EDO STATE POLYTECHNIC,
USEN
SCHOOL OF APPLIED SCIENCE
DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY
COURSE CODE: COM224   CLASS:ND 2
COURSE TITLE: MANAGEMENT INFORMATION SYSTEM.
Question 1

(a) Explain the term MIS?
(b) Define the following (i) a system (ii) a subsystem? (iii) a supersystem

Question 2

(a) Define probabilistic system and deterministic system.

(b) What is a cybernetic system?

(c) Explain close and open system

Question 3

(a) Define management, list and explain the management functions
(b) List seven principles of management

Question 4

(a) List the three categories of information and explain
(b) What are characteristics of the following :
    (i)   operational information
    (ii)   tactical information
    (iii)   strategic information

Question 5

(a) what are different activities of MIS
(b) list ten benefits of MIS to business organization

Question 6

(a) what is Data Processing
(b) list seven of the data processing activities

Question 7

        Diagrammatically explain data communication, computer networks/internet

Question 8

(a) List and explain the types of information systems
(b) List and explain different classification of database

SOLUTIONS

COURSE CODE: COM224
COURSE TITLE: MANAGEMENT INFORMATION SYSTEM.

Qusstion1

(a) Management information system is a system consisting of people, machines, procedures, databases and data models, as its elements. The system gathers data from the internal and external sources of an organization.

(b) i. System:

The term system is the most loosely held term in management literature because of its

use in different contexts. However, a system may be defined as a set of elements which are

joined together to achieve a common objective. The elements are interrelated and

interdependent.

ii.subsystem :Group of interconnected and interactive parts that performs an important job or task as a component of a larger system.

iii. A super system, is that which includes or encompasses more than one subsidiary system.

question 2

(a) A system is deterministic if its outputs are certain. This means that the relationships between its components are fully known and certain. Hence, when an input is given the output is fully predictable. An example of a deterministic system is the common entrance examination for entry into IIM. All the entities in the system and their interrelationships are well known and given an input the output can be determined with certainty

A probabilistic system is one where the output from the system behaves probabilistically, i.e., the output is predictable according to probability values. The portfolio investment systems of an asset management company that invests in the stock market will have a probabilistic output for a given input as the system and its entities behave probabilistically.

(b) It is Science dealing with mechanisms employed by natural and man-made systems to learn and evolve, and to organize, regulate, and reproduce themselves

(c) A system is said to be closed if it does not interact with the environment in which it exists. It is in a state of isolation. It is completely self-contained. This is only of theoretical interest as in reality systems exhibit different degrees of openness.

A system is said to be open when it interacts with the environment in which it exists. It exchanges inputs and outputs with the environment. Such regular interaction with the

environment makes the study of open systems difficult (Checkland 1981). A system might be said to be 'open' with regard to some entities and processes but might exhibit 'closed' behavior with respect to other entities and processes.

Question 3

(a) The organization and coordination of the activities of a business in order to achieve defined objectives. Management is often included as a factor of production along with? machines, materials, and money. According to the management guru Peter Drucker (1909-2005), the basic task of management includes both marketing and innovation.

(b) The functions of management are as follows:

i. Planning

Planning is looking ahead. According to Henri Fayol, drawing up a good plan of action is the hardest of the five functions of management. This requires an active participation of the entire organization. With respect to time and implementation, planning must be linked to and coordinated on different levels. Planning must take the organization's available resources and flexibility of personnel into consideration as this will guarantee continuity.

ii. Organizing

An organization can only function well if it is well-organized. This means that there must be sufficient capital, staff and raw materials so that the organization can run smoothly and that it can build a good working structure. The organizational structure with a good division of functions and tasks is of crucial importance. When the number of functions increases, the organization will expand both horizontally and vertically. This requires a different type of leadership. Organizing is an important function of the five functions of management.

iii. Commanding

When given orders and clear working instructions, employees will know exactly what is required of them. Return from all employees will be optimized if they are given concrete instructions with respect to the activities that must be carried out by them. Successful managers have integrity, communicate clearly and base their decisions on regular audits. They are capable of motivating a team and encouraging employees to take initiative.

iv. Coordinating

Coordination therefore aims at stimulating motivation and discipline within the group dynamics. This requires clear communication and good leadership. Only through positive employee behaviour management can the intended objectives be achieved.

v. Controlling

By verifying whether everything is going according to plan, the organization knows exactly whether the activities are carried out in conformity with the plan.

Control takes place in a four-step process:

    i.   Establish performance standards based on organizational objectives
      ii. Measure and report on actual performance
      iii. Compare results with performance and standards
      iv. Take corrective or preventive measures as needed

   (c) List the principles of management

    i.   Division of Labor
    ii.   Party of Authority & Responsibility
    iii.   Unity of Direction
    iv.   Equity
    v.   Order
    vi.   Discipline
    vii.   Scalar Chain
    viii. Centralization & De-Centralization

Question 4

   (a) It
   (b) i. Operational Information: Operational information is concerned with plant/business level information and is used to ensure proper conduction of specific operational tasks as planned/intended. Various operator specific, machine specific and shift specific jobs for quality control checks comes under this category.

       ii. Tactical Information: Tactical information is concerned with the information needed for exercising control over business resources, like budgeting, quality control, service level, inventory level, productivity level.

       iii. Strategic Information: Strategic information is concerned with long term policy decisions that defines the objectives of a business and checks how well these objectives are met. For example, acquiring a new plant, a new product, diversification of business etc., comes under strategic information.

Question 5

      (a)

i.   Data Capturing:

      MIS captures data from various internal and external sources of an organization. Data capturing may be manual or through computer terminals. End users, typically record

data about transactions on some physical medium such as paper form or enter it directly into a computer system.

ii. Processing of data:

The captured data is processed to convert it into the required management information. Processing of data is done by such activities as calculating, comparing, sorting, classifying and summarizing.

iii. Storage of information:

MIS stores processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organizational record. In this activity, data and information are retained in an organized manner for later use. Stored data is commonly organized into fields, records, files and databases.

iv. Retrieval of information:

MIS retrieves information from its stores as and when required by various users. As per the requirements of the management users, the retrieved information is either disseminated as such or it is processed again to meet the exact demands.

v. Dissemination of MIS:

Management information, which is a finished product of MIS, is disseminated to the users in the organization. It could be periodic, through reports or on-line through computer terminals.

(b) Benefits of MIS:

Functional MIS leaves managers guessing in the dark. Employees are busy going through their workdays without direction or purpose. A management information system provides the data to identify non-performing areas and leads to the following benefits:

i. **Helps to achieve a higher level of efficiency:** Managers have the information needed to identify a company's strengths and weaknesses.

ii. **Improves the quality of decisions:** Better availability of information reduces uncertainty and lets managers make more rational decisions based on reliable data.

iii. **Promotes better communications between departments in a workplace:** When managers, department heads and employees are sharing the same information, there is better communication between them to identify problem areas and find mutually agreeable solutions.

iv. **Provides a platform to explore different scenarios for various alternatives and economic environments:** Management is able to explore various alternatives to see the possible results before making decisions and commitments.

v. **Improves employee productivity:** Employees are more productive because they don't have to spend time gathering the data that management wants. A well-designed MIS will gather all the data without any more input from employees.

vi. **Strengthens a company's competitive advantage:** Running a more efficient business by reducing and eliminating weaknesses and non-performing areas increases a company's competitive advantage over its rivals.

vii. **Reveals more data about customers:** With more data about the needs of customers, management is better able to improve customer service and design more effective marketing and promotional campaigns.

A management information system is essential for any small business owner who is serious about improving the performance of his company. Without a good MIS, managers are managing by trial-and-error rather than making intelligent decisions based on a thoughtful analysis of data.

Question 6

    (a) What is data processing?

General: Operations performed on a given set of data to extract the required information in an appropriate form such as diagrams, reports, or tables. See also electronic data processing. In Computing, it is Manipulation of input data with an application program to obtain desired output as an audio/video, graphic, numeric, or text data file.

(b) Stages of the Data Processing Cycle:

i. *Collection* is the first stage of the cycle, and is very crucial, since the quality of data collected will impact heavily on the output. The collection process needs to ensure that the data gathered are both defined and accurate, so that subsequent decisions based on the findings are valid. This stage provides both the baseline from which to measure, and a target on what to improve.

ii) *Preparation* is the manipulation of data into a form suitable for further analysis and processing. Raw data cannot be processed and must be checked for accuracy. Preparation is about constructing a data set from one or more data sources to be used for further exploration and processing. Analyzing data that has not been carefully screened for problems can produce highly misleading results that are heavily dependent on the quality of data prepared.

iii) *Input* is the task where verified data is coded or converted into machine readable form so that it can be processed through an application. Data entry is done through the use of a keyboard, scanner, or data entry from an existing source. This time-consuming process requires speed and accuracy. Most data need to follow a formal and strict syntax since a great deal of processing power is required to breakdown the complex data at this stage. Due to the costs, many businesses are resorting to outsource this stage.

iv) *Processing* is when the data is subjected to various means and methods of powerful technical manipulations using Machine Learning and Artificial Intelligence algorithms to generate an output or interpretation about the data. The process may be made up of multiple threads of execution that simultaneously execute instructions, depending on the type of data. There are applications like Anvesh available for processing large volumes of heterogeneous data within very short periods.

v) *Output* and interpretation is the stage where processed information is now transmitted and displayed to the user. Output is presented to users in various report formats like graphical reports, audio, video, or document viewers. Output need to be interpreted so that it can provide meaningful information that will guide future decisions of the company.

vi) *Storage* is the last stage in the data processing cycle, where data, and metadata (information about data) are held for future use. The importance of this cycle is that it allows quick access and

retrieval of the processed information, allowing it to be passed on to the next stage directly, when needed.

The **Data Processing Cycle** is a series of steps carried out to extract useful information from raw data. Although each step must be taken in order, the order is cyclic. The output and storage stage can lead to the repeat of the data collection stage, resulting in another cycle of data processing. The cycle
provides a view on how the data travels and transforms from collection to interpretation, and ultimately, used in effective business decisions.

Question 7

(a) Data communication refers to the exchange of data between a source and a receiver via form of transmission media such as a wire cable. Data communication is said to be local if communicating devices are in the same building or a similarly restricted geographical area.

A data communication system may collect data from remote locations through data transmission circuits, and then outputs processed results to remote locations.   The different data communication techniques which are presently in widespread use evolved gradually either to improve the data communication techniques already existing or to replace the same with better options and features. Then, there are data communication jargons to contend with such as baud rate, modems, routers, LAN, WAN, TCP/IP, ISDN, during the selection of communication systems. Hence, it becomes necessary to review and understand these terms and gradual development of data communication methods.

Simple Data Communication System

(b) A computer network is a group of computer systems and other computing hardware devices that are linked together through communication channels to facilitate communication and resource-sharing among a wide range of users. Networks are commonly categorized based on their characteristics.

A Data Communication System using Remote Locations

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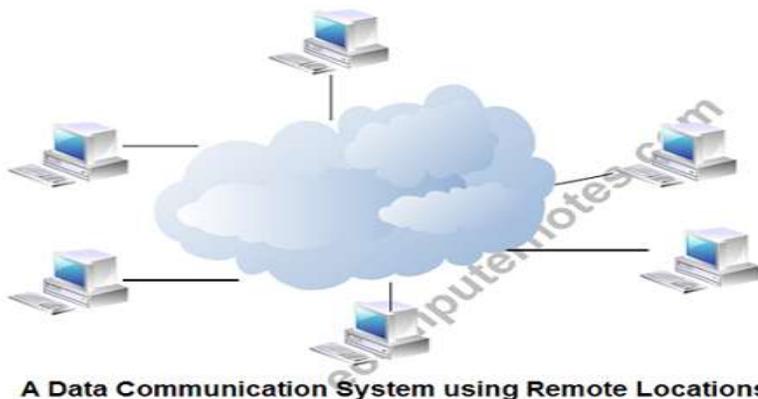
The internet is a globally connected network system that uses TCP/IP to transmit data via various types of media. The internet is a network of global exchanges – including private, public, business, academic and government networks – connected by guided, wireless and fiber-optic technologies.

The terms internet and World Wide Web are often used interchangeably, but they are not exactly the same thing; the internet refers to the global communication system, including hardware and infrastructure, while the web is one of the services communicated over the internet.

Question 8

(a)

Transaction Processing System (TPS)

Transaction processing systems are used to record day to day business transactions of the organization. They are used by users at the operational management level. The main objective of a transaction processing system is to answer routine questions such as;

- How printers were sold today?
- How much inventory do we have at hand?
- What is the outstanding due for John Doe?

By recording the day to day business transactions, TPS system provides answers to the above questions in a timely manner.

- The decisions made by operational managers are routine and highly structured.
- The information produced from the transaction processing system is very detailed.

For example, banks that give out loans require that the company that a person works for should have a memorandum of understanding (MoU) with the bank. If a person whose employer has a MoU with the bank applies for a loan, all that the operational staff has to do is verify the submitted documents. If they meet the requirements, then the loan application documents are processed. If they do not meet the requirements, then the client is advised to see tactical management staff to see the possibility of signing a MoU.

Examples of transaction processing systems include;

- **Point of Sale Systems** – records daily sales
- **Payroll systems** – processing employees salary, loans management, etc.
- **Stock Control systems** – keeping track of inventory levels
- **Airline booking systems** – flights booking management

Management Information System (MIS)

Management Information Systems (MIS) are used by tactical managers to monitor the organization's current performance status. The output from a transaction processing system is used as input to a management information system.

The MIS system analyzes the input with routine algorithms i.e. aggregate, compare and summarizes the results to produced reports that tactical managers use to monitor, control and predict future performance.

For example, input from a point of sale system can be used to analyze trends of products that are performing well and those that are not performing well. This information can be used to make future inventory orders i.e. increasing orders for well-performing products and reduce the orders of products that are not performing well.

Examples of management information systems include;

- **Sales management systems** – they get input from the point of sale system
- **Budgeting systems** – gives an overview of how much money is spent within the organization for the short and long terms.
- **Human resource management system** – overall welfare of the employees, staff turnover, etc.

Tactical managers are responsible for the semi-structured decision. MIS systems provide the information needed to make the structured decision and based on the experience of the tactical managers, they make judgement calls i.e. predict how much of goods or inventory should be ordered for the second quarter based on the sales of the first quarter.

Decision Support System (DSS)

Decision support systems are used by senior management to make non-routine decisions. Decision support systems use input from internal systems (transaction processing systems and management information systems) and external systems.

The main objective of decision support systems is to provide solutions to problems that are unique and change frequently. Decision support systems answer questions such as;

- What would be the impact of employees' performance if we double the production lot at the factory?
- What would happen to our sales if a new competitor entered the market?

Decision support systems use sophisticated mathematical models, and statistical techniques (probability, predictive modeling, etc.) to provide solutions, and they are very interactive.

Examples of decision support systems include;

- **Financial planning systems** – it enables managers to evaluate alternative ways of achieving goals. The objective is to find the optimal way of achieving the goal. For example, the net profit for a business is calculated using the formula Total Sales less (Cost of Goods + Expenses). A financial planning system will enable senior executives to ask what if questions and adjust the values for total sales, the cost of goods, etc. to see the effect of the decision and on the net profit and find the most optimal way.
- **Bank loan management systems** – it is used to verify the credit of the loan applicant and predict the likelihood of the loan being recovered.

Artificial intelligence techniques in business

Artificial intelligence systems mimic human expertise to identify patterns in large data sets. Companies such as Amazon, Facebook, and Google, etc. use artificial intelligence techniques to identify data that is most relevant to you.

Let's use Facebook as an example, Facebook usually makes very accurate predictions of people that you might know or went with to school. They use the data that you provide to them, the data that your friends provide and based on this information make predictions of people that you might know.

Amazon uses artificial intelligence techniques too to suggest products that you should buy also based on what you are currently getting.Google also uses artificial intelligence to give you the most relevant search results based on your interactions with Google and your location.

Online Analytical Processing (OLAP)

Online analytical processing (OLAP) is used to query and analyze multi-dimensional data and produce information that can be viewed in different ways using multiple dimensions.

(b)

Types And Classification Of Database Management System

There are several criteria based on which DBMS is classified. The classification and types of **Database Management System**(DBMS) is explained below based on the different factors.

Based on the data model

Relational database – This is the most popular data model used in industries. It is based on the SQL. They are table oriented which means data is stored in different access control tables, each has the key field whose task is to identify each row. The tables or the files with the data are called as relations that help in designating the row or record, and columns are referred to attributes or fields. Few examples are MYSQL(Oracle, open source), Oracle database (Oracle), Microsoft SQL server(Microsoft) and DB2(IBM).
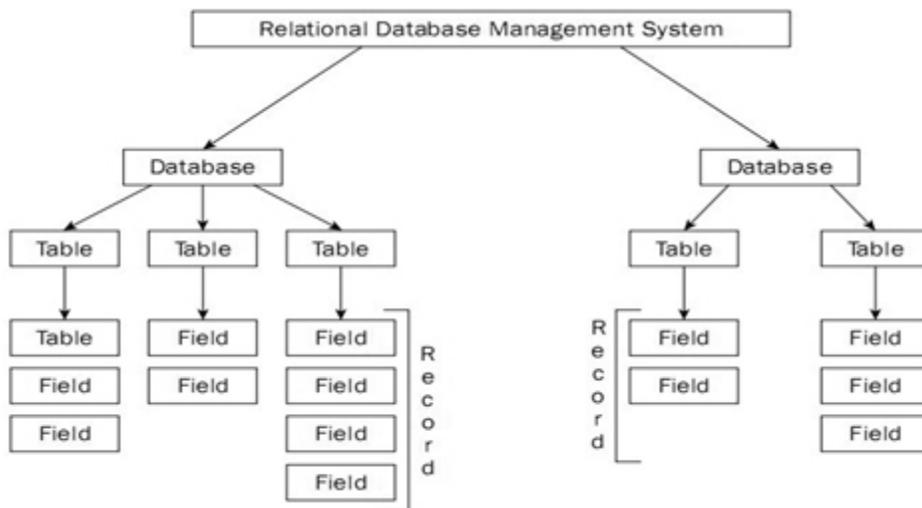
Object oriented database – The information here is in the form of the object as used in object oriented programming. It adds the database functionality to object programming languages. It requires less code, use more natural data and also code bases are easy to maintain. Examples are ObjectDB (ObjectDB software).

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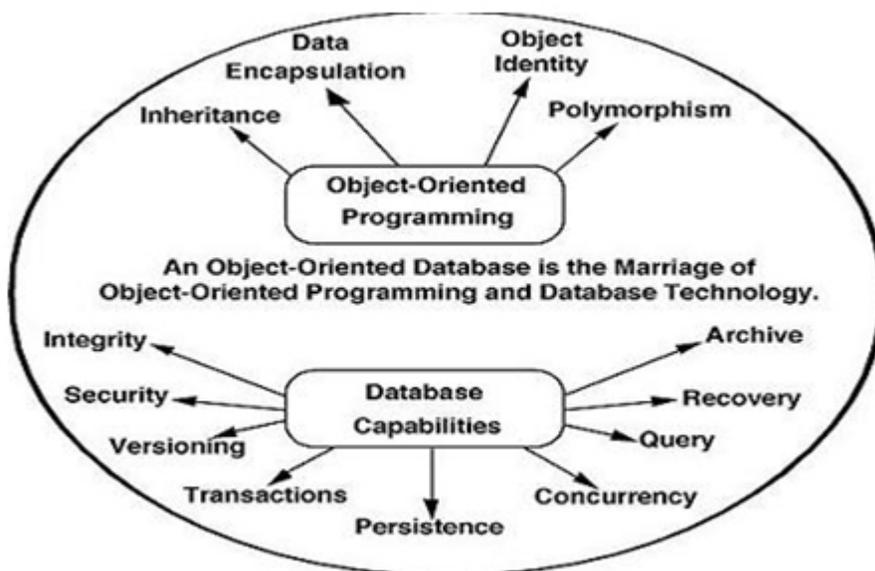
Object relational database – Relational DBMS are evolving continuously and they have been incorporating many concepts developed in object database leading to a new class called extended relational database or object relational database.

Hierarchical database – In this, the information about the groups of parent or child relationships is present in the records which is similar to the structure of a tree. Here the data follows a series of records, set of values attached to it. They are used in industry on mainframe platforms. Examples are IMS(IBM), Windows registry(Microsoft).

Hierarchical Database Model
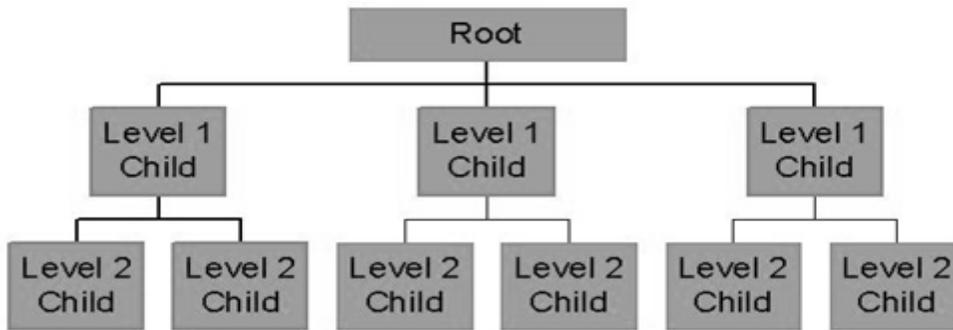
Network database – Mainly used on a large digital computers. If there are more connections, then this database is efficient. They are similar to hierarchical database, they look like a cobweb or interconnected network of records. Examples are CA-IDMS(COMPUTER associates), IMAGE(HP).
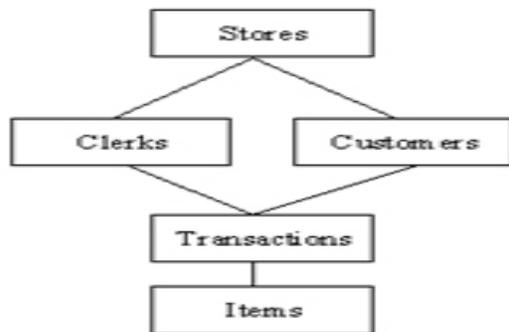

Based on the number of users

Single user – As the name itself indicates it can support only one user at a time. It is mostly used with the personal computer on which the data resides accessible to a single person. The user may design, maintain and write the database programs.

Multiple users – It supports multiple users concurrently. Data can be both integrated and shared,a database should be integrated when the same information is not need be recorded in two places. For example a student in the college should have the database containing his information. It must be accessible to all the departments related to him. For example the library department and the fee section department should have information about student's database. So in such case, we can integrate and even though database resides in only one place both the departments will have the access to it.

Based on the sites over which network is distributed

Centralized database system – The DBMS and database are stored at the single site that is used by several other systems too. We can simply say that data here is maintained on the centralized server.
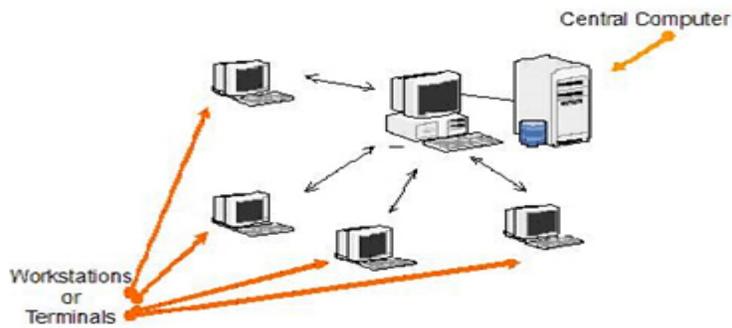
Parallel network database system – This system has the advantage of improving processing input and output speeds. Majorly used in the applications that have query to larger database. It holds the multiple central processing units and data storage disks in parallel.

Distributed database system – In this data and the DBMS software are distributed over several sites but connected to the single computer.
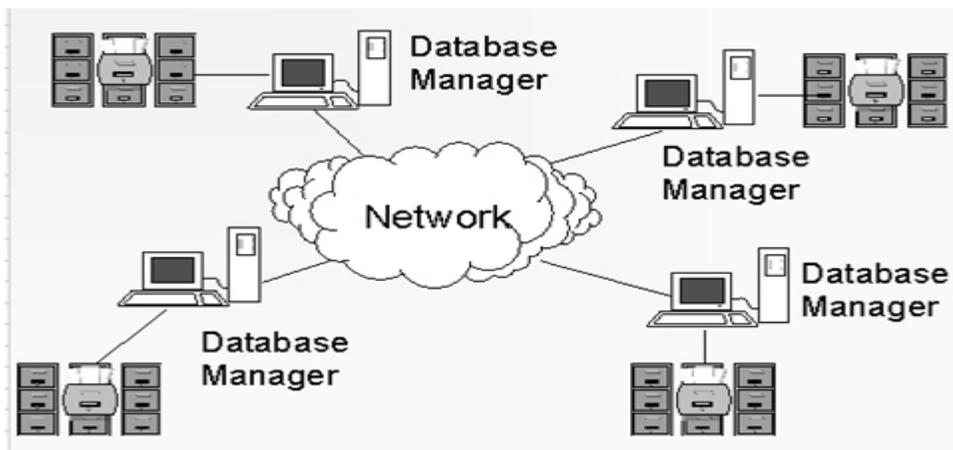
 Further they are classified as

i.**.Homogeneous DBMS** – They use same software but from the multiple sites. Data exchange between the sites can be handled easily. For example, library information systems by the same vendor ,such as Geac Computer corporation, use the same DBMS software that allows the exchanges between various Geac library sites.

    ii. .**heterogeneous DBMS** – They use different DBMS software for different sites but there is a additional software that helps the exchange of the data between the sites.

Client-server database system – This system has two logical components namely client and server. Clients are generally the personal computers or workstations whereas servers are the large workstations, mini range computers or a main frame computer system. The applications and tools of the DBMS run on the client platforms and the DBMS software on the server. Both server and client computers are connected over the network. We can relate it to client and server in real life to understand in a much better way. Here the applications and tools act as a client send the requests for its services. The DBMS processes these requests and returns the result to the client. Server handles jobs that are common to many clients say database access and updates.

Multi-tier client-server database system – The rise of personal computers in business has increased the reliability of the network hardware leading to evolution of two-tier and three-tier systems which use different software for the client and software.

Based on the access

This classification simply based on the access to data in the database systems

Sequential access – One after the other.

Online transaction processing(OLTP) DBMS – They manage the operational data. Database server must be able to process lots of simple transactions per unit of time. Transactions are initiated in real time, in simultaneous by lots of user and applications hence it must have high volume of short, simple queries.

Online analytical processing(OLAP) DBMS – They use the operational data for tactical and strategical decision making. They have limited users deal with huge amount of data,complex queries.

Big data and analytics DBMS – To cope with big data new database technologies have been introduced. One such is NoSQL (not only SQL) which abandons the well known relational database scheme.

XML DBMS two types

    i.   Native XML DBMS – Use the logical,intrinsic structure of XML document.
    ii. Enabled XML DBMS – Existing DBMS with facilities to store XML data and structured data in integrated way.

Multimedia DBMS – Stores data such as text, images, audio, video and 3D games which are usually stored in binary large object.

GIS DBMS – Stores and queries the spatial data.

Sensor DBMS – Allows to manage sensor data, bio-metric and telematics data.

Mobile DBMS – Runs on the smartphones, tablets. It Handles the local queries. Supports self management(no DBA).

Open source DBMS – Code is publicly available and can be extended by anyone, popular for small business

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EDO STATE POLYTECHNIC
USEN
SCHOOL OF APPLIED SCIENCE
DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY
COURSE CODE: COM122   **CLASS:ND 1**
COURSE TITLE: INTRODUCTION TO INTERNET.

                INSTRUCTION: Answer Question 1 and any other 2

QUESTION.(compulsory)

    (i)   Explain how you can open an email address.
    (ii)   Explain how to attach a file.
    (iii)   Explain some business you can do on the internet.

Question 2 (15mks)

    (a) What is Internet?
    (b) Write briefly on ARPANET
    (c) What is a web browser?

Question 3 (15mks)

        What is the meaning of the following:
        Browser, download, upload, Email, filter, home page, HTML, HTTP, hypertext, search engine, TCP/IP, URL, WWW

Question 4 (15mks)

    (a) With the aid of a diagram, explain the Microsoft internet explorer toolbar
    (b) What is a domain? And give some examples.

Question 5 (15mks)

    (a) Explain how to search the web
    (b) Give some examples of search engines

Solutions

COURSE CODE: COM122
COURSE TITLE: INTRODUCTION TO INTERNET.