UNIT-5

Introduction

☞ **ERP Technologies :**

- Concepts of Data Ware Housing
- Data Mining
- Business Intelligence
- ERP Security
- Other Technologies: 1. SCM, 2. CRM, 3. ECRM

- The term "Data Warehouse" was first coined by Bill Inmon in 1990
- According to Inmon, a data warehouse is a subject oriented, integrated, time-variant, and non-volatile collection of data
- This data helps analysts to take informed decisions in an organization
- An operational database undergoes frequent changes on a daily basis on account of the transactions that take place
- Suppose a business executive wants to analyze previous feedback on any data such as a product, a supplier, or any consumer data, then the executive will have no data available to analyze because the previous data has been updated due to transactions
- A data warehouses provides us generalized and consolidated data in multidimensional view
- Along with generalized and consolidated view of data, a data warehouses also provides us Online Analytical Processing (OLAP) tools
- These tools help us in interactive and effective analysis of data in a multidimensional space
- This analysis results in data generalization and data mining
- A data warehouse is a database, which is kept separate from the organization's operational database
- There is no frequent updating done in a data warehouse
- It possesses consolidated historical data, which helps the organization to analyze its business
- A data warehouse helps executives to organize, understand, and use their data to take strategic decisions
- Data warehouse systems help in the integration of diversity of application systems
- A data warehouse system helps in consolidated historical data analysis

Data Warehouse Features :

- The key features of a data warehouse are discussed below −

Subject Oriented

- A data warehouse is subject oriented because it provides information around a subject rather than the organization's ongoing operations
- These subjects can be product, customers, suppliers, sales, revenue, etc
- A data warehouse does not focus on the ongoing operations; rather it focuses on modeling and analysis of data for decision making

Integrated

- A data warehouse is constructed by integrating data from heterogeneous sources such as relational databases, flat files, etc
- This integration enhances the effective analysis of data

Time Variant

- The data collected in a data warehouse is identified with a particular time period
- The data in a data warehouse provides information from the historical point of view

Non-volatile

- Non-volatile means the previous data is not erased when new data is added to it
- A data warehouse is kept separate from the operational database and therefore frequent changes in operational database is not reflected in the data warehouse

Data Mining

- There is a huge amount of data available in the Information Industry
- This data is of no use until it is converted into useful information
- It is necessary to analyze this huge amount of data and extract useful information from it
- Extraction of information is not the only process we need to perform; data mining also involves other processes such as Data Cleaning, Data Integration, Data Transformation, Data Mining, Pattern Evaluation and Data Presentation
- Once all these processes are over, we would be able to use this information in many applications such as Fraud Detection, Market Analysis, Production Control, Science Exploration, etc
- **Data mining** is a process used by companies to turn raw data into useful information
- By using software to look for patterns in large batches of data, businesses can learn more about their customers to develop more effective marketing strategies, increase sales and decrease costs
- Data mining depends on effective data collection, warehousing, and computer processing
- The data mining process breaks down into five steps
- First, organizations collect data and load it into their data warehouses
- Next, they store and manage the data, either on in-house servers or the cloud
- Business analysts, management teams and information technology professionals access the data and determine how they want to organize it
- Then, application software sorts the data based on the user's results, and finally, the end user presents the data in an easy-to-share format, such as a graph or table

Data Mining Applications

- Data mining is highly useful in the following domains:
    - Market Analysis and Management
    - Corporate Analysis & Risk Management
    - Fraud Detection
- Apart from these, data mining can also be used in the areas of production control, customer retention, science exploration, sports, astrology, and Internet Web Surf-Aid

Market Analysis and Management

- Listed below are the various fields of market where data mining is used:
- **Customer Profiling** – Data mining helps determine what kind of people buy what kind of products
- **Identifying Customer Requirements** – Data mining helps in identifying the best products for different customers
- **Cross Market Analysis** – Data mining performs Association/correlations between product sales
- **Target Marketing** – Data mining helps to find clusters of model customers who share the same characteristics such as interests, spending habits, income, etc
- **Determining Customer purchasing pattern** – Data mining helps in determining customer purchasing pattern
- **Providing Summary Information** – Data mining provides us various multidimensional summary reports

Corporate Analysis and Risk Management

- Data mining is used in the following fields of the Corporate Sector:

- **Finance Planning and Asset Evaluation** – It involves cash flow analysis and prediction, contingent claim analysis to evaluate assets
- **Resource Planning** – It involves summarizing and comparing the resources and spending
- **Competition** – It involves monitoring competitors and market directions

Fraud Detection

- Data mining is also used in the fields of credit card services and telecommunication to detect frauds
- In fraud telephone calls, it helps to find the destination of the call, duration of the call, time of the day or week, etc
- It also analyzes the patterns that deviate from expected norms

Business intelligence(BI) :

- "Business Intelligence (BI) is a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information. It allows business users to make informed business decisions with real-time data that can put a company ahead of its competitors."
- In practice, it gives a complete and comprehensive overview of the company's historical and present data. It helps decrease inefficiencies, make changes in business by spotting market trends and allows the operations to run smoother.

● Why Business Intelligence in ERP?

- Business Intelligence in ERP systems allows an organization to analyze and leverage massive data that is captured by the ERP software. The BI software uses the data, analyses it, and represents it in an actionable and easy to interpret format.

- The critical elements of BI include:

- **Data Analysis:** It is one of the core elements of BI, where the information collected from various functions of an organization is helpful to analyze and guide management decisions.
- **Legacy Data:** With a credible BI tool, the legacy data collected from various other processes or software can be analyzed appropriately. Without a useful BI tool, it is hard to explain the legacy data.
- **Trends & Patterns:** With the right tools in place, organizations can illuminate trends and patterns from the collected data and help make quick decisions.

Supply Chain Management (SCM)

- A supply chain is the connected network of individuals, organizations, resources, activities, and technologies involved in the manufacture and sale of a product or service
- A supply chain starts with the delivery of raw materials from a supplier to a manufacturer and ends with the delivery of the finished product or service to the end consumer
- In an organization, if a product is manufactured using raw materials from various suppliers and if these products are sold to customers, a supply chain is created
- Depending on the size of the organization and the number of products that are manufactured, a supply chain may be complex or simple

- Supply Chain Management refers to the management of an interconnected network of businesses involved in the ultimate delivery of goods and services to customers
- It entails the storage and transport of raw materials, the process of inventory and the storage and transportation of the final goods from the point of manufacture to the point of consumption
- SCM is also called the art of management of providing the Right Product, At the Right Time, Right Place and at the Right Cost to the Customer

Why SCM strategy is important for an Organization

- Supply Chain Strategies are the critical backbone to Business Organizations today
- Effective Market coverage, Availability of Products at locations that hold the key to revenue recognition depends upon the effectiveness of Supply Chain Strategy rolled out
- Very simply stated, when a product is introduced in the market and advertised, the entire market in the country and all the sales counters need to have the product where the customer can buy and take delivery
- Any glitch in the product not being available at the right time can result in the drop in customer interest and demand which can be disastrous

Different Links in the Supply Chain

Customer

- The start of the supply chain is the customer
- The customer decides to purchase a product and in turn contacts the sales department of a company
- A sales order is completed with the date of delivery and the quantity of the product requested
- It may also include a segment for the production facility depending on whether the product is available in stock or not

Planning

- Once the customer has made his/her sales order, the planning department will create a production plan to produce the product adhering to the needs of the customer
- At this stage, the planning department will be aware of raw materials needed

Purchasing

- If raw materials are required, the purchasing department will be notified and they in turn send purchasing orders to the suppliers asking for the deliverance of a specific quantity of raw materials on the required date

Inventory

- Once the raw materials have been delivered, they are checked for quality and accuracy and then stored in a warehouse till they are required by the production department

Production

- Raw materials are moved to the production site, according to the specifics laid out in the production plan
- The products required by the customer are now manufactured using the raw materials supplied by the suppliers
- The completed products are then tested and moved back to the warehouse depending on the date of delivery required by the customer

Transportation

- When the finished product is moved into storage, the shipping department or the transportation department determines when the product leaves the warehouse to reach the customer on time

Levels of Activities in the Supply Chain

- In order to make sure that the above supply chain is running smoothly and also to ensure maximum customer satisfaction at the lowest possible cost, organizations adopt supply chain management processes and various technologies to assist in these processes
- There are three levels of activities Supply Chain Management in that different departments of an organization focus on to achieve the smooth running of the supply chain:

Strategic

- At this level, senior management is involved in the supply chain process and makes decisions that concern the entire organization
- Decisions made at this level include the size and site of the production area, the collaborations with suppliers, and the type of that product that is going to be manufactured and so forth

Tactical

- Tactical level of activity focuses on achieving lowest costs for running the supply chain
- Some of the ways this is done is by creating a purchasing plan with a preferred suppliers and working with transportation companies for cost effective transport

Operational

- At the operational level, activity decisions are made on a day-to-day basis and these decisions affect how the product shifts along the supply chain
- Some of the decisions taken at this level include taking customer orders and the movement of goods from the warehouse to the point of consumption

Technology and Supply Chain Management

- In order to maximize benefits from the supply chain management process, organizations need to invest in technology
- For the optimal working of the supply chain management process, organizations mainly invest in Enterprise Resource Planning suites
- Also, the advancement of Internet technologies allows organizations to adopt Web-based software and Internet communications

Customer Relationship Management (CRM)

- In an organization, sales representatives have the responsibility of creating brand awareness and making products popular among the end users
- They are the ones who interact with the customers, understand their requirements and fulfill their needs and expectations
- **The art of managing the organization's relationship with the customers and prospective clients refer to customer relationship management**
- Customer relationship management includes various strategies and techniques to maintain healthy relationship with the organization's existing as well as potential customers
- Organizations must ensure customers are satisfied with their products and services for higher customer retention
- Remember one satisfied customer brings ten new customers with him where as one dissatisfied customer takes away ten customers along with him
- **Customer relationship management (CRM) refers to the principles, practices, and guidelines that an organization follows when interacting with its customers**
- From the organization's point of view, this entire relationship encompasses direct interactions with customers, such as sales and service-related processes, and forecasting and analysis of customer trends and behaviors
- Ultimately, CRM serves to enhance the customer's overall experience
- In simpler words, customer relationship management refers to the study of needs and expectations of the customers and providing them the right solution
- The primary goal of CRM is to increase customer loyalty and in turn improve business profitability

Components of CRM

- Given figure shows the components that work together to form a successful CRM system

Analytics

- Analytics is the process of studying, handling, and representing data in various graphical formats such as charts, tables, trends, etc., in order to observe market trends

Business Reporting

- Business Reporting includes accurate reports of sales, customer care, and marketing

Customer Service

- Customer Service involves collecting and sending the following customer-related information to the concerned department:
  - Personal information such as name, address, age
  - Previous purchase patterns
  - Requirements and preferences
  - Complaints and suggestions

Human Resource Management

- Human Resource Management involves employing and placing the most eligible human resource at a required place in the business

Lead Management

- Lead Management involves keeping a track of the sales leads and distribution, managing the campaigns, designing customized forms, finalizing the mailing lists, and studying the purchase patterns of the customers

Marketing

- Marketing involves forming and implementing sales strategies by studying existing and potential customers in order to sell the product

Workflow Automation

- Workflow Automation involves streamlining and scheduling various processes that run in parallel
- It reduces costs and time, and prevents assigning the same task to multiple employees

Objectives of CRM

- The most prominent objectives of using the methods of Customer Relationship Management are as follows:

Improve Customer Satisfaction

- CRM helps in customer satisfaction as the satisfied customers remain loyal to the business and spread good word-of-mouth
- This can be accomplished by fostering customer engagement via social networking sites, surveys, interactive blogs, and various mobile platforms

Expand the Customer

- CRM not only manages the existing customers but also creates knowledge for prospective customers who are yet to convert

Enhance Business Sales

- CRM methods can be used to close more deals, increase sales, improve forecast accuracy, and suggestion selling
- CRM helps to create new sales opportunities and thus helps in increasing business revenue

Improve Workforce Productivity

- A CRM system can create organized manners of working for sales and sales management staff of a business
- The sales staff can view customer's contact information, follow up via email or social media, manage tasks, and track the salesperson's performance
- The salespersons can address the customer inquiries speedily and resolve their problems

Electronic Customer Relationship Management (ECRM) :

We have developed a Web-Based platform from which workgroups can easily create unlimited applications to automate business processes & improve collaboration.

Electronic Customer Relationship Management (CRM) is a way to identify, acquire, and retain customers - a business' greatest asset. By providing the means to manage and coordinate customer interactions, CRM helps companies maximize the value of every customer interaction and in turn improve corporate performance.

Electronic CRM concerns all forms of managing relationships with customers making use of Information Technology (IT). ECRM uses Information Technology to integrate internal organization resources and external marketing strategies to understand and fulfill their customers' needs.

Panomtech ECRM Application which is the fastest, easiest & most flexible way to manage your customer & sales data- regardless of size, location or industry. Our applications solve critical business problems because they can be customized to fit the exact CRM workflow that you need.

With this application we provide a complete view of customer interactions across departments providing information and facilities for better planning, managing, and forecasting. Tools that we are using create a chance to increase sales, reach more profitable customers, enhance the customer experience, and anticipate customer needs. Our product offers flexible access, deployment, and payment options to address business requirements.

Panomtech ECRM empowers organizations with a complete customer relationship lifecycle management solution for managing organization-wide Sales, Marketing, Customer Support & Service and Inventory Management.

- **Types of CRM :**

3 Types of Customer Relationship Management :

Majorly there are three types of CRM which are used nowadays. There are Operational CRM, Collaborative CRM, and Analytical CRM.

1) Operational CRM :

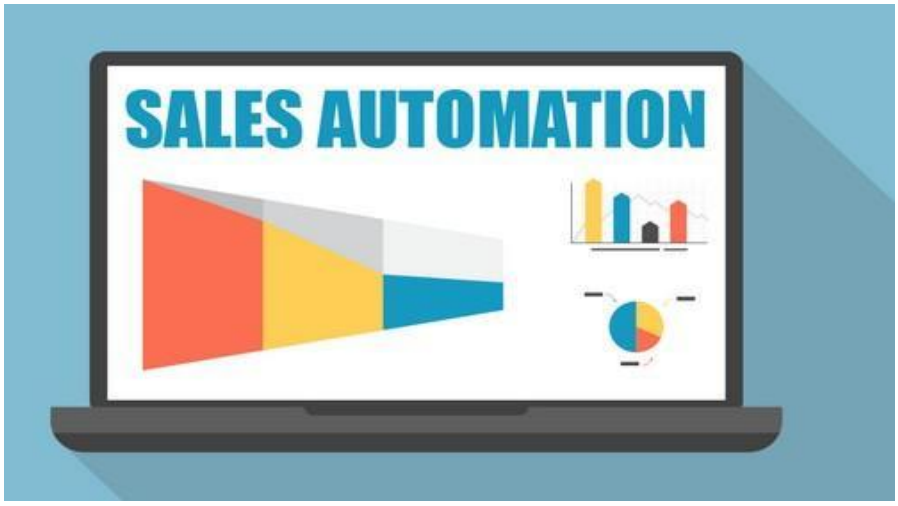
Operational CRM is the one that streamlines the business processes and also includes sales and marketing automation along with service automation. The primary purpose of

operational CRM is to generate leads and then convert them to contact while capturing all the required details and also to provide service throughout the customer lifecycle.

Operational CRM also provides support to the front office and which involves direct communication with customers via any communication method. There is an operational CRM database which stores all the details about customers including the interactions, requirements, preferences, discussion topics etc.

All of it is stored in the contact list of the customer and can be retrieved by anyone in the organization with access. It is very popular for its unified view of customers across the entire organization and all communication channels. Salesforce is such an example of operational CRM.

A) Sales automation :



Sales automation is conducted to help an organization to automate the sales process. The primary purpose of this is to establish standards within the organization for new customer acquisition and also for dealing with existing customers. Sales automation organizes information in a way that the businesses can meet the needs and demands of the customers along with increasing sales in a more efficient and effective way.

Sales automation includes various models like contact management lead Management, order management, sales forecasting and also a collaboration with the marketing department.

B) Marketing automation :

The primary purpose of marketing automation is to find the best alternatives for offering products to potential customers. It also includes the best way to offer products to potential clients. Campaign management is the main module in the marketing automation which enables the businesses to decide on effective channels to reach the customers.

With many channels available like emails phone calls a face to face meeting campaign management helps to decide the best approach for the same. This is social media is also used as an important channel for customer participation. Salesforce is also used for marketing automation.

C) Service automation :

The automation in services helps businesses to retain the existing customer by improving the service quality and enhancing the relationship. Service automation includes issue management to solve the problems of the customer and management of customer calls to handle incoming/outgoing calls of the customer. Service automation also includes monitoring the quality of service based on the pre-decided performance indicators.

2) Analytical CRM :

Analytical CRM helps to analyze the data of customers that is generated by the operational CRM apps. Analytical CRM also helps to understand the behavior of customers and help to derive their true value to the business. This helps the company to approach customers with useful information and proposals which addresses their needs and helps to satisfy them.

The applications in analytical customer relationship management use the analytical marketing tools like data mining to get meaningful information like the buying patterns of existing customers, spending patterns of potential customers, the target market, highly profitable and low profitable customers, non customers, customer conversion in a specific period of time etc.

This data helps the senior management to make better decisions and implement better marketing campaigns in the market. CRM helps in gathering information of customers from different channels and has to analyze the data in a structured way. It also helps the organization to set a proper business methodology which helps in sales and marketing decisions. It also helps to improve the effectiveness of CRM and helps analysis of key performance indicators which are set by various businesses.

3) Collaborative CRM :

This is also known as strategic CRM which helps your organization to share the information of customers to various business units like marketing team, sales team, support team, technical support, etc. For example, feedback from the Sales team could be useful for the marketing team to approach and handle the targeted customers with customized products and services. It is seen that every business unit works independently as a separate group and rarely shares the information of customers with other teams which often causes a loss in business.

❖ ERP Security :

- **The ERP security covers :**

  »Access Privileges = Job Responsibilities

  »An Appropriate Segregation of Duties

  »An Sensitive Data is Protected

  »An Third Party Access complies with Policies

  »An User IDs Populated Appropriately

  »An Consistent Security Naming Conventions

- **The ERP security is required before implementation includes:**

  »Time and Budget

  »Compliance with regulations

  »Protection for the sensitive information

•The security is divided into two parts :

1.Computer Security

2.Crime security

1. Computer owners and administrator use a variety of security techniques to protect their systems ranging from day to day low tech locks to high tech software scrambling.

The Computer Security includes :

1.Physical Access restriction

2.Password

3.Firewalls, encryption And Audits.

4.Backups

5.Emerging Security Solution

6.Human Security control

2. The Crime and Security helps the company and the

The employees as well so that they can reduce the crime created by the employees. The employees can prevent the crime by:

1.Checking the refrence

2.Do not give the notice period

3.Keep the employees list up to date

4.Do not give more access than necessary

5.Computer crime through unauthorized access should be stopped.