M.M.E.S. WOMEN'S ATRS & SCIENCE COLLEGE
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DEPARTMENT OF COMMERCE (COMPUTER APPLICATIONS)

E-CONTENT

Subject :Management Information System ***Subject code : CCP34***

Semester: III

PREPARED BY

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MANAGEMET INFORMATION SYSTEM UNIT -I

What is MIS?

MIS is the use of information technology, people, and business processes to record, store and process data to produce information that decision makers can use to make day to day decisions. The full form of MIS is **Management Information Systems**. The purpose of MIS is to extract data from varied sources and derive insights that drive business growth.

The need for MIS

The following are some of the justifications for having an MIS system

- **Decision makers need information to make effective decisions.** Management Information Systems (MIS) make this possible.
- **MIS systems facilitate communication within and outside the organization** – employees within the organization are able to easily access the required information for the day to day operations. Facilitates such as Short Message Service (SMS) & Email make it possible to communicate with customers and suppliers from within the MIS system that an organization is using.
- **Record keeping** – management information systems record all business transactions of an organization and provide a reference point for the transactions.

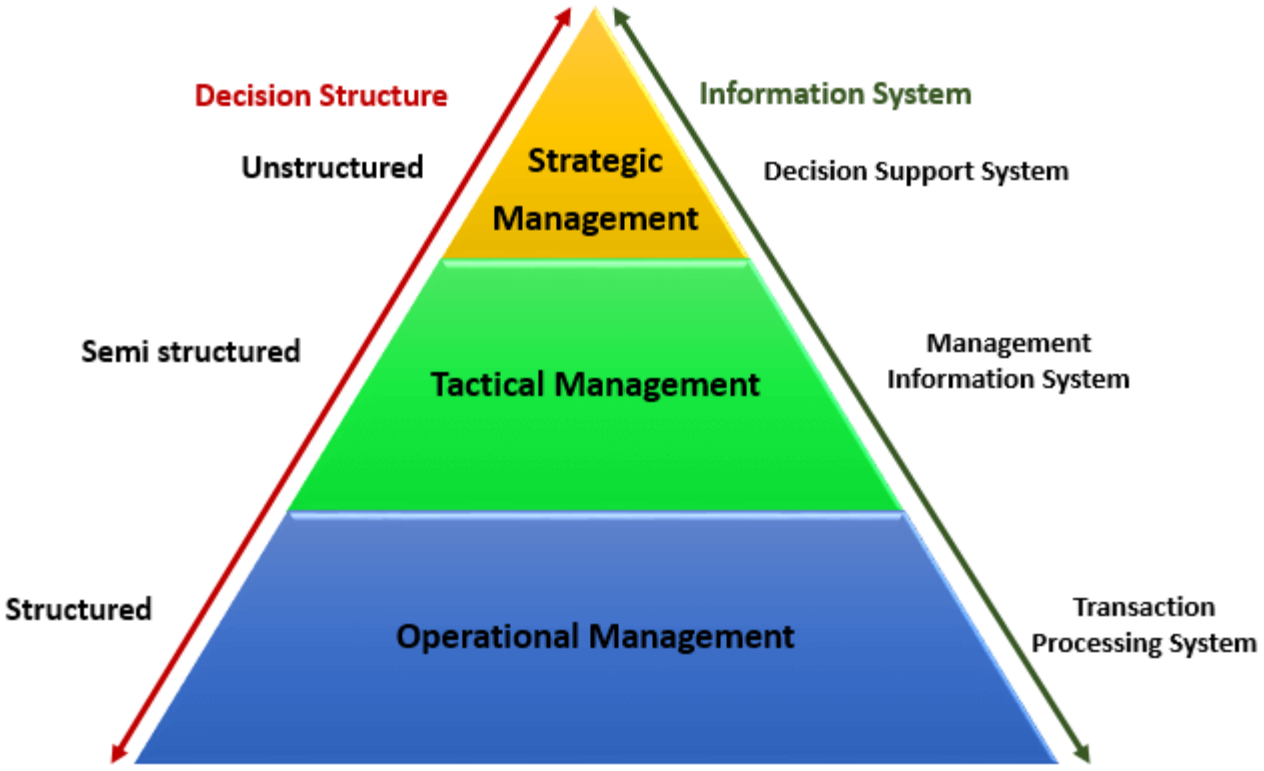
Components of MIS

The major components of a typical MIS long-form (Management Information System) are:

- **People** – people who use the information system
- **Data** – the data that the information system records
- **Business Procedures** – procedures put in place on how to record, store and analyze data
- **Hardware** – these include servers, workstations, networking equipment, printers, etc.
- **Software** – these are programs used to handle the data. These include programs such as spreadsheet programs, database software, etc.

Types of Information Systems

The type of information system that a user uses depends on their level in an organization. The following diagram shows the three major levels of users in an organization and the type of information system that they use.



Transaction Processing Systems (TPS)

This type of information system is used to record the day to day transactions of a business. An example of a Transaction Processing System is a Point of Sale (POS) system. A POS system is used to record the daily sales.

Management Information Systems (MIS)

Management Information Systems abbreviated as MIS, are used to guide tactic managers to make semi-structured decisions. The output from the transaction processing system is used as input to the MIS system.

Decision Support Systems (DSS)

Decision support systems are used by top level managers to make semi-structured decisions. The output from the Management Information System is used as input to the decision support system.DSS systems also get data input from external sources such as current market forces, competition, etc.

Manual Information Systems VS Computerized Information Systems (MIS)

Data is the bloodstream of any business entity. Everyone in an organization needs information to make decisions. An information system is an organized way of recording, storing data, and retrieving information.

In this section, we will look at manual information systems vs. computerized information systems.

Manual Information System

A manual information system does not use any computerized devices. The recording, storing and retrieving of data is done manually by the people, who are responsible for the information system.

The following are the major components of a manual information system

- **People –**people are the recipients of information system
- **Business Procedures –**these are measures put in place that define the rules for processing data, storing it, analyzing it and producing information
- **Data –**these are the recorded day to day transactions
- **Filing system –** this is an organized way of storing information
- **Reports –**the reports are generated after manually analyzing the data from the filing system and compiling it.

Level of Management: Types of Information that are required at Different Levels of Management

Operational information:

Operational information relates to the day-to-day operations of the organisation and thus, is useful in ex-ercising control over the operations that are repetitive in nature. Since such activities are controlled at lower levels of management, operational information is needed by the lower management.

For example, the information regarding the cash position on day-to-day basis is monitored and controlled at the lower levels of manage-ment. Similarly, in marketing function, daily and weekly sales in-formation is used by lower level manager to monitor the perform-ance of the sales force.

It may be noted that operational informa-tion pertains to activities that are easily measurable by specific standards. The operational information mainly relates to current and historical performance, and is based primarily on internal sources of data. The predictive element in operational information is quite low and if at all it is there, it has a short term horizon.

2. **Tactical information**:

Tactical information helps middle level man-agers allocating resources and establishing controls to implement the top level plans of the organisation. For example, information regarding the alternative sources of funds and their uses in the short run, opportunities for deployment of surplus funds in short- term securities, etc. may be required at the middle levels of man-agement.

The tactical information is generally predictive, focusing on short-term trends. It may be partly current and partly histori-cal, and may come from internal as well as external sources.

3. **Strategic information:**

While the operational information is needed to find out how the given activity can be performed better, strategic information is needed for making choices among the busi-ness options.

The strategic information helps in identifying and evaluating these options so that a manager makes informed choices which are different from the competitors and the limita-tions of what the rivals are doing or planning to do. Such choices are made by leaders only.Strategic information is used by man-agers to define goals and priorities, initiate new programmes and develop policies for acquisition and use of corporate resources. For example, information regarding the long-term needs of funds for on-going and future projects of the company may be used by top level managers in taking decision regarding going public or approaching financial institutions for term loan.

Strategic infor-mation is predictive in nature, relies heavily on external sources of data, has a long-term perspective, and is mostly in summary form. It may sometimes include ‘what if’ scenarios. However, the strategic information is not only external information.For long, it was believed that strategic information are basically information regarding the external environment. However, it is now well rec-ognised that the internal factors are equally responsible for suc-cess or failures of strategies and thus, internal information is also required for strategic decision making.

Figure 1.2 represents the types of information required at different levels of managerial hierarchy.

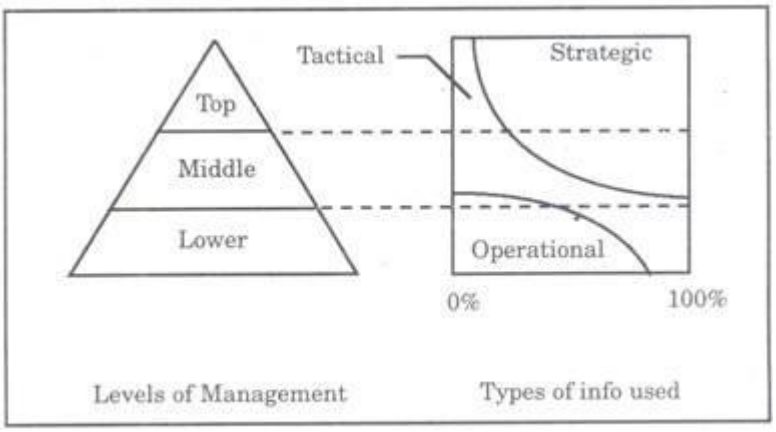


Fig. 1.2 Types of information and levels of management

It may be remembered that each type of information has its role to play in managerial effectiveness. Each type of information is needed with varying degree by the managers at all levels. Thus, a part of operational information may be used even by the chief executive of-ficer of a company.The difference lies in the proportion of each type of information in the total information needs of managers at different levels of managerial hierarchy.

What Is a Web Database?

A Web database is a database application designed to be managed and accessed through the Internet. Website operators can manage this collection of data and present analytical results based on the data in the Web database application. Databases first appeared in the 1990s, and have been an asset for businesses, allowing the collection of seemingly infinite amounts of data from infinite amounts of customers.Data Organization
Web databases enable collected data to be organized and cataloged thoroughly within hundreds of parameters. The Web database does not require advanced computer skills, and many database software programs provide an easy "click-and-create" style with no complicated coding. Fill in the fields and save each record. Organize the data however you choose, such as chronologically, alphabetically or by a specific set of parameters.

Web Database Software

Web database software programs are found within desktop publishing programs, such as Microsoft Office Access and OpenOffice Base. Other programs include the Webex WebOffice database and FormLogix Web database. The most advanced software applications can set up data collection forms, polls, feedback forms and present data analysis in real time.

Applicable Uses

Businesses both large and small can use Web databases to create website polls, feedback forms, client or customer and inventory lists. Personal Web database use can range from storing personal email accounts to a home inventory to personal website analytics. The Web database is entirely customizable to an individual's or business's needs.

MySQL

Often in the world of Web databases, MySQL (structured query language) will be mentioned. This is a relational database management system that manages different Web databases. It operates as a server, and is an open source project. MySQL is often included with Web hosting for managing either personal or business website databases. It is a programming language, so is a more difficult to work with than a straight Web database software program.

What is Data Warehousing?

A **Data Warehousing** (DW) is process for collecting and managing data from varied sources to provide meaningful business insights. A Data warehouse is typically used to connect and analyze business data from heterogeneous sources. The data warehouse is the core of the BI system which is built for data analysis and reporting.

It is a blend of technologies and components which aids the strategic use of data. It is electronic storage of a large amount of information by a business which is designed for query and analysis instead of transaction processing. It is a process of transforming data into information and making it available to users in a timely manner to make a difference.

Data warehouse system is also known by the following name:

- Decision Support System (DSS)
- Executive Information System
- Management Information System
- Business Intelligence Solution
- Analytic Application
- Data Warehouse

History of Datawarehouse

The Data warehouse benefits users to understand and enhance their organization's performance. The need to warehouse data evolved as computer systems became more complex and needed to handle increasing amounts of Information. However, Data Warehousing is a not a new thing.

Here are some key events in evolution of Data Warehouse-

- 1960- Dartmouth and General Mills in a joint research project, develop the terms dimensions and facts.

- 1970- A Nielsen and IRI introduces dimensional data marts for retail sales.
- 1983- Tera Data Corporation introduces a database management system which is specifically designed for decision support

- Data warehousing started in the late 1980s when IBM worker Paul Murphy and Barry Devlin developed the Business Data Warehouse.

- However, the real concept was given by Inmon Bill. He was considered as a father of data warehouse. He had written about a variety of topics for building, usage, and maintenance of the warehouse & the Corporate Information Factory.

How Data warehouse works?

A Data Warehouse works as a central repository where information arrives from one or more data sources. Data flows into a data warehouse from the transactional system and other relational databases.

Data may be:

1. Structured
2. Semi-structured
3. Unstructured data

The data is processed, transformed, and ingested so that users can access the processed data in the Data Warehouse through Business Intelligence tools, SQL clients, and spreadsheets. A data warehouse merges information coming from different sources into one comprehensive database.

By merging all of this information in one place, an organization can analyze its customers more holistically. This helps to ensure that it has considered all the information available. Data warehousing makes data mining possible. Data mining is looking for patterns in the data that may lead to higher sales and profits.

Types of Data Warehouse

Three main types of Data Warehouses are:

1. Enterprise Data Warehouse:

Enterprise Data Warehouse is a centralized warehouse. It provides decision support service across the enterprise. It offers a unified approach for organizing and representing data. It also provide the ability to classify data according to the subject and give access according to those divisions.

2. Operational Data Store:

Operational Data Store, which is also called ODS, are nothing but data store required when neither Data warehouse nor OLTP systems support organizations reporting needs. In ODS, Data warehouse is refreshed in real time. Hence, it is widely preferred for routine activities like storing records of the Employees.

3. Data Mart:

A data mart is a subset of the data warehouse. It specially designed for a particular line of business, such as sales, finance, sales or finance. In an independent data mart, data can collect directly from sources.

General stages of Data Warehouse

Earlier, organizations started relatively simple use of data warehousing. However, over time, more sophisticated use of data warehousing begun.

The following are general stages of use of the data warehouse:

Offline Operational Database:

In this stage, data is just copied from an operational system to another server. In this way, loading, processing, and reporting of the copied data do not impact the operational system's performance.

Offline Data Warehouse:

Data in the Datawarehouse is regularly updated from the Operational Database. The data in Datawarehouse is mapped and transformed to meet the Datawarehouse objectives.

Real time Data Warehouse:

In this stage, Data warehouses are updated whenever any transaction takes place in operational database. For example, Airline or railway booking system.

Integrated Data Warehouse:

In this stage, Data Warehouses are updated continuously when the operational system performs a transaction. The Datawarehouse then generates transactions which are passed back to the operational system.

Components of Data warehouse

Four components of Data Warehouses are:

Load manager: Load manager is also called the front component. It performs with all the operations associated with the extraction and load of data into the warehouse. These operations include transformations to prepare the data for entering into the Data warehouse.

Warehouse Manager: Warehouse manager performs operations associated with the management of the data in the warehouse. It performs operations like analysis of data to ensure consistency, creation of indexes and views, generation of denormalization and aggregations, transformation and merging of source data and archiving and baking-up data.

Query Manager: Query manager is also known as backend component. It performs all the operation operations related to the management of user queries. The operations of this Data warehouse components are direct queries to the appropriate tables for scheduling the execution of queries.

End-user access tools:

This is categorized into five different groups like 1. Data Reporting 2. Query Tools 3. Application development tools 4. EIS tools, 5. OLAP tools and data mining tools.

Who needs Data warehouse?

Data warehouse is needed for all types of users like:

- Decision makers who rely on mass amount of data
- Users who use customized, complex processes to obtain information from multiple data sources.
- It is also used by the people who want simple technology to access the data
- It also essential for those people who want a systematic approach for making decisions.
- If the user wants fast performance on a huge amount of data which is a necessity for reports, grids or charts, then Data warehouse proves useful.
- Data warehouse is a first step If you want to discover 'hidden patterns' of data-flows and groupings.

What Is a Data Warehouse Used For?

Here, are most common sectors where Data warehouse is used:

Airline:

In the Airline system, it is used for operation purpose like crew assignment, analyses of route profitability, frequent flyer program promotions, etc.

Banking:

It is widely used in the banking sector to manage the resources available on desk effectively. Few banks also used for the market research, performance analysis of the product and operations.

Healthcare:

Healthcare sector also used Data warehouse to strategize and predict outcomes, generate patient's treatment reports, share data with tie-in insurance companies, medical aid services, etc.

Public sector:

In the public sector, data warehouse is used for intelligence gathering. It helps government agencies to maintain and analyze tax records, health policy records, for every individual.

Investment and Insurance sector:

In this sector, the warehouses are primarily used to analyze data patterns, customer trends, and to track market movements.

Retain chain:

In retail chains, Data warehouse is widely used for distribution and marketing. It also helps to track items, customer buying pattern, promotions and also used for determining pricing policy.

Telecommunication:

A data warehouse is used in this sector for product promotions, sales decisions and to make distribution decisions.

Hospitality Industry:

This Industry utilizes warehouse services to design as well as estimate their advertising and promotion campaigns where they want to target clients based on their feedback and travel patterns.

Steps to Implement Data Warehouse

The best way to address the business risk associated with a Datawarehouse implementation is to employ a three-prong strategy as below

1. **Enterprise strategy**: Here we identify technical including current architecture and tools. We also identify facts, dimensions, and attributes. Data mapping and transformation is also passed.
2. **Phased delivery**: Datawarehouse implementation should be phased based on subject areas. Related business entities like booking and billing should be first implemented and then integrated with each other.
3. **Iterative Prototyping**: Rather than a big bang approach to implementation, the Datawarehouse should be developed and tested iteratively.

Here, are key steps in Datawarehouse implementation along with its deliverables

Step	Tasks	Deliverables
1	Need to define project scope	Scope Definition
2	Need to determine business needs	Logical Data Model
3	Define Operational Datastore requirements	Operational Data Store Model
4	Acquire or develop Extraction tools	Extract tools and Software
5	Define Data Warehouse Data requirements	Transition Data Model
6	Document missing data	To Do Project List

7	Maps Operational Data Store to Data Warehouse	D/W Data Integration Map
8	Develop Data Warehouse Database design	D/W Database Design
9	Extract Data from Operational Data Store	Integrated D/W Data Extracts
10	Load Data Warehouse	Initial Data Load
11	Maintain Data Warehouse	On-going Data Access and Subsequent Loads

Best practices to implement a Data Warehouse

- Decide a plan to test the consistency, accuracy, and integrity of the data.
- The data warehouse must be well integrated, well defined and time stamped.
- While designing Datawarehouse make sure you use right tool, stick to life cycle, take care about data conflicts and ready to learn you're your mistakes.
- Never replace operational systems and reports
- Don't spend too much time on extracting, cleaning and loading data.
- Ensure to involve all stakeholders including business personnel in Datawarehouse implementation process. Establish that Data warehousing is a joint/ team project. You don't want to create Data warehouse that is not useful to the end users.
- Prepare a training plan for the end users.

Advantages of Data Warehouse:

- Data warehouse allows business users to quickly access critical data from some sources all in one place.
- Data warehouse provides consistent information on various cross-functional activities. It is also supporting ad-hoc reporting and query.
- Data Warehouse helps to integrate many sources of data to reduce stress on the production system.
- Data warehouse helps to reduce total turnaround time for analysis and reporting.
- Restructuring and Integration make it easier for the user to use for reporting and analysis.
- Data warehouse allows users to access critical data from the number of sources in a single place. Therefore, it saves user's time of retrieving data from multiple sources.
- Data warehouse stores a large amount of historical data. This helps users to analyze different time periods and trends to make future predictions.

Disadvantages of Data Warehouse:

- Not an ideal option for unstructured data.
- Creation and Implementation of Data Warehouse is surely time confusing affair.
- Data Warehouse can be outdated relatively quickly
- Difficult to make changes in data types and ranges, data source schema, indexes, and queries.
- The data warehouse may seem easy, but actually, it is too complex for the average users.
- Despite best efforts at project management, data warehousing project scope will always increase.

- Sometime warehouse users will develop different business rules.
- Organisations need to spend lots of their resources for training and Implementation purpose.

The Future of Data Warehousing

- Change in **Regulatory constrains** may limit the ability to combine source of disparate data. These disparate sources may include unstructured data which is difficult to store.
- As the **size** of the databases grows, the estimates of what constitutes a very large database continue to grow. It is complex to build and run data warehouse systems which are always increasing in size. The hardware and software resources are available today do not allow to keep a large amount of data online.
- **Multimedia data** cannot be easily manipulated as text data, whereas textual information can be retrieved by the relational software available today. This could be a research subject.

Data Warehouse Tools

There are many Data Warehousing tools are available in the market. Here, are some most prominent one:

1. MarkLogic:

MarkLogic is useful data warehousing solution that makes data integration easier and faster using an array of enterprise features. This tool helps to perform very complex search operations. It can query different types of data like documents, relationships, and metadata.

2. Oracle:

Oracle is the industry-leading database. It offers a wide range of choice of data warehouse solutions for both on-premises and in the cloud. It helps to optimize customer experiences by increasing operational efficiency.

3. Amazon RedShift:

Amazon Redshift is Data warehouse tool. It is a simple and cost-effective tool to analyze all types of data using standard SQL and existing BI tools. It also allows running complex queries against petabytes of structured data, using the technique of query optimization.

KEY LEARNING

- The data warehouse works as a central repository where information is coming from one or more data sources.
- Three main types of Data warehouses are Enterprise Data Warehouse, Operational Data Store, and Data Mart.
- General state of a data warehouse are Offline Operational Database, Offline Data Warehouse, Real time Data Warehouse and Integrated Data Warehouse.
- Four main components of Data warehouse are Load manager, Warehouse Manager, Query Manager, End-user access tools
- Data warehouse is used in diverse industries like Airline, Banking, Healthcare, Insurance, Retail etc.
- Implementing Data warehouse is a 3 prong strategy viz. Enterprise strategy, Phased delivery and Iterative Prototyping.
- Data warehouse allows business users to quickly access critical data from some sources all in one place.

Knowledge Management (KM): Concept, Features and Process

Concept of KM:

KM may be defined as follows:

Knowledge management is a process of acquiring, generating, accumulating and using knowledge for the benefit of the organisation to enable it to gain a competitive edge for survival, growth and prosperity in a globalized competitive economy.

According to some management experts, notably Peter F. Drucker, KM is a bad term; in as much as knowledge cannot be managed.

Rather, KM requires conditions for the emergence of a learning organisation; which is necessary for generation, sharing and use of knowledge residing in the minds of people.

Features of Knowledge Management

Some salient features of KM are described below:

(i) KM is a systematic process; consisting of standardized procedures to collect, store, distribute and use knowledge. The essence of KM is to get right knowledge to right people, at the right time.

(ii) Knowledge is of two types – explicit and implicit. Explicit knowledge is visible information available in literature, reports, patents, technical specifications, communication with customers, suppliers, competitors etc. It can be embedded in rules, systems, policies and procedures etc. of the organisation. Tacit or implicit knowledge is personal knowledge residing in the minds of people as a result of their personal beliefs, values, perspectives and experience. There is a need for a learning organisation for enhancement, sharing and utilisation of tacit knowledge.

(iii) KM is a continuous process; as the world economy is dynamic and full of challenges. It requires constant creation of new skills and capabilities and improvement of existing ones.

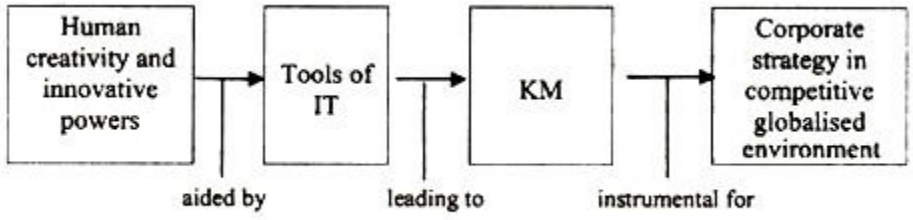
(iv) KM requires whole-hearted support of top management, to provide cultural and technical foundation for the origination and implementation of KM practices.

(v) The objective of KM is improvement in organisational performance; to enable the organisation acquire, sharpen and utilize its competitive edge for survival and growth in the global economy of today.

Knowledge Management and Information Technology:

KM is not an outgrowth of IT. Rather, KM requires human skills, creativity and innovative capabilities of people; which are the base of KM. In fact I there are tools of IT like Intranets, Lotus Notes, MS-Exchange etc.; which provide an infrastructure for the free play of human creativity and innovative powers for the formulation of corporation strategy, in a competitive globalized environment.

The above ideas are illustrated with the help of the following diagram:



KM, IT and Corporate Strategy

Knowledge Management IT and Corporate Strategy

An Overview of the Process of KM:

KM broadly consists of the following major steps:

(i) **Identification of Knowledge Needs:**

The first step in KM is an identification of what type of knowledge is required for the successful designing and implementation of corporate strategy.

(ii) **Determination of Knowledge Assets:**

The management must identify what are the knowledge assets of the organisation; which basically are competitors, suppliers, governmental agencies, products and processes, technology etc. Management must plan to get maximum returns out of knowledge assets.

(iii) **Generation of Knowledge:**

Generation of knowledge requires two sources:

(a) Acquisition of knowledge through knowledge assets e.g. knowledge about new products (from competitors), new technologies, social, economical, political changes. It also requires transformation of raw information into knowledge, useful to solve business problems.

(b) Generation of knowledge, by creating conditions for the emergence of a learning organisation. This is the most important internal source of knowledge generation which makes tacit knowledge of individuals available for organisational purposes.

(iv) **Knowledge Storage:**

It includes preserving existing and acquired knowledge in knowledge repositories. (A knowledge repository is an on line computer based storehouse of organised information about a particular domain of knowledge).

(v) **Knowledge Distribution:**

It is a process which allows members of the organisation to have an access to the collective knowledge of the organisation.

(vi) **Knowledge Utilization:**

It requires embedding knowledge in products, processes, procedures etc. of the organisation. Best utilisation of knowledge takes place when managers utilize knowledge in organisational decision making. A learning organisation creates conditions for sharing and utilizing knowledge in organisational contexts.

(vii) **Feedback on Knowledge Management**

Feedback on KM implies evaluating the significance of knowledge assets. It also includes impact of KM on organisational performance; and devising techniques for betterment of KM in future.

An overview of the process of KM- at a glance

Significance of Knowledge Management

Significance of KM could be highlighted with reference the following advantages which KM provides to the organisation:

(i**) Building and Sharpening Competitive Edge:**

KM enables a corporation to build and sharpen its competitive edge, for survival and growth in the competitive globalized economy. In fact, KM aided by IT tools enables a corporation to design and implement most appropriate corporate strategies.

(ii) **Betterment of Human Relations:**

KM is basically built on the knowledge generated, shared and utilized through a learning organisation. There is no doubt that learning organisation provides the foundation on which the building of KM could be built. A learning organisation through facilitating interaction among people of the organisation, leads to betterment of human relations; which is a very big permanent asset an organisation can boast of to possess.

(iii) **Improvement in Organisational Efficiency:**

KM provides knowledge which can be embedded in organisational processes. It makes knowledge available for decision-making purposes. Thus it helps to improve organisational efficiency, resulting in reduced costs and increased profits, for the organisation.

(iv) **Enhancement of Human Capital Capabilities**

KM-its concept and practices – motivate people to enhance their intellectual capabilities, resulting in new skills, improvement of existing skills etc. Thus not only does KM enhance the intellectual elements of people; but also indirectly prevents depreciation of human capital.

(v) **Enhancement of Enterprise Goodwill:**

Initiation and practices of KM help an enterprise enhance its goodwill in the global market; enabling it to acquire more success and prosperity.

Information System for Decision Support

Introduction

In the current globalized business environment, decision making is becoming more and more difficult. Some of the problems faced by business are as follows:There is large volume of internal organizational data on hand thanks to the modern data-storage system. However, not all data available would be useful for decision.

The flow of information over the Internet is increasing daily. Decision makers need to keep a tab on latest information available on the Internet.More and more business transactions are done online. Proliferation of e-commerce has created opportunity as well as challenges for decision makers.Multi-national companies are faced with scenarios where decision makers are spread across the globe. Every decision maker would bring his or her own perception during team discussion. Thus reaching a decision through consensus make become difficult.

Challenges in Decision Making

In today's corporate environment, there is encouragement for diverse and inclusive work environment. Therefore, employees come together from a different background to achieve a single organizational goal. However, to achieve this target several decisions need to be made. And a good decision-making process will encounter challenges.

Some decision may be stalled due to lack of experience, in particular, area of operations. Sometimes it is difficult to pin-point pain areas and fresh pair of eyes would be required to highlight the problem. Often past experiences stop us from making a decision.To overcome such challenges it is important to develop decision support system, team decision support tool and executive information system.

Decision Making Process

Simon's decision-making process identifies three main steps - intelligence, design and choice. During the intelligence stage, the current business environment is scanned to identify the problem. Once the problem is identified, it needs to be considered whether the decision maker is capable of handling the problem. Investment in time is required to develop complete problem statement. Based on information gathered, a decision model is developed, which can solve identified problems.

In the choice phase, various solutions proposed by the model are evaluated and examined. Feasibility study is carried out if the solution can be implemented in the current business scenario.

Decision Support System

Decision support system consists of three main parts - data management system, model management system and user interface.Data-management system contains primary as well as secondary data. This data is then fed

through a model management system. Model management system will carry out simulation analyst, What-If analysis, etc. and pass on the result to end users in form of data, chart, sheets, etc.

Group Decision Support System

Some decision-making process requires group involvement. Group decision support system includes tools like brain storming tools, idea ranking tools, etc.

Executive Information System

An information system designed to facilitate top level management undertake a strategic decision is called executive information system. Executive Information systems contain both primary as well as secondary data.The information system provides summary of information in a required format. The information system also has drill through facility to see the 2nd and 3rd tier of data.

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Management Information System - UNIT-2

Six Major Types of Information Systems

A typical organization has six of information systems with each supporting a specific organizational level. These systems include transaction processing systems (TPS) at the operational level, office automation systems (OAS) and knowledge work systems (KWS) at the knowledge level, management information systems (MIS) and decision support Systems (DSS) at the management level, and the executive support systems (ESS)at the strategic level.

Transaction Processing Systems

Every firm needs to process transactions in order to perform their daily business operations. A transaction refers to any event or activity that affects the organization. Depending on the organization's business, transactions may differ from one organization to another. In a manufacturing unit, for example, transactions include order entry, receipt of goods, shipping, etc., while in a bank, transactions include deposits and withdrawals, cashing of cheques etc.

\P**rimis Player Placeholder**
However, some transactions, including placing orders, billing customers, hiring employees, employee record keeping, etc., are common to all organizations. To support the processing of business transactions, the transaction processing systems (TPS) are used in the organizations.

Office Automation Systems
An office automation system (OAS) is a collection of communication technology, computers and persons to perform official tasks. It executes office transactions and supports official activities at every organizational level. These activities can be divided into clerical and managerial activities.

Clerical activities performed with the help of office automation system include preparing written communication, typesetting, printing, mailing, scheduling meetings, calendar keeping.etc. Under managerial activities, office automation system helps in conferencing, creating reports and messages, and controlling performance of organization. Many applications like word processing, electronic filing and e-mail are integrated in office automation system.

Word Processing

Word processing is used for the preparation of documents like letters, reports, memos, or any type of printable material by electronic means. The text is entered by keyboard and displayed on the computer's display unit. This text can be edited, stored, and reproduced with the help of commands present in the word processor. Word processors have facilities for spell checking, grammar checking, counting (character,lines, pages, etc.), automatic page numbering, index creation, header and footer,etc.

Features of Organizations

Email

E-mail or electronic mail facilitates the transfer of messages or documents with the help of computer and communication lines. This helps in speedy delivery of mails and also reduces time and cost of sending a paper mail. E-mail supports not only

the transfer of text messages but it also has options for sending images,audio, video, and many other types of data.

Voice Mail

Voice mail, an important call service, allows recording and storing of telephone messages into the computer's memory. The intended person can retrieve these messages any time.

Knowledge Work Systems

A knowledge work system (KWS) is a specialized system built to promote the creation of knowledge and to make sure that knowledge and technical skills are proper integrated into business. It helps the knowledge workers in creating and propagating new information and knowledge by providing them the graphics, analytical, communications, and document management tools.

The knowledge workers also need to search for knowledge outside the organization. Thus, knowledge work system must give easy access to external databases. In addition, knowledge work systems should have user-friendly interface to help users to get the required information quickly and easily.

Some examples of knowledge work systems are computer-aided design (CAD)systems, virtual reality systems, and financial workstations.

Computer-aided design (CAD) systems: These systems are used for automating the creation and revision of designs using computers and graphics software. The CAD software has the capability to provide design specifications for tooling and manufacturing process. This saves much time and money while making a manufacturing process.

Virtual Reality System: These systems have more capabilities than CAD systems for visualization, rendering and simulation. They make use of interactive graphics software to build computer-generated simulations which almost look like real. They can be used in educational, scientific and business work.

Financial Workstations: They are used to combine a wide range of data from internal as well as external sources. This data includes contact management data, market data and research reports. Financial workstations help in analyzing trading situations and large amount of financial data within no time. It is also used for portfolio management.

Management Information Systems

Management information systems are especially developed to support planning, controlling, and decision-making functions of middle managers. A management information system (MIS) extracts transaction data from underlying TPSs, compiles them, and produces information products in the form of reports, displays or responses.

Components of Decision Support Systems (DSS)

These information products provide information that conforms to decision-making needs of managers and supervisors. Management information systems use simple routines like summaries and comparisons which enable managers to take decisions for which the procedure of reaching at a solution has been specified in advance.

Generally, the format of reports produced by MIS is pre-specified. A typical MIS report is a summary report, such as a report on the quarterly sales made by each sales representative of the organization. Another type of management information system report is an; for example, exception report that specifies the exception conditions the sales made by some sales representative is far below than expected. Usually, management information systems are used to produce reports on monthly, quarterly, or yearly basis. However, if managers want to view the daily or hourly data, MIS enables them to do so. In addition, they provide managers online access to the current performance as well as past records of the organization.

Decision Support Systems

A decision support system (DSS) is an interactive computer-based information system that, like MIS, also serves at the management level of an organization. However, in contrast to MIS, it processes information to support the decision making process of managers. It provides middle managers with the information that enables them to make intelligent decisions. A decision support system in a bank, for example, enable a manager to analyze the changing trends in deposits and loans in order to ascertain the yearly targets.

Decision support systems are designed for every manager to execute a specific managerial task or problem. Generally, they help managers to make semi-structured decisions, the solution to which can be arrived at logically. However, sometimes, they can also help in taking complex decisions. To support such decisions, they use information generated by OASs and TPSs.

Decision support systems have more analytical power as compared to other information systems. They employ a wide variety of decision models to analyze data or summarize vast amount of data into a form (usually form of tables or charts) that make the comparison and analysis of data easier for managers. They provide interactive environment so that the users could work with them directly, add or change data as per their requirements, and ask new questions.

Types of Organizational Structures

Executive Support Systems

An executive support system (ESS) – an extension of MIS – is a computer based information system that helps ind decision making at the top-level of an organization. The decisions taken with the help of executive support system are non-routine decisions that effect the entire organization and, thus, require judgement and sight.

As compared to DSSs, ESSs offer more general computing capabilities, better telecommunications and efficient display options. They use the advanced graphics software to display the critical information in the form of charts or graphs that help senior executives to solve a wide range of problems. To make effective decisions, they use summarized internal data from MIS and DSS as well as data from external sources about events like new tax laws, new competitors, etc. They filter, compress, and track data of high importance and make it available to the strategic-level managers.

Executive support systems help to monitor performance, track activities of competitors, identify opportunities, and forecast trends. They also assist senior managers in answering the following question:

Decision Support System (DSS): Meaning, Features and Users

Meaning of Decision Support System (DSS):

A decision support system is that system which helps the management in taking the business decisions.

It is a system which allow human-machine interface whereby, the decision-maker possess control throughout the decision making process.

It has one primary objective that is to provide the managers with the necessary information for making intelligent decisions. This approach not only helps in bringing decision-making information directly to the executives, but also goes one

step further than typical management information systems by allowing decision-maker to interact with the computer.

In this way, the computer is simply a tool, which helps the executives in evaluation of the alternatives so that they may reach on an effective decision. The ability of an individual to retail control over the decision making process is not only useful to solve well structured problems but also helps in solving semi structured and unstructured problems.

Thus, Decision Support System (DSS) is a specialized MIS designed to support an executives' skills at all stages of decision making i.e. problem identification, selecting relevant data, picking the approach to be used in decision making and evaluating the alternative courses of action.

A decision support system must generate information in such a form that executives may understand and at a time when such an information is needed and place the information under the direct control of the executives. Thus, the DSS enables the business executives to take the efficient, effective and economic decisions.

Features/Characteristics of Decision Support System:
Features & characteristics of decision support system are:

(a) It is a way to organize information intended for use in decision-making. It envelope the use of a database for a specific decision making process. A decision support system does not automate transformation performed on data nor simply provide output in the form of report rather it supports the decision makers problem solving approach.

(b) A DSS allow the decision-maker to interact in a natural manner due to the careful design of the user interface.

(c) Decision support systems are designed to help support decisions that are formulated as semi structured, complex problem. These problems remain resistant to complete computerization.

(d) A DSS may be constructed to support one-time decision, those that are infrequent; however, the type of problem or opportunity best addressed through use of a DSS is one that requires human judgment.

(e) A decision support system is typically designed for either a particular decision-maker or a group of decision-makers. This allows the system designer to customize important system features to adapt to the type of representations.

(f) Rather than building a specific DSS from scratch, a system analyst can use a package of interrelated hardware and software called a DSS generator.

(g) A decision support system is best conceptualized as a process instead of a product.

Elements of Decision Support System:

Decision support systems were initially designed as data base management systems combined with mathematical modeling systems to provide powerful, flexible tools for quantitative analysis of management decisions.

More recently, the DSS concept has been extended by incorporating ideas from expert systems and cognitive psychology, which deals with how people solve problems and make decisions. Data are prerequisite for making managerial decisions but data alone is not sufficient to make the decision. There are various other factors that are to be taken into consideration while making managerial decisions.

The sum total factors are:

1. Data

2. Decision rules

3. Mathematical models

4. Managerial knowledge

5. Human judgement.

Decisions based on set of decision rules by a data base system, since the rules depend on a data item in a data base : net profit Note, however, that it is up to the manager to decide which rules applies, since a conventional data base system does not know whether net profit is normal, above normal, or below normal.

Selection of the appropriate decision rule depends on the manager's judgement on whether last year's net profit was normal or not (of course, precise rules could be established for determining this as well).

The set of decision rules is considerably different because it requires a forecast of net profit for the next year. The kinds of data base systems contain historical and current data, not forecasts. Of course, forecasts are often based on mathematical or statistical models that require historical Data.

Thus, a data base system can provide the Data on which to base such forecasts. The modeling component of the DSS provides the forecasting model.

Mathematically based forecasts are not without error, however, and they may not take all relevant factors into account. Thus, human judgement must be used to interpret and adjust the forecast. Managerial judgements such as these are based on knowledge of the organisation and its environment. This knowledge is not included in data base systems and is seldom found in computer systems at all.

Experts systems try to capture expert knowledge of the problem domain, or specific problem area, and use that knowledge to make decisions. Knowledge is stored as a separate entity called a knowledge base, which is analogous to the Data base in a data base system. In a data base system, the data base management system is a complex program that manipulates the Data base.

In an expert system, the interference engine is a complex program that manipulates the knowledge base (which is sometimes called a data base in the expert system literature). Data in data base tends to be numeric, with some character data.

Information in knowledge bases is more qualitative or textual in nature, and interference engines may use qualitative reasoning rather than quantitative models to reach decisions.

There is already a clearly observable trend toward the development of decision support systems that integrate data bases, knowledge bases, mathematical models, and expert system inference engines into integrated systems for management

decision making. The potential impact of these decision-support systems is tremendous.

Users of Decision Support System:
The ultimate user of a decision support system is the decision maker; however, he may not actually run the system. Based on his research on 56 Decision Support Systems, Alter identified following four distinct usage patterns.

1. Terminal mode

2. Clerk mode

3. Subscription mode

4. Intermediary mode.

1. Terminal mode

The decision maker is the direct user of the system through on line access.

2. Clerk mode:
The decision maker uses the system directly but offline, preparing input on a coding form. The primary difference between this mode and the terminal mode is in the technology employed (batch versus online).

3. Subscription mode:
The decision maker receives reports that are generated automatically on a regular basis. This is the typical mode of usage for management reporting systems. Although some data analysis systems or accounting models might be used in this way, it is not typical for decision support systems.

4. Intermediary mode:
The decision maker uses the system through intermediaries, who perform the analysis and interpret and report the results. The decision maker does not need to know the intermediary used the system to arrive at the requested information.

The role of an intermediary is common in the use of decision support systems and merits separate attention. It has typically been argued that decision support systems

will be resisted because managers will refuse to use terminals. The job of chief executives is highly fragmented with frequent interruptions.

Such a pattern of activity is a major constraint on the use of a system requiring concentration over a period of time. The use of an intermediary allows the manager to benefit from the decision support system without actually having to execute it.

There are two types of intermediaries that reflect different types of support for the manager.

(a) Expert tool user

(b) Staff assistant or staff analyst.

(a) Expert tool user:

This person is skilled in the application of one or more types of specialised problem solving tools. The expert tool user performs tasks which the problem solver does not have the skills or training to perform.

(b) Staff assistant or staff analyst:

This person has specialized knowledge about problems and some experience with the decision support technology. The staff assistant essentially extends the manager's capabilities by taking over many of the tasks of problem solving such as setting up the problem, obtaining data and building the initial model.

The manager can concentrate on the more unstructured portions of the problem solving task. The staff assistant performs work the manager could do if time were available.

Although more intermediaries are staff assistants, there is also frequent need for the expert tool user. The use of intermediaries permits the systems to be more sophisticated and powerful. On line, interactive systems are still desirable with intermediaries because they allow them to work more quickly and efficiently.

Role of Decision Support System in MIS:
Decision support system is a special class of system which facilitate decision making. As in an organisation, at each and every point and time, decisions are to be taken irrespective of their nature. Some decisions may be routine and

programmed decisions while other may be strategic, and non-programmed decisions.

But one thing is certain that decision making is done at all level of management. Decision support system involves the packages which help the managers to take right and timely decisions.

Decision support systems use data from the general management information system and they are used by a manager or a decision maker for decision support. The basic characteristic of the decision support system is that it is based on some tool, technique or model. These systems are used sometimes for testing new alternatives, training and learning. They are also used for sensiting the various parameters of the model.

The MIS designer has to look for all such situations and design the decision support system for integration in the system. The management information system would become more useful if the decision making is made person independent and executed with well designed decision support system.

All such embedded systems cover the normal variety of decision situations. If anything outside the considered variety crops up, decision support system will bring to the notice of the decision makers that action is called for in the situation.

The decision support system plays a dominant role in the management information system as a support to decision making.

What is Executive Support System ESS?

Executive Support System (ESS) is a software used by companies which has information related to business, which enables the top management to take better decisions in favor of the company.

ESS mainly deals with data related to key departments like billing, accounting, scheduling, staffing etc. In addition to providing quick access to the data, ESS helps to analyze the data systematically and helps the companies to even forecast and prepare for the future.

ESS thus saves valuable time of the executives in digging the huge pile of information to identify the critical data and helps them spend more time on brainstorming and decision making by providing only the required data. ESS can be used to view and analyze both the present data and predicted future data.

Depending on the utility, the software can be adjusted according to parameters to deliver the best results.

Some of the advantages of ESS are:

1. **Improved personal efficiency**
2. **Increased organizational control**
3. **Competitive advantage over competitors**
4. **Automation of the managerial processes.**

Role of Computers in Management Information Systems

Computers play a central role in a business's management information system, or MIS. In past decades, most companies had a few computers that served as information hubs. Today, a range of computing devices funnel important data from a variety of sources, from sales to time cards to inventory. The MIS software gathers the data and generates actionable information to guide the business.

MIS and Computers

In general, an MIS provides timely information to help managers make sound business decisions, such as when to replenish inventory, when to offer deals to customers and how to forecast sales for the coming quarter. Though some small businesses can get away with pen and paper, the great majority of MIS systems use computers to process large amounts of data quickly.

Guiding the Business

Business doesn't stand still. Internal and external circumstances change daily, and you need a road map of good information to guide you through the twists and turns. The whole purpose of MIS is to use the hard data of your business to inform day-to-day and long-term decisions. Computers ease the task of processing the data.

Capturing the Data

The most sophisticated computers in the world can't help your business if they're not "fed". Before an MIS can provide useful information, data must first enter the system.

Sales and accounting systems, for example, typically capture data when a customer places an order. Workers on the factory floor can enter manufacturing data into tablets or PCs, or the production machines themselves can capture data automatically. These detailed, nuts-and-bolts numbers are the raw materials that eventually become useful management information.

Calculating, Sorting and Searching

Modern computers excel at repetitive number crunching, accurately processing many thousands of data items per second. To summarize a month's business transactions by hand might take hours or days, while a computer can do this task in moments. Useful operations include arithmetic calculations, sorting data numerically or alphabetically and searching for a single record among thousands in a file.

Database Management Systems

Many MIS systems rely on database management systems to organize, process and protect data. The database is a special program that acts as a data warehouse, storing the raw data and also cataloging it. The database has levels of security to guard against unauthorized access. It gives the various MIS applications — accounting, payroll, inventory management and others — added efficiency, reliability and flexibility.

Reports for Managers

An MIS delivers information to managers in the form of reports. They may take many forms, including printed lists, informative screens or alerts by text or email. Generally, reports may have details, listing individual records sorted by date or other criteria, and summary figures that show totals and averages.

For example, a monthly sales report shows customer names and what they bought. The MIS may generate the reports on demand, on a schedule or when preset conditions are met.

Ad Hoc Reporting

Many of the reports in an MIS system are "canned", as software developers wrote the specifications when the system was first created. Ad hoc (improvised) reports are also possible. In this instance, you can use database software to create a custom report.

For example, in a certain month, an item you make may have been painted the wrong color. An ad hoc report can pull useful information from the MIS, such as who bought the item and when or which production machine made the item. The manager may create the report herself from a menu-driven reporting system, or she may ask a data technician to do it for her.

Computer Storage and Big Data

With the falling price of computer hard drives, it's now possible to store enormous amounts of information cheaply. Even small businesses can afford to keep reams of detailed records on hand and use them to study customer buying patterns, production quality statistics and the actions of competitors.

Garbage In, Garbage Out

With tongue in cheek, computer professionals use the term "garbage in, garbage out" to sum up how errors in data or mistakes in programming can lead to disastrous outcomes. Because computers deal with large amounts of information, it's possible that small arithmetic errors, for example, may give wildly incorrect results. Savvy businesspeople must be aware of the potential pitfalls of relying too much on computerized reports.

Evolution of MIS:

Jane Laudon identify five eras of MIS evolution corresponding to five phases in the development of computing technology:

1) Mainframe and minicomputer computing,
2) Personal computers,
3) Client/server networks,
4) Enterprise computing, and
5) Cloud computing.

The first (mainframe and minicomputer) era was ruled by IBM and their mainframe computers, these computers would often take up whole rooms and

require teams to run them, IBM supplied the hardware and the software. As technology advanced these computers were able to handle greater capacities and therefore reduce their cost. Smaller, more affordable minicomputers allowed larger businesses to run their own computing centers in-house.

The second (personal computer) era began in 1965 as microprocessors started to compete with mainframes and minicomputers and accelerated the process of decentralizing computing power from large data centers to smaller offices. In the late 1970s minicomputer technology gave way to personal computers and relatively low cost computers were becoming mass market commodities, allowing businesses to provide their employees access to computing power that ten years before would have cost tens of thousands of dollars. This proliferation of computers created a ready market for interconnecting networks and the popularization of the Internet.

As the complexity of the technology increased and the costs decreased, the need to share information within an enterprise also grew, giving rise to the third (client/server) era in which computers on a common network were able to access shared information on a server. This allowed for large amounts of data to be accessed by thousands and even millions of people simultaneously.

The fourth (enterprise) era enabled by high speed networks, tied all aspects of the business enterprise together offering rich information access encompassing the complete management structure.

The fifth and latest (cloud computing) era of information systems employs networking technology to deliver applications as well as data storage independent of the configuration, location or nature of the hardware. This, along with high speed cellphone and wifi networks, led to new levels of mobility in which managers access the MIS remotely with laptops, tablet pcs, and smartphones.

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DEPARTMENT OF COMMERCE (COMPUTER APPLICATIONS)

E-CONTENT

Subject :Management Information System ***Subject code : CCP34***

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Management Information System - UNIT-4

A marketing information system is a platform for collecting, storing, analyzing, and distributing essential marketing data received from internal and external resources. It provides marketers and other experts with easy access to accurate data that helps them make informed decisions directed at business growth.

4 Marketing Information System Components

These components form a holistic marketing information system. So, to make the most out of it, you need to combine them effectively.

1. **Internal records.** This type of information is the easiest to obtain inside your organization. For this purpose, you need to monitor your cash flow, employee salaries, product inventory, sales, and marketing reports, including the current and past ones. Internal records include all your performance reports' financial, transactional, and marketing data.
2. **Marketing research.** This essential marketing information system component allows you to present a specific problem as your current business goal and investigate all the details necessary for developing a solution. If you are considering developing a new product, conduct marketing research and come up with a solution based on your findings. Stating a problem allows marketers to direct all their efforts into collecting a particular type of data from the most meaningful sources.
3. **Marketing intelligence.** This data type makes it possible to better understand your current business situation, market changes, trends, competitors' strategies, recent

innovations, and consumer preferences. You can get it from external resources, such as journals, magazines, competitors' sites, marketplace overviews, press, partners, suppliers, etc.

4. **Marketing decision support system (MDSS).** This data can be retrieved from special analytics software and services that help marketers collect, store, and analyze data to make better decisions. For example, you can use specific third-party platforms to carry out market segmentation or discover how much your competitors spend on PPC advertising on average.

Combining these four marketing information system components will help you better understand the current situation both in the market and your company and tweak your strategies accordingly.

Marketing Information System Examples

Nowadays, almost every business has a marketing information system since it helps them make better decisions and, as a result, drive sales. For example, many retail stores provide their clients with loyalty cards, and many brands offer customers an opportunity to create profiles in their online stores. Both loyalty cards and profiles help businesses collect data about clients and keep track of their purchase behavior, average checks, engagement level, items viewed, etc. With this data, companies can manage their pricing policies, create better marketing campaigns, and come up with relevant offers in the right place and at the right time.

Online booking services operate similarly. They monitor their client's habits, preferences, and routes to gain insights and act on them. For example, airlines and hotel services keep track of the demand and increase prices when it rises. They can also offer their frequent buyers discounts during the off-season.

Congrats, now you know the benefits of having a marketing information system, its components, and some examples. Implement this approach for your business to keep pace with any market changes and increase your profits.

The designing of an effective production planning and control information system for a given plant requires a clear comprehension of the nature of the manufacturing problem and an understanding of the planning and manufacture of standard products. For designing effective production planning and control Procedures a materials and tools records and Control system must be derived and machine capacity data must be compiled.

Information needs for PPC System are:

(i) Full details of forecasted sales by product and actual sales. This will provide necessary inputs to the production managers to modify their plans as and when required. Such data is useful in managing the problem of under and over production,

(ii) The availability on a daily basis of productive resources viz. space, man-hours and machine capacity. This will provide details regarding the overtime, working, additional shift arrangement and any sub-contracting facility if and when needed,

(iii) Data relating to materials stock, the availability of supplies and the leads times needed for deliveries into the system and distribution from the system,

(iv) Knowledge of company policy relating to work in progress and buffer stock levels,

(v) Details of the factory organisation, layout and maintenance facilities available,

(vi) Human factors which might affect the operation of the plan e.g. absenteeism and industrial unrest if any,

(vii) Feed-back information relating to actual production.

Manufacturing information system.

Manufacturing information system is a complete set of tool for managing the flow of manufacturing production data throughout the enterprise. This IS was designed to provide tools for both IT and operations personnel who would deliver services to anyone in the plant. Manufacturing consists of many different disciplinary areas including product engineering, facility design and scheduling, fabrications, and quality control management. Each of them can be dramatically improved by using information systems. A manufacturing system takes material, equipment, data management and information systems technology as the input and uses manufacturing and information processes to generate better final product as output. The manufacturing designed around the transaction process of raw materials into usable components or materials. These systems are value added processes such as materials processing or support systems such as scheduling.

Business information system.

Business information system in marketing, manufacturing, and human resources with a special emphasis on computer integrated manufacturing. It describes the most widely used types of accounting information systems as well as information needed for the effective financial management of a firm. Functional Business information systems: Marketing Production/operations Accounting Finance Human resource managemen

ACCOUNTING INFORMATION SYSTEM

Like MIS, Accounting Information System (AIS) is also a computer-based system, which an organization uses to take important financial decisions. An AIS will collect, process, analyze and store financial data of a company. And when called upon it will retrieve and report such data to its users, namely accountants, consultants, financial officers CFO, auditors, government tax authorities etc.

There are three basic objectives of an AIS, which are

- It helps an organization fulfill its statutory obligations of preparing and publishing certain accounting statements and information

- It analyses financial data and provides reliable and accurate financial information to the users of the AIS
- Protects a firms accounting data from breach or theft (which can be a significant problem)

Components of Accounting Information System

An AIS, like most computer systems, consists of six basic components. Let us take a look.

- ***People***: These are the users of the AIS. Internal users include accountants and other financial officers o the company. Then there are also users outside the organization, that can be given access to the AIS. Some such external users are auditors, consultants, tax authorities etc.
- ***Procedures***: These are the procedures the system follows to collect and process data. The database for such a process can be internal (like employee names, sales figures) or external databases (like customer orders, tax slabs etc). The feeding of the data can be both manual as well as automated.
- ***Data***: An AIS mainly deals with all kinds of financial and commercial data. Any data that is pertinent to the accounting of the firm will be input data for an AIS. Care must be taken that the data entered is accurate and complete. Examples of such data include invoices, orders, payroll, bills etc.
- ***Software***: AIS software performs all the functions of storing, processing, analyzing, retrieving financial data of a company. The software can be generalized software that is available in the market (Tally, Oracle etc) or can be specialized software created specifically for a particular company and it's accounting needs. Some of this software has an inbuilt internal control and audit options. They even help in tax management.
- ***Hardware***: Like any other information system, AIS will also require some hardware components. these can include computers, laptops, servers, printers, scanners, secondary storage hardware etc.

t 4. Accounting information system. Accounting information system is the part of organisations information system. The information system processes a mixture of quantitative and qualitative data but the accounting information system focuses almost entirely on processing quantitative data. The accounting system and information system must work together in an effective and efficient way. Accounting information system provide efficient delivery of information needed to perform necessary accounting work and to assist in delivery of accurate and informative data to users especially those who are not familiar with the accounting and financial reporting areas itself. A high value of data processing characterizes these applications. Data processing consists of 4 major tasks- data gathering, data manipulation, data storage, and document preparation.

Inventory Control System

An inventory control system is a technology solution that manages and tracks a company's goods through the supply chain. This technology will integrate and manage purchasing, shipping, receiving, warehousing, and returns into a single system.

The best inventory control system will automate a lot of manual processes. It will provide an accurate picture of what inventory you have, where it is, and when you need to reorder to keep your stock at optimal levels.

Types of Inventory Control Systems

Inventory control systems have evolved. Earlier systems were little more than spreadsheets, and now machine learning is adding more automation to inventory control. There are two key types of inventory control systems.

1. Perpetual inventory system.

A perpetual inventory control system tracks inventory in real-time. As soon as a product is sold, its barcode is scanned and it is removed from a global inventory database. When one is received, it is scanned and added to the inventory database. Each part of the system has access to the same database and information.

A perpetual inventory provides a highly detailed view of inventory changes and an accurate accounting of inventory levels without the need for manual inventory counts. It is suitable for all sizes of businesses and is necessary for stores with high sales volume or multiple locations.

2. Periodic inventory system.

A periodic inventory system is kept up to date by a physical count of goods on hand at specific intervals. With a periodic inventory system, a business will not know how many products it has until after the physical count is completed. It is easy to see how this can be a problem when it comes to filling orders. Your stock count was accurate weeks or months ago, but now when a customer wants to buy, you have to physically check your inventory to see if you have it to sell.

Counting stock manually is a process that takes a lot of time and manpower. Each and every SKU has to be counted. This would not work well for a large store. A periodic system is only acceptable for smaller businesses with minimal amounts of inventory.

Why Are Inventory Control Systems Important?

For your business to run smoothly and be profitable, you need to have the product on the shelves when a customer demands it. Underneath this simple statement lies the complexity of purchases, sales, shipping, receiving, and storage. An inventory control system will automate and manage this complexity so you can focus on other parts of your business.

1. Real-time inventory levels.

A perpetual inventory system will update inventory levels globally whenever a product is sold, purchased, manufactured, or returned. With an accurate real-time inventory, you can analyze inventory flow to set effective reorder points. This helps eliminate out-of-stock situations and excess inventory. Real-time inventory levels improve customer relationships by preventing backorders and improving employee relationships by giving them an accurate view of inventory status.

2. Optimize your logistic workflow.

Your supply chain is complex. There are a lot of steps involved in getting a product to your customer. An effective inventory control system will not only allow you to track a product each step of the way, but also give you the tools to find bottlenecks in your logistic workflow. This gives you more time to work on improvements.

3. Financial savings.

There are many ways inaccurate inventory can cost you. If you don't have a product in stock, a customer could cancel an order and buy that product somewhere else rather than wait on a backorder. On the other hand, an inaccurate inventory can also lead to excess stock which will increase storage cost, insurance cost, and taxes. An inventory control system will save you money by keeping inventory at optimal levels.

4. Reduce manual labor inaccuracies.

Physical inventory tracking can be prone to errors and fraud. By tracking a product from purchase order to customer delivery, an inventory control system will take human error and theft out of the equation.

5. Improve customer satisfaction.

In this day and age of next-day or even same-day delivery, customers expect to get their orders quickly. If your inventory is inaccurate, a customer could order an item you show in stock but don't actually have. This could result in a backorder or canceled order, which can lead to an unhappy customer who may not order from your store next time.

Conclusion

Inventory is the lifeblood of any ecommerce store. Having the right products in stock will prevent backorders, keeps customers happy, and make your business profitable. A robust inventory control system will do much of this work for you by automating manual inventory

control processes, streamlining your logistic workflow, and giving you a real-time view of inventory levels.

Introduction

In the opening chapters of this text, we focused on the technology behind information systems: hardware, software, data, and networking. In the last chapter, we discussed business processes and the key role they can play in the success of a business. In this chapter, we will be discussing the last component of an information system: people.

People are involved in information systems in just about every way you can think of: people imagine information systems, people develop information systems, people support information systems, and, perhaps most importantly, people *use* information systems.

The Creators of Information Systems

The first group of people we are going to look at play a role in designing, developing, and building information systems. These people are generally very technical and have a background in programming and mathematics. Just about everyone who works in the creation of information systems has a minimum of a bachelor's degree in computer science or information systems, though that is not necessarily a requirement. We will be looking at the process of creating information systems in more detail in chapter 10.

Systems Analyst

The role of the systems analyst is to straddle the divide between identifying business needs and imagining a new or redesigned computer-based system to fulfill those needs. This individual will work with a person, team, or department with business requirements and identify the specific details of a system that needs to be built. Generally, this will require the analyst to have a good understanding of the business itself , the business processes involved, and the ability to document them well. The analyst will identify the different stakeholders in the system and work to involve the appropriate individuals in the process.

Once the requirements are determined, the analyst will begin the process of translating these requirements into an information-systems design. A good analyst will understand what different technological solutions will work and provide several different alternatives to the requester, based on the company's budgetary constraints, technology constraints, and culture. Once the solution is selected, the analyst will create a detailed document describing the new system. This new document will require that the analyst understand how to speak in the technical language of systems developers.

A systems analyst generally is not the one who does the actual development of the information system. The design document created by the systems analyst provides the detail needed to create the system and is handed off to a programmer (or team of programmers) to do the actual creation of the system. In some cases, however, a systems analyst may go ahead

and create the system that he or she designed. This person is sometimes referred to as a programmer-analyst.

In other cases, the system may be assembled from off-the-shelf components by a person called a systems integrator. This is a specific type of systems analyst that understands how to get different software packages to work with each other.

To become a systems analyst, you should have a background both in the business and in systems design. Many analysts first worked as programmers and/or had experience in the business before becoming systems analysts.

Programmer

Programmers spend their time writing computer code in a programming language. In the case of systems development, programmers generally attempt to fulfill the design specifications given to them by a systems analyst. Many different styles of programming exist: a programmer may work alone for long stretches of time or may work in a team with other programmers. A programmer needs to be able to understand complex processes and also the intricacies of one or more programming languages. Generally, a programmer is very proficient in mathematics, as mathematical concepts underlie most programming code.

Computer Engineer

Computer engineers design the computing devices that we use every day. There are many types of computer engineers, who work on a variety of different types of devices and systems. Some of the more prominent engineering jobs are as follows:

- Hardware engineer. A hardware engineer designs hardware components, such as microprocessors. Many times, a hardware engineer is at the cutting edge of computing technology, creating something brand new. Other times, the hardware engineer's job is to engineer an existing component to work faster or use less power. Many times, a hardware engineer's job is to write code to create a program that will be implemented directly on a computer chip.
- Software engineer. Software engineers do not actually design devices; instead, they create new programming languages and operating systems, working at the lowest levels of the hardware to develop new kinds of software to run on the hardware.
- Systems engineer. A systems engineer takes the components designed by other engineers and makes them all work together. For example, to build a computer, the mother board, processor, memory, and hard disk all have to work together. A systems engineer has experience with many different types of hardware and software and knows how to integrate them to create new functionality.
- Network engineer. A network engineer's job is to understand the networking requirements of an organization and then design a communications system to meet those needs, using the networking hardware and software available.

There are many different types of computer engineers, and often the job descriptions overlap. While many may call themselves engineers based on a company job title, there is also a professional designation of "professional engineer," which has specific requirements behind it. In the US, each state has its own set of requirements for the use of this title, as do different countries around the world. Most often, it involves a professional licensing exam.

Information-Systems Operations and Administration

Another group of information-systems professionals are involved in the day-to-day operations and administration of IT. These people must keep the systems running and up-to-date so that the rest of the organization can make the most effective use of these resources.

Computer Operator

A computer operator is the person who keeps the large computers running. This person's job is to oversee the mainframe computers and data centers in organizations. Some of their duties include keeping the operating systems up to date, ensuring available memory and disk storage, and overseeing the physical environment of the computer. Since mainframe computers increasingly have been replaced with servers, storage management systems, and other platforms, computer operators' jobs have grown broader and include working with these specialized systems.

Database Administrator

A database administrator (DBA) is the person who manages the databases for an organization. This person creates and maintains databases that are used as part of applications or the data warehouse. The DBA also consults with systems analysts and programmers on projects that require access to or the creation of databases.

Help-Desk/Support Analyst

Most mid-size to large organizations have their own information-technology help desk. The help desk is the first line of support for computer users in the company. Computer users who are having problems or need information can contact the help desk for assistance. Many times, a help-desk worker is a junior-level employee who does not necessarily know how to answer all of the questions that come his or her way. In these cases, help-desk analysts work with senior-level support analysts or have a computer knowledgebase at their disposal to help them investigate the problem at hand. The help desk is a great place to break into working in IT because it exposes you to all of the different technologies within the company. A successful help-desk analyst should have good people and communications skills, as well as at least junior-level IT skills.

Trainer

A computer trainer conducts classes to teach people specific computer skills. For example, if a new ERP system is being installed in an organization, one part of the implementation

process is to teach all of the users how to use the new system. A trainer may work for a software company and be contracted to come in to conduct classes when needed; a trainer may work for a company that offers regular training sessions; or a trainer may be employed full time for an organization to handle all of their computer instruction needs. To be successful as a trainer, you need to be able to communicate technical concepts well and also have a lot of patience!

Managing Information Systems

The management of information-systems functions is critical to the success of information systems within the organization. Here are some of the jobs associated with the management of information systems.

CIO

The CIO, or chief information officer, is the head of the information-systems function. This person aligns the plans and operations of the information systems with the strategic goals of the organization. This includes tasks such as budgeting, strategic planning, and personnel decisions for the information-systems function. The CIO must also be the face of the IT department within the organization. This involves working with senior leaders in all parts of the organization to ensure good communication and planning.

Interestingly, the CIO position does not necessarily require a lot of technical expertise. While helpful, it is more important for this person to have good management skills and understand the business. Many organizations do not have someone with the title of CIO; instead, the head of the information-systems function is called vice president of information systems or director of information systems.

Functional Manager

As an information-systems organization becomes larger, many of the different functions are grouped together and led by a manager. These functional managers report to the CIO and manage the employees specific to their function. For example, in a large organization, there is a group of systems analysts who report to a manager of the systems-analysis function. For more insight into how this might look, see the discussion later in the chapter of how information systems are organized.

ERP Management

Organizations using an ERP require one or more individuals to manage these systems. These people make sure that the ERP system is completely up to date, work to implement any changes to the ERP that are needed, and consult with various user departments on needed reports or data extracts.

Project Managers

Information-systems projects are notorious for going over budget and being delivered late. In many cases, a failed IT project can spell doom for a company. A project manager is responsible for keeping projects on time and on budget. This person works with the stakeholders of the project to keep the team organized and communicates the status of the project to management. A project manager does not have authority over the project team; instead, the project manager coordinates schedules and resources in order to maximize the project outcomes. A project manager must be a good communicator and an extremely organized person. A project manager should also have good people skills. Many organizations require each of their project managers to become certified as a project management professional (PMP).

Information-Security Officer

An information-security officer is in charge of setting information-security policies for an organization, and then overseeing the implementation of those policies. This person may have one or more people reporting to them as part of the information-security team. As information has become a critical asset, this position has become highly valued. The information-security officer must ensure that the organization's information remains secure from both internal and external threats.

Emerging Roles

As technology evolves, many new roles are becoming more common as other roles fade. For example, as we enter the age of "big data," we are seeing the need for more data analysts and business-intelligence specialists. Many companies are now hiring social-media experts and mobile-technology specialists. The increased use of cloud computing and virtual-machine technologies also is breeding demand for expertise in those areas.