

DIGITAL NOTES

Enterprise Resource Planning

R18A0052

B.Tech –IIIYear –ISemester

DEPARTMENT OF MECHANICAL ENGINEERING



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution – UGC, Govt.of India)

Recognizes under 2(f) and 12(B) of UGC ACT 1956

(Affiliated to JNTUH, Hyderabad, Approved by AICTE –Accredited by NBA & NAAC-“A” Grade-ISO 9001:2015

Certified)

ENTERPRISE RESOURCE PLANNING

OBJECTIVES

- To know the basics of ERP
- To understand the key implementation of ERP
- To know the business modules of ERP
- To evaluate the current and future trends in ERP

UNIT 1

INTRODUCTION: Overview and Benefits of ERP, ERP Related Technologies- Business Process Reengineering (BPR), Online Analytical Processing (OLAP), Supply chain Management (SCM). Applications of ERP.

UNIT II

ERP IMPLEMENTATION: Implementation and Product Lifecycle, Implementation Methodology, Planning Evaluation and selection of ERP systems, Organizing the Project Management and Monitoring. Case Study on Manufacturing.

UNIT III

ERP MODULES: Business modules in an ERP Package- Manufacturing, Human Resources, Plant Maintenance, Materials Management, Data Warehousing, Data Mining, Quality Management, Sales and Distribution. Case Study in Banking Sector.

UNIT IV

POST IMPLEMENTATION: Overview of ERP software solution. Maintenance of ERP- Organizational and Industrial impact; Success and Failure factors of ERP Implementation. Case Study of Success Story and Failure of Processing Sector.

UNIT V

EMERGING TRENDS IN ERP: Extended ERP system, ERP add-ons –Customer Relations Management (CRM), Customer satisfaction (CS). Business analytics etc- Future trends in ERP systems-web enabled, Wireless technologies. Case Study in Service Sector.

Course Outcomes:

- To know the strategic importance of Enterprise Resource Planning
- To Understand and implement ERP in various Sectors.

TEXT BOOKS:

1. Jagan Nathan Vaman, ERP in Practice, Tata McGraw-Hill, 2008
2. Alexis Leon, "ERP Demystified", Tata McGraw Hill, New Delhi, 2000
3. Mahadeo Jaiswal and Ganesh Vanapalli, ERP Macmillan India, 2009.

REFERENCE BOOKS:

1. Alexis Leon, Enterprise Resource Planning, second edition, Tata McGraw-Hill, 2008.
2. Vinod Kumar Grag and N.K. Venkitakrishnan, ERP- Concepts and Practice, Prentice Hall of India, 2nd edition, 2006.
3. Joseph A Brady, Ellen F Monk, Bret Wagner, "Concepts in Enterprise Resource Planning", Thompson Course Technology, USA, 2001.

CONTENTS

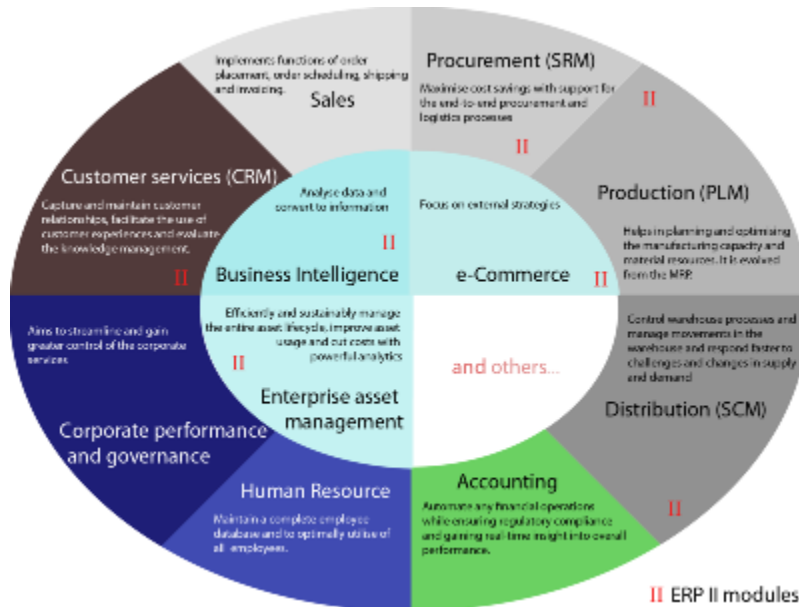
UNIT NO	NAME OF THE UNIT	PAGE NO
I	INTRODUCTION TO ERP	5-20
II	ERP IMPLEMENTATION	21-33
III	ERP MODULES	34-43
IV	POST IMPLEMENTATION	44-48
V	EMERGING TRENDS IN ERP	49-61

UNIT 1

INTRODUCTION

Enterprise resource planning (ERP) is business process management software that allows an organization to use a system of integrated applications to manage the business and automate many back office functions related to technology, services and human resources.

ERP software typically integrates all facets of an operation — including product planning, development, manufacturing, sales and marketing — in a single database, application and user interface.



ERP is an Enterprise Application

ERP software is considered to be a type of enterprise application, that is software designed to be used by larger businesses and often requires dedicated teams to customize and analyze the data and to handle upgrades and deployment. In contrast, Small business ERP applications are lightweight business management software solutions, often customized for a specific business industry or vertical.

Today most organizations implement ERP systems to replace legacy software or to incorporate ERP.



Examples of ERP system modules include: product lifecycle management, supply chain management (for example purchasing, manufacturing and distribution), warehouse management, customer relationship management (CRM), sales order processing, online sales, financials, human resources, and decision support system

Overview and Benefits of ERP:

There are many advantages to implementing an Enterprise Resource Planning (ERP) software solution. Among countless other advantages, implementing ERP software can improve productivity, increase efficiencies, decrease costs and streamline processes. Let's look at 15 of the most common benefits of an ERP system that companies have reported after implementation.

ERP implementation is broken up into three phases: discovery, implementation, and results. In the initial phase, we install the software, build a prototype, and train your staff. Then we test the ERP system, create reporting templates, and run more targeted training sessions. Finally, we finalize the model of your ERP system, conduct readiness assessments, and go live.

WorkWise provides expert level software implementation, which is the process of placing sub-systems into your main ERP system and ensuring that they all are able to function together as one seamless system. Taking a knowledge based approach to ERP implementation, WorkWise pairs each client with a skilled consultant with proven industry experience. They take into

account the outside software needed to help maintain and complete daily business activities. During the implementation process, clients are also able to take part in a training process which provides them with the tools and knowledge to user their software correctly and to the best of its ability

- COMPETITION

It's true that ERP software requires a major investment, but there's also an even bigger cost in not making the investment. While some manufacturers choose to stick to the tried and true methods of the past, others seek technology solutions. Manufacturers cannot afford to put off an ERP implementation while their competition invests in ERP and starts reaping the many benefits we'll touch on below.

- EFFICIENCY

An ERP solution eliminates repetitive processes and greatly reduces the need to manually enter information. The system will also streamline business processes and make it easier and more efficient for companies to collect data, no matter what department they're working in.

- FORECASTING

Enterprise resource planning software gives your users, and especially managers, the tools they need to create more accurate forecasts. Since the information within ERP is as accurate as possible, businesses can make realistic estimates and more effective forecasts.

- COLLABORATION

Nobody wants to run a siloed business with each department functioning separate from the other. Collaboration between departments is a crucial and often necessary part of the business. With the data entered into ERP systems being centralized and consistent, there's no reason why departments can't work together. The software also touches on almost every aspect of a business, thus naturally encouraging collaborative, interdepartmental efforts.

- SCALABILITY

Did you know? Structured ERP systems allow the addition of new users and functions to grow the initially implemented solution over time. When your business is ready to grow or needs more resources, enterprise resource planning software should be able to facilitate that growth.

- INTEGRATED INFORMATION

No more issues with data spread across separate databases; all information will be housed in a single location. This means you can integrate platforms like your CRM software with the ERP system, keeping data consistent, accurate, and unique. Know your customer, their orders, and your inventory, all in one place.

- COST SAVINGS

With one source of accurate, real-time information, ERP software reduces administrative and operations costs. It allows manufacturers to proactively manage operations, prevents disruptions and delays, breaks up information logjams and helps users make decisions more quickly. If you've chosen the right solution for your business, and the right vendor who meets your needs, you're bound to see a powerful ROI.

- STREAMLINED PROCESSES

As manufacturers grow, their operations become more and more complex. Manufacturing software automates business operations cross-departmentally, providing accurate, real-time information to everyone utilizing the solution. ERP increases efficiency and productivity by helping users navigate complex processes, preventing data re-entry, and improving functions such as production, order completion and delivery. Streamlined, efficient processes throughout.

- MOBILITY

An advantage of ERP solutions like Work Wise ERP software is having access to a centralized database from anywhere you work. Home, office, wherever, through our mobile-friendly solution and application.

- REPORTING

ERP software helps make reporting easier and more customizable. With improved reporting capabilities, your company can respond to complex data requests more easily. Users can also run their own reports without relying on help from IT, saving your users time to use toward other projects.

- **PRODUCTIVITY**

Save time and increase productivity levels. Sound too good to be true? It's not with ERP software. By having redundant processes automated, users have more time to work on other pressing projects and tasks. They'll also be able to work easier since the solution was designed for ease-of-use.

- **REGULATORY COMPLIANCE**

A benefit of ERP software which sometimes goes unnoticed is how it ties well into regulatory compliance in the manufacturing industry. Powerful ERP solutions will keep track of regulations within the industry and monitor changes in compliance.

- **FLEXIBILITY**

Modern ERP software systems are robust, flexible, and configurable. They are not a one-size-fits-all proposition but can be tailored to the unique needs of a business. ERP systems also can adapt to the ever-changing needs of a growing business, ensuring you won't have to buy a new solution once your needs change or your business grows.

- **CUSTOMER SERVICE**

It's easier to provide high-quality customer service using an enterprise solution, especially when you're using one as well-equipped as Work Wise ERP. Sales and customer service people can interact with customers better and improve relationships with them through faster, more accurate access to customers' information and history. You'll also have access to marketing automation and contact center software, ensuring your customers are being interacted with consistently.

- **SECURITY**

Data security isn't a worry when you have an enterprise resource planning solution in place. A new system will improve the accuracy, consistency, and security of data, all through built-in resources and firewalls. Restrictions to data can also be enhanced by managers of the solution, so you can make your own software as secure as you'd like.

ERP Related Technologies:

Before giving you an ERP technologies list, it is very important to understand the typical structure of ERP systems. In a real life, enterprise resource planning solutions consist of dozens of connected application, databases, modules, APIs etc. However, as any applications, they can be viewed as a structure built of the database, backend or server part and the frontend or the user interface:

- **Database** – it is where the data about the assets (like the number of products in the warehouse etc) is stored.
- **Backend** – the engine that performs the operations in the system according to the users' request, for example, make a request for the database to make a list of the products and goods on the particular warehouse and render it to the user.
- **Frontend** – the graphical interface that allows the users to communicate with the backend and to form the requests and then display the received information.

Those are the very simplified explanation of the ERP components from the software architecture perspective. In this article, we will use them as the criteria for listing of the technologies in ERP systems to show their role and exhibit their value for the business intelligence software as a whole.

Business Process Reengineering (BPR):

Davenport & Short (1990) define business process as "a set of logically related tasks performed to achieve a defined business outcome." A process is "a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization" (Davenport 1993). In their view processes have two important characteristics: (i) They have customers (internal or external), (ii) They cross organizational boundaries, i.e., they occur across or between organizational

subunits. One technique for identifying business processes in an organization is the value chain method proposed by Porter and Millar (1985).

Processes are generally identified in terms of beginning and end points, interfaces, and organization units involved, particularly the customer unit. High Impact processes should have process owners. Examples of processes include: developing a new product; ordering goods from a supplier; creating a marketing plan; processing and paying an insurance claim; etc.

Business process reengineering (often referred to by the acronym BPR) is the main way in which organizations become more efficient and modernize. Business process reengineering transforms an organization in ways that directly affect performance

Business process reengineering (BPR) is the analysis and redesign of workflow within and between enterprises. BPR reached its heyday in the early 1990's when Michael Hammer and James Champy published their best-selling book, "Reengineering the Corporation". The authors promoted the idea that sometimes radical redesign and reorganization of an enterprise (wiping the slate clean) was necessary to lower costs and increase quality of service and that information technology was the key enabler for that radical change. Hammer and Champy felt that the design of workflow in most large corporations was based on assumptions about technology, people, and organizational goals that were no longer valid. They suggested seven principles of reengineering to streamline the work process and thereby achieve significant levels of improvement in quality, time management, and cost:

1. Organize around outcomes, not tasks.
2. Identify all the processes in an organization and prioritize them in order of redesign urgency.
3. Integrate information processing work into the real work that produces the information.
4. Treat geographically dispersed resources as though they were centralized.
5. Link parallel activities in the workflow instead of just integrating their results.
6. Put the decision point where the work is performed, and build control into the process.
7. Capture information once and at the source.

Role of information technology

Information technology (IT) has historically played an important role in the reengineering concept. It is considered by some as a major enabler for new forms of working and collaborating within an organization and across organizational borders.

The early BPR literature, e.g. Hammer & Champy (1993), identified several so called disruptive technologies that were supposed to challenge traditional wisdom about how work should be performed.

1. Shared databases, making information available at many places
2. Expert systems, allowing generalists to perform specialist tasks
3. Telecommunication networks, allowing organizations to be centralized and decentralized at the same time
4. Decision-support tools, allowing decision-making to be a part of everybody's job
5. Wireless data communication and portable computers, allowing field personnel to work office independent
6. Interactive videodisk, to get in immediate contact with potential buyers
7. Automatic identification and tracking, allowing things to tell where they are, instead of requiring to be found
8. High performance computing, allowing on-the-fly planning and revisioning

In the mid 1990s, especially workflow management systems were considered as a significant contributor to improved process efficiency. Also ERP (Enterprise Resource Planning) vendors, such as SAP, positioned their solutions as vehicles for business process redesign and improvement.

Impact of BPR on organizational performance

The two cornerstones of any organization are the people and the processes. If individuals are motivated and working hard, yet the business processes are cumbersome and non-essential activities remain, organizational performance will be poor. Business Process Reengineering is the key to transforming how people work. What appear to be minor changes in processes can have dramatic effects on cash flow, service delivery and customer satisfaction. Even the act of documenting business processes alone will typically improve organizational efficiency by 10%.

Tips for Implementation of BPR project

The best way to map and improve the organization's procedures is to take a top down approach, and not undertake a project in isolation. That means:

- Starting with mission statements that define the purpose of the organization and describe what sets it apart from others in its sector or industry.
- Producing vision statements which define where the organization is going, to provide a clear picture of the desired future position.
- Build these into a clear business strategy thereby deriving the project objectives.
- Defining behaviours that will enable the organization to achieve its' aims.

- Producing key performance measures to track progress.
- Relating efficiency improvements to the culture of the organization
- Identifying initiatives that will improve performance.

Once these building blocks in place, the BPR exercise can begin

Methodology

Although the labels and steps differ slightly, the early methodologies that were rooted in IT-centric BPR solutions share many of the same basic principles and elements. The following outline is one such model, based on the PRLC (Process Reengineering Life Cycle) approach.

Online Analytical Processing:

OLAP (Online Analytical Processing) is the technology behind many Business Intelligence (BI) applications. OLAP is a powerful technology for data discovery, including capabilities for limitless report viewing, complex analytical calculations, and predictive “what if” scenario (budget, forecast) planning.

OLAP is an acronym for Online Analytical Processing. OLAP performs multidimensional analysis of business data and provides the capability for complex calculations, trend analysis, and sophisticated data modeling. It is the foundation for many kinds of business applications for Business Performance Management, Planning, Budgeting, Forecasting, Financial Reporting, Analysis, Simulation Models, Knowledge Discovery, and Data Warehouse Reporting. OLAP enables end-users to perform ad hoc analysis of data in multiple dimensions, thereby providing the insight and understanding they need for better decision making.

Advantages of OLAP

Knowledge is the foundation of all successful decisions. Successful businesses continuously plan, analyze and report on sales and operational activities in order to maximize efficiency, reduce expenditures and gain greater market share. Statisticians will tell you that the more sample data you have, the more likely the resulting statistic will be true. Naturally, the more data a company can access about a specific activity, the more likely that the plan to improve that activity will be effective. All businesses collect data using many different systems, and the challenge remains: how to get all the data together to create accurate, reliable, fast information about the business. A company that can take advantage and turn it into shared knowledge, accurately and quickly, will surely be better positioned to make successful business decisions and rise above the competition.

OLAP technology has been defined as the ability to achieve “fast access to shared multidimensional information.” Given OLAP technology’s ability to create very fast

aggregations and calculations of underlying data sets, one can understand its usefulness in helping business leaders make better, quicker “informed” decisions.

OLAP for Multidimensional Analysis

Business is a multidimensional activity and businesses are run on decisions based on multiple dimensions. Businesses track their activities by considering many variables. When these variables are tracked on a spreadsheet, they are set on axes (x and y) where each axis represents a logical grouping of variables in a category. For example, sales in units or dollars may be tracked over one year’s time, by month, where the sales measures might logically be displayed on the y axis and the months might occupy the x axis (i.e., sales measures are rows and months are columns). To analyze and report on the health of a business and plan future activity, many variable groups or parameters must be tracked on a continuous basis—which is beyond the scope of any number of linked spreadsheets. These variable groups or parameters are called Dimensions in the On-Line Analytical Processing (OLAP) environment. Nowadays, many spreadsheet users have heard about OLAP technology, but it is not clear to them what OLAP means. Unlike relational databases, OLAP tools do not store individual transaction records in two-dimensional, row-by-column format, like a worksheet, but instead use multidimensional database structures—known as Cubes in OLAP terminology—to store arrays of consolidated information. The data and formulas are stored in an optimized multidimensional database, while views of the data are created on demand. Analysts can take any view, or Slice, of a Cube to produce a worksheet-like view of points of interest. Rather than simply working with two dimensions (standard spreadsheet) or three dimensions (for example, a workbook with tabs of the same report, by one variables), companies have many dimensions to track—for example, a business that distributes goods from more than a single facility will have at least the following Dimensions to consider: Accounts, Locations, Periods, Salespeople and Products. These Dimensions comprise a base for the company’s planning, analysis and reporting activities. Together they represent the “whole” business picture, providing the foundation for all business planning, analysis and reporting activities. The capability to perform the most sophisticated analyses—specifically, the multidimensional analysis provided by OLAP technology—is an organizational imperative. Analysts need to view and manipulate data along the multiple dimensions that define an enterprise—essentially, the dimensions necessary for the creation of an effective business model.

Implementing an OLAP Solution

OLAP technology implementations depend not only on the type of software, but also on underlying data sources and the intended business objective(s). Each industry or business area is specific and requires some degree of customized modeling to create multidimensional “cubes” for data loading and reporting building, at minimum. An OLAP solution might be

intended for dynamic reporting for finance professionals, with source data originating in an ERP system. Or a solution might address a medical institution's activities as concerns patient analysis. All of which is to say that customers need to have clear objectives in mind for an intended solution, and start to consider product selection on that basis. Another factor to consider in an OLAP implementation is the delivery to end users: does the initial user base want to adopt a new front end, or is there a preference for utilizing a dashboard? Or perhaps users are better served by a dynamic spreadsheet "delivery" system to achieve, for example, a collaborative budgeting and forecasting solution

Supply chain Management (SCM):

Supply chain management (SCM) is the broad range of activities required to plan, control and execute a product's flow, from acquiring raw materials and production through distribution to the final customer, in the most streamlined and cost-effective way possible.

SCM encompasses the integrated planning and execution of processes required to optimize the flow of materials, information and financial capital in the areas that broadly include demand planning, sourcing, production, inventory management and storage, transportation -- or logistics -- and return for excess or defective products. Both business strategy and specialized software are used in these endeavors to create a competitive advantage.

Supply chain management is an expansive, complex undertaking that relies on each partner -- from suppliers to manufacturers and beyond -- to run well. Because of this, effective supply chain management also requires change management, collaboration and risk management to create alignment and communication between all the entities.

In addition, supply chain sustainability -- which covers environmental, social and legal issues, in addition to sustainable procurement -- and the closely related concept of corporate social responsibility -- which evaluates a company's effect on the environment and social well-being -- are areas of major concern for today's companies.

Logistics vs. supply chain management

The terms supply chain management and logistics are often confused or used synonymously. However, logistics is a component of supply chain management. It focuses on moving a product

or material in the most efficient way so it arrives at the right place at the right time. It manages activities such as packaging, transportation, distribution, warehousing and delivery.

In contrast, SCM involves a more expansive range of activities, such as strategic sourcing of raw materials, procuring the best prices on goods and materials, and coordinating supply chain visibility efforts across the supply chain network of partners, to name just a few.

Benefits of supply chain management

Supply chain management creates efficiencies, raises profits, lowers costs, boosts collaboration and more. SCM enables companies to better manage demand, carry the right amount of inventory, deal with disruptions, keep costs to a minimum and meet customer demand in the most effective way possible. These SCM benefits are achieved through the appropriate strategies and software to help manage the growing complexity of today's supply chains.

Supply chain complexity

The most basic version of a supply chain includes a company, its suppliers and the customers of that company. The chain could look like this: raw material producer, manufacturer, distributor, retailer and retail customer.



A more complex, or extended, supply chain will likely include a number of suppliers and suppliers' suppliers, a number of customers and customers' customers -- or final customers -- and all the organizations that offer the services required to effectively get products to customers, including third-party logistics providers, financial organizations, supply chain software vendors and marketing research providers. These entities also use services from other providers.

The totality of these organizations, which evokes the metaphor of an interrelated web rather than a linear chain, gives insight into why supply chain management is so complex. That complexity also hints at the types of issues that can arise, from demand management issues, such as a release of a new iPhone that chokes demand for old iPhone cases; to natural supply chain disruptions, such as the halt of transportation in the U.S. in 2015 due to extreme winter weather, or California's drought and its effect on crops; to political upheaval, such as the strikes in India that throttled movement at its largest container port.

The role of supply chain management software

Technology is critical in managing today's supply chains, and ERP vendors offer modules that focus on relevant areas. There are also business software vendors that focus specifically on SCM. A few important areas to note include:

- Supply chain planning software for activities such as demand management.
- Supply chain execution software for activities such as day-to-day manufacturing operations.
- Supply chain visibility software for tasks such as spotting and anticipating risks and proactively managing them.
- Inventory management software for tasks such as tracking and optimizing inventory levels.
- Logistics management software and transportation management systems for activities such as managing the transport of goods, especially across global supply chains.
- Warehouse management systems for activities related to warehouse operations.

Infor, JDA Software, Oracle and SAP are well-known vendors of supply chain software.

The increasingly global nature of today's supply chains and the rise of e-commerce, with its focus on nearly instant small deliveries straight to consumers, are posing challenges, particularly in the area of logistics and demand planning. A number of strategies -- such as lean -- and newer approaches -- such as demand-driven material requirements planning -- may prove helpful.

Technology -- especially big data, predictive analytics, internet of things (IoT) technology, supply chain analytics, robotics and autonomous vehicles -- is also being used to help solve modern challenges, including in the areas of supply chain risk and disruption and supply chain sustainability.

Applications of ERP:

ERP's scope usually implies significant changes to staff work processes and practices. Generally, three types of services are available to help implement such changes—consulting, customization, and support. Implementation time depends on business size, number of modules, customization, the scope of process changes, and the readiness of the customer to take ownership for the project. Modular ERP systems can be implemented in stages. The typical project for a large enterprise takes about 14 months and requires around 150 consultants. Small projects can require months; multinational and other large implementations can take years. Customization can substantially increase implementation time.

Besides that, information processing influences various business functions e.g. some large corporations like Wal-Mart use a just in time inventory system. This reduces inventory storage and increases delivery efficiency, and requires up-to-date data. Before 2014, Walmart used a system called Inform developed by IBM to manage replenishment.

Process preparation

Implementing ERP typically requires changes in existing business processes. Poor understanding of needed process changes prior to starting implementation is a main reason for project failure. The difficulties could be related to the system, business process, infrastructure, training, or lack of motivation.

It is therefore crucial that organizations thoroughly analyze business processes before they implement ERP software. Analysis can identify opportunities for process modernization. It also enables an assessment of the alignment of current processes with those provided by the ERP system. Research indicates that risk of business process mismatch is decreased by:

- Linking current processes to the organization's strategy
- Analyzing the effectiveness of each process
- Understanding existing automated solutions

ERP implementation is considerably more difficult (and politically charged) in decentralized organizations, because they often have different processes, business rules, data semantics, authorization hierarchies, and decision centers.^[41] This may require migrating some business units before others, delaying implementation to work through the necessary changes for each unit, possibly reducing integration (e.g., linking via Master data management) or customizing the system to meet specific needs

A potential disadvantage is that adopting "standard" processes can lead to a loss of competitive advantage. While this has happened, losses in one area are often offset by gains in other areas, increasing overall competitive advantage.

Configuration

Configuring an ERP system is largely a matter of balancing the way the organization wants the system to work with the way it was designed to work. ERP systems typically include many settings that modify system operations. For example, an organization can select the type of inventory accounting—FIFO or LIFO—to use; whether to recognize revenue by geographical unit, product line, or distribution channel; and whether to pay for shipping costs on customer returns

ERP Industry Applications:

- **Engineering**
- **Manufacturing**
- **Automobile / Automotive**
- **Die Casting**
- **Plot Developers / Builders**
- **Construction**
- **Retail**
- **Food and Beverage**

UNIT I Important questions:

QNO	Imp Questions	Page No of Text Book
•	What is ERP and what are the benefits of ERP?	TB -12,58
•	What are various ERP related Technologies?	TB-73
•	Discuss in detail about Business Process Reengineering	TB-98
•	What is OLAP discuss in detail?	TB-130
•	What is Supply Chain Management? Discuss in detail.	TB-154
•	What are the applications o ERP in various industries.	TB-58

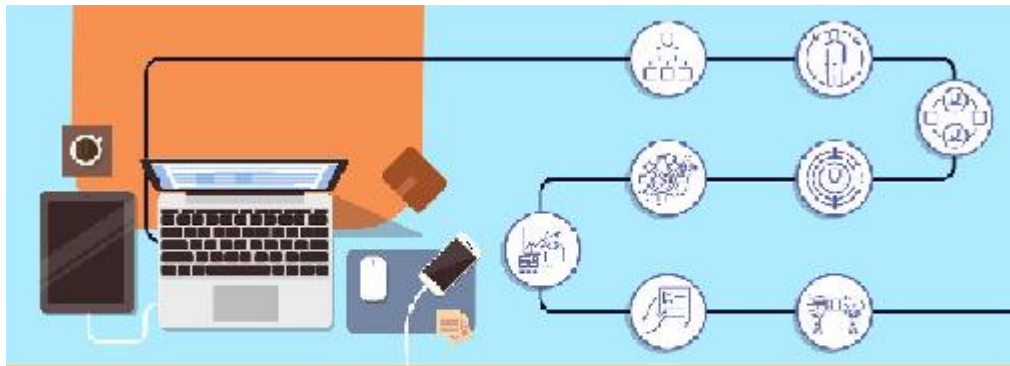
TB-Textbook, “ERP Demystified” By Alexis leon Second edition Tata McGraw Hill, New Delhi, 2000

UNIT II

ERP Implementation

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. Choosing the right partner for implementing your ERP system is almost as important as selecting the right software in the first place.

As with any large project, it's imperative that you take things one step at a time. Thankfully, successful and calm ERP implementations are not only feasible, but actually quite common.



What is the ERP Implementation Process?

Acumatica
The Cloud ERP

When it comes to ERP Implementation

I am sure most organizations spend most of their initial time only on the following three domains:

- Projected Cost of Implementations.
- Functional Capabilities of the ERP system selected.
- Future Benefits the system will bring in on successful implementation.

Whether you are a Multi-National or an SME, with the growing advancements in technology there is no doubt that your competition is getting tougher each day.

There is therefore a growing need to better organize your business processes, keep your customers satisfied and improve on your profit making skills.

ERP Implementation is therefore the best investment you can make to your help your business pace up your customer service deliveries, to keep your data organized and to keep your growth systematized.

Every ERP project is unique and thus requires a pre-planned detailed approach but this do not look relevant until much later in the project.

Here's a step by step high level process to ensure that your time and resources are invested only in a successful ERP Implementation.

ERP Implementation: The 12 Step Process

1. Define Scope of Implementation and End Objectives
2. Select an ERP System.
3. Create the Project plan.
4. Define phases of Implementation.
5. Make urgent but achievable Schedule.
6. Make a Communication Plan.
7. Arrange mid-way Approvals.
8. Plan your Testing.
9. Migrate Business Data
10. Prepare for the change
11. Plan your Go-Live
12. Support and Maintenance

Product Lifecycle

Product Lifecycle Management (PLM) is a systematic approach to managing a product's lifecycle from inception to disposal. PLM serves as a product backbone by integrating human skills, data and business processes, e.g., enterprise resource planning (ERP) and manufacturing execution

systems (MES).

PLM is linked with the manufacturing industry but is also applied to software development and services.

Product Lifecycle Management (PLM)

PLM differs from product life cycle management (marketing) (PLCM), which approaches products in terms of costs and sales. PLM serves as a product's engineering system framework, i.e., specifications and attributes are managed throughout a product's lifecycle.

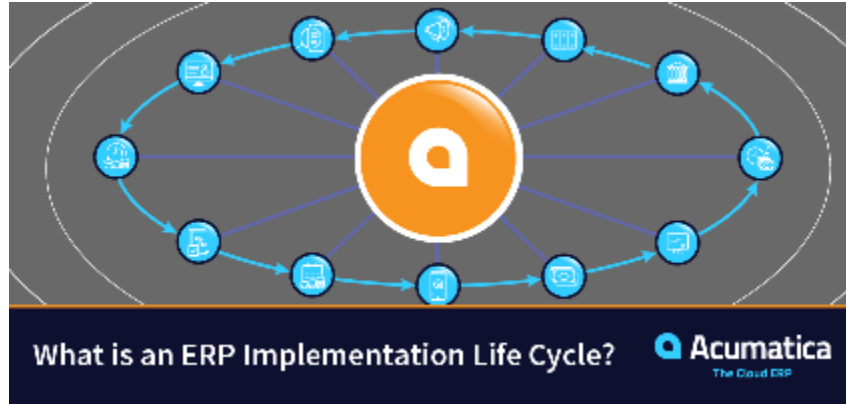
PLM is one of five information technology (IT) structural elements, which are the foundation for organizational data and communication systems, as follows:

- Product Lifecycle Management (PLM)
- Customer Relationship Management (CRM)
- Supply Chain Management (SCM)
- Enterprise Resource Planning (ERP)
- System Development Life Cycle (SDLC)

The five stages in the product life cycle are product **development, introduction, growth, maturity, and decline**. The product **development** phase is the phase in which a company has a new idea for a product.

ERP implementation life cycle is the process of deploying enterprise resource planning software—from planning through go-live and beyond. The typical implementation cycle is six to 12 months. But don't think it's all about software. Make sure you're prepared for these eight stages of ERP implementation.

One question that always comes up very early in the process when considering an ERP implementation is "How long will it take?" While there is no general answer to that question – ERP implementations proceed at their own pace – the process can be outlined by way of a timeline or life cycle. Just for perspective, an ERP implementation can take anywhere from a few months to several years, with the majority ranging from six-to-12 months from kick-off (project planned and funded, team organized and ready to go, ERP technology and ERP system software delivered – if appropriate – and installed) to a live system in full operation.



The 8 of the ERP implementation life cycle

- Planning and organization – In this commentary, we’re not counting this phase as part of the time it takes to implement the system as it all occurs before the start of spending money or real physical activity. Nevertheless, a team can be assembled and a decent plan developed in a matter of a few weeks, for a motivated company. More typically, the planning stage might last up to six months or more.
- System selection and installation – Selecting the ERP system software and ERP technology can be a challenging endeavor, given its importance to the project and the vast array of choices. From requirements definition and early market surveys through determining the “short list”, gathering proposals, holding demonstrations, final selection and negotiation, this phase typically consumes anywhere from 3-to-6 months.
- Installation – Sometimes there is a lead time for delivery of hardware and software, installation of infrastructure components like networking facilities and data collection / display devices, and installation of software that could be anywhere from several days to several weeks or more. Cloud-based ERP may have little or no installation lead time and no software installation requirements.
- Data conversion and loading – Once the ERP technology and ERP system software is ready, data must be entered and/or moved into the system’s database. This includes “basic records” like customer, vendor and item master files, bills of material, production facilities and routings, general ledger chart of accounts, and the like. Just before going live, active transactional data is converted or transactional activity is transitioned into the new ERP system software. Some of this activity can be completed in parallel with other tasks like training and validation. IT resources and consultants/contractors can primarily accomplish some of this activity, as well. While a significant amount of time and effort is required, this requirement will not add significantly to the implementation timeline.
- User training and procedure development – This is arguably the most important part of ERP implementations; procedure development (and documentation) and user training should take up the majority of the timeline. These requirements consume considerable time and effort from operational employees (actual future users of the system) who are also expected to do their existing jobs at the same time. The duration of this phase

depends on the size and complexity of the ERP system software being implemented (number of modules or functional areas involved, number of users, how different the new procedures will be from existing procedures), and how much time users can dedicate to the implementation each day or week. Some companies bring in temporary help but these outside resources should be devoted to maintaining old procedures rather than working on the implementation per se.

- Testing and validation – IT resources will be heavily involved in this task, working with the users to compare and examine both basic records and transactional data to verify that the data is exactly as it should be (and at least as accurate as in the incumbent system) and that the new ERP system software is producing the expected results. Testing and validation occurs over an extended period as each functional area loads data and starts processing (test) transactions by the users during training and procedure development. This is not necessarily parallel operation; in most cases, it is more of a “pilot” testing situation. Testing and validation do not add much to the timeline explicitly but must be considered in planning the duration of the training and procedure development process.
- Cut-over and “go live” – This can be instantaneous (sometimes called a ‘big bang’ approach), phased in piece-by-piece, or parallel operation where users are expected to keep the old system and the new system in operation simultaneously for a specified period of time (typically one or two accounting periods). You will find a discussion of these alternative strategies here .
- Follow-through and project completion – Implementation is not complete once the new system is ‘live’ and the old system is turned off. Users and technical support resources must continue to validate and verify proper operation; user training should continue to enable a more extensive use of what the ERP system software has to offer and expand the benefits of the system.

Implementation methodology of ERP:

ERP Implementation Methodology: The Traditional Method

The first methodology is the Traditional methodology, since it has been around since the early 1980’s. This methodology uses the following phases:

- **Planning:** The project managers (customer and vendor) work together to form the ERP implementation team, and plan the project based on the right ERP implementation methodology for the project scope and available resources. A kickoff meeting involves the entire team to review the project plan and communicate the company objectives for the project.
- **Education:** The vendor consultants educate the implementation team. In this methodology, this is a very important step. Most advocates of this methodology believe the education of the core team is the key to the customer’s self-sufficiency and a successful project.

- **Design/Configuration:** The consultants assist the implementation team in designing, configuring and setting up the new system and business processes. The vendor consultants support the implementation team, and the team does the work.
- **Conference Room Pilot:** The implementation team tests the system in multiple Conference Room Pilots (CRP). The final CRP becomes a simulated “go-live.” At the end of the phase, the system is accepted by the team as ready to go live. The vendor consultants support the team’s effort. By the end of this phase, the customer team has established a complete understanding of the new system.
- **Cutover Activities:** The implementation team plans the cutover process and trains the rest of the end-users on the new system. The implementation team performs the training, and the vendor consultants support the team.
- **Go-Live Support:** The implementation team supports the end-user in the use of the new system. The implementation team provides real-time support. The vendor consultants are also on-site during the first month to support the quick resolution of new problems as they arise.

ERP Implementation Methodology: The Turnkey Method

The second methodology is the Turnkey methodology because it is clearly a vendor-led method. This methodology uses the following phases:

- **Planning:** The activities are the same in this phase as the traditional methodology, with the vendor consultant taking a bigger role in the construction of the plan. Also, the vendor project manager is planning the vendor consultants’ time since they are involved full-time in the next four phases of the project.
- **Discovery/Setup/Configuration:** Here we see the major difference between the two methodologies. In this phase, the vendor consultants review the current process, design/configure/setup new processes, and perform an initial test with minimal involvement of the customer team. The customer implementation team is only involved in discovery by providing input on current processes. In essence, the vendor team is providing a “turnkey” approach to system design and the setup of the new system.
- **Prototype Review/Education:** In this phase, the vendor team delivers the new system to the customer implementation team and begins to educate the customer team through prototype demonstration workshops. In these reviews, the customer team is getting educated on the new system and the capabilities of the product. The vendor team identifies issues and adjusts the new system as needed. At the end of this phase, the customer team accepts the design of the new system.
- **Conference Room Pilot:** In this phase, the vendor team leads the customer team through several phases of a conference room pilot (CRP). The last CRP becomes a simulated “go-live”. When this CRP is completed, the customer team accepts the new system and is ready to go live.

- **Cutover Activities:** The implementation team plans the cutover process, and trains the rest of the end-users on the new system. The implementation team performs the training and the vendor consultants support the team.
- **Go-Live Support:** The implementation team supports the end-user in the use of the new system. The implementation team provides real-time support. The vendor consultants are also on-site during the first month to support the quick resolution of new problems as they arise.

Planning Evaluation and selection of ERP systems:

A successful ERP project requires selecting an ERP solution, implement the solution, manage changes and examine the practicality of the system, Wei and Wang, (2004). Wrong ERP solution choice would either fail the implementation or weaken the system to a greater impact on the enterprise, Hicks, (1995); Wilson, (1994).

Most enterprises often jump into looking at ERP functions and features rather than examining the strategy and business processes. It is important for management to know the current strategy, processes and supporting systems compared to what they could be with the new systems, Donovan, (2001).

For most enterprises, the decision to implement ERP functionalities will require buying a software package from one of the more popular vendors on ERP market like SAP and Oracle. But the selection process is not a straightforward task, hence thorough understanding of what ERP packages are to offer, differences in each of them and what might be at stake in selecting one package over the other should be well examined.

Evaluating and selecting an ERP system can be a very complex process on the other hand, but it should be a 'fact-based' process that will bring the enterprise to the point where comfortable & well-informed decisions can be made.

Therefore, a research carried out by Management Agility Inc, (2005), revealed that it is imperative to adopt a thorough evaluation and evaluation process before adopting any ERP solution in SMEs.

- Planning
- RFP
- Solution Evaluation
- Negotiation
- Selection and Agreement

ERP Software & Hardware (Solution) Evaluation and Selection Steps

- Define Requirements
- Shop Round for Product
- Clarify Requirements
- Evaluation Vendor Inquiry
- Interact with Vendors
- Negotiate Agreement
- Action Agreement

Define business case/need and spell-out required values. Be specific. Ensure the business sponsor is willing to push through business case for change.

Look round the market for what product is available. Identify vendors that operates and their general approaches to technologies the take. Discuss with others in the same industry as you are etc.

Clarify your requirements and be sure of what you are looking for in line with you business case. Refine requirements if possible and be specific too.

Find out what product is looking promising in line with the business need and from which vendor. Identify which vendor and their products and invite interesting ones for demo etc. Request for proposal (RFP).

Invite each shortlisted vendor over for a chat and find out more about the product. List out expectations based heavily on business requirements.

At this point evaluate this approach. Can you afford to change your current process? Can you afford the change the new product will bring and many more?

Initiate Negotiation for the selected product with the selected vendor. Agree on who does what, when are they to be done. Negotiate deliverables, timelines, cost & payments schedules and terms, support inclusive.

Review all legal terms, finalise the contract and select product for onward implementation.

Alignment of business requirement to what the software/hardware can provide. This is the core of the whole exercise else stop the evaluation.

Evaluate the product capabilities in line with the business requirement. Evaluate the impact of this product on the business requirement.

Stage 1 - Plan Requirement

Business need is defined, along with areas in business that required technical approach. Develop a specific business case with business value for a solution. Ensure that the project sponsor is willing to articulate the business case for change. Identify vendors that operate in

the line of products you are looking for. Get familiar with the software and hardware infrastructure presence for the solution seeking. Get general view of investment needed, considering software, hardware, other related infrastructure and ongoing support. Based on the survey, evaluate the organization readiness for the investment and decide whether to continue or not. Now define priorities under "must-have" and "nice-to-have" accordingly.

Stage 2 - Request for Proposals (RFP)

Shortlist interesting vendor based on the outcome of market survey for products. Invite interesting vendors for interaction/demonstration of their products. Collects facts/functionalities in line with the business need from various products demonstrations for the developments of unbiased RFP for vendors. Set-up a neutral body to develop RFP using all facts gathered during products demonstration aligned to the business requirements. Distribute out RFP that addresses the vendor as a company and the products they offer. Generate basic expectations from an ideal proposal in line with the business need for onward selection of the ideal software vendor.

Stage 3 - Solution Evaluation

Identify and priorities remaining gaps between software capabilities as demonstrated and business requirements. Identify how the gaps will be bridge in terms of configuration, configuration, process change or combination of all these. If the gaps can be bridge consider reengineering of those affected business processes affected and continue with the evaluation.

Stage 4 - Contract Negotiation

Negotiate with each vendor. Establish software, hardware and other infrastructure agreement requirements, which include version, components, maintenance and support. Also negotiate participation in user groups, license costs, maintenance fees and many others. Establish service provider agreement which also include deliverables, timelines, resources, costs and payment schedules. Establish other legal requirements.

Stage 5 - Selection and Agreement

Upon successful negotiation with the right vendor; Review all legal terms on privacy protection, operation guidance and data manipulation etc. Approve agreements with the selected vendors. Agree on implementation plan.

Organizing the Project Management and Monitoring:

Anyone who has worked on any type of project in the past knows projects can be delayed for many reasons. The reality is projects rarely go as planned. When this happens, it is time to tap into strategy for ERP project management methodology, and specifically the Monitoring and Controlling process group, as this is the group used to trigger the change requests necessary to get a project back on track.

The PMBOK, “Project Management Body of Knowledge” is a solid resource in ERP project management methodology and describes this process group in the following: “The Monitoring and Controlling Process Group consists of those processes required to track, review, and orchestrate the progress and performance of a project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.”

Keeping an eye on project performance and reacting quickly and appropriately to issues is key to successfully pushing your project forward. Tasks in this process group includes the following:

- Monitor and Control Project Work
 - This includes tracking, reviewing, and reporting progress to meet the performance objectives defined in your ERP project management methodology.
 - Regularly assessing progress related to scope, benchmark goals, timeline, and budget, which will help ensure there are no unpleasant surprises as the project unfolds.
- Perform Integrated Change Control
 - Even well-planned projects are going to require change from time to time. Therefore the following processes are essential: reviewing all change requests, approving changes, managing changes to the deliverables, and organizing process assets, project documents and the project management plan.
- Verify Scope
 - Verifying the scope includes monitoring the status of the project and managing changes to the scope baseline.
 - This phase also requires a re-visiting to other process groups to be sure all objectives have been met. If this is not the case, reflecting any changes is part of the follow-through needed as the project continues toward completion.
- Control Scope
 - If there have been adjustments to budget, timeline, or the desired end-product, it is important to re-visit the documentation related to scope and mitigate any unresolved challenges.
 - Controlling the scope also entails maintaining effective communication with stakeholders and related stakeholders, which will keep everyone updated and engaged in the project's success.

- Control Schedule
 - Schedule control involves controlling project progress adjustments and addressing any unforeseen circumstances in relation to the project schedule baseline.
 - Monitoring the project properly to decrease the chances of schedule issues becoming major setbacks.
- Control Costs
 - Since there is the potential for many factors to affect cost throughout the project timeline, this group must keep track of any changes in budget so communication around cost control is clear and accurate.
- Perform Quality Control
 - This group must quantify and report any and all quality control issues. This action is necessary and ongoing to support the accuracy and responsiveness of the project.
 - Make process adjustments based on findings during monitoring.
- Report Performance
 - It is imperative this group collect and report performance data in order to complete proper forecasting with regard to timeline and phasing.
 - To support positive relations, it is necessary this project group keep stakeholders aware of team progress toward benchmark goals.
- Monitor and Control Risks
 - Tracking risk, responding to documented risk, and evaluating response to risk is all part of ensuring the project progresses effectively through each phase of the timeline.
- Administer Procurements
 - Because team needs will change throughout the project, additional items may be required while other items and services may not be needed at all.
 - In order to deliver the project within or as close to budget as possible, it is necessary to keep track of all paperwork that documents any changes in contracts.

ERP Case Study | Manufacturing

Client Problem

A large, multi-national consumer products company had a fragmented and inefficient operating model. With operations in more than 30 countries, the company was not leveraging its size to achieve process efficiencies or economies of scale. In essence, it was operating as 30 different companies. To address these operational inefficiencies and to build an operating infrastructure that would support very aggressive growth objectives, the CIO decided that the company needed to implement a new business and technology infrastructure.

Panorama Solution

Not knowing which ERP system to choose, the CIO turned to the Panorama team to facilitate a technology-independent evaluation and selection of ERP software and implementation vendors. Panorama managed a six-month evaluation and selection process to identify the ERP software that would best enable its future business requirements and corporate growth objectives.

Solution Highlights

- Defined and documented global operating business requirements
- Researched ERP market for organizations of similar size and industry
- Developed software vendor evaluation criteria and priorities
- Facilitated vendor software demonstrations and user evaluations
- Applied quantitative assessment models to evaluate ERP research and demonstration results
- Developed detailed business case to assess feasibility of ERP investment, including detailed project costs and tangible business cost and revenue improvements
- Reached final decision on ERP software and implementation partners
- Developed high-level, 2-year global implementation strategy in conjunction with selected ERP vendors
- Assisted client with vendor contract negotiations to secure favorable terms and costs for client
- Developed organizational change management, communications and training strategy for implementation
- Created resource plan for internal and external resources to support global implementation
- Established key performance measures and target performance levels to support client's future growth targets and overall business strategy
- Developed ERP Benefits Realization plan to enable achievement of projected costs and business benefits
- Conducted knowledge transfer to key client project team members to empower them to execute against defined implementation and organizational change management strategy

Measurable Business Results

Panorama delivered significant and measurable results to the client to enable a high return on investment.

Highlights of Results

- Identified ERP software capable of delivering 96% of the functionality required by client, higher than any other evaluated vendor
- Secured fixed-costs for client's software licenses and implementation services at 40-percent less cost than benchmark implementation costs for companies of similar size and geographic reach
- Identified more than \$7 million in annual cost savings at full system implementation, resulting in a 20-percent internal rate of return on investment

UNIT II Important question:

QNO	Imp Questions
1.	Discuss in Detail about ERP implementation
2.	What is ERP Product life Cycle
3.	Discuss in detail about ERP Implementation methodologies
4.	How does an Organisation plan and evaluate a ERP system in them firm?
5.	How to select a ERP System for an organisation
6.	What is project management and monitoring?
7.	Discuss about Case Study on manufacturing in ERP

TB-Textbook, "ERP Demystified" By Alexis leon Second edition Tata McGraw Hill, New Delhi, 2000

UNIT III ERP MODULES

Basic Modules of ERP System – ESDS

Enterprise Resource Planning System (ERP), just by considering name we can simply define ERP as System or software that used to manage all the resources of the whole enterprise. Right from employee payments to a single screw coming into the enterprise, everything can be managed & tracked by using ERP Systems. ERP is cross-functional software that supports all the business processes within the organization.

In an organization, ERP helps to manage business processes of various departments & functions through the centralized application. We can make all the major decisions by screening the information provided by ERP.

There are many vendors in the market which are providing traditional ERP solutions or Cloud-based ERP solutions. Though implementation platforms or technologies are different, there are common & basic modules of ERP which can be found in any ERP System. Depending on organizations need required components are integrated & customized ERP system is formed. All the below-mentioned modules can be found in an ERP system:

- Manufacturing
- Human Resource
- Inventory
- Sales & Marketing
- Purchase
- Finance & Accounting
- Customer Relationship Management(CRM)
- Engineering/ Production
- Supply Chain Management (SCM)



Each component mentioned above is specialized to handle the defined business processes of the organization. Let us go through the introduction of the various modules.

Human Resource Module(HR):

Human Resource module helps to HR team for efficient management of human resources. HR module helps to manage employee information, track employee records like performance reviews, designations, job descriptions, skill matrix, time & attendance tracking. One of the important submodules in the HR module is Payroll System which helps to manage salaries, payment reports etc. It can also include Travel Expenses & Reimbursement tracking. Employee Training tracking can also be managed by ERP.

Inventory Module:

Inventory module can be used to track the stock of items. Items can be identified by unique serial numbers. Using that unique numbers inventory system can keep track of item and trace its current location in the organization.

e.g. you have purchased 100 hard disks, so using inventory system you can track how many hard disks are installed, where they are installed, how many hard disks are remaining etc.

Inventory module includes functionalities like inventory control, master units, stock utilization reporting etc.

There may be an integration of the inventory module with the purchase module of ERP.

Sales Module :

Typical sales process includes processes like Sales queries & inquiry analysis & handling, quotation drafting, accepting sales orders, drafting sales invoices with proper taxation, dispatch/Shipment of material or service, tracking pending sales order. All these sales transactions are managed by the sales module of ERP. CRM module can take the help of the Sales module for future opportunity creation & lead generation.

Purchase Module:

As the name indicates, purchase modules take care of all the processes that are part of the procurement of items or raw materials that are required for the organization. Purchase module consists of functionalities like supplier/vendor listing, supplier & item linking, sending quotation request to vendors, receiving & recording quotations, analysis of quotations, preparing purchase orders, tracking the purchase items, preparing GRNs(Good Receipt Notes) & updating stocks & various reports. Purchase module is integrated with Inventory module & Engineering/production module for updating of stocks.

Finance & Accounting module:

Whole inflow & outflow of money/capital is managed by the finance module. This module keeps track of all account-related transactions like expenditures, Balance sheet, account ledgers, budgeting, bank statements, payment receipts, tax management etc. Financial

reporting is an easy task for this module of ERP. Any Financial data that is required for running the business is available on one click in Finance module.

Customer Relationship Management (CRM) module:

CRM department is helping to boost the sales performance through better customer service & establishing a healthy relationship with customers. All the stored details of the customer are available in the CRM module.

CRM module helps to manage & track detailed information of the customer like communication history, calls, meetings, details of purchases made by the customer, contract duration etc. CRM module can be integrated with the Sales module to enhance sales opportunities.

Engineering / Production module:

Production module is a great help for the manufacturing industry for delivering the product.

This module consists of functionalities like production planning, machine scheduling, raw material usage,(Bill of material)preparation, track daily production progress production forecasting & actual production reporting.

Supply Chain Management (SCM):

SCM module manages the flow of product items from manufacturer to consumer & consumer to manufacturer.

Common roles involved are a manufacturer, Super Stockiest, Stockiest, distributors, retailers etc. SCM involves demand & supply management, sales returns & replacing process, shipping & transportation tracking etc.

Today many SMBs face challenges in their process automation. ERP is a great help for such organizations. ERP can efficiently streamline the business operations of the organization. Above introduction of modules can help you to choose & customize the ERP modules depending on your organization's requirements.

ERP: Manufacturing Module

Manufacturing is the process by which raw materials are transformed into finished products. The role of the ERP manufacturing module is to complete the inventory management by implementing the operations specific to a streamlined manufacturing process.Manufacturing recipes management in ERP

The first phase of the process is represented by the entry of a project into manufacturing process and it involves the generation of recipes, based on which the final product will be

created. In the ERP system it is named composed product and it can have one or more attached recipes. The recipe types are: promotion, manufacturing, composition, decomposition.

- A promotional recipe is used if there is no manual labor involved. Eg: if you buy 10 pencils you get a free sharpener. When such a promotional product is selected, the system automatically discharges the components.
- Composition, decomposition or manufacturing recipes are used in specific processes.

Human resources Module in ERP

People produce the products all manufacturers sell. The human resources module in ERP supports those people. ERP helps by controlling the payroll rates and benefit packages each employee earns. Management knows when an employee is due for an appraisal or raise, and the new pay rate can be immediately used to calculate payroll costs. The HR module works with the quality module tracking what training and certifications an employee needs to perform their current work or to become eligible for a promotion. Workers who fall behind in their certifications cannot be scheduled for work in the production scheduling module.

HR modules are where management uses future employee characteristics as a model helping locate and hire employees with the skills that will be required tomorrow.

Plant Maintenance ERP: A module to support operational needs

ERP Software Finance Module the Plant and Machine Maintenance module in resource ERP provides an integrated solution for supporting the operational needs of an enterprise-wide system. The module includes an entire family of products covering all aspects of plant/machine maintenance and becomes integral to the achievement of process improvement.

Resource ERP Plant & Machine Maintenance module supports various options for structuring technical systems with its object, type and function-related views, and enables flexible navigation. Data concerning the planning processing and history of maintenance tasks is documented in the system and complies with business verification requirements.

All maintenance tasks such as inspection, servicing and repair activities are saved in a historical database. In addition to standard indicators, diverse analysis options are also available in the system for evaluating this data.

Plant and Machine Maintenance module provides you with technical and business reports and various presentation options, according to the criteria used: for example organizational unit, location, execution period for tasks, or system manufacturer. This information helps you to reduce the duration and costs of plant down times as a result of damage and to recognize possible weak points within your technical system in good time.

It also forms the basis for defining an optimum maintenance strategy in the sense of 'Total Productive Maintenance (TPM) or risk-optimized maintenance.

The major sub-systems of the resource ERP Plant & Machine Maintenance module are:

- Breakdown Repair Log
- Equipment Master Register
- Machine Breakdown Log
- Maintenance Type1
- Man Power for Machine Details
- Preventive Maintenance Record
- Spare Part Installation Log

Materials Management module in ERP:

(RHR MM) consists of all master data, system configuration, and transactions to complete the Procure to Pay process.

ERP - MM Module

- Vendor Master and Material Master Data.
- Consumption Based Planning.
- Purchasing.
- Inventory Management.
- Evaluation of Materials.
- Invoice Verification.

ERP Materials Management is a part of SAP Logistics functionality. ...Materials Management contains many aspects of SAP functionality, including purchasing, goods receiving, material storage, inventory, and invoicing. Disclaimer: Content Accuracy is assured as much as possible. Discretion advised. Materials handling, packaging, warehouse planning, accounting, scrap, surplus and obsolete materials disposal, finished goods safety and care are the activities managed by the materials management department

Data Warehousing:

Enterprise resource planning (ERP) systems integrate and automate internal and external management of information. They allow for basic financial planning primarily by aggregating departmental budgets. They tend to provide static reporting rather than analysis, which often involves transforming the data to answer the question.

Data warehouses are required because ERP systems don't store the data in a manner that supports analysis and reporting. They also do not always gather all available data because of system incompatibilities and increasing amounts of information from systems external to the enterprise.

The purpose of data warehouses is to extract data from disparate sources, cleanse it, and align it so that it can be aggregated, compared, and analyzed to enable business decisions. Then, it is stored in a single common platform optimized to support enterprise-wide data analysis.

Data Mining:

Data mining is the computational process that involves a wide variety techniques in statistics being applied to big data sets usually to discover patterns. It is normally applied to predict events or end results and also detect trends by making use of methods that involve artificial intelligence, database systems, machine learning, and statistics.

This is often done with the general goal of extracting information from a set of data to transform it into a structure that is understandable for further use. The concise and valuable knowledge of interest that has been discovered can be incorporated into a decision support system and the results are used to make informed business decisions by firm owners.

Data Mining ERP software is what results. This is an integration of specific applications meant to ease the input of data and the output of sensible information for business owners.

This software has become a great industry, producing components that flourish a variety of business functions. Such software is now considered a key organizational tool because of its ability to put together diverse organizational systems and facilitate transactions and production free from error.

The ERP software runs on several networks and computer hardware configurations, usually making use of a database as an information source.

Quality Management:

Quality management includes customer-driven quality, top management leadership and commitment, continuous improvement, fast response, actions based on facts, employee participation and above all a quality management culture. Each part of the company is involved in total quality, operating as a customer or supplier to one another.

Ultimately whatever be the industry in which you're present or the size, to survive and succeed in the present scenario, it is imperative that you maintain a very high quality at all stages of manufacturing and distribution

Quality Management module in Ramco ERP on Cloud addresses:

- **Procurement & Subcontract process (for Goods or Services):** During the Goods receipt or on completion of Services, the quality parameters and attributes can be captured. This serves as the basis for clearance, usage and supplier payment
- **Inventory & Storage:** During the storage of materials, a periodic quality check can be done to assess the quality
- **Production:** During the start of a batch or a new product, or periodically – it would be required to check and record the Quality at different stages based on which action pertaining to re-work, recalibration, tool setting, etc would be undertaken
- **Sales & Dispatch:** Quality inspection can also be carried out before dispatch of goods
- **Project Tasks:** Quality check could be done for tasks being executed as part of a project

Some of the specific features pertaining to quality include:

- Facility for In-process Inspection and Quality Clearance
- Ability to define control points based on control factors like Warehouse, Master Recipe, Supplier, Customer, etc
- Ability to define inspection plan for each control point
- Ability to have attribute / non-attribute based (check list) inspection plan
- Facility to define standard operating procedures
- Ability to capture Analysis methods for attributes
- Ability to specify attribute values for each inspection plan
- Ability to override sample result status
- Ability to suggest lot change / item change based on Quality Clearance Feedback

Sales and Distribution:

Sales and Distribution Module to keep pace with rapid changes in the business world, companies need an integrated and flexible enterprise system that supports all aspects of their business with state-of-the-art functionality. This innovative solution should upgrade effortlessly and interface easily with third-party applications as well as have the ability to incorporate existing systems while extending its reach to the Internet and e-commerce.

In today's competitive business environment, companies are increasingly being forced to streamline business processes. In a world where it is no longer enough to simply have the best product; companies are focusing on core competencies and closer partnerships over the whole supply chain.

Here, increased efficiency in sales and distribution is a key factor to ensure that companies retain a competitive edge and improve both profit margins and customer service. In helping business to 'beat them on delivery', the Sales and Distribution module of resource ERP systems offers a comprehensive set of best-of-bred component for both order and logistics management.

Resource ERP system is tightly integrated with the Sales and Distribution module. This integration enables the mapping and supply of single-site or multi-site organizations. Developing precise logistics planning for just-in-time deliveries, this system can also generate replenishment orders by using defined warehouse requirements.

The following are the sales related business transactions:

- Sales queries, such as inquiries and quotations
- Sales orders
- Outline agreements, such as contracts and scheduling agreements
- Delivery/Shipment
- Invoicing/billing
- After sales support

During sales order-processing the following basic functions are carried out:

- Inquiry handling
- Quotation preparation and processing
- Contracts and contact management (order management)
- Monitoring the sales transaction
- Checking for availability
- Transferring requirements to materials planning (MRP)
- Scheduling the delivery
- Calculating pricing and taxes
- Checking credit limits
- Invoicing/billing
- Creating printed or electronically transmitted documents

Depending on how your particular system is configured, these functions may be completely automated. The data that results from these basic functions is stored in the system where it can be displayed. Resource ERP's Sales and Distribution module very actively interacts with the material management and financial accounting module for delivery and billing.

Case Study in Banking Sector in ERP:

Enterprise resource planning (ERP) systems integrate the organizations business functions allowing efficient information sharing across all business divisions. Through the information

sharing is achieved not only better coordination but also faster and more efficient adjustment to the potential risks and business opportunities alike. This paper examines the particularities of ERP systems implementation and operation for the banking sector by considering a wide range of sources such as journal and conference papers, empirical studies and reports. Finally, through the thorough examination of the available literature, we draw conclusions about the effect by the implementation of ERP systems in the banking sector

CURRENT STATE OF ERP SYSTEMS IN BANKING SECTOR

On a daily basis the banks fulfil several obligations towards their customers. ERP systems with their capabilities can provide useful aid towards that direction. A financial institution as part of its typical responsibilities needs to receive a customer's money and cheques as collection and to credit his account with them. It also needs to provide a statement of account and a statement of the balance on request. Banks are supposed to honour their cheque up to the credit balance or overdraft limit, provided they are in order and there is no stop [14]. Needless to say, that all the aforementioned processes must be executed with strict secrecy about customer affairs. The banking industry is highly data-oriented and offers enormous potential for ERP applications. An ERP system offers wide-ranging integration between different banking system modules. ERP integrates users, information, processes, and applications for higher productivity. It facilitates decision making with simulations for enhanced responsiveness and change. It uses portal technology, business intelligence, knowledge management, and mobile technologies that save time and reduce costs. It enables banking employees interact with bank's top management for reduced time and effort and reverses the usual communication 'top-down' to 'bottom-up' ERP system provides complete end-to-end solution covering payment processing, cash accounting, cash management, technical analysis, index tracking and portfolio optimization

Revamping payment processing needs a high quality understanding on how banks make payments. This may be clear cut for one branch at particular location but may become more complex while dealing with multiple branches in different countries and operating under country specific legislations. Similarly, cash accounting complexity increases with multiple locations and currencies. As for cash management, there is a need to administer available account on regular basis so that investments of funding decisions can be made in an appropriate manner. Loans, advances and bills discounted or purchased are the principal components of bank assets and main source of income of banks. Collectively they represent total bank credit to the commercial sector. While advances are in the form of cash credits and overdrafts, loans may be demand loans or term loans. Demand loans are more or less temporary financial arrangement granted to customers to meet unforeseen situation but customers are required to pay heavy rate of interest. On the other hand, term loans are extended for longer time period such as 2 to 30 years. Term loans are usually secured and granted for a variety of purposes such as renovation, expansion and modernization of industrial units, meeting requirements of core working capital, and for repayments of bonds preference shares, etc. Term loans have a fixed or floating charge against the assets of a company.

They are granted on the basis of a formal agreement, which contains the terms and conditions of providing loans. Modern ERP systems include modules for efficient portfolio management. Fundamental analysis tools focus exclusively on the company's performance in order to determine whether or not the stock should be bought or sold. On the other hand, technical analysis disregards completely the value of financial statements analysis and focuses exclusively on the movement of the stock prices in order to determine whether to buy or sell a particular stock. While techniques for selecting stocks can be traced back to the 19th century, it was not until the 1952, when Markowitz introduced his pioneering Mean - Variance (MV) portfolio selection model, that the field attracted considerable attention. Markowitz's theory suggests maximizing portfolio expected return for a given amount of portfolio risk or solving its dual problem minimizing portfolio risk for a given level of expected return Modern ERP systems make use of a plethora of tools for efficient portfolio management.

Unit III Important questions:

QNO	Imp Questions	Page No of Text Book
1.	What are the various ERP Modules	TB-387
2	What is manufacturing and materials management module in ERP how it works?	TB-403,421
3	What is Human Resources and Plant maintenance	TB-412,418
4.	What is Data warehousing and data mining	TB-112,123
5.	What is Quality management and Sales and distribution	TB-426.432
6	Discuss about the case study in Banking sector	MT-

TB-Textbook, "ERP Demystified" By Alexis leon Second edition Tata McGraw Hill, New Delhi, 2000

IV UNIT

ERP software solution

Grow Your Business With Epicor ERP Solutions

Discover how enterprise resource planning (ERP) software can help you perfect your growth plans and your ability to execute on them when you access the Epicor ERP Resource Kit:

View **Epicor ERP overview** and learn how it eliminates complexity making ERP easier to use, more collaborative and more responsive

Explore Epicor ERP features that enhance manufacturing performance in the **Epicor ERP virtual tour & demo**.

Register through the below link and practice:

4 Tips for ERP System Maintenance

The enterprise resource planning system (ERP) is the backbone for most organizations. They invest a lot of money in software, implementation and training costs related to their ERP systems to collect, track and report on critical business data. Once the system is in production and the organization is dependent on the results provided by the ERP system, a maintenance plan must be developed and documented to ensure the system continues to operate at its best.

Below are some general rules to keep the ERP system operating with the fewest possible issues:

1. Have a documented and verified disaster recovery plan.

What would happen after an earthquake, flood, hurricane or blizzard? What about a hard disk failure or server crash? A necessary element in any ERP implementation is a well-documented disaster recovery plan. A good disaster recovery plan will account for several types of disasters – both man-made and natural – that may affect the ERP system. Disasters cannot always be avoided, but the impact they have, such as downtime and data loss, can be minimized.

A disaster recovery plan identifies preventative and corrective measures required in the event of a disaster. It should address backups, how to store them (off-site) and how often to create them. It should identify redundant array of independent disks (RAID) levels on the server. It should detail how to recover from a disaster with a tested and verified recovery solution. A disaster recovery plan is essential to any organization and should be tested often to avoid downtime and data loss.

2. Have a documented maintenance plan.

Identify key areas of the ERP system with future expansions or roadmaps defined. You should understand your business and how it maps to the ERP system. Constantly reevaluate your requirements and what areas of the ERP system may be improved.

The plan should identify the key players for the ERP system. Who is the vendor? When does the maintenance need to be renewed? Who provides the support? Who internally is in charge of the system?

3. Keep the software up-to-date.

Software continuously evolves with additional features and improvements to existing features. Know what software versions you are using and what the latest updates are. Vendors provide service packs or version upgrades to address bugs that have been identified, add additional functionality, improve navigation or change the look and feel of the software. The updates are essential to keep the system up-to-date and supported.

Keeping your system up-to-date allows you to utilize the new features available that may significantly improve your system. How has the software changed? How has your business changed? How can you capitalize on the new features to improve the system or its efficiency? Hardware should also be evaluated and upgraded on a periodic basis to ensure they are adequate for the ERP software and keeping it running at its best.

4. The staff should be well-trained.

After implementation, training is what keeps the ERP system running smoothly with minimal user issues. Initial training is great, but ongoing training should be provided periodically. Ongoing training ensures staff is utilizing the system efficiently, is current on processes and is able to maximize the system's new features. Ongoing training further allows the users to identify improvements to functionality and processes within the organization. Another recommendation is to have cross-functional training. This ensures that if an employee is absent or leaves the company, someone is ready to perform the duties until the employee returns or is replaced.

By developing a maintenance plan, taking steps to back up important information, keeping your software up-to-date and providing ongoing training opportunities to your staff, you can make the most out of your ERP system.

How the ERP system can make impact on organization ?

With the fast developing of industries and the need for managing procedures and resources, it has become very important to have a tool which can help you coordinate several activities, and the best one is ERP. The advantages of having ERP are many. It gives you the opportunity of integrating every procedure of your business while improving the quality of several areas simultaneously. These areas include human resources, accounting and operations. In addition, ERP helps to increase your production levels and to control your costs more efficiently, and this means that you will be able to control the whole enterprise more efficiently.

A very important facility of the ERP systems is that they increase the availability of the information, helping companies to have information in real time to make decisions and accurate prognostics regarding the organization. It is important to mention that ERP systems are a very powerful tool when it comes to processing and organizing financial data. It improves the development of the commercial activity in the short and long term.

In the enterprise management module you can perform integral strategic planning, keeping an eye on the daily activities and having fluent communication with the investors. The human resources module allows you to make decisions and optimize the company's investments regarding employees. With all of this one can see that an ERP system brings visible advantages.

Another important consideration to make is that the implementation of ERP takes time and generates deep changes in the way you do business. But the important thing to remember is that every enterprise can see the benefits of the ERP systems, although for the first period it may only seem like an investment. The benefits indeed are really bigger than the costs, and it is very valuable to invest in an ERP system.

Success and Failure factors of ERP Implementation

There are many **factors** that determine the **success and failure** of **ERP implementation**. **Failure of ERP implementation** can be a result of improper planning, unclear objective or too much customization.

WHY ERP IMPLEMENTATION FAILS

There are many factors that determine the success and failure of ERP implementation. Failure of ERP implementation can be a result of improper planning, unclear objective or too much customization. The major reasons why ERP implementations fail are: Reasons for why ERP implementations fail are:- 1. Lack of Management Participation One of the major causes of ERP implementation failure is lack of management backing, ERP needs the active participation of people in the organization and until and unless management doesn't make clear that ERP implementation is a priority there will always...

ERP implementations can fail because organizations underestimate the magnitude of the undertaking and develop a project plan with an unrealistic timeline that leaves no flexibility to accommodate delays due to even minor unforeseen circumstances. In fact, these “unknowns” can result in significant project delays, as the dependencies between activities tend to affect project schedule and resource costs because team members are not effectively utilized. Planning and managing milestones are critical success factors for the execution of a successful ERP project schedule. While it’s important to give consideration to resource loading to ensure the team is equipped to handle the project, it’s extraordinarily difficult to maintain a fully resource-balanced plan at the task level for a large ERP implementation.

Case Study of Success Story and Failure of Processing Sector.

SWOT *analysis* of Food- **Processing Industry** in Karnataka ,can be attributable to this problem in the **case** of individual commodities. The present **study** focuses on documentation of **success** and **failure stories** of a food **processing**.

Case 1: Success story of Mahesh Cashew Industries The credit of establishing the first cashew processing industry at Nellikatte in Moodubelle in 1999 under the name of Mahesh Cashew Industries belongs to Belle Nagaraj Kamath. Earlier, Nagaraj Kamath’s family had a grocery shop and gradually began to deal with raw cashew nuts. Their area of operation was right up to Bhatkal and Moodubidre-Kinnigoli acquiring raw nuts from the shops and supplying to B.R. Kamath and Sons Cashew Factory at Karkala, considered to be the largest in Karnataka. Having been in the procurement of the raw cashew nuts business for quite a long time, Belle Nagaraj Kamath, who had studied up to PUC in St. Lawrence PU College at Moodubelle and was a commerce graduate (B.Com) from the MGM College, Udupi, decided to start his own processing cashew factory under the Khadi Gramodyog Scheme with government subsidy. Belle Nagaraj Kamath says that, as he himself had come up in life with great economic difficulties and practically rose from nothing, he had a dream of providing employment to the poorer and marginalised section of the village population by starting some kind of gainful enterprise. He could fulfil this dream by establishing the Mahesh Cashew Industries and later another cashew factory named Ashwini Cashew Industries at Arasikatte at Bhatkal. In both these cashew factories, Nagaraj could provided employment to around 250 persons, most of whom are women. According to Nagaraj, the cashew nut processing operations are carried out throughout the year. The raw nuts required for the processing are procured locally and from the states of Kerala, Karnataka, Goa and Maharashtra. Nagaraj also imports raw nuts from other countries such as Indonesia, Vietnam, South Africa and Tanzania. On an average, the Mahesh Cashew Industries process around 40 bags of raw cashews nuts weighing about 3,500 Kgs. The processed and graded cashew kernels are then filled in 65 tins of 10 Kgs each per day. Nagaraj pointed out that the cashew nut processing operation has certain important stages. At the first stage, the raw cashew nuts are sun dried for two days and then stored. In the second stage, the required amount of nuts per day is steam-boiled. In the third stage, the women who work in the cutting operation

take the nuts from the boiler room to the cutting section and separate the kernels from the nut-shells. 43 The cutting is done machines and the women's have to be quite careful during this operation. They take necessary precaution by applying castor oil to their hands and some of them even use gloves. After the process of cutting the kernels are separated from the nut-shells and the nut-shells are used as raw material for cashew nut oil mills. In the fourth stage, the kernels are roasted in hot-chambers which look like huge cupboards through electric power with heat up to 80 degree Celsius. The fifth is the peeling stage in which the kernel is separated from the thin husk. Some of the women who are unable to spend an entire day in the factory can carry fixed amount of roasted cashew nuts for peeling and return on the next day and take home another fresh lot. The sixth stage is the grading stage during which the cashew kernel is sorted out according to its quality. According to Nagaraj, as per the quality, the cashew kernel can be graded into 35 varieties. In the final stage, the cashew kernels are packed in tins according to their qualities indicated by embossed code letters and numbers indicating the quality of nuts contained in the tin. They are then sealed and labeled. Two tins containing the same quality of cashew nuts are then packed in a carton and kept ready for sending to the market by the dealer. The processed cashew from the Mahesh Cashew Industries is marketed in Bangalore, Mumbai and Delhi. There is also provision for retail selling of smaller packets of cashew nuts in the factory. Belle Nagaraj Kamath says that there are around 150 cashew processing units in the Udupi District alone. These cashew factories are a boon for the villagers, especially for girls and women as they are given preference in the cashew processing units. They are given all monetary and other facilities. Transport is provided for picking up and dropping them at their residences. The workers are provided cheaper food through canteen facility. They are given monetary incentives such as Provident Fund (PF), Dearness Allowance (DA) and Bonus. They are also eligible for Employees State Insurance Scheme (ESIS) in

Unit IV Important Questions:

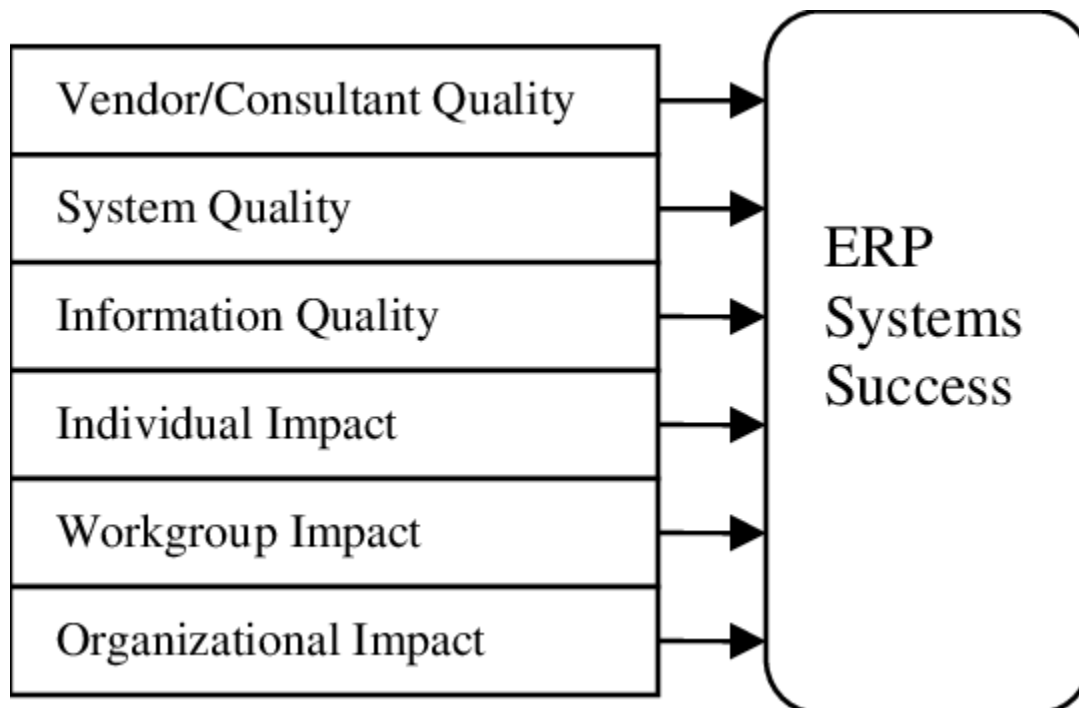
1	Write detailed notes on Overview of ERP software solution?
2	Discuss in details about Sales and Distribution?
3	What do you mean by Maintenance of ERP, Discuss?
4	What are the problems of Maintaining ERP?
5	What is Organizational and Industrial impact of ERP?
6	Write Success and Failure factors of ERP Implementation by talking some imp.organization?
7	Write a Case Study of Success Story and Failure of Processing Sector?
8	What are the advantages and dis-advantages of ERP system implementation in Organizations?
9	Mention what are software's available for ERP solution?
10	Discuss Success Factors of Implementation of ERP in Educational Institution?

V UNIT

Extended ERP system

Enterprise resource planning, is **software** that enables business processes in the finance, manufacturing, distribution, sales and other areas. **Extended ERP** includes other **software** and business processes. ... Customer relationship management, or CRM, includes **software** related.

Extends the foundation **ERP** system's functionalities such as finances, distribution, manufacturing, human resources, and payroll to customer relationship management, supply chain management, sales-force automation, and Internet-enabled integrated e-commerce and e-business.



ERP add-ons

3 ERP AddOns that will make your life easier:

Advanced and Third Party **ERP Add-Ons**. Most **ERP** systems have a set of **ERP add-ons** and applications that are delivered as part of their core or standard offering. ... In these situations, the vendors have typically written standard integrations so the **ERP add-ons** and core systems work seamlessly together.

Many Small Businesses depend on accounting software to organize their operations. Simple ERP solutions, with low total cost of ownership and high return on investment, offer the tools that these businesses need to get started in streamlining processes, managing business growth, and reducing costs. These solutions accomplish this by increasing visibility into company operations and laying down a procedural backbone that organizes and tracks the ongoing activities of a business.

Smaller ERP systems often depend on third party applications to deliver the complete suite of functionality that benefits a business. This can offer a good alternative for companies to attain additional functionalities necessary to run their business. On the other hand it can also lead to issues of integration and companies becoming more dependent on a variety of different providers for support and upgrades to their solution.

Popular ERP Modules and Add-ons

- **Modules**
 - ✓ Production Planning
 - ✓ Materials Management
 - ✓ Sales and Distribution
 - ✓ Financial and Accounting Management
 - ✓ Human Resource
- **Add-ons**
 - ✓ Customer Relationship Mgmt (CRM)
 - ✓ Supply Chain Mgmt (SCM)
 - ✓ Product Lifecycle Mgmt (PLM)

(to p7)

Semantic view of ERP platform



6

Customer Relations Management (CRM)

Customer-relationship management is an approach to manage a company's interaction with current and potential customers. It uses data analysis about customers' history with a company to improve business relationships with customers, specifically focusing on customer retention and ultimately driving sales growth.

Customer Relationship Management (CRM) is a strategy for managing all your company's relationships and interactions with your customers and potential.

Customer-relationship management (CRM)

is an approach to manage a company's interaction with current and potential customers. It uses data analysis about customers' history with a company to improve business relationships with customers, specifically focusing on customer retention and ultimately driving sales growth

One important aspect of the CRM approach is the systems of CRM that compile data from a range of different communication channels, including a company's website, telephone, email, live chat, marketing materials and more recently, social media.^[2] Through the CRM approach and the systems used to facilitate it, businesses learn more about their target audiences and how to best cater to their needs.





Customer Satisfaction

It is a measure of how products and services supplied by a company meet or surpass customer expectation. Customer satisfaction is defined as "the number of customers, or percentage of total customers, whose reported experience with a firm, its products, or its services (ratings) exceeds specified satisfaction goals."



What Is The Meaning Of Customer Satisfaction?

Before we explore it in more detail, we need to define customer satisfaction itself.

At its most basic, customer satisfaction measures how your product, service, and overall experience either falls short, meets, or exceeds customer expectations.

How you measure it varies from business to business. Some may base it entirely on retention and repeat customers, while others may create a numerical value based on data and/or customer feedback.

Regardless, it measures, rates, and attempts to manage how happy your customers are with you, your products, and your brand as a whole.

Happy = good. Not-so-happy = bad. It's really that simple.

Business analytics etc- Future trends in ERP systems-web enabled, Wireless technologies. Case Study in Service Sector.

Business analytics

Business analytics (BA) refers to the skills, technologies, practices for continuous iterative exploration and investigation of past **business** performance to gain insight and drive **business** planning.

Business Analytics is a combination of **Data Analytics**, **Business Intelligence** and Computer Programming. It is the science of analysing data to find out patterns that will be helpful in developing strategies.

Business Analytics

According to Gartner, Business analytics is comprised of solutions used to build analysis models and simulations to create scenarios, understand realities and predict future states.

Quite heavy? Let's distill the above explanation through an example. Suppose you are the product head of a mobile device manufacturing company and has been asked to do research about launching a new mobile phone. What all you will do? Let's list down:

- Gathering details about usage of mobiles in the past 5 years
- Gather statistics about sales of mobiles (company wise, location wise, price wise) in the past 5 years
- Find out which mobiles were a success/failure by comparing the sales
- Assess what caused some mobiles to be successful and others to fail by comparing parameters like features, price, etc...
- Find out if there are any trends and insights in the details and numbers captured by you
- Predict the features required in your mobile phone, its price and number of sales for your mobile to be successful

Aren't all the above steps quite logical? Yes, they are and that all what is done in business

analytics. **In the above steps, we performed data mining, statistical analysis and predictive**

analytics on historical business data/performance and they were done to gain insights and

help in business planning and decision making. At a more complex level, business analytics

can include algorithms, models and specialized tools to compare data gathered from different

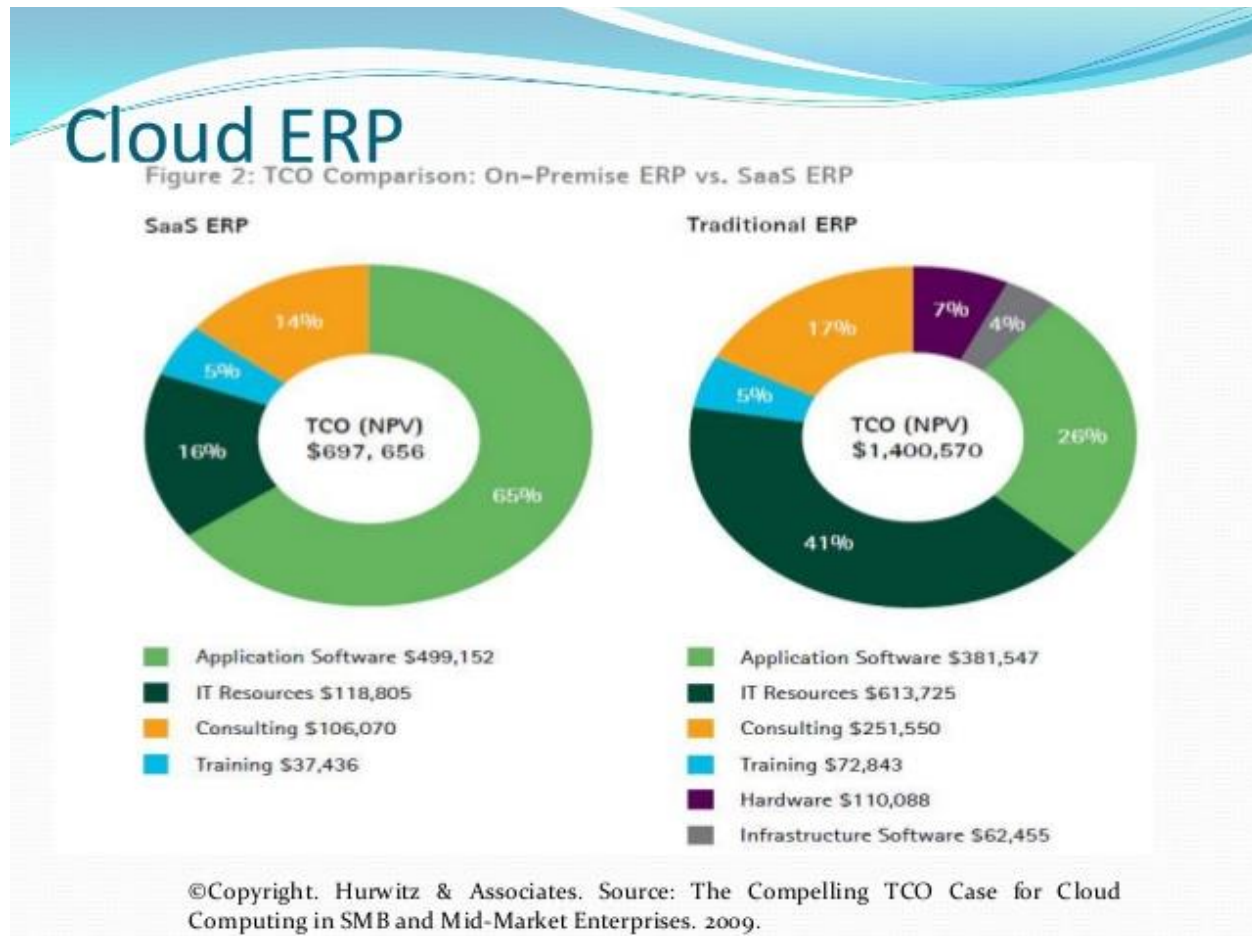
sources.

Future trends in ERP systems

Future trends of ERP Systems that will shape the Future of Industry 4.0 are:

- The **Internet of Things (IoT)**

- **Wearable** technology.
- **Big data analytics** (Embedded **analytics** instead of isolated on in-memory appliances)
- Opening business to **innovation**.
- **Mobile ERP**.



The most businesses that has a moved beyond the startup phase are likely looking into acquiring *enterprise resource planning (ERP) software*. The *ERP systems* one of the a most

adopted information technology (IT) solutions in a organizations

Future trends in ERP

- The rapid consumerization of technology over the past few years has lead enterprises to move on to cloud and new trends viz wireless technology
- **ERP systems will become easier to use, while the cloud, mobile devices and social media will have an impact on products on offer to manufacturers.**

ERP applications are an integral component of any information architecture and today's application **system** are required to address more than the processes

WEB ENABLED ERP SYSTEM

Web enabled refers to a product or service that can be used through, or in conjunction with, the World Wide Web. A Web-enabled product may be accessed through a Web browser or be able to connect to other Web-based applications in order to synchronize data.

This term used to be an attractive buzzword to include in a product description, but now it would be rarer to have technology that is not Web enabled.

Web enabled

Capable of connecting to the Web or running an application from the Web. This term may refer to general Web surfing, connecting to a specific website for some purpose or running applications within a Web browser.



Benefits of Web-Enabling a Data Warehouse

- Better-informed decision making
- Lower costs of deployment and management
- Lower training costs
- Remote access
- Enhanced customer service and improved image as a technology leader
- Greater collaboration among users

Wireless technologies

WIRELESS TECHNOLOGY USED IN ERP:

Advancement of wireless technology in ERP has given it a boost that has made ERP a big solution provider to the companies working in different sectors. Today the effect of ERP on the market is immense due to the use of wireless technology that gives it the reach beyond geographical locations and has made data communication and integration faster and reliable in real time.

With the advent of wi-fi internet connections and offices, web enabled mobile devices and laptops ERP application and its features can be used and accessed from any where. Manufacturing companies working from many locations with their head office, manufacturing units, warehouses and sales offices at different locations ERP application alone would have made a little difference in reducing the pile of problems they faced, but with the use of wireless technology in integrating ERP applications, the data transfer and its availability to all the concerned departments with in the organization and outside organization has solved chunk of their problems.

Manufacturing company management is now aware of the stocks in the warehouse, production status of any product, shipping details, deal status and various other set of information, crucial for decision making, at their laptops with out any delays due to far locations. Compliance of best practices and company policies are much easier today with advancement of wireless technology in ERP. Sales force of any company of any sector gets access to relevant data and status of the customer from any where which helps them in closing the deals faster.

Distribution companies whether small or big can have 24x7 working with e-commerce feature only possible with wireless technology in ERP. Maintenance of web store can be automated with out any human intervention to avoid delays and wastage of man power. Self service options provided to customers or possible customers not only improve customer satisfaction but save valuable man hours of the front office which can be utilized for more productive work than simply providing price and warranty details.

Today large organizations have global headquarters working with many headquarters in different countries connected by servers through wireless technology. These organizations rely for their decisions on their ERP which provides them with updated data to give real picture irrespective of the geographical location of the point of data entry. The advancement of wireless technology only has made ERP application capable of providing such facilities to its users.

Like any other technology wireless technology also has some problem areas which are to be taken care of. With the use of wireless technology privacy becomes of utmost significance, whenever the real data is brought under the public domain it becomes literally impossible to maintain privacy from the third party. More security features are desired, to maintain privacy of the companies using ERP with wireless technology. More and more alternates shall be used for data transfer and integration as they may be helpful in the case of emergency when any system crashes down. But there are no two opinions on the fact that advancement of wireless technology has taken ERP applications few steps ahead in providing solutions to their users.

A CASE STUDY:**Erp in services sector**

Service companies vary hugely in terms of what they deliver to their customers and the scale on which they operate. In terms of information technology (IT), the front office systems are usually specialized to support the specific service operations. As a result, the front office systems are often provided by niche suppliers. However, the back office systems tend to be fairly standard, supporting functions such as Finance, HR, Sales Order Processing, Purchasing, Inventory Control, etc. These functions are best supported by ERP systems provided by a large range of ERP vendors and partners. Therefore, the challenge for service companies is to find the best balance between front office and back office systems.

It is completely viable for the ERP system to be provided on a “Software as a Service” (SAAS) basis, allowing the ERP system to be paid for on a monthly subscription rather than an upfront license fee. New entrepreneurial style service organizations, which are planning to grow rapidly, should give careful consideration to the front or back office split in an ERP software. Using an ERP based approach for the back office will deliver a cost effective and scalable solution. The ERP system also enhances the rich functionality provided by the specialized front office system.

In recent years we have seen much of the traditional manufacturing industries in Europe relocate to the lower cost economies such as those in Asia. Governments across Europe are looking to the Services sector to replace the jobs which are being lost. Leaders speak of the “Knowledge Economy” or the “Smart Economy” as the way forward. This Opinion considers how service companies can have sophisticated and effective IT systems with affordable total cost of ownership.

Service companies vary hugely in terms of what they deliver to their customers and the scale on which they operate. Large utilities companies operate nationally and internationally, and in recent years can deliver multiple services to their customers e.g. gas and electricity from one supplier. At the other end of the scale we find small companies delivering specialist services locally e.g. Solicitors, Accountants and Engineers. Increasingly we are seeing new entrepreneurial style organisations emerging, particularly in the technology sector, which are growing rapidly and have global reach in terms of their markets. These organisations face the challenge of being able to deliver their services effectively using affordable and scalable information technology support.

All services companies have similar attributes in term of their business models. In simple terms they develop, sell and deliver services to their customers, while managing human and financial resources. In terms of information technology (IT) this can be represented as “front office” and “back office” systems. The front office systems are usually specialised to support the specific service operations. As a result, the front office systems are often bespoke developed or provided by niche suppliers. The back office systems however tend to be fairly standard, supporting functions such as Finance, HR, Sales Order Processing, Purchasing, Inventory Control, etc. These functions are best supported by Enterprise Resource Planning (ERP) type

systems provided by a large range of ERP vendors and partners. The challenge therefore for services companies is to find the best balance between front office and back office systems.

A systems landscape where the front and back office applications are separated will require critical interfaces to be developed to keep the two sides in line. Typically this would involve demand/order information passing from the front office to the back office, and status information passing from the back office to the front office, e.g. credit checking, inventory availability, order status, etc. With the sophisticated middleware and communications technology available today, there is no requirement for the two sides to be on the same platform or database. Also, it is completely viable for the ERP system to be provided on a “Software as a Service” (SAAS) basis, allowing the system to be paid for on a monthly subscription rather than an upfront licence fee. New entrepreneurial style service organisations, which are planning to grow rapidly, should give careful consideration to the front/back office split. Using an ERP based approach for the back office will deliver a cost effective and scalable solution, and will enhance the rich functionality provided by the specialised front office system.

Important questions of UNIT V

1	What do you mean by Extended ERP system?
2	What are the advantages and disadvantages of ERP system?
3	Write detailed notes on ERP add-ons?
4	What do you mean by Customer Relations Management (CRM)?
5	What are the advantages of maintaining relations with customers?
6	What do you mean by Customer satisfaction? Discuss.
7	Why we need to obtain Customer Satisfaction and also mention advantages of same?
8	What do you mean by Business analytics, Discuss
9	What are Future trends in ERP systems? Discuss in detail.
10	Write Case Study about Service Sector taking any one organization?
11	Discuss various Wireless technologies related to ERP?

