UNIT 3: ENTERPRISE MANAGEMENT SYSTEM

3.1 Enterprise management system (EMS)

EMS Solutions is a software solution provider with a range of products and services for the enterprise market. First EMS established in 1995 and developed our products and solutions for clients in the Utilities, Government and Housing sectors. Our flexible Basic software platform allows us to develop complex solutions to best match our client requirements, while still delivering in reasonable timeframes at very competitive prices. If your company is struggling to keep track of various applications, spreadsheets and other random documents, then EMS may have the solution for you.

Enterprise systems (ES) are large-scale application software packages that support business processes, information flows, reporting, and data analytics in complex organizations. While ES are generally packaged enterprise application software (PEAS) systems they can also be custom developed systems created to support a specific organization's needs.

Types of enterprise systems include:

- Enterprise resources planning (ERP).
- Enterprise planning systems (EPS).
- Customer relationship management (CRM).
- Supply chain management system (SCM).

Although data warehousing or business intelligence systems are enterprise-wide packaged application software often sold by ES vendors, since they do not directly support execution of business processes, they are often excluded from the term.

3.2 Enterprise Software: ERP/SCM/CRM

3.2.1 Enterprise Resource Planning (ERP)

Enterprise resource planning (**ERP**) is business-management software that typically a suite of integrated applications—that an organization can use to collect, store, manage and interpret data from many business activities, including:

- Product planning and cost
- Manufacturing or service delivery
- Marketing and sales
- Inventory management
- Shipping and payment

ERP provides an integrated view of core business processes, often in real-time, using common databases maintained by a database management system. ERP is an integrated, real-time, cross-functional enterprise application, an enterprise-wide transaction framework that supports all the internal business processes of a company.

It supports all core business processes such as sales order processing, inventory management and control, production and distribution planning, and finance.

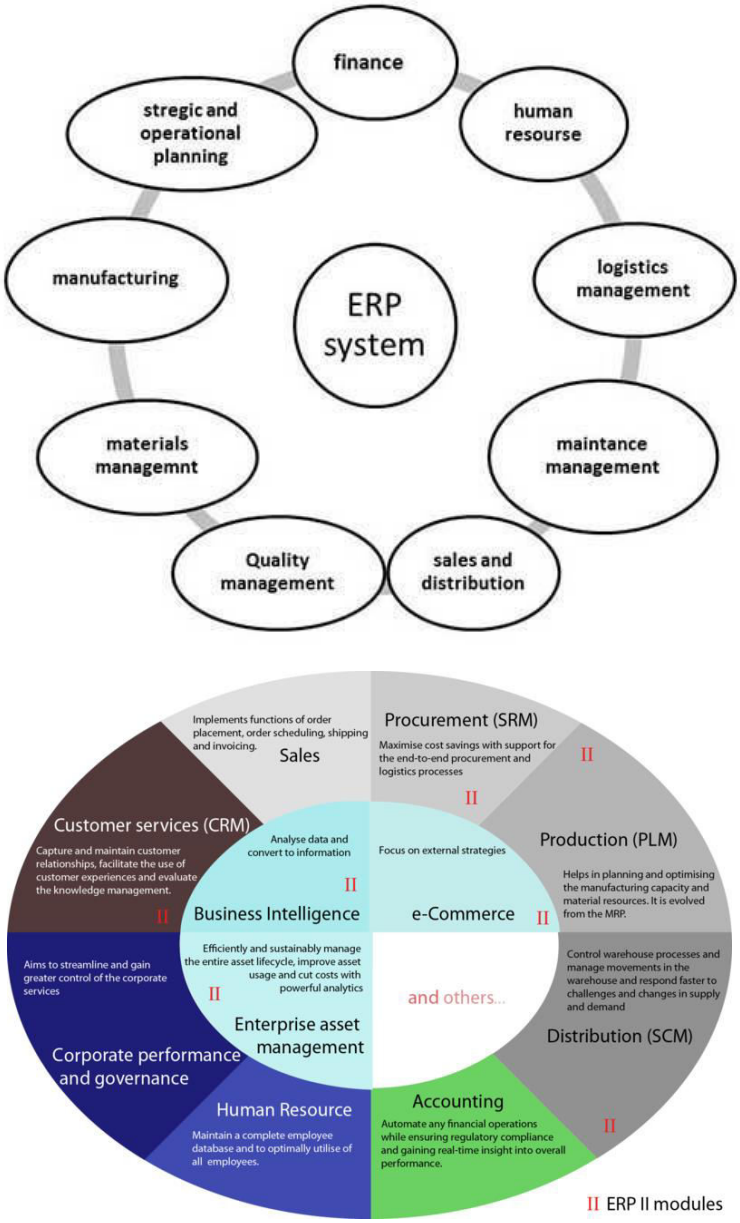


Fig: Enterprise Resource Planning

Scope of ERP:

 Finance: Financial accounting, Managerial accounting, treasury management, asset management, budget control, costing, and enterprise control.

 Logistics: Production planning, material management, plant maintenance, project management, events management, etc.

 Human resource: Personnel management, training and development, etc.

 Supply Chain: Inventory control, purchase and order control, supplier scheduling, planning, etc.

 Work flow: Integrate the entire organization with the flexible assignment of tasks and responsibility to locations, position, jobs, etc.

Advantages of ERP:

- Reduction of lead time
- Reduction of cycle time
- Better customer satisfaction
- Increased flexibility, quality, and efficiency
- Improved information accuracy and decision making capability
- Onetime shipment
- Improved resource utilization
- Improve supplier performance
- Reduced quality costs
- Quick decision-making
- Forecasting and optimization
- Better transparency

Disadvantage of ERP:

- Expense and time in implementation
- Difficulty in integration with other system
- Risk of implementation failure
- Difficulty in implementation change
- Risk in using one vendor

3.2.2 Supply Chain Management System (SCM)

The concept of supply chain management is having the right product in the right place at the right time at right price and in the right condition. It means delivery of goods to the customer through integrated management of supply chain components.

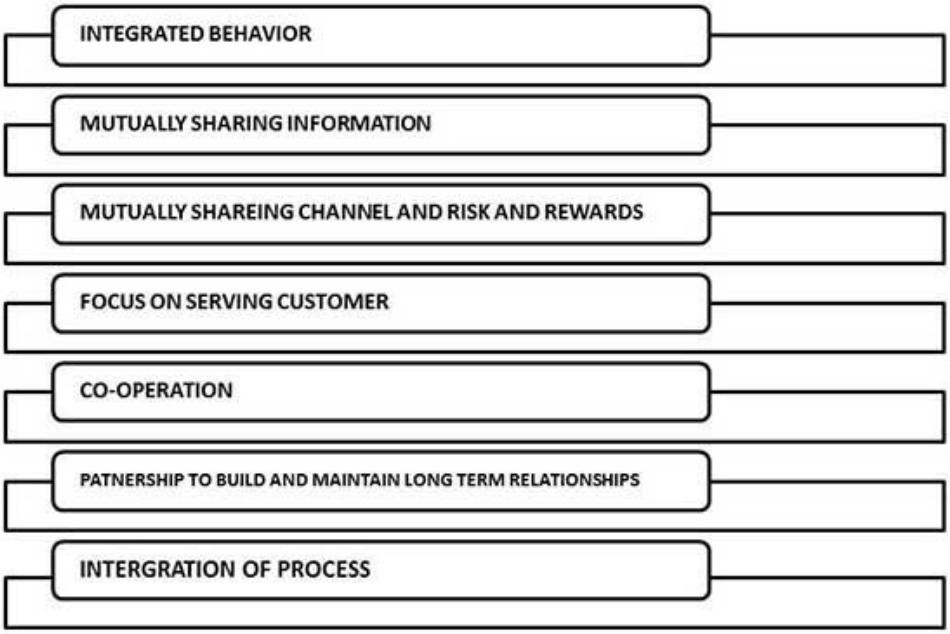
SCM is an integral part of the business framework. It transforms the way companies deal with suppliers, partners and even customer. The goal is to improve efficiency and profitability, but it also means creating new opportunities for everyone involved. It is internet enabled supply chain, planning and controlling the flow of materials from suppliers through the distribution channel to the end user. E-supply chain allows customers to directly reach the seller bypassing the mediators.

Supply chain management is the systemic, strategic coordination of the traditional business functions and tactics across these business functions - both within a particular company and across businesses within the supply chain- all coordinated to improve the long-term performance of the individual companies and the supply chain as a whole.

SCM consists of:

- Operations management
- Logistics
- Procurement
- Information technology
- integrated business operations

Features of SCM:



Scope of SCM:

Benefits of SCM

1. It is web-based architecture (client and server).
2. It incorporates broadcast and active messaging to proactively notify an individual of a condition that requires attention.
3. It supports the exchange of real time information through trading communities such as employees, customers, suppliers, distributors and manufactures.
4. It has open internet application architecture which allows for rapid deployment and scalability, combining unlimited internal/external users in a real time environment.
5. It has interface capability with any third party software.
6. It is platform independent.
7. It is a fully integrated system
8. It has web visibility and processing capacity—24x7
9. It is rule based.

Supply chain Management component:

There are five components of e-supply chain management. These are as follows:

1. **Advanced scheduling and Manufacturing Planning Program**
   This automated program provides detailed coordination of all manufacturing and supply efforts based on individual customer orders. Scheduling creates job schedules for managing the manufacturing process and logistic.
2. **Demand forecasting program**
   This module supports a range of statistical tools and business forecasting techniques. It constantly takes into account changing market and economic factors while making decisions.
3. **Transportation logistic program**
   This program facilitates resource allocation and execution to ensure that materials and finished goods are delivered at the right time and the right place, according to the planning schedule, at minimal cost.
4. **Distributing planning program**
   This is integrated with demand forecasting, manufacturing schedules and transportation logistics to reach the customer.
5. **Order commitment**
   Order commitment is linked to all the other modules so that accurate delivery of goods and services can be guaranteed.

3.2.3 Customer Relationship Management (CRM)

CRM is an information system that combines business strategies, methodologies, software, and internet to help an organization establish stronger customer relation. It also involves using human resources and information technologies to gain insight into customer behaviors and their values. CRM is an enterprise application module that manages a company's interactions with current and future customers by organizing and coordinating, sales and marketing, and providing better customer services along with technical support. Customer Relationship Management is a comprehensive strategy and process of acquiring, retaining, and partnering with selective customers to create superior value for the company and the customer.

In any case, CRM is expected to achieve the following goals:

- Better customer service and customer
- More efficient cross selling products
- Simplified market and sales processes
- Improve profitability and customer satisfaction

The overall goal of CRM is to identify what truly matter for the customers. There are three phases of CRM and they are:

- Acquisition of new customers
- Enhancement of relationship with customers
- Retention of profitable customer for a longtime

Scope of CRM:

Benefits of ECRM:

Web based customer support has following advantages:

1. Lower cost per contact
2. An emotional bond with customer
3. An ability to communicate with more emotive content
4. Fewer errors
5. Greater customer interactivity with a website
6. Improved reliability
7. Greater responsiveness
8. Greater return on investment
9. Improved scalability
10. Less variability in the quality and content of communication.

CRM Toolkit:

An e-CRM toolkit is an application that consists of wide varieties of activities in order to bring true customers relationship management across online business.

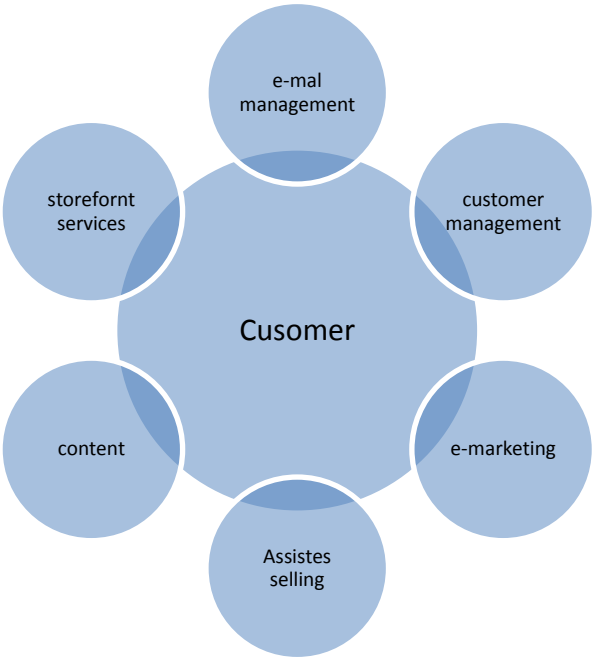


Fig: E-CRM Toolkit

3.3 Information Management and Technology of Enterprise software

Enterprise information management (EIM) is a set of business processes, disciplines and practices used to manage the information created from an organization's data. EIM initiatives seek to build efficient and agile data management operations with capabilities for information creation, capture, distribution and consumption. The goal is to provide and preserve information as a business asset that remains secure, easily accessible, meaningful, accurate and timely.

Enterprise Information Management strategies are the evolution of traditional information management practices due to the explosion of data and the rise of the Information Enterprise. EIM enables businesses to secure their information across the diverse and complex landscapes of organizational departments, legacy systems, corporate and regulatory policies, business content and unstructured big data.

Enterprise Information Management software helps businesses attain 360 degree views of their big data and analytics by streamlining organizational workflows, increasing the quality of information and creating integrated user interfaces for end users within a single source platform. EIM strategy requires three things: Information Readiness, Information Capabilities, and Information Confidence.

Fig: Requirement of EIM Strategy

The Enterprise Software Technologies Program prepares outstanding from around the world to be technical leaders in the rapidly changing software development environment. It offers an unsurpassed education in the fundamentals of software development and in-depth exposure to the latest technologies and trends shaking the foundation of Enterprise software development. Enterprise application development (EAD) is also technique of developing enterprise application.

The program focuses on the study and research of distributed N-Tier Client/Server architectures that employ multiple clients and scalable server-side technologies to develop high performance systems that scale across multiple tiers of servers. Hence technology of enterprise software (ES) can be listed below:

- Cloud Technologies
- Virtualization Technologies
- Software Engineering Processes
- Software Quality Assurance and Testing
- Computer Network Design
- Network Programming and Applications
- Business Intelligence Technologies

Enterprise applications are specifically designed for the sole purpose of promoting the needs and objectives of the organizations.
Enterprise applications provide business-oriented tools supporting electronic commerce, enterprise communication and collaboration, and web-enabled business processes both within a networked enterprise and with its customers and business partners.

Services Provided by Enterprise Applications

Some of the services provided by an enterprise application includes:

- Online shopping, billing and payment processing
- Interactive product catalogue
- Content management
- Customer relationship management
- Manufacturing and other business processes integration
- IT services management
- Enterprise resource management
- Human resource management
- Business intelligence management
- Business collaboration and security
- Form automation

Basically these applications intend to model the business processes, i.e., how the entire organization works. These tools work by displaying, manipulating and storing large amounts of data and automating the business processes with these data.

3.4 Role of IS and IT in Enterprise Management

The role of the IS and IT in an organization can be compared to the role of heart in the body. The information is the blood and IS and IT is the heart. Here are some of the important roles of the MIS:

1. The IS and IT satisfies the diverse needs through variety of systems such as query system, analysis system, modeling system and decision support system.

2. The IS and IT helps in strategic planning, management control, operational control and transaction processing. The IS and IT helps in the personal in the transaction processing and answers the queries on the data to the transaction, the status of a particular record and reference on a variety of documents.

3. The IS and IT helps the junior management personnel by providing the operational data for planning, scheduling and control and helps them further in decision-making at the operation level to correct an out of control situation.

4. The IS and IT helps the middle management in short term planning, target setting and controlling the business functions. It is supported by the use of the management tools of planning and control.

5. The IS and IT helps the top level management in goal setting, strategic planning and evolving the business plans and their implementation.

6. The IS and IT plays the role of information generation, communication, problem identification and helps in the process of decision-making. The IS and IT, therefore, plays a vital role in the management, administration and operation of an organization.

3.5 Enterprise engineering, Electronic organism, loose integration vs. full integration, Process alignment, Framework to manage integrated change, Future trends

3.5.1 Enterprise engineering

Enterprise engineering is defined as the body of knowledge, principles, and practices to design an enterprise. An enterprise is a complex, socio-technical system that comprises interdependent resources of people, information, and technology that must interact with each other and their environment in support of a common mission. Enterprise engineering is a sub discipline of systems engineering. The discipline examines each aspect of the enterprise, including business processes, information flows, and organizational structure. Enterprise engineering may focus on the design of the enterprise as a whole, or on the design and integration of certain business components.

Enterprise engineering involves formal methodologies, methods and techniques which are designed, tested and used extensively in order to offer organizations reusable business process solutions:

- Computer Integrated Manufacturing Open Systems Architecture (CIMOSA) engineering
- Integrated Definition (IDEF) engineering.
- Unified Modeling Language (UML) engineering.
- Enterprise Function Diagrams (EFD) engineering
- System engineering
- Process engineering
- Forward engineering
- Reverse engineering

3.5.2 Electronic Organism or Digital Organism

A digital organism is a self-replicating computer program that mutates and evolves. Digital organisms are used as a tool to study the dynamics evolution and to test or verify specific hypotheses or mathematical models of evolution. The study of digital organisms is closely related to the area of artificial life.

Electronic organism refers to the electronic program for managing information system as well as data by using the electronic medium. It is used for the accessing and providing information in any enterprise or organization by the principle of electronic tactics.

3.5.3 Loose Integration vs. Full Integration

Level	Full Integration	Loose Integration
1. Physical coupling	Direct physical link required	Physical intermediary
2. Communication style	Synchronous	Asynchronous
3. Type system	Strong type system (e.g., interface semantics)	Weak type system (e.g., payload semantics)
4. Interaction pattern	OO-style navigation of complex object trees	Data-centric, self-contained messages
5. Control of process logic	Central control of process logic	Distributed logic components
6. Service discovery and binding	Statically bound services	Dynamically bound services
7. Platform dependencies	Strong OS and programming language dependencies	OS- and programming language independent

Fig: Differentiate between the Full integration and Loose integration

3.5.4 Process Alignment

Process alignment, or process harmonization, is the activity of resolving differences between business processes. Processes must be aligned in many practical situations, including:

- Mergers, where the differences between the merging organizations must be identified and resolved or accepted;
- Audits, where differences between prescribed processes and processes as they are actually performed must be identified; and
- Compliance checks, where compliance to standard processes and regulations is checked.

Developing a common understanding among the key stakeholders of the purpose and goals of the project and the means and methods of accomplishing those goals is called the alignment process. It is important to accomplish this alignment during the initiation phase. Project managers usually conduct a start-up meeting that is sometimes called a kickoff meeting. The agenda and duration of the start-up meeting depends on the complexity level of the project.

Defining how the work of the project will be accomplished is another area of common understanding that is developed during the alignment session.

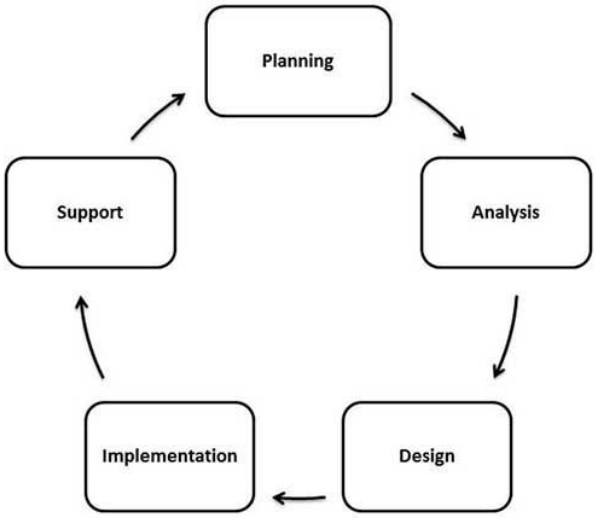


Fig: Process alignment

An understanding of the project management methods that will be used on the project and the output that stakeholders can expect is developed. On smaller and less complex projects, the understanding is developed through a review of the tools and work processes associated with the following:

- Tracking progress
- Tracking costs
- Managing change

On more complex projects, the team may discuss the use of project management software tools, such as Microsoft Project, to develop a common understanding of how these tools will be used. The team discusses key work processes, often using flowcharts, to diagram the work process as a team.

3.5.5 Framework to manage integrated change

The pace of change experienced by modern businesses is phenomenal. Businesses today have to abandon many of the principles that have guided generations of managers, and develop a new set of objectives and rules that will enable them to successfully manage change and guide them to transform into 21st century corporations.

Extensive work has been done recently to develop models and frameworks for addressing a variety of the issues associated with organizational change. This paper integrates and advances some of the models and concepts in an effort to develop an all-encompassing framework to guide managerial action.

Managing changes is critical for a successful, energy-efficient, retrofit project. Good change management (CM) enables the evaluation of change dependencies and effects, and it is essential to controlling and mitigating failure factors in projects. For example, inappropriate management may generate disruptive impacts on energy efficiency goals. The use of Building Information Modeling (BIM) has facilitated the delivery of both new build and retrofit projects; but, there is inadequate support for the management of changes, and very little research has been conducted to integrate CM processes within BIM.

Dimensions of manage integrated change

The first tutorial in the series highlighted project management and change management as two critical elements of successful projects and initiatives and set the stage for the unified value proposition. While the disciplines are distinct in their focus and approach, in action the technical side and people side of change are often interacting and intermingling. Prosci has identified five dimensions of integration for change management and project management:

- People dimension
- Process dimension
- Tools dimension
- Methodologies dimension
- Results and outcomes

3.5.6 Future Trends

With a new year come both reflection of the past and contemplation of the future. It is with these thoughts in mind that many manufacturing companies are now looking at the possibility of a new enterprise resource planning (ERP) system. Regardless of whether the ERP evaluation is to replace an existing system or to purchase a first system, knowing the trends in ERP can be a critical factor in decision making.

ERP has evolved through the years. What began as a Material Resource Planning (MRP) system has grown to include most aspects of the enterprise such as estimating, sales and distribution, quality, maintenance, and accounting. With so many ERP companies in business today, it is important to know what sets each package apart and the common trends among the ERP players.

Some example EMS by using the following future trends:

- Artificial Intelligence
- Neural Network
- Expert System
- Genetic Algorithm
- Data Warehousing and Data Mining
- Web Mining
- Cloud Computing