OFFICE AUTOMATION:

Office automation refers to the application of computer and communication technology to office functions.

Office automation systems are meant to improve the productivity of managers at various levels of management by providing secretarial assistance and better communication facilities.

Office automation system is the combination of hardware, software and people in information system that process office transactions and support office activities at all levels of the organization.

These systems include a wide range of support facilities, which include word processing, electronic filing, electronic mail, message switching, data storage, data and voice communications, etc.

Office activities may be grouped under two classes, namely:

1. Activities performed by clerical personnel (clerks, secretaries, typists, etc).

2. Activities performed by the executives (manages, engineers or other professionals like economists, researchers etc.)

In the first category, the following is a list of activities

a. Typing

b. Mailing

c. Scheduling of meetings and conferences,

d. Calendar keeping and

e. Retrieving documents

The following is a list of activities in the second category (managerial category)

a. Conferencing

b. Production of information (messages, memos, reports, etc) and

c. Controlling performance

Information technology facilitates both types of activities. A wide variety of office automation devices like fax machine, copier, phones etc. are used in officer.

Some of the applications of office automation systems are discussed, in brief:

✓ **WORD PROCESSING:** This refers to the computer –assisted preparation of documents (like letters, reports, memos, etc) from textual data. Data once entered can be manipulated in various ways.

✓ **ELECTRONIC FILING:** This facilitates the filling of incoming and outgoing mail/documents on a magnetic media. Information is captured from the documents and is stored for future reference.

✓ **ELECTRONIC MAIL:** It involves the transfer of letters and other documents through telecommunication lines, rather than through physical delivery. An electronic mail system requires a telecommunication network and software.

DECISION SUPPORT SYSTEM:

The term decision support system refers to a class of systems, which support the process of making decisions.

The emphasis is on "support" rather than on automation of decision. Decision support systems allow the decision maker to retrieve data and test alternative solutions during the process of problem solving.

Decision support system 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.

Decision support systems are computer based information systems that provide interactive information support to managers and business professionals during the decision - making process.

Decision support systems use the following:

- Analytical models

- Specialized databases

- Decision maker's own insights and judgments

CHARACTERISTICS OF DECISION SUPPORT SYSTEM:

Decision support systems have many characteristics that allow them to be effective management support tools. Following are some characteristics of DSS

- ➤ **Provide rapid access to information:** Some DSS's provide fast and continuous access to information; for example, the gauges on the dashboard of a car or truck are used to see how the vehicle is running.

- ➤ **Handle large amounts of data from different sources:** For instance, advanced database management systems and data warehouses have allowed decision makers to search for information

- ➤ **Provide report and presentation flexibility:** Managers can get the information they want, presented in a format that suits their needs. Further, output can be displayed on computer screens or printed, depending on the needs and desires of the problem solvers

- ➤ **Offer both textual and graphical orientation:** Today's DSS's can produce text, tables, line drawings, pie charts, trend lines, and more. By using these managers can get better idea of the situation.

- ➤ **Support drill down analysis:** A manager can get more levels of detail when needed by drilling down through data. For example, a manager can get more detailed information for a project – viewing the overall project cost or drilling down and seeing the cost for each phase, activity and task.

- ➤ **Perform complex, sophisticated analysis and comparison using advanced software packages:** Marketing research surveys, for example, can be analyzed in a variety of ways using programs that are part of a DSS. Many of the analytical programs associated with a DSS are actually stand-alone programs and the DSS brings them together.

BENEFITS OF DSS:

- ✓ **Improving personal efficiency:** Many DSS do not do anything. A person could not do himself or herself. People could not do himself or herself. People prepared budgets for centuries before spread sheet software came into use. DSS help them do it faster and with less changes of error.

- ✓ **Improving problem solving:** DSS can make it possible for a person or a group to solve problem faster or better, than they could without it.

- ✓ **Facilitating communications:** After found that DSS facilitating interpersonal communication in several ways. The system can indicate when a particular action should be taken in the future (offensive) or when a particular action was justified in the past (defensive use).

- ✓ **Promoting Learning or training:** Using DSS can also help people learned more about using computers and about software package that are in the DSS although this is seldom a specific objective of development of the DSS it can be valuable by project.

- ✓ **Increasing organizational control:** Some DSS can also control information about an individual's decision to his or her managers. This information can then be used to access the productivity of the individual questions in terms of how many decisions they make and how good their decisions turned out to be.

EXPERT SYSTEM:

An **expert system** acts or behaves like a human expert in a field or area where an advisory program attempts to imitate the reasoning process of human experts.

- There are reasons to build Expert Systems:

    - to make the expertise of an individual available to others in the field

    - to capture knowledge from an expert who is likely to be unavailable in the future

    - to provide consistency in decision making

COMPONENTS OF AN EXPERT SYSTEM:

- An **expert system** consists of a collection of integrated and related components, including

    - Knowledge Base

    - An Inference Engine

    - Explanation Facility

    - Knowledge Acquisition Subsystem

    - A User Interface.

- **Knowledge base:** Stores all relevant information, data, rules, cases, and relationships used by the expert system

- **An Inference Engine:** Seeks information and relationships from the knowledge base and provides answers, predictions, and suggestions in the way a human expert would

- **Rule:** A conditional statement that links given conditions to actions or outcomes

- **Fuzzy Logic:** A specialty research area in computer science that allows shades of gray and does not require everything to be simply yes/no, or true/false

- **Backward Chaining:** A method of reasoning that starts with conclusions and works backward to the supporting facts

- **Forward Chaining:** A method of reasoning that starts with the facts and works forward to the conclusions

- **Explanation Facility:** A part of the expert system that allows a user or decision maker to understand how the expert system arrived at certain conclusions or results

- **Knowledge Acquisition Facility**

    - Provides a convenient and efficient means of capturing and storing all components of the knowledge base

User interface software is used for designing, creating, updating, and makes use of an expert system easier for users and decision makers.

ADVANTAGES OF EXPERT SYSTEMS:

- Easy to develop and modify

- It improves quality by providing consistent advice and by making reduction in the error rate.

- It leads to cost reduction as the human expertise is costly.

- Expert systems work faster than human expertise.

- It improves problem solving.

- It built knowledge based database for the organization

LIMITATIONS OF EXPERT SYSTEMS:

- Not widely used or tested

- Limited to relatively narrow problems

- Cannot readily deal with "mixed" knowledge

- Possibility of error

- Cannot refine own knowledge base

- Difficult to maintain

- May have high development costs

APPLICATIONS:

- ✓ Manufacturing

  - Analyzing quality and providing corrective measures

  - Scheduling job-tasks

  - Selecting transportation routes

- ✓ Marketing

  - Responding to customer inquiries

  - Assisting with marketing timing decisions

  - Determining discount policies

- ✓ Accounting and finance

  - Providing tax advice and assistance

  - Helps in credit authorization decisions

  - Selecting forecasting models

- ✓ Personnel

  - Assessing applicant qualifications

 - Giving employees assistance in filling out forms
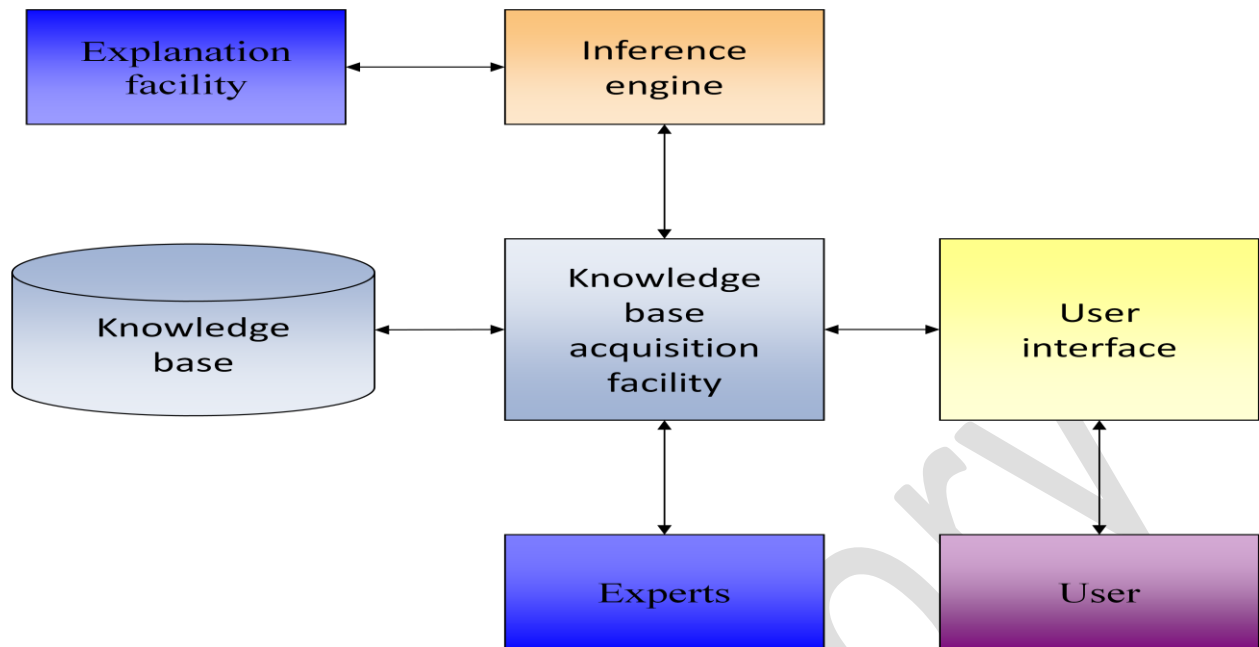
KNOWLEDGE WORK SYSTEMS:

- **Knowledge work systems**

    - Systems for knowledge workers to help create new knowledge and ensure that knowledge is properly integrated into business

- **Knowledge workers**

    - Researchers, designers, architects, scientists, and engineers who primarily create knowledge and information for the organization

REQUIREMENTS OF KNOWLEDGE WORK SYSTEMS:

➢ Knowledge workers require highly specialized knowledge work systems

➢ Substantial computing power for graphics, complex calculations

➢ Powerful graphics, and analytical tools

➢ Communications and document management capabilities

➢ Access to external databases

➢ User-friendly interfaces

➢ Optimized for tasks to be performed (design engineering, financial analysis)

COMPONENTS OF KNOWLEDGE WORK SYSTEMS:

Hardware platform: knowledge workstation
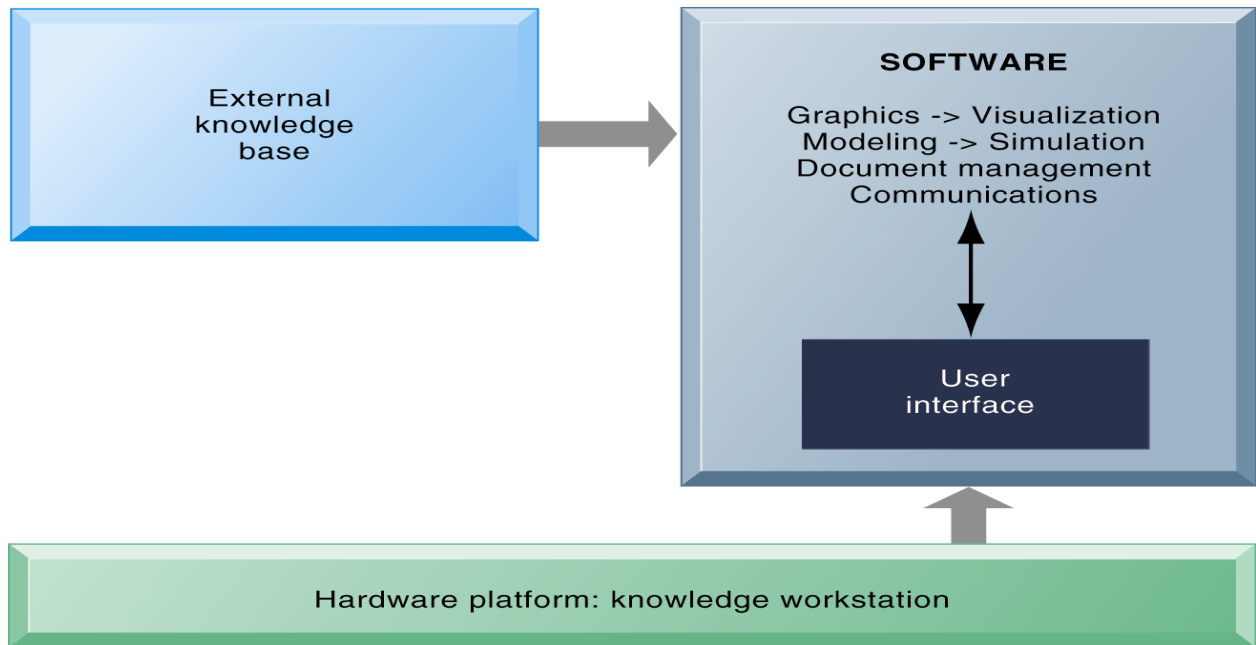
EXAMPLES OF KNOWLEDGE WORK SYSTEMS:

- **CAD:** Automates creation and revision of engineering or architectural designs, using computers and sophisticated graphics software

- **Virtual reality systems:** Software and special hardware to simulate real-life environments. Interactive software creates photorealistic simulations of real world objects. (VRML)

    - E.g. 3-D medical modeling for surgeons

- **Investment workstations:** High-end PCs used in finance to analyze trading situations, facilitate portfolio management

    - Streamline investment process and consolidate internal, external data for brokers, traders, portfolio managers

Artificial intelligence (AI):

✓ Computers with the ability to mimic or duplicate the functions of the human brain

✓ Artificial intelligence systems

The people, procedures, hardware, software, data, and knowledge needed to develop computer systems and machines that demonstrate the characteristics of intelligence

- Intelligent behavior

- Learn from experience

- Apply knowledge acquired from experience

- Handle complex situations

- Solve problems when important information is missing

- Determine what is important

- React quickly and correctly to a new situation

- Understand visual images

- Process and manipulate symbols

- Be creative and imaginative

- Use heuristics

MAJOR BRANCHES OF AI:

- Perceptive system

  - A system that approximates the way a human sees, hears, and feels objects

- Vision system

  - Capture, store, and manipulate visual images and pictures

- Robotics

  - Mechanical and computer devices that perform tedious tasks with high precision

- Expert system

  - Stores knowledge and makes inferences

- Learning system

  - Computer changes how it functions or reacts to situations based on feedback

- Natural language processing

- Computers understand and react to statements and commands made in a "natural" language, such as English

- Neural network

  - Computer system that can act like or simulate the functioning of the human brain
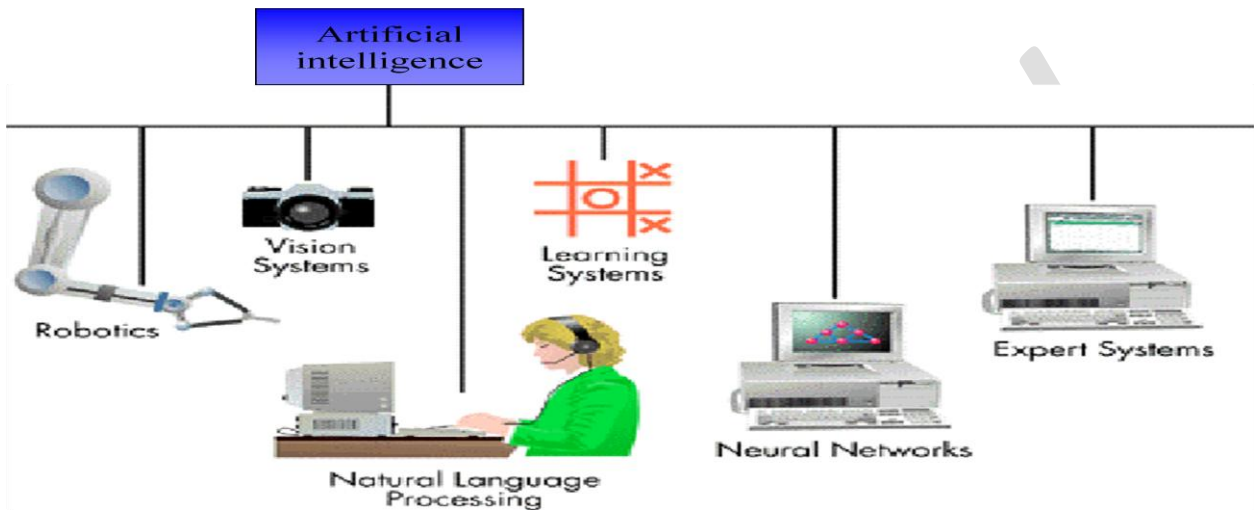
- **Group Decision Support System (GDSS)**

  - Contains most of the elements of DSS plus software to provide effective support in group decision-making settings
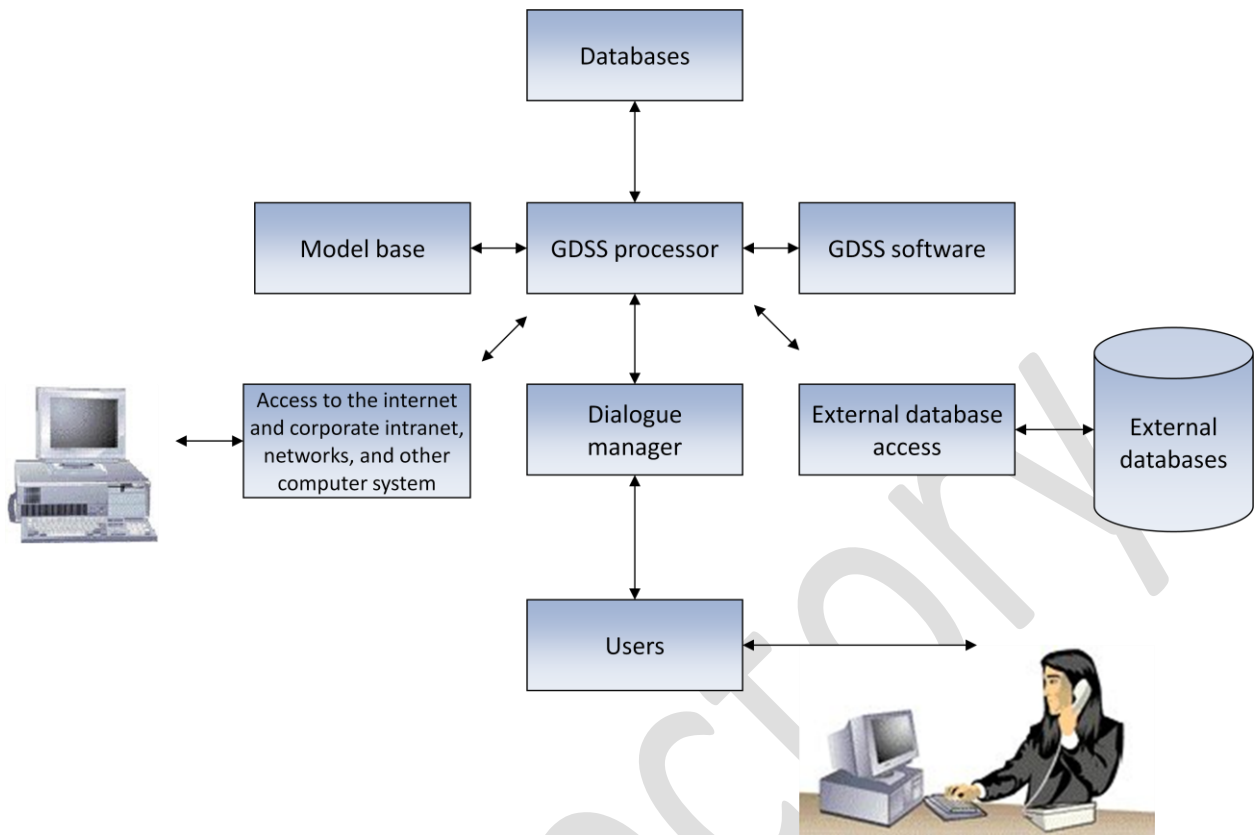
CHARACTERISTICS OF A GDSS:

- Special design

- Ease of use

- Flexibility

- Parallel communication

- Automated record keeping

- Cost, control, complexity factors

- Decision-making support

  - Delphi approach (decision makers are geographically dispersed)

  - Brainstorming

  - Nominal group technique

Components of a GDSS

- Database

- Model base

- Dialogue manager

- Communication capability

- Special software (also called GroupWare)

- E.g., Lotus Notes

  - people located around the world work on the same project, documents, and files, efficiently and at the same time

Decision Room

- Decision Room

  - For decision makers located in the same geographic area or building

  - Use of computing devices, special software, networking capabilities, display equipment, and a session leader

  - Collect, coordinate, and feedback organized information to help a group make a decision

  - Combines face-to-face verbal interaction with technology-aided formalization

Wide Area Decision Network

- Characteristics

  - Location of group members is distant

  - Decision frequency is high

  - Virtual workgroups

  - Groups of workers located around the world working on common problems via a GDSS