroll                      | This process produces pay checks. Should also produce data for tax purposes and keep track of various deductions such as loans, insurance, etc.  |

## Notes

**Table 10.2: Representative List of Entities Forming Data Model in a Manufacturing Company**

| Process                     | Description   |
|-----------------------------|---|
| External data               | Consists of all important entities outside the firm that interact with it such as consumers, suppliers, competitors and distributors. Also includes predictive data regarding economy and future events occurring in external environment, labour and RM availability scenario. |
| Internal data               | Data generated from the firm's transaction processing system, internal forecasts or parameters monitored.   |
| Transaction processing data | This data includes day-do-day operations as well as those involving revenues and expenses. Also, sales data that result from specific mix of products.  |
| Internal forecast data      | Normally includes planning data such as expected expenses from each of the functional areas as well as sales and revenue projections from the marketing department.   |
| Funding data                | Includes information on specific sources of funds as well as availability, terms and conditions, financial obligations and so on.   |
| Portfolio data              | Includes the current portfolio of securities held by the firm as well as their prices in the financial market.  |
| Government regulations      | Mostly government regulations pertaining to what business firms can and what they cannot do.  |
| Strategic plan              | Includes the current portfolio of securities held by the firm as well as their prices in the financial market.  |
| Marketing research data     | Mainly consumer related data that can be used to support marketing decisions, e.g., result of surveys.  |
| Marketing intelligence data | Includes information about strategies of competitors. It is mostly semi-structured data collected through the media and commercial database services.   |
| Production data             | Shop floor data on production processes including standards and actuals of time and material resources concerned.   |
| Inventory data              | Includes inventories of raw materials, goods-in-process and finished goods.   |
| Vendor data                 | Includes sources, prices and lead times, ratings for raw material and services. It also includes products offered by vendors and their prices.  |
| Personnel data              | Mostly includes profiles of employees, their skill levels, experience and past performance on various assignments.  |
| Union data                  | Data on regulated pay scales, hiring, firing and warning conditions.  |
| Labour data                 | Data about labour market, sources and prices for various skills and their availability.   |
| Engineering specification   | Includes how products can be built on standards, components and manufacturing process, drawings and libraries of specifications.  |
| Internal marketing data     | Includes internal forecasts department-wise, work centre-wise for production purposes and marketing specified standards on products.  |
| Sales forecast              | Product-wise, period-wise forecast for various products sold by the company.  |
| Production capacity         | Data about installed and available capacities of various means of production.   |

*Contd...*

**Notes**

|                         |   |
|-------------------------|---|
| Production schedule     | Time-based plan giving details of how products or services are going to be made available.  |
| Inventories             | Availability of all possible resources, e.g., materials in manufacturing, or seats in an airline. Does not necessarily include physical resources.        |
| Warehouse capacity data | Data about storage capacity and distribution channels where goods or services can be stored. May be national as in case of airline seats.                 |
| Inventory               | Data about availability of RM, WIP and finished goods along with reorder level and reorder quantity and also on anticipated availability and commitments. |
| Shippers data           | Data about agencies involved in transportation and clearing of goods along with their service capabilities and reach.                                     |
| Purchase commitments    | Data about specifications and features of various products or services marketed by the company.   |
| Payroll data            | Data about salaries, tax deductions, statutory forms and other deductions.  |
| General ledger          | Integrated transaction data from payroll and account receivable. Account payable. It is the basis for budgeting and planning data.                        |
| General ledger          | Integrated transaction data from payroll and account receivable. Account payable. It is the basis for budgeting and planning data.                        |

**10.1.3 ERP System Architecture**

All the ERP packages have some core technology which is defined as the technical premise on which the ERP system is built—the total system architecture. It includes the client/server structure, the network and the hardware platform. It also includes issues of scalability, the database engine and performance management. Most ERP packages are hardware vendor neutral and will run in a wide variety of environments, from a small Windows NT application up to massively parallel systems.

The system manager will find several online help documents to aid in the development of an optimally functioning system. All of these documents are available in CD-ROM format, primarily Windows-based.

The system manager will need to decide, based upon projections of throughput and response time, how to distribute the system. The purpose is to divide up the most time-intensive uses of the system to balance the load.



**Example:** Background processing might be moved to its own server.

The system manager will plan and monitor the distributed system to maximise performance and availability. The database server will prove to be the bottleneck for throughput. It should be loaded with the database, shared files, the update server, the message server and the lock server. Other functions that can be offloaded should be offloaded.

**10.1.4 System Administration**

The smallest ERP application may run on a single server and support a modest number of terminals. The database may run on a separate machine, or again, in

**Notes**

the simplest circumstance, the server and the database machine may physically be the same equipment. Within that machine, the database and the applications server will logically be different entities.

Stopping the central ERP System assumes that all processes have ended normally. When there are several instances, each must be stopped individually. An instance is a specific application of ERP, complete with its set of servers, which share a common profile. During the process of implementing ERP, project teams will generally establish up to three instances to separate test systems from actual production systems.

Stopping an instance does not automatically shut down the database system. Processes are shut down in parallel rather than sequentially. It may be necessary to stop the system during an upgrade or for a full backup, but not always.



**Example:** In some cases, it is possible to block to a certain database to do a backup. When the backup is complete, the system manager can initiate a roll forward, applying any transactions that occurred during the back up to the actual database.

Starting up the ERP system requires that you start the database and the application servers, including the gateway server, the system logging process and the spool system transfer process. The gateway server opens connections between the application and the communications protocol. The logging process maintains records of system errors and is essential for debugging problems. The spool system transfer process will pass files for printing, faxing or output to the correct host spooler. The host spooler, in turn, knows which device (specific printer for instance) is to be activated.

Starting up the system may be accomplished for the entire system or for a single host system. The start-up profile can be accessed from any application server and can be used to indicate exactly what is being started up.

System security is always a concern for the systems administrator, who must maintain records (located in the user master records file) of approved users having various levels of security. You may add additional password checks to increase security. Additions of this nature are maintained whole even when new releases are implemented. Individual users will have differing access privileges.



**Example:** One user may be allowed to only read information about a particular customer, while another may be allowed to add or change information for that customer. It is possible to separate privileges so that one person may enter the access information but is not able to activate it, while another may activate but not edit the information.

The systems manager will need to activate a system of tracing access to programmes.

## Notes



**CAUTION** Trace files are written by the individual host system processes. The data are used only in the event of problems in the system that require the manager to know exactly which transactions were executed and which were not.

A table is a matrix that describes a relationship between sets of data. A domain describes the value range for a certain field.



### **Example: Value Range - A discount schedule**

A field is a subset of a table. Each entry in a table (a customer, for example) contains a set of fields (name, address, type of customer, etc.). The type of customer might be coded to indicate the appropriate value in the discount schedule. The field itself may be made up of one or more data elements.

Tables are the features mentioned most often by those who have implemented this system. They are defined differently by different people. Tables contain various types of information and can both manage data and carry out control functions.

There are three major types of tables—system configuration tables, control tables and application data tables. All are defined in the data repository. These are the tables that define the structure of the system. A table exists to define table types and another exists to define objects used for transport. Customers do not change these tables. Other system configuration tables identify peripherals such as printers. These are set up and maintained by the IS department.

To customise the system, the project team will use both control tables and application data tables. Control tables define functions that guide the user in his or her activities.



**Example:** A control table might be set up to require that a customer service representative enter a line item to reference the material master data before a purchase order is accepted. Control tables contain the structure of the company, including such data as company codes, which plants are related to which companies within the corporate structure, which sales organisations relate to which products and which storage locations hold certain products. This is the central repository of the company hierarchy which must be determined prior to installation and configuration.

Application data tables are divided into two main types—transactions and master data files. Both are updated using the appropriate ERP applications. Transaction tables are the largest since they contain the daily operations data

**Notes**

such as orders, payments received, invoices and shipments. Master data files describe sets of basic business entities such as customers, vendors, products, materials and the like. There are also master data files that contain static data such as zip codes.

Application data table, for example will be surrounded by a layer of tables, each of which represents an attribute of the customer, pricing schedule, discounts, location of warehouses that supply the customer and so forth. The sub tables can be thought of as fields in a record. The value of a table structure is that similar tables, such as types of customer (government, key accounts, and retail customers) will apply to all customers and thus, are identified only once and referenced via elements in the file for each customer.

A material master table may contain descriptive text, the title of the material and engineering data, for example. It has a layer of tables that apply to a plant defining the procurement data, minimum order quantities and persons authorised to order. Another layer related to the materials master table will provide the warehousing information. The user may obtain different views of these related tables for sales, inventory or accounting purpose.

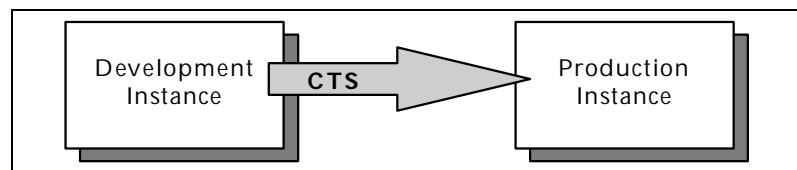
**10.1.5 Business Workflow**

The Business Workflow feature allows the project team to provide procedural automation of the steps in a business process. It can provide suggestions to the end users regarding tasks that must be done and can track work that has been accomplished. Sales managers, for example, can easily track number of orders and status of the individual orders. Orders will (presumably) flow through the system faster because of the prompts the system provides to individuals.

Managers can assign tasks based on capacity competency and skills and can reassign work if necessary, due to illness or special assignments. The business workflow feature is linked to the organisation structure and tasks are tied to position descriptions and responsibilities.

**10.1.6 Correction and Transport System**

The Correction and Transport System (CTS) manages changes to the system and provides the capability of moving these changes from one system to another. Any change to an object receives a correction number. ERP defines objects as groups of data like screens, help text, dynamic programmes and application for programmes. CTS propagate these changes from one instance to another or when the system receives an upgrade (see Figure 10.3).



**Figure 10.3: Correction and Transport System**



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## 10.2 ERP SYSTEMS

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### Notes

In the present scenario, technical jumps attained at the level of cloud computing and mobile devices as tablets and smart phones, as well as the fast development seen in social networks. All these force the employers to think of making use of the technology in best possible manner. These trends contribute to make ERP systems at par with the requirements of business and making it fun to use all its capabilities to take advantage of technical and make plans to keep pace with this objective.

### 10.2.1 Web Enabled

Business applications specializing in their respective domains might not be suited in a native web environment. This means that some technology is being used by the application that is not offered via web based protocols, or that the application was written for previous support of direct database connectivity for speed. These applications get directly loaded onto the user's PC through a set up program. Some people purchase the software and load it onto their PC's while some have installed their own websites. These applications function well in single user environments or for enterprise environments where the application is specialized.

Companies are disregarding their legacy system of simply using Internet for interacting with other processes. They have turned towards Web enabled, integrated ERP systems. These integrated systems have become a part of their overall business strategy which leads to connectivity between an enterprise with its suppliers, customers and transform the whole value chain.

### 10.2.2 Future Trends in ERP – Web Enabled

Future Trends in ERP can be visualized as follows:

1. Cloud ERP
2. Open Source ERP
3. Mobile ERP
4. Social ERP
5. Data

#### ***Cloud ERP***

Allows the companies to access data over the Internet.

It includes cloud computing models such as:

- Public Cloud
- Private Cloud
- Hybrid Cloud

**Notes**

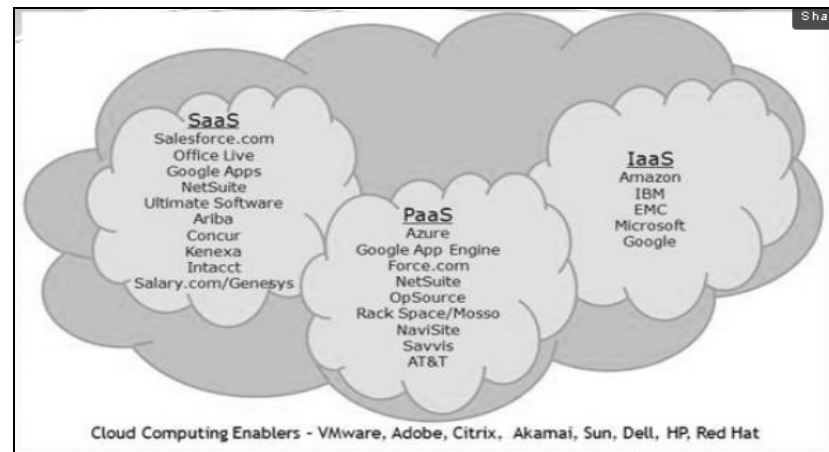
Integration of Cloud-based ERP services, both with other clouds and with installed ERP systems. As per need –basis, more and more companies have started consuming ERP services through the cloud.

Interoperability between cloud services will remove the requirement of companies to install middleware and programming for making third-party module work with present ERP systems. With the trend moving from CAPEX to OPEX and from on-site to off-site, ERP in the cloud facilitates managed service businesses that allow them to focus on their core activities.

Listing out cloud-computing services:

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)

Interoperability between cloud services will eliminate the need for companies to install middleware and programming to make third-party modules work with existing ERP systems.



**Figure 10.4: Cloud Computing Services**

### ***Open Source ERP for SaaS***

- It involves Upfront Costs such as
  - ❖ Free licensing fees
  - ❖ Customization, training, data migration and configuration
- It includes On-going Costs

You need to pay to the provider till the contract lasts.

- It includes Ease or Speed in Implementation

It can be implemented in just a few hours whereas customizations, training and data migration takes weeks or months.

**Notes**

- It involves flexibility
- Reducing the amount of flexibility

***Open Source ERP***

It includes customization

- Less customizable solutions are SaaS.
- Multi-tenant enables the customer to gain access to the sourcecode.

It provides Support

Provider is needed who can understand both the software and the service delivery.

It includes new Features and updates

New features and updates are available without a schedule of upgrades or bug fixes.



Open Source ERP involves security. It requires careful management in order to ensure proper security access and process management

***Mobile ERP***

Breaking down of information into archives through mobile technologies, leading to real-time data sharing. Provision of  $24 \times 7$  anytime, anywhere accessibility of data will further better decision making process, extending across all the departments of an organization.

- Better decisions can be made everywhere
- Valuing rapid time
- To extend mobile analytics all the way and beyond your organization.
- Building Visual Analysis for next generation
- New On-demand and Cloud Solutions

***Social ERP***

- Ability to capture the decision
- Relevant information provider
- Ability to leverage the network
- To assemble collaboration and business intelligence
- Allow real-time social analysis
- Collaboration can be captured at all points in the information supply chain.

**Notes****Data**

Simplification of data input by installing sensors throughout the enterprise that automatically collects different kind of data.

- Wide Data and Business Intelligence (BI)
  - ❖ It allows BI for in-memory solutions
  - ❖ It allows BI for real-time operational systems, Internet activity, or streaming data
- Huge volumes of data and Storage
- Virtual data centres

**Learning Activity**

Point out the various features of Android application in mobile phones. Analyse its usefulness in terms of integrating social connectivity between individuals.

**10.2.3 Other Future Trends of ERP – Web Enabled**

1. Markets should concentrate on SMEs with the availability of ERP to the cloud systems.
2. It becomes easier to use ERP Systems, while the cloud, mobile devices and social media will have an effect on products on offer to manufacturers.
3. Simplification of ERP can be done in respect of the deployment of the system and to align it with the business processes of the organization. It can be done through
4. Easy installation of ERP and its rapid consumption. As market doesn't wish to consider these big, costly, mono monolithic implementations of traditional ERP.
5. Fine user interfaces (UIs) which have been particularly designed for user roles and user groups, from the workers on the factory floor to front-line employees to executives in the C-suite.
6. UI's as it grows fastly to modify the ways input, process and retrieve data.
7. Voice recognition for search features – a new way of user experience.
8. Advanced analytics will get continue to be produced by vendors which, in turn, will help companies to have better, rapid access to the increasingly huge amounts of data that is collected by ERP systems.
  - ❖ Influential impact on analytics by wide data, which are data sets that have grown Very large for commonly used software tools for capturing, managing and processing expediently.



**Example:** A big data engine has been released by SAP very recently which is called HANA that combines in-memory analytics with high-performance processing.

## Notes

- ❖ Another important trend for the future of ERP is predictive analysis, such as recommendation engines, enabled by faster analytics which leads to better business decisions made faster.
  - ❖ Completion of reports now in a matter of minutes which were earlier been taken more than a day to process.
  - ❖ More accurate decisions can be taken through advanced analytics which are based on near real-time information, such as how many units need to be manufactured or how much inventory needs to be replenished.
9. Another global trend also affects the evolution of ERP: sustainability. ERP's can go –green in two ways:
- ❖ Companies can use their ERP system for tracking data which is related to its ecological impact.
  - ❖ Companies prefer to use virtualization methods to make ERP, a running green-technology.
10. Reduction in ERP downtime due to data storage at multiple sites for preventing time lags.

This way ERP can replace a committed sustainability system. With virtualization, a company can combine ERP applications on fewer servers that make a more energy efficient ERP system. ERP moving to the cloud makes for a greener ERP for the same reason.

## 10.3 FUTURE TRENDS IN WIRELESS TECHNOLOGIES OF ERP

Wireless ERP has helped organizations for making use of the communication channels effectively and efficiently. Now it becomes possible for many elements to operate in ERP, which was not possible earlier. Wireless ERP is all about sharing enterprise information through devices like Internet and other devices which makes it possible for outsiders for the same access.

Internet extends help to organizations for integrating data and processes across all functional departments.

Companies that wish to move into a net economy have started to emerge and concentrate on multi-enterprise systems integration and growth. They are constructing strategic partnerships with major infrastructure providers like Sun, IBM and Microsoft for continuous integration of their ERP systems to achieve internal and external performance target. Major ERP vendors like Oracle, SAP, BAAN, JD Edwards and i2 are continuously upgrading and releasing integrated ERP/e-business suites for assisting an open, collaborative and competitive business environment.

**Notes**

Wireless ERP is advancement to core ERP applications and systems for facilitating interactions with this information to mobile sales force and customer service personnel from anywhere, at any time.

- It provides products such as Xora Platform 3.0.
- For Vendors
  - ❖ SAP
  - ❖ PeopleSoft
  - ❖ Sonic Software and Xora Inc. are developing software products that will integrate with supply chain systems. Sonic Air provides a wireless messaging software-Sonic MQ e-business messaging middleware server. Remote access software is being built up by Xora.
  - ❖ Sonic is in collaboration with GE Global Exchange Services and Commerce one also.
  - ❖ Ironside
  - ❖ Using XML in B2B communications will enable a series of new relationships between companies, vendors, suppliers and customers. It has therefore, become a standardized feature for exporting data from application suites and developer tools by using XML.



**Example:** IBM converts generic XML information into device – specific formats which can be useful on wireless devices.

- ❖ Outsourcers, ERP vendors and e-business infrastructure providers' partnership together for providing more robust, measurable and compatible e-business platforms for the companies.



**Example:** A strategic alliance between Sun and AOL with Price water house coopers in providing technology and services that allow companies to build critical e-business solutions. It will leverage investments in SAP R/3. Netscape Application Server for R/3 has provided a stable infrastructure for Web Solution (iPlanet) that enables the customers for obtaining SAP system in a secure manner (iPlanet, 2000).

- **For Customer Profiles**
  - ❖ *World Commerce Online Inc.* It offers its offers its customers (agricultural consortiums and flower consortium, a fruit consortium) web-based wireless interface to its ERP system. This is based on Xora technology.
  - ❖ *Intertape Polymer Group, Montreal, PQ, Canada-* It employs PalmVII PDAs for allowing its sales force to retrieve customer information wirelessly. They use Ironside's eWireless platform.

## Notes

**Example: Customer Profile – Lamson and Sessions***Manufacturing ERP***Company**

Lamson & Sessions - an electrical manufacturer and distributor, based in Cleveland, Ohio

*Business and Technology Problem*

SAP Inventory management application (receiving, shipping and order fulfilment) under SAP R/3 version 3.1 did not permit users to retrieve information using Symbol handheld devices and its Spectrum24 wireless LAN. Only a more recent version of SAP 4.6 offers this support.

**Technology Solution**

The customer employed a consulting company and developed an interim custom solution that bypasses the middleware but using SAP's console function. Now the factory workers can retrieve his information from their handheld devices in real-time fashion. It will then, increases accuracy of data input as well as its timeliness.

SAP had released SAPConsole, a tool-kit that bar-code-allows any part of SAP's enterprise software. This enables any SAP graphical interface to text interface. Unfortunately, SAPConsole requires SAP version 4.6 - an expensive upgrade for Lamson & sessions at this stage. Custom software solution cost the company approximately \$750,000 to one million dollars.

The customer gave justification on investment which is based on improving order fulfilment and faster shipment.

**10.3.1 Convergence of Internet and other Wireless Technologies**

With the convergence of the Internet and other wireless technology, users now operate Web enabled ERP systems anywhere and at any time through the use of newer and easy-to use devices like personal digital assistants (PDAs), smart phones, in-devices and biometric tools.



**Example:** Leveraging a company's ERP with a personal digital assistant by an accounting manager who is out of town for reviewing financial reports and providing directions to his juniors. He/She can log in to the system by using his/her fingerprint or voice.

**Learning Activity**

Analyse the convergence of Internet with smart phones. Point out relevant applications to be used in smart phones.

## Notes



### **Business Analytics of Bajaj Electricals**

**B**ajaj Electricals, a known name in consumer electronics for almost 65 years in India, was confined to legacy systems for most of their business processes.

This was causing hindrance to core business operations, as growth was fast but the legacy systems weren't able to support it. At places, these systems were more than 12 years old and it was becoming costly and difficult to maintain them. Even the supporting technology platforms had become out-dated. Hence it was decided by the management to initiate a project that will focus towards improving business processes with IT systems. They decided to implement ERP, SCM, CRM & BI applications together with complete integration taking a big-bang approach. The Oracle Business suite of applications was selected for implementation, and the project was named 'Project SMILE.' This is an acronym for the objectives to be achieved:

- S – Simplify the business processes
- M – Migration to newer technologies
- I – Innovative and Integrated Business applications
- L – Create learning orientation across the organization
- E – to make entire organization Effective and Efficient.

Before implementation of this project, inefficient processes resulted in revenue loss as there were no forecasting or planning tools available. Plus, legacy systems were not built to support current business processes. These challenges were overcome by implementation of the following products: Oracle E-business Applications (ERP), Oracle Siebel CRM Applications, Oracle Demantra, Demand Management Tool for demand forecasting, and on top of these apps, business intelligence solutions like Oracle Daily Business Intelligence and Oracle Business Intelligence Enterprise Edition for Sales Analytics, Dashboards & Reporting (OBI) were also implemented.

Mr Siddhartha Kanodia, Executive VP & Head Corporate Service said "Project SMILE was not just a plain vanilla ERP implementation. Besides financials, it involved implementing and planning of CRM tools such as Demantra, Advanced Supply Chain Planning and Siebel CRM. This called for a huge change initiative and I am proud to say that the entire operations team at Bajaj Electricals embraced the changed processes and leveraged the planning tools extremely well. The support from the IT team also was more than commensurate to make this a possibility".

Post deployment, the company has been able to get the investment payback achieved within the first year, and just from the savings coming out from

*Contd...*



one module called Siebel Dynamic Pricing Module. The company can now make right items available at the right time with Advanced Supply Chain Planning solution, which has reduced the overall inventory in the pipeline and also improve the company's ability to service customer orders. The overall inventory losses have been brought down by 2% due to this.

### Questions

1. Highlight the challenges faced by Bajaj Electricals before implementation of Project SMILE comprising of ERP, SCM, CRM and BI applications.
2. How do they overcome those challenges for streamlining their business processes?
3. Draw a business analytics framework for Bajaj Electricals.

Source: <http://www.dnserp.com/bajaj.htm> m#sthash.G17Zs98c.ZILmHkgo.dpbs



1. The central system configuration consists of an application server, a message server, a gateway server and the database system. These three servers are generally combined at the server layer and addressed by the desktop or presentation layer.
2. The data repository provides current information to language interpreters, report functions and screen generators, as well as to certain help tests. The rules for structuring this information are consistent with the concepts of the relational data model using tables, domains and fields.

## SUMMARY

- Business Analytics means the skills, technologies, applications and practices for constant repeated exploration and investigation of past business performance for achieving new insight and drive business planning. Business analytics aims in developing new ideas and understanding of business performance based on data and statistical methods.
- The approach to going for an ERP solution is linked with overall business analytics planning and requires the development first of a business model comprising the core business processes or activities of the business.
- All the ERP packages have some core technology which is defined as the technical premise on which the ERP system is built—the total system architecture. It includes the client/server structure, the network and the hardware platform. It also includes issues of scalability, the database engine and performance management.

## Notes

**Notes**

- The smallest ERP application may run on a single server and support a modest number of terminals. The database may run on a separate machine, or again, in the simplest circumstance, the server and the database machine may physically be the same equipment. Within that machine, the database and the applications server will logically be different entities.
- Tables are the features mentioned most often by those who have implemented this system. They are defined differently by different people. Tables contain various types of information and can both manage data and carry out control functions. There are three major types of tables—system configuration tables, control tables and application data tables. All are defined in the data repository.
- The Business Workflow feature allows the project team to provide procedural automation of the steps in a business process.
- Business applications specializing in their respective domains might not be suited in a native web environment. This means that some technology is being used by the application that is not offered via web based protocols, or that the application was written for previous support of direct database connectivity for speed. These applications get directly loaded onto the user's PC through a set up program. Some people purchase the software and load it onto their PC's while some have installed their own websites. These applications function well in single user environments or for enterprise environments where the application is specialized.
- Wireless ERP is advancement to core ERP applications and systems for facilitating interactions with this information to mobile sales force and customer service personnel from anywhere, at any time.

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**KEYWORDS**

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**Business Analytics:** Business Analytics means the skills, technologies, applications and practices for constant repeated exploration and investigation of past business performance for achieving new insight and drive business planning. Business analytics aims in developing new ideas and understanding of business performance based on data and statistical methods.

**Streamlining Business Process through ERP:** The approach to going for an ERP solution is linked with overall business analytics planning and requires the development first of a business model comprising the core business processes or activities of the business.

**ERP System Architecture:** All the ERP packages have some core technology which is defined as the technical premise on which the ERP system is built—the total system architecture. It includes the client/server structure, the network and the hardware platform. It also includes issues of scalability, the database engine and performance management.

**Notes**

**System Administration:** The smallest ERP application may run on a single server and support a modest number of terminals. The database may run on a separate machine, or again, in the simplest circumstance, the server and the database machine may physically be the same equipment. Within that machine, the database and the applications server will logically be different entities.

**Tables defined in data Repository:** Tables are the features mentioned most often by those who have implemented this system. They are defined differently by different people. Tables contain various types of information and can both manage data and carry out control functions. There are three major types of tables—system configuration tables, control tables and application data tables. All are defined in the data repository.

**Business Workflow:** The Business Workflow feature allows the project team to provide procedural automation of the steps in a business process.

**Web-enabled ERP Systems:** Business applications specializing in their respective domains might not be suited in a native web environment. This means that some technology is being used by the application that is not offered via web based protocols, or that the application was written for previous support of direct database connectivity for speed. These applications get directly loaded onto the user's PC through a set up program. Some people purchase the software and load it onto their PC's while some have installed their own websites. These applications function well in single user environments or for enterprise environments where the application is specialized.

**Wireless ERP:** Wireless ERP is advancement to core ERP applications and systems for facilitating interactions with this information to mobile sales force and customer service personnel from anywhere, at any time.

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**SELF-ASSESSMENT QUESTIONS**

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**Short Answer Questions**

1. What is business analytics?
2. State the examples of business analytics.
3. What kind of services business can get facilitated with by using ERP in business analytics?
4. How business processes can get streamlined through ERP? Explain with diagram.
5. How to model business processes through ERP?
6. Give any four representative lists of various core processes in a manufacturing company.
7. Give any four representative lists of entities forming data model in a manufacturing company.

### Notes

8. What do you mean by ERP system architecture?
9. What do you mean by system administration in ERP?
10. Define tables. What are the three major types of tables that are defined in data repository?
11. What is a material master table?
12. What do you mean by business workflow?
13. How correction and transport system manage changes to the system?
14. What do you mean by web-enabled ERP system?
15. State future trends of web-enabled ERP systems.
16. What are cloud ERP and open-source ERP?
17. Discuss at least five other future web-enabled trends of ERP.
18. Define wireless ERP. Give examples.
19. What kind of Wireless technologies are used in ERP?
20. What do you mean by convergence of Internet with other wireless technologies?

### Long Answer Questions

1. Explain business analytics through ERP with examples. How does business streamline their business processes through ERP?
2. Explain working of business analytics with flowchart diagram. Highlight twelve representative lists of various core processes of a manufacturing company.
3. Explain ERP architecture with system administration.
4. "A table is a matrix that describes a relationship between sets of data". Explain different types of tables that are defined in data repository with examples.
5. "The Business Workflow feature allows the project team to provide procedural automation of the steps in a business process". Discuss this statement. How correction and transport system manage changes to the system? Explain with diagram.
6. "Business applications specializing in their respective domains might not be suited in a native web environment". Discuss future trends of web-enabled ERP systems with examples.
7. Discuss other future trends of web-enabled ERP system.
8. How do wireless technologies of ERP help vendors and customers in managing their profiles?

9. “Wireless ERP has helped organizations for making use of the communication channels effectively and efficiently”. Explain future trends in wireless technologies of ERP.
10. Explain Convergence of Internet and other Wireless technologies with examples. Discuss mobile ERP, social ERP and data-input as future trend of web-enabled ERP.

**Notes**

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## FURTHER READINGS

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Summer (2008), *Enterprise Resource Planning*, Pearson Education.

Vaman, Nathan, Jagan (2008), *ERP in Practice*, Tata McGraw-Hill.

Jaiswal, Mahadeo and Vanapalli (2009), *Enterprise Resource Planning*, MacMillan, India.

Ray, Rajesh (2011), *Enterprise Resource Planning*, Tata McGraw Hill Education.

Alexis, Leon (2007), *ERP demystified*, 2<sup>nd</sup> edition, Tata McGraw-Hill.



# Model Question Paper

Reg. No.: 

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## M.B.A. DEGREE EXAMINATION

Third Semester

DBA 7304— ENTERPRISE RESOURCE PLANNING

(Common to all Branches)

(Regulations 2013)

Time: Three hours

Maximum: 100 marks

Answer ALL questions.

### PART A – (10 × 2 = 20 marks)

1. Define 'Enterprise Resource Planning' (ERP).
2. What do you understand by the term 'Closed-loop MRP'?
3. What is 'Business Logic' in ERP perspective?
4. List out the common sub-systems of a HR Module of an ERP system.
5. What do you understand by 'Analytical Hierarchical Process'?
6. What is 'Data Migration' process of an ERP system?
7. List out the steps involved in the maintenance of the ERP Systems.
8. When does an ERP system is considered as an 'Ideal ERP System'?
9. Why the Demand Chain and Supply Chain has to be decoupled?
10. What is Business Analytics?

### PART B – (5 × 13 = 65 marks)

11. (a) Discuss elaborately the 'evolution phases' of Enterprise Resource Planning (ERP) right from 1960s to till date. (13)  

Or

(b) Explain the following with suitable examples wherever necessary:  

(i) Risks and benefits of ERP for Firms. (7)  
(ii) Cross Functional Integrated ERP Systems. (6)
12. (a) Explain the various criteria to be met and possessed by an ERP system, when proposed for the small and medium enterprises. (13)

Or

(b) Explain the following with suitable examples wherever necessary:

- (i) Material management module of an ERP system (components). (7)
- (ii) Business process management techniques. (6)

13. (a) Using a flow diagram, explain the various 'Phases' involved in the ERP implementation life cycle. (13)

Or

(b) Explain with suitable examples, the eight areas in which the hidden costs are incurred leading to budget overrun, while implementing ERP. (13)

14. (a) Explain the following with suitable examples wherever necessary:

- (i) Industrial impact of ERP (Elements and sub-elements). (6)
- (ii) Maintenance of ERP (Steps and components). (7)

Or

(b) With relevant points and suitable examples, describe the various factors and sub-factors that determine the success of ERP implementation. (13)

15. (a) Explain the following with suitable examples wherever necessary:

- (i) ERP for fleet management and trading domains (key features). (7)
- (ii) Benefits of 'CRM Software' as a module of CRM in ERP. (6)

Or

(b) Explain the following with suitable examples wherever necessary:

- (i) ERP system architecture. (6)
- (ii) Future trends in web-enabled ERP. (7)

**PART C – (1 × 15 = 15 marks)**

16. (a) Glomove is a Singapore based premier MNC, Involved in the design, manufacturing, global marketing and selling of its high demand products such as Footwear, Sports shoes, apparels, equipment etc right from 2006. This profit making firm decided to adopt ERP in 2014 and fully implemented the ERP system by 2015 in its many modules say CRM, Manufacturing, HR, SCM, FICO etc by renowned ERP Vendors. Initially ERP was seen as a success, but of late especially after July 2016, the firm's customer attrition, operating cost etc are increasing whereas the sales volume has come down. Having invested huge capital in ERP implementation and maintenance the firm is now puzzled and want to identify the probable failure factors responsible for this ERP debacle. The firm has approached you and in your assumed role as a ERP Management Consultant prepare and present the firm with a 'Generic Report' incorporating the most probable factors, possible avenues (both Internal and external) along with any other solid reasons for the ERP failure, as identified by you. You may assume relevant data for this case, but the same needs mention in the report. Justify your report with valid points as well as your valuable suggestions for the Firm to overcome the debacle.



Or

- (b) You have recently joined as Technology Consultant in a leading Chennai based automobile firm that manufactures various models of passenger Cars and three wheelers right from 2007. This profit making firm plans to streamline its main business process, i.e., its manufacturing process through ERP adoption. Now, your GM instructs you to prepare and present a 'Manufacturing Process cum Data Model' for your firm, which will be treated as a Blueprint for streamlining your firm. Your 'Process cum Data Model' should provide the following:
- (i) Representative list of various core processes and their brief description in an ideal automobile manufacturing company like your firm and
  - (ii) Representative list of various Entities and their brief description, for forming a 'Data Model' that is suitable for a manufacturing company like your firm. Justify your report with charts providing valid information on processes and relevant Data.