UNIT-5 (DECISION SUPPORT SYSTEM)

Introduction to DSS:

Decision making is one of the most significant and implement activities in business. There are two types of decision Structured Decision: involves processing a certain kind of information in a specified way so that you will always get the right answer. Non-Structured decision: is one for which there may be several "right" answers and there is no precise way to get a right answer. No rules or criteria exist that guarantee you a good solution.

Four phases of Decision making:

When you make a decision whether you realize it or not you go through distinct phases:

1. **The Intelligence Phase(Find what to fix)**

   The intelligence phase consists of finding, identifying, and formulating the problem or situation that calls for a decision. This has been called *deciding what to decide*. The intelligence stage may involve, for example, comparing the current status of a project or process with its plan. The end result of the intelligence phase is a decision statement.

   The name of this phase, "intelligence," can be confusing. Intelligence as we usually use the term informally, is talking about decision making, it is what we use after we know a decision must be made. Simon borrowed the term from its military meaning, which involves the gathering of information without necessarily knowing what it will lead to in terms of decisions to be made. In business decision making, we must often collect a great deal of information before we realize that a decision is called for.

2. **The Design Phase(Find fixes)**

   The design phase is where we develop alternatives. This phase may involve a great deal of research into the available options. During the design phase we should also state our objectives for the decision we are to make. Consider possible ways of solving the problem, filling the need or taking advantage of the opportunity.

3. **The Choice Phase(pick a fix)**

   In the choice phase, we evaluate the alternatives that we developed in the design phase and choose one of them. The end product of this phase is a decision that we can carry out.

   A course of action is selected out of the available alternatives as devised in the design phase. Typical Activities include:

   Get information

   Final evaluation

   Sensitivity analysis

4. **The Implementation Phase(apply the fix)**

   Implement the selected course of action. Typical Activities include:

   Follow the implementation plan

Deal with resistance to change and necessary approvals and authorizations

Conduct training

Transfer resource

What is DSS?

A decision support system (DSS) is a computer program application that analyzes business data and presents it so that users can make business decisions more easily. It is an "informational application" (to distinguish it from an "operational application" that collects the data in the course of normal business operation).Typical information that a decision support application might gather and present would be:

1. Comparative sales figures between one week and the next
2. Projected revenue figures based on new product sales assumptions
3. The consequences of different decision alternatives, given past experience in a context that is described

Features of DSS:

From the above definitions it is evident that there is no universal definition of DSS. However, a quick survey of existing literature will reveal that most authors either explicitly or implicitly believe that a DSS should have the following nine basic characteristics.

1. DSS assists managers in their decision making specifically in semi-structured and unstructured fields.
2. DSS supports and enhances, rather than replaces, managerial decisions.
3. DSS improves the effectiveness of the decision rather than its efficiency.
4. DSS combines the use of models and analytical techniques with conventional data access and retrieval functions.
5. DSS has features (including interactive features) which make its use by non-computer people easier.
6. DSS has enough flexibility to accommodate changes in the environment, the approach and the needs of the users.
7. DSS supports managers at all levels that take decisions.
8. DSS is user initiated and user controlled.
9. DSS supports the personal decision making styles of individual managers.

Components of DSS:

A DSS consists of essentially three components or modules. They are:

1. Database Management Module
2. Knowledge or model management Module
3. Dialog or User Interface Module

Data management:

The data management components perform the function of strong and maintaining the information that you want your DSS to use. The data management components therefore, consist of both the DSS information and the DSS database management system

Model management:

The model management component consists both the DSS models and the DSS model management system. A model is a representation of some event fact or situation. Because it's not always practical or wise to experiment with reality people build models and use them for experimentation. Models can take various forms.

User interface management:

The user interface management components allow you to communicate with the DSS. It consists of the user interface and the user interface management system. This is the components that allow you to continue your knowledge with the user and processing capabilities of the computer

The desirable capabilities for a DSS to support the user system interface include:

1. ability to handle a variety of dialogue styles;
2. the ability to accommodate user actions in a variety of media;
3. the ability to present data in a variety of formats and media
4. the ability to provide flexible support for the user's knowledge base.

Advantages of DSS:

(1) Time savings. For all categories of decision support systems, research has demonstrated and substantiated reduced decision cycle time, increased employee productivity and more timely information for decision making. The time savings that have been documented from using computerized decision support are often substantial.

(2) Enhance effectiveness. A second category of advantage that has been widely discussed and examined is improved decision making effectiveness and better decisions. Decision quality and decision making effectiveness are however hard to document and measure. Most researches have examined soft measures like perceived decision quality rather than objective measures. Advocates of building data warehouses identify the possibility of more and better analysis that can improve decision making.

(3) Improve interpersonal communication. DSS can improve communication and collaboration among decision makers. In appropriate circumstances, communications- driven and group DSS have had this impact. Model-driven DSS provides a means for sharing facts and assumptions. Data-driven DSS make "one version of the truth" about company operations available to managers and hence can encourage fact-based decision making.

(4) Competitive advantage. Vendors frequently cite this advantage for business intelligence systems, performance management systems, and web-based DSS. Although it is possible to gain a competitive advantage from computerized decision support, this is not a likely outcome. Vendors routinely sell the same product to competitors and even help with the installation. Organizations are most likely to gain this advantage from novel, high risk, enterprise-wide, inward facing decision support systems.

(5) Cost reduction. Some researches and especially case studies have documented DSS cost saving from labor savings in making decisions and from lower infrastructure or technology costs. This is not always a goal of building DSS.

(6) Increase decision maker satisfaction. The novelty of using computers has and may continue to confound analysis of this outcome. DSS may reduce frustrations of decision makers, create perceptions that better information is being used and/or creates perceptions that the individual is a "better" decision maker. Satisfaction is a complex measure and researchers often measure satisfaction with the DSS rather than satisfaction with using a DSS in decision making.

(7) Promote learning. Learning can occur as a by-product of initial and ongoing use of a DSS. Two types of learning seem to occur: learning of new concepts and the development of a better factual understanding of the business and decision making environment. Some DSS serve as "de facto" training tools for new employees.

(8) Increase organizational control. Data-driven DSS often make business transaction data available for performance monitoring and ad hoc querying. Such systems can enhance management understanding of business operations and managers perceive that this is useful. What is not always evident is the financial benefit from increasingly detailed data.

Decision Support Systems (DSS) are a class of computerized information system that support decision-making activities. DSS are interactive computer-based systems and subsystems intended to help decision makers use communications technologies, data, documents, knowledge and/or models to complete decision process tasks. A decision support system may present information graphically and may include an expert system or artificial intelligence (AI). It may be aimed at business executives or some other group of knowledge workers.

5.4 Types of DSS:

There are a number of Decision Support Systems. These can be categorized into five types:

Communication-drivenDSS
Most communications-driven DSSs are targetted at internal teams, including partners. Its purpose are to help conduct a meeting, or for users to collaborate. The most common technology used to deploy the DSS is a web or client server. Examples: chats and instant messaging softwares, online collaboration and net-meeting systems.

Data-drivenDSS

Most data-driven DSSs are targeted at managers, staff and also product/service suppliers. It is used to query a database or data warehouse to seek specific answers for specific purposes. It is deployed via a main frame system, client/server link, or via the web. Examples: computer-based databases that have a query system to check (including the incorporation of data to add value to existing databases

Document-drivenDSS

Document-driven DSSs are more common, targeted at a broad base of user groups. The purpose of such a DSS is to search web pages and find documents on a specific set of keywords or search terms. The usual technology used to set up such DSSs are via the web or a client/server system. Examples:

Knowledge-drivenDSS:

Knowledge-driven DSSs or 'knowledgebase' are they are known, are a catch-all category covering a broad range of systems covering users within the organization seting it up, but may also include others interacting with the organization - for example, consumers of a business. It is essentially used to provide management advice or to choose products/services. The typical deployment technology used to set up such systems could be slient/server systems, the web, or software runnung on stand-alone PCs

Model-driven DSS

Model-driven DSSs are complex systems that help analyse decisions or choose between different options. These are used by managers and staff members of a business, or people who interact with the organization, for a number of purposes depending on how the model is set up - scheduling, decision analyses etc. These DSSs can be deployed via software/hardware in stand-alone PCs, client/server systems, or the web.

5.4.1 GDSS:

A group decision support system (GDSS) is an interactive computer based system that facilitates a number of decision-makers (working together in a group) in finding solutions to problems that are unstructured in nature. They are designed in such a way that they take input from multiple users interacting simultaneously with the systems to arrive at a decision as a group.

5.4.1.2 Components of Group Decision Support System (GDSS):

Hardware: It includes electronic hardware like computer, equipment used for networking, electronic display boards and audio visual equipment. It also includes the conference facility, including the physical setup – the room, the tables and the chairs – laid out in such a manner that they can support group discussion and teamwork.

Hardware:

i. Input / output devices.
ii. Audio visual instruments.
iii. Electronic display board/ screens.
iv. Computer equipments.
v. Conferencing infrastructure.
vi. Network

Software Tools: It includes various tools and techniques, such as electronic questionnaires, electronic brainstorming tools, idea organizers, tools for setting priority, policy formation tool, etc. The use of these software tools in a group meeting helps the group decision makers to plan, organize ideas, gather information, establish priorities, take decisions and to document the meeting proceedings. As a result, meetings become more productive

Software:
i. Database and database management system.
ii. Modeling capabilities.
iii. Dialogue management with multiple user access.
iv. Specialized application programmes to facilitate the group access.

People: It compromises the members participating in the meeting, a trained facilitator who helps with the proceedings of the meeting, and an expert staff to support the hardware and software. The GDSS components together provide a favorable environment for carrying out group meetings.

People and the procedure:
i. Trained facilitators.
ii. Decision making participants.
iii. Support staff.

Features of Group Decision Support System (GDSS):

- **Ease of Use:** It consists of an interactive interface that makes working with GDSS simple and easy.
- **Better Decision Making:** It provides the conference room setting and various software tools that facilitate users at different locations to make decisions as a group resulting in better decisions.
- **Emphasis on Semi-structured and Unstructured Decisions:** It provides important information that assists middle and higher level management in making semi-structured and unstructured decisions.
- **Specific and General Support:** The facilitator controls the different phases of the group decision support system meeting (idea generation, discussion, voting and vote counting etc.) what is displayed on the central screen and the type of ranking and voting that takes place, etc. In addition, the facilitator also provides general support to the group and helps them to use the system.
- **Supports all Phases of the Decision Making:** It can support all the four phases of decision making, viz intelligence, design, choice and implementation.
- **Supports Positive Group Behavior:** In a group meeting, as participants can share their ideas more openly without the fear of being criticized, they display more positive group behavior towards the subject matter of the meeting.

Geographical information system (GIS)::

☐ A geographic information system (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface. GIS can show many different kinds of data on one map. This enables people to more easily see, analyze, and understand patterns and relationships.

- With GIS technology, people can compare the locations of different things in order to discover how they relate to each other. For example, using GIS, the same map could include sites that produce pollution, such as gas stations, and sites that are sensitive to pollution, such as wetlands. Such a map would help people determine which wetlands are most at risk.

- **Application of GIS:**

1. GIS in Mapping:

- Mapping is a central function of Geographic Information System, which provides a visual interpretation of data. GIS store data in a database and then represent it visually in a mapped format. People from different professions use map to communicate. It is not necessary to be a skilled cartographer to create maps. Google map, Bing map, Yahoo map are the best example for web-based GIS mapping solution.

2. Telecom and Network services:

- GIS can be a great planning and decision making tool for telecom industries. GDi GISDATA enables wireless telecommunication organizations to incorporate geographic data into the complex network design, planning, optimization, maintenance and activities. This technology allows telecom to enhance a variety of application like engineering application, customer relationship management and location-based services.

3. Accident Analysis and Hot Spot Analysis:

- GIS can be used as a key tool to minimize accident hazard on roads, the existing road network has to be optimized and also the road safety measures have to be improved. This can be achieved with proper traffic management. By identifying the accident locations, remedial measures can be planned by the district administrations to minimize the accidents in different parts of the world. Rerouting design is also very convenient using GIS.

4. Transportation Planning:

- GIS can be used in managing transportation and logistical problems. If the transport department is planning for a new railway or a road route then this can be performed by adding environmental and topographical data into the GIS platform. This will easily output the best route for the transportation based on the criteria like flattest route, least damage to habitats and least disturbance from local people. GIS can also help in monitoring rail systems and road conditions.

- **Advantages of GIS:**

a. It can improve organizational integration. GIS would then integrate software, hardware and also data to capture, analyse, manage and so display all forms of information is geographically referenced.

b. GIS would also allow viewing, questioning, understanding, visualizing and interpreting the data into numbers of ways which will reveal relationships, trends and patterns in the form of globes, maps, charts and reports.

c. Geographic Information System is to provide help in answering questions as well as solve problems through looking at the data in a way which is easily and quickly shared.

d. GIS technology could also be integrated into framework of any enterprise information system.

e. And there would be numbers of employment opportunities.

Disadvantages of GIS:

a. GIS technology might be considered as expensive software.

b. It as well requires enormous data inputs amount that are needed to be practical for some other tasks and so the more data that is to put in.

c. Since the earth is round and so there would be a geographic error that will increase as you get on a larger scale.

d. GIS layers might lead to some costly mistakes once the property agents are to interpret the GIS map or the design of the engineer around the utility lines of the GIS.

e. There might be failures in initiating or initiating additional effort to fully implement the GIS but there might be large benefits to anticipate as well.

Artificial Intelligence:

- ☐ Artificial intelligence exhibited by machines or software. It is also the name of the academic field which studies how to create computers and computer software that are capable of intelligent behavior.
- ☐ It is the science of making machine that imitate human thinking and behavior

Types of AI:

- ☐ The artificial intelligence systems that businesses use most can be classified into the following major categories:

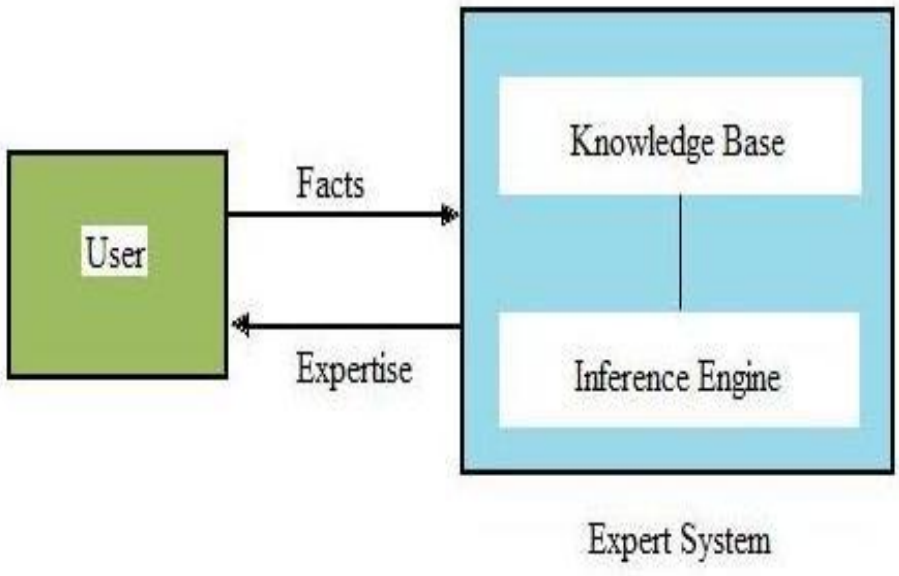
1. Expert System
2. Neural Network
3. Genetic algorithms
4. Intelligent agents

What is Expert System:

Expert system is an artificial intelligence program that has expert-level knowledge about a particular domain and knows how to use its knowledge to respond properly. Domain refers to the area within which the task is being performed. Ideally the expert systems should substitute a human expert. *Edward Feigenbaum* of Stanford University has defined expert system as "an intelligent computer program that uses knowledge and inference procedures to solve problems that are difficult enough to require significant human expertise for their solutions.

- ☐ The *expert systems* is a branch of AI designed to work within a particular domain. As an expert is a person who can solve a problem with the domain knowledge in hands it should be able to solve problems at the level of a human expert. The source of knowledge may come come from a human

expert and/or from books, magazines and internet. As knowledge play a key role in the functioning of expert systems they are also known as knowledge-based systems and knowledge-based expert systems. The expert's knowledge about solving the given specific problems is called knowledge domain of the expert.



Basic Concept of an Expert System Function:

- ☐ The expert system consists of two major components: knowledge base and inference engine.
- ☐ **Knowledge base** contains the domain knowledge which is used by the inference engine to draw conclusions.
- ☐ The **inference engine** is the generic control mechanism that applies the axiomatic knowledge to the task-specific data to arrive at some conclusion. When a user supplies facts or relevant information of query to the expert system he receives advice or expertise in response. That is given the facts it uses the inference engine which in turn uses the knowledge base to infer the solution.

Characteristics of Expert Systems:

- ☐ **High performance:** They should perform at the level of a human expert.
- ☐ **Adequate response time:** They should have the ability to respond in a reasonable amount of time. Time is crucial especially for real time systems.
- ☐ **Reliability:** They must be reliable and should not crash.
- ☐ **Understandable:** They should not be a black box instead it should be able explain the steps of the reasoning process. It should justify its conclusions in the same way a human expert explains why he arrived at particular conclusion.

What is Neural Networks?

Neural network or Artificial Neural Network (ANN) is a massively parallel distributed processor made up of simple processing units, which has a natural propensity for storing experiential knowledge and making it available for use. A **neural network** contains a large number of simple

neuron like processing elements and a large number of weighted connections encode the knowledge of a network.

- Neural networks are useful to a variety of applications. For example, many airports use a neural network called SNOOPE to detect bombs in luggage. Because chemical compounds have distinct patterns. SNOOPE can easily detect the compounds inside the luggage as they pass through a checking system.
- Neural networks attempt to mimic the structure and functioning of the human brain. Conceptually neural network consists of three layers of virtual nerves cells (neurons) and these three layers are:
- a. Input Layer
- b. Output Layer
- c. Middle Layer (Hidden Layer)

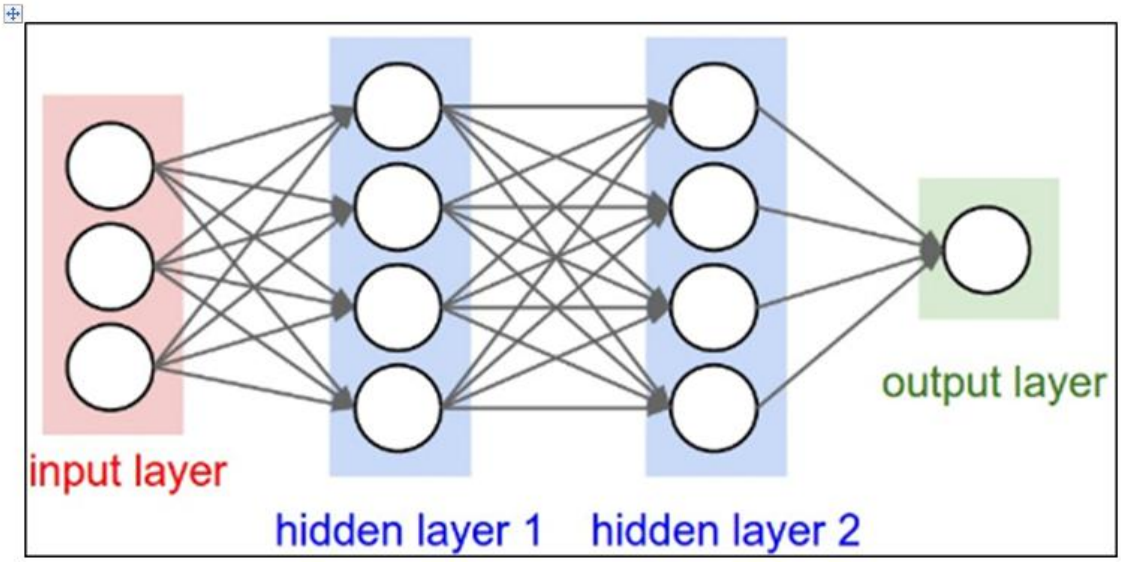


Fig: Neural Networks

- The input and output layers are connected to the middle layer by connections having different weights. All the inputs and the corresponding weights are computed to calculate a value. If the final value is greater than or equal to a particular threshold value then the system takes some action accordingly. There may be multiple hidden layers in between input and output layers.

Applications of Neural Networks:

1. Character Recognition:

- The idea of character recognition has become very important as handheld devices like the Palm Pilot are becoming increasingly popular. Neural networks can be used to recognize handwritten characters.

2. Image Compression:

- Neural networks can receive and process vast amounts of information at once, making them useful in image compression. With the Internet explosion and more sites using more images on their sites, using neural networks for image compression is worth a look.

3. Stock Market Prediction:

- The day-to-day business of the stock market is extremely complicated. Many factors weigh in whether a given stock will go up or down on any given day. Since neural networks can examine a lot of information quickly and sort it all out, they can be used to predict stock prices.

4. Face Recognition Using Artificial Neural Networks:

- Face recognition entails comparing an image with a database of saved faces to identify the person in that input picture. Face detection mechanism involves dividing images into two parts; one containing targets (faces) and one providing the background.

Advantages of Neural Networks:

a. A neural network can perform tasks that a linear program cannot.
b. When an element of the neural network fails, it can continue without any problem by their parallel nature.
c. A neural network learns and does not need to be reprogrammed.
d. It can be implemented in any application.
e. It can be performed without any problem.

- **Limitations of Neural Networks:**

a. The neural network needs the training to operate.
b. The architecture of a neural network is different from the architecture of microprocessors, therefore, needs to be emulated.
c. Requires high processing time for large neural networks.

What are genetic algorithms?

- Genetic algorithms are based on biological evolution. Genetic algorithms can be used to solve a wide variety of problems. Given a problem a genetic algorithm generates a set of possible solutions and evaluates each in order to decide which solutions are fit for reproduction. If a particular solution is more fit then it will have more chances to generate new solutions. Finally we can find a real solution

- Genetic algorithm use three concepts of a solution:

1. Selection: or survival of the fittest. The key to selection is to give preference to better outcomes.
2. Crossover: or combining portions of good outcomes in the hope of creating an even better outcome.
3. Mutation: or randomly trying combinations and evaluating the success(or failure) of the outcome.
4. For example: US West uses a GA to determine the optimal configuration of fiber-optic cable in a network that may include as many as 100,000 connection points.

Applications Area of Genetic Algorithms:

1. Optimization:

Genetic Algorithms are most commonly used in optimization problems wherein we have to maximize or minimize a given objective function value under a given set of constraints.

2. Economics:

- GAs are also used to characterize various economic models like the cobweb model, game theory equilibrium resolution, asset pricing, etc.

3. Image Processing:

- GAs are used for various digital image processing (DIP) tasks as well like dense pixel matching.

- **Advantages of Genetic Algorithms:**

a. The concept is easy to understand.
b. Genetic Algorithms search from a population of points, not a single point.
c. Genetic Algorithms use payoff (objective function) information, not derivatives.
d. Genetic Algorithms support multi-objective optimization
e. Genetic Algorithms use probabilistic transition rules, not deterministic rules.

f. Genetic Algorithms are good for "noisy" environment.
g. Genetic Algorithms are robust to local minima/maxima.
h. Genetic Algorithms are easily parallelized.
i. Genetic Algorithms can operate on various representation.
j. Genetic Algorithms **are** stochastic.
k. Genetic Algorithms work well on mixed discrete or continuous problem.

- **Disadvantages of Genetic Algorithms:**

a. Genetic Algorithms implementation is still an art.
b. Genetic Algorithms require less information about the problem, but designing an objective and getting the representation and operators right can be difficult.
c. Genetic Algorithms are computationally expensive i.e. time-consuming.

Intelligent Agents:

- An IA is an AI system which can move around your computer or network performing repetitive tasks independently, adapting itself to your preferences. IA usually work in the background. So your computer is still available to you for use.

- For example: your IA agent might search the internet every morning for information about your internet every morning for information about your state senators, your favorite sports team, the cosmic strip you like the most and so on.

- An IA is constructed from one or more of the most modern system, neural networks, genetic algorithms and object oriented programming. IA can

1. Act as personal assistants

2. Find and retrieve information from your company's database or
3. Find and retrieve information across networks.
4. Essentially there are four types of intelligent agent and they are:

1. Information Agent:

They are intelligent agents that search for information of some kind and provides it back. For example, a buyer agent that helps the customers to find the appropriate products or services they needed.

2. Monitoring and Surveillance Agent:

- ☐ They are also called predictive agent and are the intelligent agent that constantly observe and report on some entity of interest, a network or manufacturing equipment. They are often used to monitor complex computer networks and to track out any problem in the network. Such agents are commonly used for various activities such as:

a. To watch the competitors and provide information about competitors price and special offers.

b. To monitor internet websites, discussion groups, mailing list, etc.

3. Data Mining Agents:

- ☐ A data mining agent operates in a data warehouse to discover the hidden pattern, trends or relationship between data. Such agents provide data patterns which are very much useful in business decision making.

4. User or Personal Agents:

- ☐ They are an intelligent agent that take action on behalf of a user. They are useful in doing the repetitive personal tasks of common users for example:

a. To check email, to sort them in according to our priority alert us when an important email arrives.

b. Play computer game as our opponent.

c. To fill out forms on the web automatically and even to store information for future reference.

Combining IT Brainpower System:

- ☐ A brain-computer interface (BCI system) records the brain's electrical activity using EEG (Electroencephalography) signals, which are detected with electrodes attached to the scalp. Machine learning software learns to recognize the patterns generated by each user as they think of a certain concept, such as "left" or "right".

- ☐ Researchers are discovering, however, that they get better results in some tasks by combining the signals from multiple BCI users. Until now, this "collaborative BCI" technique has been used in simple pattern recognition tasks.

So they developed a simulator in which pairs of BCI users had to steer a craft towards the dead centre of a planet by thinking about one of eight directions that they could fly in, like using compass

points. Brain signals representing the user's chosen direction, as interpreted by the machine learning system, were merged in real-time and the spacecraft followed that path.

What does Executive Information System (EIS)/Executive Support System(ESS)?

- ☐ An Executive Information System can be defined as a specialized Decision Support System. This type of the system generally includes the various hardware, software, data, procedures and the people. With the help of all this, the top level executives get a great support in taking and performing the various types of the decisions. The executive information system plays a very important role in obtaining the data from the different sources, then help in the integration and the aggregation of this data. After performing these steps the resulting information is displayed in such a pattern that is very easy to understand.

- ☐ Executive information system is 'a computer based system that serves the information that is needed by the various top executives. It provides very rapid access to the timely information and also offers the direct access to the different management reports.'

- ☐ Executive Information System is very user friendly in the nature. It is supported at a large extent by the graphics.

- ☐ Executive support system can be defined as the comprehensive executive support system that goes beyond the Executive Information System and also includes communications, office automation, analysis support etc.

- ☐ Executive information systems (EIS) provide a variety of internal and external information to top managers in a highly summarized and convenient form. EIS are becoming an important tool of top-level control in many organizations. They help an executive spot a problem, an opportunity, or a trend. Executive information systems have these characteristics:

- ☐ **Characteristics of the Executive support system/ Executive Information System**

1. Informational characteristics

i. Flexibility and ease of use.
ii. Provides the timely information with the short response time and also with the quick retrieval.
iii. Produces the correct information.
iv. Produces the relevant information.
v. Produces the validated information.

2. User interface/orientation characteristics

i. Consists of the sophisticated self help.
ii. Contains the user friendly interfaces consisting of the graphic user.
iii. Can be used from many places.
iv. Offers secure reliable, confidential access along with the access procedure.
v. Is very much customized.
vi. Suites the management style of the individual executives.

3. Managerial / executive characteristics

i. Supports the over all vision, mission and the strategy.
ii. Provides the support for the strategic management.
iii. Sometimes helps to deal with the situations that have a high degree of risk.
iv. Is linked to the value added business processes.

v. Supports the need/ access for/ to the external data/ databases.
vi. Is very much result oriented in the nature.

Information needs of executive:

1. EIS provide immediate and easy access to information reflecting the key success factors the company and of its units.

2. A User-seductive interfaces, presenting information through color graphics or video, allow an EIS user to grasp trends at a glance.

3. EIS provide access to a variety of databases, both internal and external, through a uniform interface.

4. Both current status and projections should be available from EIS.

5. An EIS should allow easy tailoring to the preferences of the particular users or group of users.

6. EIS should offer the capability to A drill down into the data.

Executive Information System / Executive Support System benefits
1. Achievement of the various organizational objectives.
2. Facilitates access to the information by integrating many sources of the data.
3. Facilitates broad, aggregated perspective and the context.
4. Offers broad highly aggregated information.
5. User's productivity is also improved to a large extent.

6. Communication capability and the quality are increased.
7. Provides with the better strategic planning and the control.
8. Facilitates pro active rather than a reactive response.
9. Provides the competitive advantage.
10. Encourages the development of a more open and active information culture.
11. The cause of a particular problem can be founded.

☐ **Advantages:**

a. Easy for upper-level executives to use, extensive computer experience is not required in operations.
b. Provides timely delivery of company summary information.
c. Information that is provided is better understood.
d. EIS provides timely delivery of information. Management can make decisions promptly.
e. Improves tracking information.
f. Offers efficiency to decision-makers.

☐ **Disadvantages:**

☐ a. System dependent
b. Limited functionality, by design
c. Information overload for some managers
d. Benefits hard to quantify
e. High implementation cost.
f. System may slow, large, and hard to manage

g. Need good internal processes for data management
h. May leads to less reliable and less secure data

TABLE 8.3 Comparison of EIS and DSS

Dimension	*EIS*	*DSS*
Focus	Status access, drill down	Analysis, decision support
Typical users	Senior executives	Analysts, professionals, managers (via intermediaries)
Impetus	Expediency	Effectiveness
Application	Environmental scanning, performance evaluation, identification of problems and opportunities	Diversified areas where managerial decisions are made
Decision support	Indirect support, mainly high-level and unstructured decisions and policies	Supports semistructured and unstructured decision making, ad hoc decisions, and some repetitive decisions
Type of information	News items, external information on customers, competitors, and the environment; scheduled and demand reports on internal operations	Information supporting specific situations
Principal use	Tracking and control, opportunity identification	Planning, organizing, staffing, and controlling
Adaptability to individual users	Tailored to the decision-making style of each individual executive, offers several options of outputs	Permits individual judgments, what-if capabilities, some choice of dialog style
Graphics	A must	Important part of many DSS

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Decision support	Indirect support, mainly high-level and unstructured decisions and policies	Supports semistructured and unstructured decision making, ad hoc decisions, and some repetitive decisions
Type of information	News items, external information on customers, competitors, and the environment; scheduled and demand reports on internal operations	Information supporting specific situations
Principal use	Tracking and control, opportunity identification	Planning, organizing, staffing, and controlling
Adaptability to individual users	Tailored to the decision-making style of each individual executive, offers several options of outputs	Permits individual judgments, what-if capabilities, some choice of dialog style
Graphics	A must	Important part of many DSS

- ☐ NOTE:
- ☐ **Reduced instruction set computing**, or **RISC** (pronounced 'risk'), is a CPU design strategy based on the insight that a simplified instruction set provides higher performance when combined with a microprocessor architecture capable of executing those instructions using fewer microprocessor cycles per instruction. A computer based on this strategy is a *reduced instruction set computer*, also called *RISC*. The opposing architecture is called complex instruction set computing

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