

Overview of Information Systems and Practical Aspects of their Applications in Enterprise Processes

Classification of System

On the basis of Elements

Abstract System also known as Conceptual System or Model can be defined as an orderly arrangement of interdependent ideas or constructs. For example, a system of theology is an orderly arrangement of ideas about God and the relationship of humans to God.

Physical System, on the other hand, is a set of tangible elements, which operated together to accomplish an objective e.g. Computer system, University system etc.

On the basis of Interactive behavior

An **Open System** interacts with other systems in its environment.

For example: Information system is an open system because it takes input from the environment and produces output to the environment, which changes as per the changes in the environment.

Closed System does not interact with the environment and does not change with the changes in environment.

Consider a 'throw-away' type sealed digital watch, which is a system, composed of a number of components that work in a cooperative fashion designed to perform some specific task.

On the basis of Working/Output

A **Deterministic System** operates in a predictable manner.

For example - software that performs on a set of instructions is a deterministic system.

A **Probabilistic System** can be defined in terms of probable behavior.

For example - inventory system is a probabilistic system where the average demand, average time for replenishment, etc may be defined, but the exact value at any given time is not known.

On the basis of Degree of Human intervention

In a **Manual System**, the activities like data collection, maintenance and final reporting are done by human.

In an **Automated System**, the activities like data collection, maintenance and final reporting are carried out by computer system or say machine itself.

Information Systems and its Components

Some of the important characteristics of Computer Based Information Systems are given as follows:

1. All systems work for predetermined objectives and the system is designed and developed accordingly.
2. In general, a system has a number of interrelated and interdependent subsystems or components.
3. No subsystem can function in **isolation**; it depends on other subsystems for its inputs.
4. If one subsystem or component of a system fails; in most of the cases, the whole system does not work. However, it depends on 'how the subsystems are **interrelated**'.
5. The way a subsystem works with another subsystem is called **interaction**.
6. The different subsystems interact with each other to achieve the **goal** of the system.
7. The work done by individual subsystems is integrated to achieve the **central goal** of the system.

8.The goal of individual subsystem is of lower priority than the goal of the entire system.

Functions of Information Systems

Finance and Accounting – The main goal of this subsystem is to ensure the financial viability of the organization, enforce financial discipline and plan and monitor the financial budget.

It also helps in forecasting revenues, determining the best resources and uses of funds and managing other financial resources.

Typical **sub-application areas** in finance and accounting are –

Financial accounting;
General ledger;
Accounts receivable/payable;
Asset accounting;
Investment management;
Cash management;
Treasury management;
Fund management
Balance sheet.

Marketing and Sales – Marketing and sales activities have a key role for running a business successfully in a competitive environment.

The objective of this subsystem is to maximize the sales and ensure customer satisfaction.

The marketing system facilitates the chances of order procurement by marketing the products of the company, creating new customers and advertising the products.

The sales department may use an order processing system to keep the status and track of orders, generate bills for the orders executed and delivered to the customer, strategies for rendering services during warranty period and beyond, analyzing the sales data by category such as by region, product, sales manor sales value.

Production or Manufacturing – The objective of this subsystem is to optimally deploy man, machine and material to maximize production or service.

The system

generates production schedules and
schedules of material requirements,
monitors the product quality,

plans for replacement or overhauling the machinery and also helps in overhead cost control and waste control.

Inventory /Stores Management- The inventory management system is designed with a view to keeping the track of materials in the stores.

The system is used to regulate the maximum and minimum level of stocks, raise alarm at danger level stock of any material, give timely alert for re-ordering of materials with optimal re-order quantity and facilitate

various queries about inventory like total inventory value at any time, identification of important items in terms stock value (ABC analysis), identification most frequently moving items (XYZ analysis) etc.

Human Resource Management- Human resource is the most valuable asset for an organization.

Utilization of this resource in the most effective and efficient way is an important function for any enterprise.

Human Resource Management System (HRMS) aims to achieve this goal. Skill database maintained in HRM system, with details of qualifications, training, experience, interests etc. helps management for allocating manpower to right activity at the time of need or starting a new project.

This system also keeps track of employees' output or efficiency.

An **HRM system** may have the following modules –

Promotion management

Recruitment management;

Travel management;

Benefit administration;

Salary administration;

Personnel administration; etc.

Types of Information Systems – OK-MS

Operational-Level Systems (OLS)	Knowledge-Level Systems(KLS)	Management-Level Systems(MLS)	Strategic Level Systems (SLS)
TPS Activities TPS components – IPSO -Input -Processing -Storage -Output Features of TPS – (SLAB) -Source of input for other systems -Large volume of data -Automation of basic operations -Benefits are easily measurable	(A) Office Automation Systems (OAS) >OAS operations -Document Capture -Document Creation -Receipts and Distribution -Recording Utilization of Resources -Calculations -Filling, Search, Retrieval and Follow up >4-Benefits of OAS >Computer Based OAS -TPS -EDMS -EMCS +Electronic Mail +FAX +Voice Mail -Teleconferencing and Video-conferencing Systems	(A) Management Information Systems (MIS) >Characteristics of an effective MIS -Management Oriented -Management Directed -Integrated -Computerized -Common Data Flows -Common Database -Heavy Planning Element -Sub System Concept >8-Misconceptions about MIS >Pre-requisites of an Effective MIS -Database -Qualified System and Management Staff -Support of Top Management -Control and maintenance of MIS >Evaluation of MIS >Constraints in operating a MIS >8-Limitations of MIS	(A) Executive Information Systems (EIS) >6-Characteristics of EIS. >5-types of information used in executive decision making –(H-FILL) -High degree of uncertainty -Future orientation -Informal Source -Lack of structure -Low level of detail >6-Contents/Principles of EIS >7-Differences between EIS vs TIS.

	(B) Knowledge Management System (KMS) -Explicit -Tacit	(B) Decision Support System (DSS) >planning languages -GPPL -SPPL >10-Characteristics of DSS >3-Components of DSS -The user -Databases Implementation of Database – 3 levels +Physical +Logical +External -Model base >Examples of DSS in Accounting -CAS -CBS -BVAS -GDSS >6 -Difference between DSS and traditional MIS	
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Specialized Systems-ECC

(A) Expert System	(B) Cross Functional Information Systems	(C) Core Banking System (CBS)
Business applications of ES-(AMMPG) -Account and Finance -Marketing -Manufacturing -Personnel -General Business >Need for ES – (3 MAJOR REASONS) >5-Benefits of ES Potential applications of ES –(CA-DSE) -Complexity -Availability -Domain -Structure -Expertise	>ERP >Components of ERP – (S-PCC) -Software Component -Process Flow -Customer Mindset -Change Management >10-Benefits of ERP	10-Elements of core banking

Application of Information Systems in Enterprise Processes

3 vital roles in business firms -S³

1.Support an organization's business processes and operations: This includes operations support systems such as Transaction Processing Systems, Process Control Systems.

2.Support business decision-making: This includes MIS, DSS, and EIS.

3.Support strategic competitive advantage: This includes ES, KMS, SIS, and Functional Business Systems.

To operate Information Systems (IS) effectively and efficiently a business manager should have following knowledge about it: (MB-DFI)

Management Challenges – It includes

‘how the function and IT resources are maintained’ and utilized to attain top performance and build the business strategies.

Business Applications – It includes major uses of IT in business steps i.e. processes, operations, decision making, and strategic/competitive advantage.

Development Processes – It comprise how end users and IS specialists develop and execute business/IT solutions to problems.

Foundation Concepts – It includes fundamental business, and managerial concepts

e.g. ‘what are components of a system and their functions’, or ‘what competitive strategies are required’.

Information Technologies (IT) – It includes

operation,
development and management of hardware,
software,
data management,
networks, and
other technologies.

Following are some of the important implications of information systems in business:

Information system	- helps managers in efficient decision-making to achieve the organizational goals. - helps in making right decision at the right time i.e. just on time. - is viewed as a process; it can be integrated to formulate a strategy of action or operation. - may help in generating innovative ideas for solving critical problems
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-An organization will be able to survive and thrive in a highly competitive environment on the strength of a well-designed Information system.

-Knowledge gathered through Information system may be utilized by managers in unusual situations.

Various types of Business Applications

1. E-business

This is also called electronic business and includes purchasing, selling, production management, logistics, communication, support services and inventory management through the use of internet technologies.

The primary components of E - business are infrastructure (computers, routers, communication media e.g. wire, satellite etc., software and programmers), electronic commerce and electronically linked devices and computer aided networks.

The advantage of E-business is 24-hour sale, lower cost of doing business, more efficient business relationship, eliminate middlemen, unlimited market place and access with broaden customer base, secure payment systems, easier business administration and online fast updating.

Only investment is needed in the purchase of space on internet, designing and maintenance of website.

Different types of business can be done e.g. it may be B2B (Business to Business), B2C (Business to Customer), C2C (Customer to Customer) and C2B (Customer to Business).

2. Financial Service Sector

The financial services sector (banks, building societies, life insurance companies and short term insurers) manages large amounts of data and processes enormous numbers of transactions every day.

Owing to application of IT, all the major financial institutions operate nationally and have wide networks of regional offices and associated electronic networks.

The associated substantial client databases are handled via large central mainframe systems that characterize the industry.

IT has changed the working style of financial services and makes them easier and simpler for customers also.

It also reduces their cost in terms of office staff and office building.

Through the use of internet and mobile phones financial service sectors are in direct touch with their customers and with adequate databases it will be easier for service sectors to manage customer relationships. For example, through emails or SMS

3. Wholesaling and Retailing

A visit to any large store will show that IT has become a vital part of retailing.

Retail business uses IT to carry out basic functions including till systems for selling items, capturing the sales data by item, stock control, buying, management reports, customer information and accounting.

The laser scanners used in most grocery supermarkets and superstores to read product bar codes are among the most distinctive examples of modern computer technology.

By using internet or mobile phones retailers can collect and exchange data between stores, distribution centers, suppliers and head offices.

Public sectors

It includes services provided by the government mainly hospitals, police stations, universities etc.

IT/IS can be used here, to keep records of the cases, respective people involved it, other related documents and can consult the existing data warehouse or databases to take appropriate actions.

4.Others

IT is efficiently used in entertainment industry (games, picture collection etc.), agriculture industry (information is just a mouse click away to the farmers), Tour industry (railway, hotel and airline reservations) and consultancy etc.

Thus, we can say that IT has changed the working style of business world drastically and make it simpler day-by-day with its advancement.

Overview of Underlying IT Technologies

we discuss some of the IT tools crucial for business growth. **(CB-SBI)**

1.Business Website

By having a website, enterprise/business becomes reachable to large amount of customers.

In addition, it can also be used in an advertisement, which is cost effective and in customer relationship management.

These websites can be designed by using HTML, XML, ASP.NET etc.

2.Internet and Intranet

It is the best source of communication. Time and space is no more obstacles for conducting meeting of people working in a team from multiple locations, or with different vendors and companies.

Intranet is system that permits the electronic exchange of business data within an organization, mostly between managers and senior staff.

E-commerce among partners (suppliers, wholesalers, retailers, distributors) using intranets, e-mail etc. provides new platform to the business world for conducting business in a faster and easier way.

3.Software and Packages

DBMS, data warehousing, data mining tools, knowledge discovery can be used for getting information that plays important role in decision making that can boost the business in the competitive world.

e.g. by having information of buying habits of customer, sales of product; marketing strategy can be built quickly and effectively with the use of data mining tools and Knowledge Discovery in Database (KDD).

These can be used in Supply chain logistics, including planning, purchasing, replenishment, logistics, and space management.

4.Business Intelligence (BI)

refers to applications and technologies that are used to collect and provide access and analyze data and information about companies' operations.

BI software consists of range of tools.

Some BI applications are used to analyze performance or internal operations e.g. EIS (executive information system), business planning, finance and budgeting tools.

While others are used to store and analyze data e.g. Data mining, data warehouses, Decision support system etc.

Some BI applications are also used to analyze or manage the human resources e.g. customer relationship and marketing tools.

A complete Business Intelligence provides consistent and standard information essential in enterprise operations.

5. Computer Systems, Scanners, Laptop, Printer, Webcam, Smart Phone etc.

Webcam, microphone etc. are used in conducting long distance meeting.

Use of computer systems, printer; scanner increases accuracy; reduce processing times; enable decisions to be made more quickly and speed up customer service.

For example, one can charge accurate prices and eliminates the need to apply price labels to individual items by the use of scanning system.