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Skills for a secure future

# Certified ERP Manager
# Sample Material

## V-Skills Certifications

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V-Skills

Skills for a secure future

# 1. EVOLUTION OF ERP

ERP (Enterprise Resource Planning) is the evolution of Manufacturing Requirements Planning (MRP) II. From business perspective, ERP has expanded from coordination of manufacturing processes to the integration of enterprise-wide backend processes. From technological aspect, ERP has evolved from legacy implementation to more flexible tiered client-server architecture.

The following table summarizes the evolution of ERP from 1960s to 1990s.

| Timeline | System | Description |
|---|---|---|
| 1960s | Inventory Management &Control | Inventory Management and control is the combination of information technology and business processes of maintaining the appropriate level of stock in a warehouse. The activities of inventory management include identifying inventory requirements, setting targets, providing replenishment techniques and options, monitoring item usages, reconciling the inventory balances, and reporting inventory status. |
| 1970s | Material Requirement Planning (MRP) | Materials Requirement Planning (MRP) utilizes software applications for scheduling production processes. MRP generates schedules for the operations and raw material purchases based on the production requirements of finished goods, the structure of the production system, the current inventories levels and the lot sizing procedure for each operation. |
| 1980s | Manufacturing Requirements Planning (MRP II) | Manufacturing Requirements Planning or MRP utilizes software applications for coordinating manufacturing processes, from product planning, parts purchasing, inventory control to product distribution. |
| 1990s | Enterprise Resource Planning (ERP) | Enterprise Resource Planning or ERP uses multi-module application software for improving the performance of the internal business processes. ERP systems often integrate business activities across functional departments, from product planning, parts purchasing, inventory control, product distribution, fulfillment, to order tracking. ERP software systems may include application modules for supporting marketing, finance, accounting and human resources. |

The initials ERP originated as an extension of MRP (material requirements planning, later manufacturing resource planning) and CIM (Computer Integrated Manufacturing). It was introduced by research and analysis firm Gartner in 1990. ERP systems now attempt to cover all core functions of an enterprise, regardless of the organization's business or charter. These systems can now be found in non-manufacturing businesses, non-profit organizations and governments.

To be considered an ERP system, a software package must provide the function of at least two systems. For example, a software package that provides both payroll and accounting functions could technically be considered an ERP software package Examples of modules in an ERP which formerly would have been stand-alone applications include: Product lifecycle management, Supply chain management (e.g. Purchasing, Manufacturing and Distribution), Warehouse Management, Customer Relationship Management (CRM), Sales Order Processing, Online Sales, Financials, Human Resources, and Decision Support System.

**Overview of ERP Solutions:** Some organizations – typically those with sufficient in-house IT skills to integrate multiple software products – choose to implement only portions of an ERP system and develop an external interface to other ERP or stand-alone systems for their other application needs. For example, one may choose to use human resource management system from one vendor, and the financial systems from another, and perform the integration between the systems themselves. This is common to retailers, where even a mid-sized retailer will have a discrete Point-of-Sale (POS) product and financials application, then a series of specialized applications to handle business requirements such as warehouse management, staff roistering, merchandising and logistics.

Ideally, ERP delivers a single database that contains all data for the software modules, which would include:

- ✓ **Manufacturing:** Engineering, bills of material, scheduling, capacity, workflow management, quality control, cost management, manufacturing process, manufacturing projects, manufacturing flow.
- ✓ **Supply chain management:** Order to cash, inventory, order entry, purchasing, product configuration, supply chain planning, supplier scheduling, and inspection of goods, claim processing, and commission calculation.
- ✓ **Financials:** General ledger, cash management, accounts payable, accounts receivable, fixed assets.
- ✓ **Project management:** Costing, billing, time and expense, performance units, activity management.
- ✓ **Human resources:** Human resources, payroll, training, time and attendance, roistering, benefits.
- ✓ **Customer relationship management:** Sales and marketing, commissions, service, customer contact and call center support, Data warehouse and various self-service interfaces for customers, suppliers, and employees.
- ✓ **Access control:** user privilege as per authority levels for process execution Customization - to meet the extension, addition, change in process flow.

Enterprise Resource Planning (ERP) is a term originally derived from manufacturing resource planning (MRP II) that followed material requirements planning (MRP). MRP evolved into ERP when "routings" became a major part of the software architecture and a company's capacity planning activity also became a part of the standard software activity. ERP systems typically handle

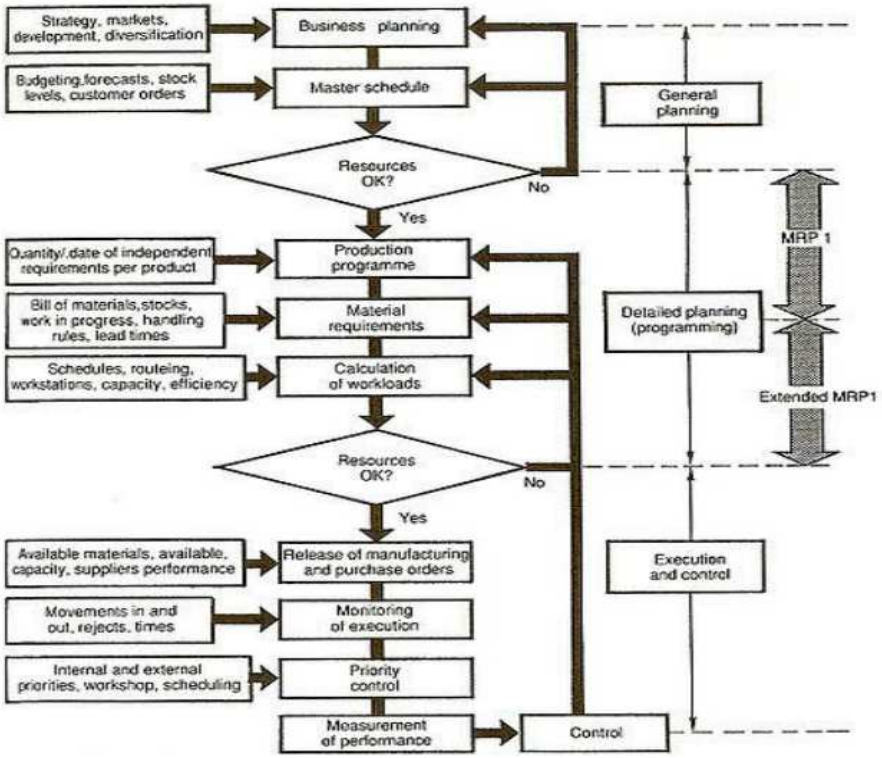
the manufacturing, logistics, and distribution, inventory, shipping, invoicing, and accounting for a company. ERP software can aid in the control of many business activities, including sales, marketing, delivery, billing, production, inventory management, quality management and human resource management.

ERP systems saw a large boost in sales in the 1990s as companies faced the Y2K problem in their legacy systems. Many companies took this opportunity to replace their legacy information systems with ERP systems. This rapid growth in sales was followed by a slump in 1999, at which time most companies had already implemented their Y2K solution.

ERPs are often incorrectly called back office systems indicating that customers and the general public are not directly involved. This is contrasted with front office systems like customer relationship management (CRM) systems that deal directly with the customers, or the e Business systems such as ecommerce, e Government, e Telecom, and e Finance, or supplier relationship management (SRM) systems.

ERPs are cross-functional and enterprise wide. All functional departments that are involved in operations or production are integrated in one system. In addition to manufacturing, warehousing, logistics, and information technology, this would include accounting, human resources, marketing and strategic management. ERP II means open ERP architecture of components. The older, monolithic ERP systems became component oriented.

EAS – Enterprise Application Suite is a new name for formerly developed ERP systems which include (almost) all segments of business, using ordinary Internet browsers as thin clients.



**Introduction:** The unprecedented growth of information and communication technologies (ICT) driven by microelectronics, computer hardware and software systems has influenced all facets of computing applications across organizations. Simultaneously the business environment is becoming increasingly complex with functional units requiring more and more inter- functional data flow for decision making, timely and efficient procurement of product parts, management of inventory, accounting, human resources and distribution of goods and services. In this context, management of organizations needs efficient information systems to improve competitiveness by cost reduction and better logistics.

It is universally recognized by large and small-to medium- size enterprises (SME) that the capability of providing the right information at the right time brings tremendous rewards to organizations in a global competitive world of complex business practices. Starting in the late 1980s and the beginning 10 of the 1990s new software systems known in the industry as enterprise resource planning (ERP) systems have surfaced in the market targeting mainly large complex business organizations. These complex, expensive, powerful, proprietary systems are off the- shelf solutions requiring consultants to tailor and implement them based on the company's requirements. In many cases they force companies to reengineer their business processes to accommodate the logic of the software modules for streamlining data flow throughout the organization. These software solutions, unlike the old, traditional in-house-designed company specific systems, are integrated multi-module commercial packages suitable for tailoring and adding "add-ons" as and when required. The phenomenal growth of computing power and the Internet is bringing ever more challenges for the ERP vendors and the customers to redesign ERP products, breaking the barrier of proprietorship and customization, and embracing the collaborative business over the intranet, extranet and the Internet in a seamless manner. The vendors already promise many "add-on" modules, some of which are already in the market as a sign of acceptance of these challenges by the ERP vendors. It is a never-ending process of reengineering and development bringing new products and solutions to the ERP market. ERP vendors and customers have recognized the need for packages that follow open architecture, provide interchangeable modules and allow easy customization and user interfacing.

**Evolution of ERP Systems:** The evolution of ERP systems closely followed the spectacular developments in the field of computer hardware and software systems.

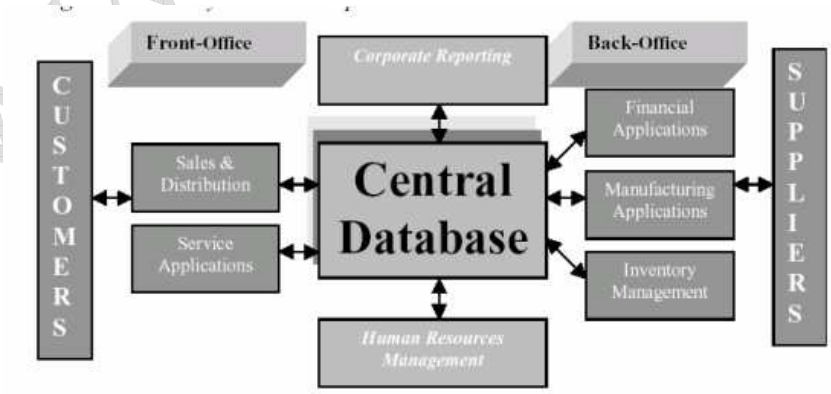



Figure 1.1: ERP systems concept

1960s most organizations designed, developed and implemented centralized computing systems, mostly automating their inventory control systems using inventory control packages (IC). These were legacy systems based on programming languages such as COBOL, ALGOL and FORTRAN. Material requirements planning (MRP) systems were developed in the 1970s which involved mainly planning the product or parts requirements according to the master production schedule. Following this route new software systems called manufacturing resources planning (MRP II) were introduced in the 1980s with an emphasis on optimizing manufacturing processes by synchronizing the materials with production requirements. MRP II included areas such as shop floor and distribution management, project management, finance, human resource and engineering. ERP systems first appeared in the late 1980s and the beginning of the 1990s with the power of enterprise-wide inter-functional coordination 11 and integration. Based on the technological foundations of MRP and MRP II, ERP systems integrate business processes including manufacturing, distribution, accounting, financial, human resource management, project management, inventory management, service and maintenance, and transportation, providing accessibility, visibility and consistency across the enterprise. During the 1990s ERP vendors added more modules and functions as "add-ons" to the core modules giving birth to the "extended ERPs." These ERP extensions include advanced planning and scheduling (APS), e-business solutions such as customer relationship management (CRM) and supply chain management (SCM). Figure 2 summarizes the historical events related with ERP.


Figure1.2: ERP Evolution

## 1.1. What is ERP?

Enterprise resource planning systems or enterprise systems are software systems for business management, encompassing modules supporting functional areas such as planning, manufacturing, sales, marketing, distribution, accounting, financial, human resource management, project management, inventory management, service and maintenance, transportation and e-business. The architecture of the software facilitates transparent integration of modules, providing flow of information between all functions within the enterprise in a consistently visible manner. Corporate computing with ERPs allows companies to implement a single integrated system by replacing or re-engineering their mostly incompatible legacy information systems. American Production and Inventory Control Society (2001) has defined ERP systems as "a method for the effective planning and controlling of all the resources needed to take, make, ship and account for customer orders in a manufacturing, distribution or service company." We quote several definitions from the published literature to further explain the concept: "ERP (enterprise resource planning systems) comprises of a commercial software package that promises the seamless integration of all the information flowing through the company–financial, accounting, human resources, supply chain and customer information" (Davenport, 1998). "ERP systems are configurable information systems packages that integrate information and information-based processes within and across functional

areas in an organization" (Kumar & Van Hillsgers berg, 2000) "One database, one application and a unified interface across the entire enterprise" (Tadjer, 1998). "ERP systems are computer-based systems designed to process an organization's 12 transactions and facilitate integrated and real-time planning, production, and customer response" (O'Leary, 2001).

ERP is the acronym of Enterprise Resource Planning. ERP utilizes ERP software applications to improve the performance of organizations' resource planning, management control and operational control. ERP software is multi-module application software that integrates activities across functional departments, from product planning, parts purchasing, inventory control, and product distribution, to order tracking. ERP software may include application modules for the finance, accounting and human resources aspects of a business.

**ERP vs. CRM and SCM:** CRM (Customer Relationship Management) and SCM (Supply Chain Management) are two other categories of enterprise software that are widely implemented in corporations and non- profit organizations. While the primary goal of ERP is to improve and streamline internal business processes, CRM attempts to enhance the relationship with customers and SCM aims to facilitate the collaboration between the organization, its suppliers, the manufacturers, the distributors and the partners.

**ERP Definition - A Systems Perspective:** ERP, often like other IT and business concepts, are defined in many different ways. A sound definition should several purposes:

- ✓ It provides a base for defining more detailed concepts in the field - ERP software, ERP systems, ERP implementation etc.
- ✓ It provides a common ground for comparison with related concepts - CRM, SCM etc.
- ✓ It helps answer the basic questions in the field - benefits of ERP, the causes of ERP failure etc.

A definition of ERP based on Systems Theory can serve those purposes. ERP is a system which has its goal, components, and boundary.

The Goal of an ERP System - The goal of ERP is to improve and streamline internal business processes, which typically requires reengineering of current business processes.

The Components of an ERP System - The components of an ERP system are the common components of a Management Information System (MIS).

ERP Software - Module based ERP software is the core of an ERP system. Each software module automates business activities of a functional area within an organization. Common ERP software modules include product planning, parts purchasing, inventory control, product distribution, order tracking, finance, and accounting and human resources aspects of an organization. Business processes within an organization falls into three levels strategic planning, management control and operational control. ERP has been promoted as solutions for supporting or streamlining business processes at all levels. Much of ERP success, however, has been limited to the integration of various functional departments.

ERP Users - The users of ERP systems are employees of the organization at all levels, from workers, supervisors, and mid-level managers to executives.

Hardware and Operating Systems - Many large ERP systems are UNIX based. Windows NT and Linux are other popular operating systems to run ERP software. Legacy ERP systems may use other operating systems.

The boundary of an ERP system is usually small than the boundary of the organization that implements the ERP system. In contrast, the boundary of supply chain systems and ecommerce systems extends to the organization's suppliers, distributors, partners and customers. In practice, however, many ERP implementations involve the integration of ERP with external information systems.

Enterprise resource planning (ERP) is the industry term used to describe a broad set of activities supported by multi-module application software that helps a manufacturer or other business manage the important parts of its business. These parts can include product planning, parts purchasing, maintaining inventories, interacting with suppliers, providing customer service, and tracking orders. ERP can also include application modules for the finance and human resources aspects of a business. Some of the bigger players in the ERP outsourcing market are SAP, People soft, and J. D. Edwards. New comers include Oracle, IBM, and Microsoft.

ERP stands for Enterprise Resource Planning ERP is a way to integrate the data and processes of an organization into one single system. Usually ERP systems will have many components including hardware and software, in order to achieve integration, most ERP systems use a unified database to store data for various functions found throughout the organization.

The term ERP originally referred to how a large organization planned to use organizational wide resources. In the past, ERP systems were used in larger more industrial types of companies. However, the use of ERP has changed and is extremely comprehensive, today the term can refer to any type of company, no matter what industry it falls in. In fact, ERP systems are used in almost any type of organization - large or small.

In order for a software system to be considered ERP, it must provide an organization with functionality for two or more systems. While some ERP packages exist that only cover two functions for an organization (QuickBooks: Payroll & Accounting), most ERP systems cover several functions.

Today's ERP systems can cover a wide range of functions and integrate them into one unified database. For instance, functions such as Human Resources, Supply Chain Management, Customer Relations Management, Financials, Manufacturing functions and Warehouse Management functions were all once stand alone software applications, usually housed with their own database and network, today, they can all fit under one umbrella - the ERP system

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

Although the ideal configuration would be one ERP system for an entire organization, many larger organizations usually create and ERP system and then build upon the system and external interface for other stand alone systems which might be more powerful and perform better in fulfilling an organizations needs. Usually this type of configuration can be time consuming and does require lots of labor hours.

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

- ✓ **Manufacturing:** Some of the functions include engineering, capacity, workflow management, quality control, bills of material, manufacturing process, etc.
- ✓ **Financials:** Accounts payable, accounts receivable, fixed assets, general ledger and cash management, etc.
- ✓ **Human Resources:** Benefits, training, payroll, time and attendance, etc
- ✓ **Supply Chain Management:** Inventory, supply chain planning, supplier scheduling, claim processing, order entry, purchasing, etc.
- ✓ **Projects:** Costing, billing, activity management, time and expense, etc.
- ✓ **Customer Relationship Management:** sales and marketing, service, commissions, customer contact, calls center support, etc.
- ✓ **Data Warehouse:** Usually this is a module that can be accessed by an organizations customers, suppliers and employees.

**ERP Improves Productivity:** Before ERP systems, each department in an organization would most likely have their own computer system, data and database. Unfortunately, many of these systems would not be able to communicate with one another or need to store or rewrite data to make it possible for cross computer system communication. For instance, the financials of a company were on a separate computer system than the HR system, making it more intensive and complicated to process certain functions.

Once an ERP system is in place, usually all aspects of an organization can work in harmony instead of every single system needing to be compatible with each other. For large organizations, increased productivity and less types of software are a result.

Enterprise resource planning (ERP) is a company-wide computer software system used to manage and coordinate all the resources, information, and functions of a business from shared data stores.

An ERP system has a service-oriented architecture with modular hardware and software units or "services" that communicate on a local area network. The modular design allows a business to add or reconfigure modules (perhaps from different vendors) while preserving data integrity in one shared database that may be centralized or distributed.

## 1.2. Reasons For The Growth of ERP

**Growth Reasons for a New Manufacturing ERP System**

There are lots of reasons that might make you consider implementing a new manufacturing ERP system. If you're having problems with the following growth situations than it is definitely time for new ERP software that better fits your needs.

Does your ERP solution offer simple implementation options for more efficient new technologies and functionality, such as barcodes, warehouse management, and fixed asset tracking?

Customers are attracted to easy solutions to their business needs and technology is developed based on that need. If your ERP software doesn't allow your functionality to keep pace with current technology and business options, then new customers will be hard to find.

Does your vendor still support your ERP software solution? Many manufacturing and distribution ERP software solutions are no longer being supported by their vendors. If you are not receiving the support to keep up with the market and if the ERP software itself is not expanding to support your needs, then it's time to shop for a new solution.

Are your business needs outrunning your ability to create your own custom solutions and the standard ERP solutions are just not enough?

Sometimes business demands outweigh the ability to create your own custom ERP software solutions. Often, a new ERP system will have the solutions that you need or will be willing to work with you to develop supported solutions in the standard product that will fit the demand for less than the cost of doing it yourself.

Do you have multiple locations and can your manufacturing ERP solution handle them? If you have added or are planning to add additional locations to your business, and your current ERP system can't handle multiple plants, locations, or distribution centers, then it's time for you to find an ERP system that will allow you to easily coordinate and execute the business procedures across your company.

Are you expanding into multiple countries?
When businesses grow, they often expand into multiple countries. Many ERP systems can't handle the globalization of the supply chain or business procedures. If this is the case, you should be shopping for a new one.

## 1.3. Scenario and Justification of ERP In India

Having ERP in India is like an investment that most business houses look up to. ERP or enterprise resource planning can be defined as an integrated, multi-module system that assimilates all the data and processes of an organization into a unified system. To attain this goal, it is essential to strike a successful combination of both hardware and software.

The whole concept of enterprise resource planning originated in the large industrial types of companies where the system was used to simplify their processes and workflow. However, with the passage of time, ERP has evolved as a more comprehensive system and now it is largely available to companies of all types and sizes. It serves and supports a wide range of business functions like manufacturing, order entry, accounts receivable and payable, general ledger, purchasing, warehousing, transportation and human resources.

## The ERP Scenario in India

There are several positive and negative factors as far as the ERP scenario in India is concerned. Though having ERP in companies of India mostly provides a profitable source of income and quality customer service, there are several challenges to the introduction of ERP in India. This includes change management, organizational intervention, replacing outdated software, shifting from function view to process view, hiring ERP-literate staff and faith in package software in the place of custom-built software.

Certain concerns that have never used ERP software are intimidated whereas some view ERP as a takeover to there IT professionals. Most of the Indian corporations have large in-house IT shops and they consider ERP as a threat to their very existence. Moreover, ERP places more value on the domain knowledge of functions rather than IT skills. The communication infrastructure needed to implement ERP are lacking in some of the indigenous companies.

In spite of all these, the growth of ERP in India is quite promising. Several well-known business houses in India like Cadbury India, Mercedes Benz India, Siemens, Haldia Petrochemicals, L&T, TISCO, and UTI use SAP while Kellogg's India Ltd., Maruti Udyog Ltd., Sony India Pvt. Ltd. and CESC are Oracle users. India's most valuable contribution to ERP came in 1980s when the country launched the world class ERP product Marshall from Ramco Systems, by using the technology of the 80's. Marshall is the first successful large scale software from India and several companies like HDFC Bank, Hyundai, Nestle Limited and Standard Chartered Bank use this ERP package. Actually, this product is a formative ERP called virtual splat. A virtual splat enables merging of accounting and manufacturing practices in an easy-to-use, implemented package and is used by small start-up companies.

## The benefits of ERP in India

ERP will provide the companies in India the facility to have information available freely, thus making the generation of enquiry or report easier. These systems automatically adhere to most of the standard company rules and compliances, making it easier for the organization to follow. The developed performance modules help the businesses to develop refined analysis, insights, and innovative schemes for improvement. ERP systems in India will also produce more dynamic jobs and improved customer care service and it will also enhance product values. As more and more Indian companies become accustomed to ERP, they can develop a successful broader scale of products for consumers. Last but not the least, having ERP in India implies not having to go and develop software products in foreign countries and distributing them back to India.

## Justification of ERP

The expected return on investment provides the cost justification and motivation for investing in ERP. There are quantifiable benefits as well as intangible benefits in the ERP investment decision. The quantifiable benefits have a bottom-line impact on profitability, asset turnover, and a potential effect on stock value. This section discusses the quantifiable and the intangible benefits of an ERP system, which compares firm performance before and after implementing ERP. Other scenarios are encountered in justifying ERP investments. For example, a firm may be considering replacement versus upgrade or re-implementation of an ERP software package. There are significant costs for not successfully implementing an ERP system. Manufacturers often pay more for the lack of systems than they would have paid for improved systems. They carry excess

inventory or provide poor customer service, for instance and manufacturers may invest in ERP without gaining the benefits because the systems are partially implemented, unsuccessfully implemented, or usage deteriorates over time.

## Quantifiable Benefits from an ERP System

Studies that surveyed manufacturers about the impact of ERP systems on firm performance indicate that company size and industry do not affect the results. Benefits have been indicated for large and small firms, whether they make standard or custom products or are in discrete or process manufacturing environments. This section explains the quantifiable benefits in terms of several areas of improvement.

**Typical Benefits:** The most significant quantifiable benefits involve reductions in inventory, material costs, and labor and overhead costs, as well as improvements in customer service and sales. Improved planning and scheduling practices typically lead to inventory reductions of 20 percent or better. This provides not only a one time reduction in assets (and inventory 17 typically constitutes a large proportion of assets), but also provides ongoing savings of the inventory carrying costs. The cost of carrying inventory includes not only interest but also the costs of warehousing, handling, obsolescence, insurance, taxes, damage, and shrinkage. With interest rates of 10 percent, the carrying costs can be 25 percent to 30 percent.

ERP systems lead to lower inventories because manufacturers can make and buy only what is needed. Demands rather than demand insensitive order points drive time phased plans. Deliveries can be coordinated to actual need dates; orders for unneeded material can be postponed or canceled. The bills of material ensure matched sets are obtained rather than too much of one component and not enough of another. Planned changes in the bills also prevent inventory build-up of obsolete materials. With fewer part shortages and realistic schedules, manufacturing orders can be processed to completion faster and work-in-process inventories can be reduced. Implementation of JIT philosophies can further reduce manufacturing lead times and the corresponding inventories.

**Material cost reductions:** Improved procurement practices lead to better vendor negotiations for prices, typically resulting in cost reductions of 5 percent or better. Valid schedules permit purchasing people to focus on vendor negotiations and quality improvement rather than on expediting shortages and getting material at premium prices. ERP systems provide negotiation information, such as projected material requirements by commodity group and vendor performance statistics. Giving suppliers better visibility of future requirements helps them achieve efficiencies that can be passed on as lower material costs.

**Labor cost reductions:** Improved manufacturing practices lead to fewer shortages and interruptions, and less rework and overtime. Typical labor savings from successful ERP are a 10 percent reduction in direct and indirect labor costs. By minimizing rush jobs and parts shortages, less time is needed for expediting, material handling, extra setups, disruptions, and tracking split lots or jobs that have been set aside. Production supervisors have better visibility of required work and can adjust capacity or loads to meet schedules. Supervisors have more time for managing, directing and training people. Production personnel have more time to develop better methods and improve quality and throughput.

**Improved customer service and sales**: Improved coordination of sales and production leads to better customer service and increased sales. Improvements in managing customer contacts, in making and meeting delivery promises, and in shorter order to ship lead times, lead to higher customer satisfaction and repeat orders. Sales people can focus on selling instead of verifying or apologizing for late deliveries. In custom product environments, configurations can be quickly identified and priced, often by sales personnel or even the customer rather than technical staff. Taken together, these improvements in customer service can lead to fewer lost sales and actual increases in sales, typically 10 percent or more.

ERP: systems also provide the ability to react to changes in demand and diagnose delivery problems. Corrective actions can be taken early, such as determining shipment priorities, notifying customers of changes to promised delivery dates, or altering production schedules to satisfy demand.

**Improved accounting controls:** Improved collection procedures can reduce the number of days of outstanding receivables, thereby providing additional available cash. Underlying these improvements is fast accurate invoice creation directly from shipment transactions, timely customer statements, and follows through on delinquent accounts. Credit checking during order entry and improved handling of customer inquiries further reduces the number of problem accounts. Improved credit management and receivables practices typically reduce the days of outstanding receivables by 18 percent or better. Trade credit can also be maximized by taking advantage of supplier discounts and cash planning, and paying only those invoices with matching receipts. This can lead to lower requirements for cash-on-hand.

**ERP System Benefits on the Balance Sheet:** Benefits from improved business processes and improved information provided by an ERP system can directly affect the balance sheet of a manufacturer. To illustrate this impact, a simplified balance sheet is shown in figure 1.3 for a typical manufacturer with annual revenue of $10 million. The biggest impacts will be on inventory and accounts receivable. In the example, the company has $3 million in inventory and $2 million in outstanding accounts receivable. Based on prior research concerning industry averages for improvements, implementation of an ERP system can lead to a 20 percent inventory reduction and an 18 percent receivables reduction.

| | Typical Current | | Improvement Benefit |
|---|---|---|---|
| Current assets | | | |
| Cash and other | 500,000 | | |
| Accounts receivable | 2,000,000 | 18% | 356,200 |
| Inventory | 3,000,000 | 20% | 600,000 |
| Fixed assets | 3,000,000 | | _____ |
| Total assets | $8,500,000 | | $956,200 |
| Current liabilities | xxx,xxx | | |
| Non current liabilities | xxx,xxx | | |
| Stockholder's equity | xxx,xxx | | |
| Total liabilities and equity | xxx,xxx | | |
| | | | |

Figure 1.3: Summarized balance sheet for a typical $10 million firm

**Inventory Reduction:** A 20 percent inventory reduction results in $600, 000 less inventory. Improved purchasing practices (that result in reduced material costs) could lower this number even more.

Accounts Receivable. Current accounts receivable represent seventy-three days of outstanding receivables. An 18 percent reduction (to sixty days' receivables) results in $356, 200 of additional cash available for other uses.

**ERP Benefits on the Income Statement:** A simplified, summary income statement for the same $10 million manufacturer is shown in figure 1.4. For many manufacturers, the cost of sales ranges from 65 to 75 percent of sales (the example will use 75 percent). Using industry averages for each major benefit, the 19 improved business processes and associated information system almost double the current pretax income.

**Inventory Reduction:** A 20 percent reduction in the current inventory of $3 million results in ongoing benefits of lower inventory carrying charges Using a carrying cost of 25 percent results in $150,000 in lower carrying charges each year, identified here as part of the administrative expenses.
**Material Cost Reductions:** A 5 percent reduction in material costs because of improved purchasing practices results in annual savings of $225, 000.
**Labor Cost Reductions:** A 10 percent reduction in labor costs because of less overtime and improved productivity results in annual savings of $100,000.
**Increased Sales:** Improvements in customer service typically lead to a 10 percent sales increase, this is not shown in figure 1.3

Annual benefits totaling $475, 000 in this example almost equals the current pretax income of $500, 000.

| | | Current | Typical Improvement | Benefit |
|---|---|---|---|---|
| Sales | | $10,000,000 | 10% | |
| Cost of sales | | 7,500,000 | | |
| Material | 4,500,000 | 60% | 5% | $225,000 |
| Labor | 1,000,000 | 13% | 10% | $100,000 |
| Overhead | 2,000,000 | 27% | | |
| Administrative expenses | | 2,000,000 | | $150,000 |
| Pretax income | | $ 500,000 | | $475,000 |

Figure 1.4: Summarized income statement for a typical $10 million firm

**ERP Impact on Key Financial Ratios:** Ration analysis provides another way to look at the impact of an ERP system. Three ratios illustrate the effect---two related to liquidity and one to operating performance. Inventory turnover (Cost of Sales/Inventory), Low inventory turnover can indicate possible overstocking and obsolescence. It may also indicate deeper problems of too much of the wrong kind of inventory which can create shortages of needed inventory for production and sales. High turnover indicates better liquidity and superior materials management and merchandising.

Given the example $10 million company, the current number of inventory turns is 2.5. With a 20 percent inventory reduction, the number of inventory turns increases to 3.1.

Days of Receivables (365 * 1/ (Sales/Receivables)): This ratio expresses the average time in days that receivables are outstanding. It is a measure of the management of credit and collections. Generally, the greater the number of days outstanding, the greater the probability of delinquencies in accounts receivable. The lower the number of days, the greater the cash availability With an 18 percent reduction in receivables, the current days receivable of seventy-three days can be reduced to sixty. This means $356,200 is available for other purposes.

Return on Assets (Profit before Taxes/Total Assets). This ratio measures the effectiveness of management in employing the resources available to it. Several calculations are necessary to determine the return on assets. In this example, the return on assets can be improved from 5.9 to 12.9 by effectively implementing an ERP system.

Performance evaluation based on ratio analysis can also use comparisons between one's own company and similar firms in terms of size and industry. The Annual Statement Studies provide comparative ratios for this purpose. This use of comparative ratio analysis will use the same three ratios for inventory turnover, days receivable, and return on assets. To perform the analysis, you identify the median and upper quartile ratios for firms in the same industry. These roughly correspond to average and good performance. By comparing the ratios with your firm's current performance, you can calculate how much better your company should be performing to be competitive. The same analysis can be performed using the "BenchmarkReport.com" website.

Using the inventory turns ratio for the example $10 million manufacturer, assume the Annual Statement Studies indicate that the median and upper quartile are four and six turns for other firms in the same industry. Average performance of four inventory turns translates into an expected inventory of $1.875 million ($7.5 million divided by four). If the example firm had this ratio, it would have had $1.125 million less in inventory. With inventory carrying costs at 25 percent, this would produce savings of $281,250 each year.

For the days receivable ratio, assume the Annual Statement Studies indicate that sixty and fifty days are the median and upper quartile. The days receivable in the example $10 million manufacturer is currently seventy-three days, an improvement to sixty days would reduce receivables by $356,200 (using a daily sales rate of $27,400 and a thirteen day reduction). This means that cash is available for other purposes.

Note that the return on assets ratio is 5.9 for the example company. Assuming the Annual Statement Studies indicate the return on assets is ten and fifteen for firms in the same industry at the median and upper quartiles, improving the return on assets to equivalent levels would mean increased profits or asset turnover.

**ERP Impact on Stock Price**

If the integration and improved information of an ERP system results in a better balance sheet and increased profits, these improvements should impact stock price for the company. Although stock price is affected by a variety of factors, the typical effect of improved profits and balance sheet ratios can be estimated. Using the already described example of $10 million manufacturer and

typical benefits, and assuming 100,000 shares outstanding and an existing stock price of $30.00 per share,the stock price exhibits the effects of an effective ERP, as figure shows. With a price/earnings multiplier of six, the stock price for the example company could be increased from $30 to $58.80 per

**Calculating the potential stock appreciation**

| | Before ERP | After ERP |
|---|---|---|
| Before tax profit | $500,000.00 | $980,000.00 |
| Earnings per share | $ 5.00 | $9.80 |
| Current stock price | $30.00 | 6 * 9.80 = $58.80 |
| Multiplier | 6 | 6 |

These calculations suggest that ERP systems can lead to significant impacts on financial results, including the balance sheet, income statement, key ratios, and stock price.

- ✓ The Intangible Effects of ERP
- ✓ Effects on Accounting
- ✓ Effects on Product and Process Design
- ✓ Effects on Production and Materials Management
- ✓ Effects on Sales
- ✓ Effects on the MIS Function

**The Intangible Effects of ERP:** The intangible or non-financial benefits of an integrated enterprise resource planning (ERP) system can be viewed from several perspectives. For illustrative purposes, the discussion will focus on the benefits for accounting, product and process design, production, sales, and management information system (MIS) functions. From the overall company standpoint, ERP provides a framework for working effectively together and providing a consistent plan for action.

Each of the intangible effects could be quantified in terms of cost savings. Duplicate data maintenance; for example, requires personnel time in entering data (and possibly managerial time in determining which set of data should be used for decision making). Expediting efforts have a visible effect of consuming personnel time. These quantified cost savings can also be used to show impacts on financial results.

**Effect on Accounting:** With a common database from ERP, accounting no longer requires duplicate files and redundant data entry. Product costing, for example, can be performed using accurate and up to date product structures. Product costing simulations can be used to analyze the impact of changing material costs, labor rates, and overhead allocations as well as planned changes to bills and routings. Differences between actual and standard costs are highlighted as variances. Order related variances help pinpoint problem areas.

Customer invoices can be based on actual shipments (without duplicate data entry), which helps speed invoice processing. Payables can use purchase order and receipt data for three ways matching with supplier invoices.

As manufacturing transactions are recorded, the financial equivalents are automatically generated for updating the general ledger. This provides a complete audit trail from account totals to source documents, ensures accurate and up to date financial information, and permits tracking of actual versus budgeted expenses. Detailed transaction activity can also be easily accessed on line for answering account inquiries.

Since manufacturing transactions automatically update the general ledger, time consuming manual journal entries can be eliminated. Period end closing procedures can be performed in hours or days, rather than weeks. This improves reduces clerical accounting work, and improves the timeliness of financial reports.

Financial reports can be easily customized to meet the needs of various decision makers. Financial projections can be based on detailed ERP calculations for future requirements. Cash planning, for example, can account for current and projected sales orders and planned 22 purchases, as well as current receivables and payables. Decision support tools (such as spreadsheets, graphics packages and data managers) can use the financial data maintained in the ERP database.

**Effects on Product and Process Design:** The product structure database offers engineering much greater control over product and process design, especially in terms of engineering change control. Planned changes can be phased in and emergency changes can be communicated immediately.

ERP systems offer numerous analytical tools for the engineering function. When diagnosing the impact of changes to materials and resources, for example, engineers can check where used information to identify the affected products. Lead time reduction efforts can use critical path analysis of item lead times in multi-level bills to focus attention on those key components affecting cumulative manufacturing lead time. Costed multi-level bills can be used to focus cost reduction efforts on high value items. Bill comparisons can be used to highlight differences between products or between revisions of the same product such as to identify upgrade kit requirements.

ERP systems support custom product configurations. Rules-based configurations reduce the need for expert assistance from engineers, and ensure sales personnel (or even customers) can develop timely accurate configurations. Cost estimates and pricing for custom product configurations can also be quickly calculated.

**Effects on Production and Materials Management:** ERP systems help establish realistic schedules for production and communicate consistent priorities so that everyone knows the most important job to work on at all times. Visibility of future requirements helps production prepare for capacity problems, and also helps suppliers anticipate and meet your needs. As changes to demands or supplies do occur, ERP helps identify the impact on production and purchasing.

Finite scheduling capabilities in ERP ensure production activities get scheduled based on capacity, tool and material constraints. Scheduling rules help minimize setup times and optimize sequencing. Changes in factory demands, as well as changes in available machine time, labor headcount and skill levels, tools, and material, can be immediately simulated to assess the impact on production and purchasing. ERP helps eliminate many crisis situations, so people have more time for planning and quality. Buyers can spend more time in vendor negotiation and quality

improvement. When the shortage list is no longer used to manage the shop, the quality of working life can improve.

**Effects on Sales:** Customer service can be improved by making valid delivery promises and then meeting those promises. Custom product quotations can be developed faster and more accurately, which improves job estimating. Delivery lead times can be shortened and customer inquiries on order status can be answered immediately.

E-commerce capabilities enable customers to place orders and check status over the internet at any time. In addition to customer convenience, this reduces the time requirement for sales and customer service personnel.

**Effects on the MIS Function:** An ERP system implemented as an integrated software package offers several advantages to the MIS function. The software package can offer a growth path from simple to comprehensive applications built on top of a database management system. It provides an upgrade path to technology and functional enhancements supported by the software vendor. It can reduce the development time and cost for software, documentation, and training classes. These costs would be incurred before the firm can start obtaining the benefits of an ERP system. It permits the MIS staff to focus their attention on organizational change and servicing user needs for customization and professional assistance.

- ✓ Costs of Implementing an ERP System
- ✓ One-Time Costs
- ✓ Ongoing Annual Costs

**Costs of Implementing an ERP System:** Enterprise resource planning (ERP) implementation costs can be divided into one-time costs and ongoing annual costs. Both types of costs can be segmented into hardware, software, external assistance, and internal personnel. The cost of an ERP software package varies widely, ranging from $30,000 (USD) for micro-based packages to several million for some mainframe packages. The number of concurrent users generally drives the software costs, so that smaller systems cost less. For illustrative and general guideline purposes, the software package costs range from $50,000 to $200,000 (USD) for smaller manufacturers. In addition to the ERP software package, one-time costs may include systems software, development of customized software, or integration with other applications.

**Hardware:** Hardware selection is driven by the firm's choice of an ERP software package. The ERP software vendor generally certifies which hardware (and hardware configurations) must be used to run the ERP system. Hardware may need to be replaced or upgraded. As a general rule, small to medium-size manufacturers already have microcomputers and a local area network, so that a micro-based ERP system built on de facto standards requires little additional investment in hardware.

**External Assistance:** External assistance includes the consulting and training costs to implement the ERP package. The software vendor, reseller or independent consultant groups may provide external assistance. The amount of required external assistance is dependent on several factors, such as the complexity of the ERP package, the experience or knowledge of internal personnel,

and the extent to which external personnel are used in place of internal personnel to implement the system.

A general guideline for these costs has been the ratio with the cost of the ERP software package. A comprehensive micro-based ERP package typically has a .5 to 1.0 ratio, the manufacturer requires $.50 to $1.00 (USD) of external assistance for each dollar of software package costs. The elapsed time for implementation of the entire ERP application typically requires four to six months. Many of the mainframe ERP packages have a three to five ratio for the costs of external assistance the software package typically costs more, and the elapsed time for implementation requires nine to twenty-four months.

**Internal Personnel:** Internal personnel time reflects the time commitments for the implementation project team, the executive steering committee, the users in various functional areas, and management information system (MIS) personnel. The time commitments include training classes, development of internal procedures for using the system, developing customized reports and applications, preparation of the data, meetings with external consultants, and team meetings. A general guideline for internal personnel costs can also be expressed as a ratio with the ERP software costs, where a typical ratio is .5 to 1.0. 24

**One-Time Costs:** The one-time costs for implementing an ERP system can be simplistically estimated using typical ratios with ERP software costs. In many cases, the use of de facto standard hardware means that a firm already has the hardware for an ERP system.

## On Going Annual Costs

**Software:** Ongoing software costs should include the annual customer support agreement with the ERP software and vendor. This customer support typically provides telephone assistance and software upgrades and is typically priced around 15 percent to 20 percent of the software price. Upgrades to system software releases will also be required.

The upgrade path for new releases of the ERP software package is critical. New releases contain enhancements for functionality and bug fixes, and ensure the software runs on the latest technology platform. From the user's point of view, the upgrade path enables the manufacturer to take advantage of hundred of man-years of development efforts undertaken by the ERP software vendor (and other technology vendors) with minimal investment. From the vendor point of view, it is much easier to support users on the latest releases. However, user changes to source code and other user customizations can make it very expensive or even impossible to upgrade. Additional costs must then be incurred to ensure the customizations work with the latest upgrade. A phased implementation approach may mean that additional software must be purchased. A data collection system, for example, may be implemented as part of a second phase.

**Hardware:** Ongoing hardware costs will reflect new requirements specified by the ERP vendor to run the software.

**External Assistance:** External assistance should be used as part of a continuous improvement program to effectively use an ERP system application for running the company. Training and consulting can focus on improved business processes, new or poorly used software functionality, and training of new personnel. A phased implementation approach requires additional assistance

at each phase. Additional customizations may be required, especially with evolving user sophistication. As shown in the example estimates in figure 3.4, a ratio of .1 to .2 could be used for total annual costs related to external assistance.

**Internal Personnel:** The implementation project team does not necessarily end its responsibilities at time of system cutover. A phased implementation approach and continuous improvement efforts will require ongoing time commitments. Employee turnover and job rotation will also require ongoing training efforts. The nature of the ERP software package (and associated system software and hardware) typically mandates the number and expertise of MIS personnel needed for ongoing support. It may range from a part-time clerical person (for administering a micro-based ERP package) to a large group of MIS experts (for some mainframe ERP packages). As shown in the example estimates in figure 3.4, a ratio of .1 to

**Replacing or re-implementing an ERP system**

- ✓ Replacing or Re-implementing an ERP System
- ✓ Classifications of ERP Success

## Replacing or Re-implementing an ERP System

An investment analysis focusing on enterprise resource planning (ERP) benefits frequently applies to those firms initially justifying an ERP implementation. It can also be used to justify a "re-implementation" when the initial efforts have failed to produce desired results.

Several measures have been used to gauge the successful implementation of an ERP system. The impacts on business performance and bottom-line results provide the best measure of success. Another measure of success is the degree to which the formal ERP system is used to run the business. Four classifications termed Class A through Class D have often been used to characterize success.

**Class A User:** The formal ERP system is effectively used to run the entire company. The manufacturing database defines the way products are really built, and efforts have been undertaken to simplify factory layouts and business processes. The ERP system defines realistic agreed-upon S&OP (sales and operations planning) game plans that cover all demands, sales orders have realistic delivery promises, and the schedules are actually used to coordinate supply chain activities. Coordination efforts reflect action messages, with a manageable number of exceptions. The ERP system correctly updates accounting and provides useful management information. The ERP system typically reflects the latest releases from the software vendor. Class B User: The formal ERP system is partially effective in being used to run the entire company. It defines S&OP game plans, but they typically lack company-wide agreement and completeness. Supply chain activities are frequently initiated that do not reflect schedules from the ERP system, and the volume of action messages frequently makes them difficult to use. Unrealistic delivery promises on many sales orders contribute to the problem, and also create a larger-than-necessary volume of exception conditions requiring expediting. Some informal and parallel systems are employed to manage expediting outside the formal system. While the manufacturing database provides a reasonably complete and accurate model of how products are really built, there are just enough exceptions to make some people question the formal system. The accounting applications are closely coupled to operational reporting, but sufficient exceptions exist to make the financial impacts suspect.

**Class C User:** The formal ERP system is only used in part of the company, typically in recording information about sales orders, shipments, purchase order receipts and accounting applications. The manufacturing database provides an incomplete or inaccurate model of how products are really built. S&OP game plans are typically non-existent, and unrealistic delivery promises are made on many sales orders. Several informal or parallel systems are required to coordinate procurement and production activities, typically with excessive expediting efforts and duplicate data maintenance. The accounting applications are not closely coupled to the activities reported in production. The ERP system reflects an old version of the software package.

**Class D User:** The formal ERP system is not used to run any part of the company, and might be "running" only in the management information system (MIS) function. Informal and parallel systems are being used to manage the business.
Over the last twenty-five years, field surveys about ERP success indicate approximately 10percent of firms achieve Class A status, 40percent are Class B, 40percent are Class C and the remainder (10percent) are failures.
Many manufacturers think they need a "new system" when they really need to upgrade and re-implement their current ERP software package. They can be characterized as a "Class B" or "Class C" user, and are not achieving the possible benefits---both quantifiable and intangible. In many cases, they are using an older version of the software package and have made significant customizations.

The costs to re-implement an ERP system should be significantly lower than implementing a new system. The users have familiarity with system usage, and should know the system strengths and weaknesses. Many firms can live with the shortcomings of their existing system. External assistance from the software vendor and consultants can help develop solutions to shortcomings, and should in any case be part of continuous improvement efforts. With a firm understanding of the re-implementation costs and shortcomings, the investment decision should be justified on the basis of benefits.

Many manufacturers are faced with decisions about replacing their current ERP software package or homegrown system. The replacement decision can stem from any number of situations. The current ERP software package is no longer supported, is too expensive to maintain, is heavily customized and cannot be upgraded, runs on old technology, is too complex and expensive to implement, and so forth. A homegrown ERP system provides partial solutions or non-integrated solutions, it's not on the right technology platform, nobody knows the system and can support it, no-body can upgrade the system, and so forth. The investment decision in these cases tends to use cost comparisons between alternatives.
The starting point for cost comparisons should be the previously discussed classification of costs, both one-time and ongoing annual costs. The following case study illustrates the use of cost displacement as the basis for ERP investments.

## 1.4. Evaluation of ERP

ERP, an abbreviated form of Enterprise Resource Planning is essentially an integrated, multi-module application software package that is capable of performing multiple business functions. Such a system encloses purchasing, warehousing, transportation, software for manufacturing, general ledger, order entry, accounts receivable and payable, as well as human resource. The modules of an ERP system are capable of interfacing with a company's own software, with required

efforts, and depending on the software. ERP is essentially packaged software meant for manufacturing industry. The aims of an ERP system involve maximize efficiencies, streamlining operations and manage enterprise resources.

**ERP evaluation**: There are several companies, which offer ERP solutions. An in-depth view would reveal that there are greater differences between every product. Though these products may seem similar functionally, however they have some key differences in the design and internal workings. 27 Most of the companies make a wrong choice by selecting vendors who are popular in the market. They may choose software based on cost, as this is the decisive factor for most industries. Such factors are not feasible for ERP assessment.

In general, there are many key identifying factors that assist in ERP assessment. This assessment is a major step taken for choosing ERP solution that might be perfect for a business or organization. For an instance, business functionality is considered an important indicator of effective and dependable ERP software solution. It determines both the versatility and effectiveness of the ERP software to cope up with a particular line of business. Implementation of an ERP system is quite difficult. The human cost for installation and customization of the software is far greater than software itself. The ERP vendor's as well as the so-called top consulting companies offer consulting services based on implementing ERP packages. The vendor should accept the implementation risk and reducing the chances of cost overruns. This is why proper assessment of ERP is vital act for any company.

An ERP system is designed to automate the well-engineered business practices. However, most of them lack the best business practices. They are often tempted to modify their software to manage their poor business practices. It is a way of guaranteeing a failed implementation. A better option would be to streamline the business before ERP software implementation. It helps to customize the software less. This would increase the chances of successful implementation.

Every business has something unique about it; this lends it a competitive advantage. Other things should not be automated. The ERP solution must not address these functions. These other things, which should not be automated and your ERP solution should not address these functions. ERP package should only automate those functions, which are common across all industries. These are the mundane function. They add value to the business. However, it must be handled efficiently so that the business survives.

The views of a company may not tally with the views of an ERP vendor. The ERP solutions are found in modules. Each module addresses different function, and the modules are normally sold exclusively. A company should select only those modules that are essential for its functioning and purchase it. This would help to avoid both cost as well as the risk of implementation.

## 1.5. Various Modules of ERP

ERP software is made up of many software modules. Each ERP software module mimics a major functional area of an organization. Common ERP modules include modules for product planning, parts and material purchasing, inventory control, product distribution, order tracking, finance, accounting, marketing, and HR. Organizations often selectively implement the ERP modules that are both economically and technically feasible.

ERP Production Planning Module In the process of evolution of manufacturing requirements planning (MRP) II into ERP, while vendors have developed more robust software for production planning, consulting firms have accumulated vast knowledge of implementing production planning module. Production planning optimizes the utilization of manufacturing capacity, parts, components and material resources using historical production data and sales forecasting.

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

**ERP Inventory Control Module:** Inventory module facilitates processes of maintaining the appropriate level of stock in a warehouse. The activities of inventory control involves in identifying inventory requirements, setting targets, providing replenishment techniques and options, monitoring item usages, reconciling the inventory balances, and reporting inventory status. Integration of inventory control module with sales, purchase, finance modules allows ERP systems to generate vigilant executive level reports.

**ERP Sales Module:** Revenues from sales are live blood for commercial organizations. Sales module implements functions of order placement, order scheduling, shipping and invoicing. Sales module is closely integrated with organizations' ecommerce websites. Many ERP vendors offer online storefront as part of the sales module.

## 1.6. ERP Market in Module

ERP marketing module supports lead generation, direct mailing campaign and more.

**ERP Financial Module:** Both for-profit organizations and non-profit organizations benefit from the implementation of ERP financial module. The financial module is the core of many ERP software systems. It can gather financial data from various functional departments, and generates valuable financial reports such balance sheet, general ledger, trail balance, and quarterly financial statements.

**ERP HR Module**: HR (Human Resources) is another widely implemented ERP module. HR module streamlines the management of human resources and human capitals. HR modules routinely maintain a complete employee database including contact information, salary details, attendance, performance evaluation and promotion of all employees. Advanced HR module is integrated with knowledge management systems to optimally utilize the expertise of all employees

## 1.7. Advantage of ERP

There are a number of powerful advantages to Enterprise Resource Planning. It has been used to solve a number of problems that have plagued large organizations in the past. At the same time, it is not without a number of disadvantages. Being able to weigh the two will allow a company to decide if this solution will properly meet their needs.

It should first be noted that companies that fail to utilize systems such as ERP may find themselves using various software packages that may not function well with each other. In the long run, this could make the company less efficient than it should be.

There are a number of processes that a company may need to integrate together. One of these processes is called design engineering. When a company is in the process of designing a product, the process of actually creating it is just as important as the end result. ERP can be useful in helping a company find the best design process. Another area where ERP can be useful is order tracking. When a company receives orders for a product, being able to properly track the orders can allow the company to get detailed information on their customers and marketing strategies. If different software packages are being used, this data may not be consistent.

Perhaps one of the most important advantages of ERP is its accounting applications. It can integrate the cost, profit, and revenue information of sales that are made, and it can be presented in a granular way. Enterprise Resource Planning can also be responsible for altering how a product is manufactured. A dating structure can be set up which can allow the company to be informed of when their product should be updated. This is important, because it will allow the company to keep better track of their products, and it can allow the products themselves to be produced with a higher level of quality. Another area where ERP can be an indispensable tool is the area of security. It can protect a company against crimes such as embezzlement or industrial-espionage.
However, with all the advantages that ERP offers, there are a number of disadvantages as well. Perhaps one of the biggest disadvantages to this technology is the cost. At this time, only large corporations can truly take advantage of the benefits that are offered by this technology. This leaves most small and medium sized businesses in the dark. A number of studies have shown that the biggest challenges companies will face when trying to implement ERP deals with investment. The employees must be continually trained on how to use it, and it is also important for companies to make sure the integrity of the data is protected.

According to Anthony, R. A, organizational processes fall into three levels - strategic planning, management control and operational control. Even though much of ERP success has been in facilitating operational coordination across functional departments, successful implementation of ERP systems benefit strategic planning and management control one way or other.

**Help reduce operating costs:** ERP software attempts to integrate business processes across departments onto a single enterprise-wide information system. The major benefits of ERP are improved coordination across functional departments and increased efficiencies of doing business. The immediate benefit from implementing ERP systems we can expect is reduced operating costs, such as lower inventory control cost, lower production costs, lower marketing costs and lower help desk support costs.

**Facilitate Day-to-Day Management**: The other benefits from implementing ERP systems are facilitation of day-to-day management. The implementations of ERP systems nurture the establishment of backbone data warehouses. ERP systems offer better accessibility to data so that management can have up-to-the-minute access to information for decision making and managerial control. ERP software helps track actual costs of activities and perform activity based costing.

**Support Strategic Planning:** Strategic Planning is "a deliberate set of steps that assess needs and resources, define a target audience and a set of goals and objectives, plan and design coordinated strategies with evidence of success, logically connect these strategies to needs, assets, and desired outcomes, and measure and evaluate the process and outcomes." Part of ERP software systems is designed to support resource planning portion of strategic planning. In reality, resource planning has been the weakest link in ERP practice due to the complexity of strategic planning and lack of adequate integration with Decision Support Systems (DSS).

**Industry wise advantages:**

- ✓ Manufacturing Sector: Speeding up the whole process.
- ✓ Distribution and retail Stores: Accessing the status of the goods
- ✓ Transport Sector: Transmit commodities through online transactions.
- ✓ Project Service industry: Fastens the compilation of reports.
- ✓ The advantage and disadvantage of ERP is best understood by studying them under different Categories. Hence the next paragraph presents information on corporate as a whole because the advantage of ERP systems in a company is different when compared industry wise.

**Advantages in a corporate entity:** The accounts department personnel can act independently. They don't have to be behind the technical persons every time to record the financial transactions. Ensures quicker processing of information and reduces the burden of paperwork. Serve the customers efficiently by way of prompt response and follow up. Disposing queries immediately and facilitating the payments from customers with ease and well ahead of the stipulated deadline. It helps in having a say over your competitor and adapting to the whims and fancies of the market and business fluctuations. The swift movement of goods to rural areas and in lesser known places has now become a reality with the use of ERP. The database not only becomes user friendly but also helps to do away with unwanted ambiguity. It is suitable for global operations as it encompasses all the domestic jargons, currency conversions, diverse accounting standards, and multilingual facilities .In short it is the perfect commercial and scientific epitome of the verse "Think Local. Act Global". ERP helps to control and data and facilitates the necessary contacts to acquire the same.