ROLE OF DECISION SUPPORT SYSTEMS

Abstract

When it comes to making wise decisions, relying excessively on instinctive judgments based on perception or traditions when we are constantly being barraged with information might be problematic. Sometimes, people miss out on important information that would have helped them make a decision. This can be due to our business or a lack of resources, including money, time, and other resources. However, perhaps we wouldn't want to take the chance when making organisational decisions causes are plain to see. Among many other things, a poor choice could harm the employer's brand, product lifecycle, financial status, or brand image. We frequently find it difficult to use the principles of operations research, statistics, and economics to help us make wise decisions. We, therefore, require some knowledge-based systems to assist in company decision-making processes.

DSSs are computer-based tools that allow decision-makers to utilize data and models to approach semi or unstructured problems. Information reports are generated by a decision support system based on the collection and analysis of data. DSS can be used in a variety of organisational knowledge fields. Real-time reporting is one of a DSS's primary applications in an organisation. Organizations that engage in just-in-time (JIT) inventory management may find it to be quite beneficial. It is essential that a company has real-time information about its inventory levels in a JIT inventory system in order to avoid production delays that could have negative consequences. A DSS is therefore more appropriate than a traditional system for the individual or organisation making the decision.

Keywords: Decision Support System (DSS), Organisation decision support system, Executive Information System, Business Intelligent Systems.

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I. INTRODUCTION

During the late 1960s, model-driven decision support systems began to emerge. These ideas were developed during the 1970s, but spreadsheet-based DSSs, financial planning systems, and group DSS weren't implemented until the middle of the 1980s. Business intelligence, data warehouses, and ODSS were all established in the late 1980s and early 1990s, along with EIS (Executive Information System) (Organisation Decision Support System).A wide range of decision support systems based on knowledge appeared in the mid-1990s, including those based on the Internet. Information system with an integrated decision support system made up of decision models, database, and decision-maker. a computer-based tool that managers regularly employ for themselves or their direct reports in order to directly support management decision-making. a group of computer-based resources that managers can employ to aid in problem-solving and decision-making. For less complex challenges where the science of management and the art of management are combined, decision support systems are used as information system powered by computers that influence or is designed to influence how humans make decisions. Decision support systems facilitate managerial or professional decision-making by bringing vital data into view. An organised group of individuals, processes, programs, databases, and tools that enable decision-making for particular problems. computer-based information systems are made to aid managers in choosing from a variety of potential solutions. Systems of information based on computers that support manager's decision-making through interactive information. a collection of materials that managers and analysts can employ to comprehend, assess, and resolve issues. An integrated collection of computer tools enables direct interaction between a decision-maker and computers to provide data that can be used to make unexpected semi-structured and unstructured judgments (Prachi Juneja).

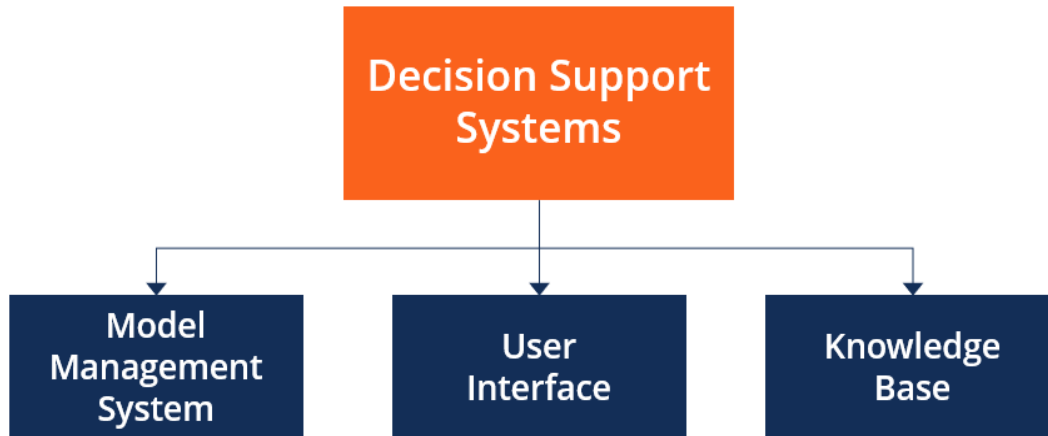**What is a Decision Support System (DSS)?**

Generally, decision support systems are computer-based tools that compile, combine, and analyse unprocessed data from the social sciences, practical sciences, mathematical sciences, managerial sciences, and personal knowledge (of decision-makers) to identify problems and select the best solutions in order to promote the best decision-making.

An interactive computer program called a decision support system has full access to all the data about the organisation. When employed, it provides comparison data comparing one period to the next. Revenue amounts are forecast based on assumptions about product sales. We could understand the costs involved and their effects with the assistance of a DSS.

Components of a Decision Support System: A DSS framework consists of three key parts:

1. **Model management system:** In order to make decisions, managers can access and store models that can be used to make decisions. Models are used to forecast product or service demand and decision-making regarding the financial health of an organization.

2. **Use interface system:** Integrated DSS interfaces include tools to help the end-user utilize the system more easily.

3. **Information base system:** Journals and online databases are a part of the knowledge base, which includes internal and external sources (information gathered in transactions process systems)

Adopted from CFI Team (2022)
Figure 1: Components of Decision Support System

Types of DSS

- **Model-driven:** Allows access to organisational, financial, and statistical models and management. Data is obtained and parameters are set by utilising the information that users have provided. The data is transformed into a decision-making model for scenario analysis. An example of a model-driven DSS is Dicodess, an open-source model-driven DSS.
- **Document-driven:** Manages information that is unstructured in various electronic formats.
- **Communication-driven:** Enables businesses to support tasks that call for the participation of multiple people. It contains integrated technologies like Google Docs and Microsoft SharePoint Workspace.
- **Knowledge-driven:** Uses interactive decision-making tools like flowcharts to provide precise, factual solutions to issues.
- **Data-driven:** Helps businesses store and analyse both internal and external data.

Developing a Decision Support System

In order to create a decision support system, a great deal of work goes into it. It only functions as a support system after being fed intelligence while being developed. Because it is a difficult procedure, developing a DSS takes longer. Inputs, activities, and outputs are repeated three times during each stage of the system development lifecycle.
Categorization/Classification of DSS on the basis of the nature of operations:

File drawer model: This type of system provides data that can be used to make a decision. Similar to a file drawer, it allows you to store various kinds of data under various headings or classifications.

Formula-based decision support systems: These are used to compare data. They use basic data processing techniques, such as inventory analysis.

Information analysis model: various data sets are analyzed to produce informative reports that can be used to access a scenario.

Support for accounting and finance: Cash and inventories are tracked using this sort of support system.

Solver or representation method: This type of system stimulates or executes decision-making for a given problem or domain. It computes and contrasts the results of various choice routes. The decision-maker can perform a "what if" analysis and base their choice on the results obtained.

Optimization model: This DSS, which primarily offers suggestions for operations management, is based on simulated models. The emphasis is on offering the best options for decisions on product mix, material mix, and task scheduling.

Proposal system: By assisting in the collection and organisation of data, this kind of assistance system recommends the best course of action in a specific circumstance.

II. ROLE OF DSS

A decision support system (DSS) is a technology that, by combining all of the relevant data, aids people in making better business decisions. The phrase is occasionally used to describe computer applications that can import data from various sources and compile it into a useable format for decision-making. Decision support systems are crucial to the operation of any organisation, regardless of whether the system is built to make substantial use of computer technology or depends on more traditional techniques for data assimilation.

Data organisation is one of the most crucial features of decision support systems. When information from diverse sources is combined using a knowledge-based system, it is considerably simpler to relate all aspects of the data. The optimum way to manage a company's resources moving forward can be determined, for example, by combining data on sales generated for a certain time with actual receivables for the same period and comparing those statistics to the cost of production. If there is a central data repository that is not simply a dumping ground but a well-organized picture of the firm, it is much simpler to grasp where the company is at this time.

The ability of decision support systems to aid in the future transition is another crucial function. Once the data has been gathered and structured into a coherent and valuable body of knowledge, it is much simpler to evaluate alternative future plans and project the results of those decisions. Owners and managers can decide if a specific method is worthwhile in terms of the time and resources involved in comparison to the projected returns, or if an alternative approach should be used, by giving a strong foundation on which to create those estimates.

Decision support systems may have a substantial effect on a company's internal structure. When all pertinent data is combined, it might occasionally become clear that waste

is happening at different levels inside the company, with its impacts being seen throughout the entire operation. From this angle, a capable DSS can be the instrument that enables a business to internally restructure to decrease waste, allowing the business to lower costs and boost profits even if finished goods production is flat.

There is no doubt that decision support systems may swiftly repay any expenditures involved with their adoption, even though the precise role they play in each firm varies. By giving the decision-making process a basis that is founded on facts and offers simple access to all pertinent data, time can be saved in the decision-making process. In addition to reducing decision-making time, a trustworthy DSS also makes it simpler to prevent acts that might have short- or even long-term negative effects on the business, increasing the possibility that it will continue to exist for many more years.

Input-based categorization

The solution is available in text, spreadsheet, and database formats and it is oriented toward solving problems (situation-specific)

Support Offered Categorization

- Personal Data Security System
- DSS for a group
- DSS for an organization

Differentiation of DSS according to Decision Making Types and Frequencies

This is a system that is used on a regular basis to aid institutional choices. The decision is mainly made by the programming team on a daily basis. Implementing routines for managing technical issues, enforcing discipline, and using mechanics troubleshooting techniques.

Ad-hoc DSS: An ad-hoc decision support system aids in making a specific decision in an unforeseen circumstance. The choice taken is specific to the issue. Due to inadequate knowledge, this kind of technology is utilised to support non-programmed decisions.
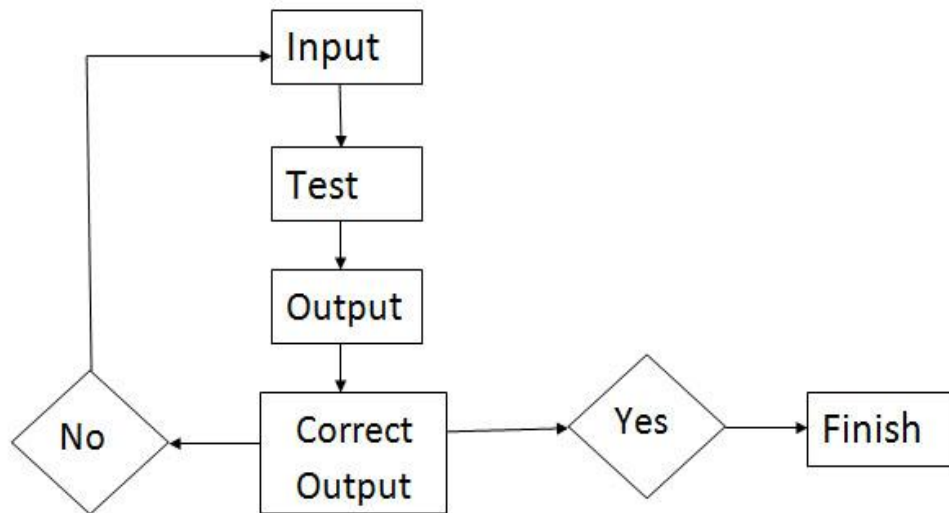
A decision support system's component:

DSS is a software system like any other, with components and stages of development. No of the type of decision support system you want to create, you must structure your planning around these four elements:

What kind of input is necessary to complete the analysis? It can be rule, problem, spreadsheet, text, or database focused, as was before indicated.

User Knowledge/Expertise: Whether or not the user will need to manually analyse inputs.

Output: Should the results be generic or comparative?

Making a decision: Should it be a suggestion support system? Or do you simply want it to evaluate the information and results of various actions?
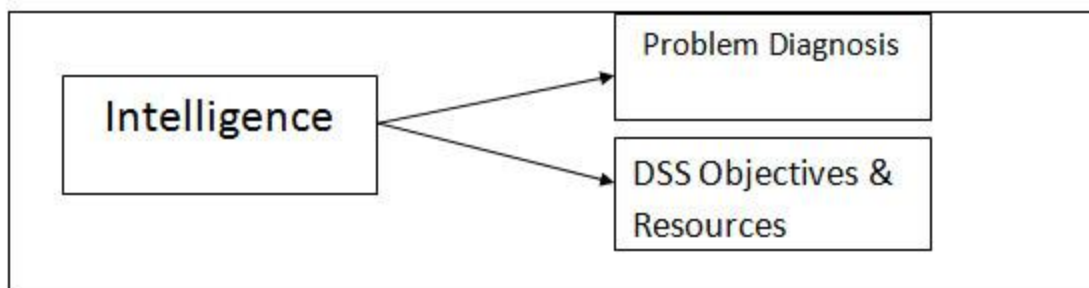
Adopted from www.managementstudyguide.com

Figure 2: Flow Chart of Decision Support System

**A DSS framework design and development goes through four stages**

1. **Intelligence:** This stage is about identifying problems, situations, and conditions that need to be addressed.

Figure 3: Stages Used In Intelligence

Identify and define the problem for which support is required, as a business. A clear understanding of our objectives and resources is essential so that we can measure our success.

2. **Design:** The purpose of this stage is to analyse all possible and determine how to design and build the system.
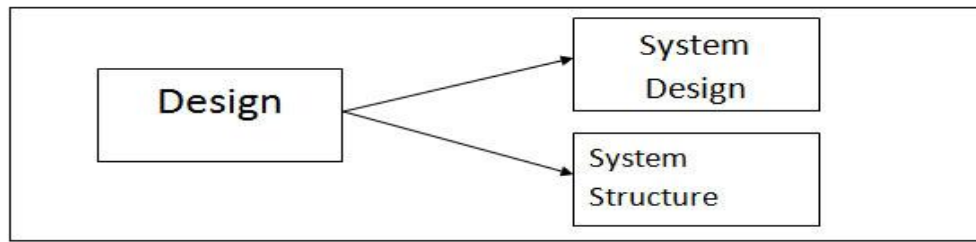
Figure 4: Stages used in Design

The choice of components, platforms, function libraries, and special languages is part of system design, whereas the choice of the prototype approach is part of system structure. The determining of hardware needs is another step in this process. Here, the development begins.

3. **Choice:** After we have analysed all possible courses of action and shortlisted them, we can now ready to select the most effective one from among them, based on our business objectives.

III. IMPLEMENTATION

This is the final stage where testing, evaluation, adjustments, and deployment takes place. This is the final product but can be tweaked, refined, and upgraded in accordance with our activities and requirements.

It is important to keep these factors in mind when developing a custom DSS:

- Data management functions
- Available hardware platforms
- User interface
- Compatibility with other applications
- Cost

Technology Trends in DSS

It is a constant process of evolution for Decision Support Systems. Their continuous evolution is a result of new technologies, new approaches, and ever-changing business needs. Their development has been primarily influenced by technology.

We may see key developments or trends in software systems of this type in the near future, according to experts. These include:

Developing a borderless business environment will require GIS (Geographical Information System). By managing and analysing geographical data, the system assists design makers in planning location-based services and manufacturing. Also, Using GIS technology, it is possible to determine whether a certain region is suitable for a plant or manufacturing based on its latitude and altitude. The decision-maker can adjust the product supply chain based on consumer behavior in different regions.

It is possible to provide decision-makers with a more accurate picture of a given situation by using OR (Operational Research).

- We are affected by Internet technology in almost every aspect of our lives. In the next-generation DSS, a search engine will be used for speedy searching and addressing particular problems.
- The DSS may provide a near-correct indication of a product's shelf life. In the future, it may be capable of understanding the emotional and psychological factors involved in purchase decisions.
- By leveraging cognitive features such as visualization, memory, reasoning, attention, and comprehension, DSSs may be able to leverage cognitive features in the future.

IV. DSS FOR STRATEGIC DECISION MAKING

DSS will undoubtedly assist organisations in making unstructured decisions given how swiftly they are expanding. The following iteration of intelligent DSS will be more equipped to assist decision-makers in making long-term commercial decisions that affect the bottom line. Here are some examples of strategic decisions:

A new product has to be assigned, made, and released as part of the work.

How can a business achieve its goals more quickly and successfully?

What course is your company taking/

What are the best strategies for battling it out and keeping an advantage?

What aspects of a business can lead to stagnation?

Decision support systems will get more intelligent every year. As computer technologies augment human intellect, businesses have a lot to look forward to.

The Eight Best Decision Support System Examples

1. **Data-driven DSS:** Users can access a large amount of internal and external data. Data will be retrieved using a mainframe, an external server, or the Internet using this DSS. The purpose of data mining is to reveal trends and specifics about the data under consideration. Making decisions about businesses, inventories, and products is enabled by data-driven systems. For managers analysing recent and historical data to report on the state of a department or the firm as a whole, data-driven decision support systems may be especially helpful. The use of data-driven systems is possible for the CEO, manager, and employee.

    Examples of data-driven DSS software include file drawer systems and geographic information system (GIS).

- Executive information systems
- Computer-based databases that use queries.

2. **Model-driven DSS:** It allows users to view and manipulate specific data models, like those with statical, financial, or scheduling implications. Often, this type of decision support system offers less data than other types of decision support systems because it's customised to the kind of model the customer wants to use. Models, such as work schedules, can be created using the analysis of situations and data. Depending on the model's objective and the user's requirements, they may use simple analysis techniques or complex statistics. A model-driven approach may be used by managers, employees, and other stakeholders in a business.

   Model-driven DSS software examples include the following:

   - Scheduling software
   - Financial modelling.
   - Models for decision analysis
   - Optimization applications

3. **Knowledge-driven DSS:** To aid in decision-making, a knowledge-driven DSS keeps track of regularly updated data about an organisation. Business-appropriate action recommendations are derived from diagnosis, prediction, interpretation, and classification. Since a knowledge-driven DSS completes choose the products and services they want to buy.

   The most common part of these DSS is data mining. In addition to managers and employees, a knowledge-driven DSS can also be used by external users, including consumers. Customers may be identified as both current and potential clients by a knowledge-driven DSS.

4. **Documents based DSS:** A document-driven DSS is used to recover unstructured data from various electronic sources. It looks up relevant information by searching webpages, documents in databases, and other materials using the search terms entered by the user. It is possible for a document-driven DSS to be as specific as a company's private documents or as comprehensive as a typical internet search engine. Every user of a database or an internet search engine uses a document-driven DSS.

   These are some examples of software that could be included in a document-driven DSS:

   - Internet search engines
   - Software for searching databases
   - Online databases of articles that allow searching.

5. **Communication driven DSS:** A communication-driven DSS makes use of tools to promote collaboration and communication. Email is a prime example of a communication-driven DSS. This type of DSS comprises software that facilitates digital communication between individuals as well as sharing capabilities that allow several individuals to work together on a project at once. It improves a collaborative effort's efficacy and efficiency and can help with meeting and conversation facilitation. Internal

team members, corporate meeting hosts, and users of online chat and video conferencing software can all benefit from a communication-driven DSS.

Software examples of a communication-driven DSS include:

- Chat and instant messaging services
- Collaboration software, such as document sharing and editing software
- Email

6. **Intelligent DSS:** The term intelligent DSS (IDSS) refers to any DSS that incorporates artificial intelligence during development. To sort through enormous datasets. AI performs data mining and processing. In essence, an IDSS offers services similar to those of human consultants. Patterns and trends are used to aid decision-making. Problems can be evaluated and dealt with by them. A DSS can benefit from fuzzy logic and machine learning thanks to AI components. An IDSS may be used by managers, diagnosticians, and other decision-makers.

An intelligent DSS may include the following software:

- Manufacturing systems with smart features
- Medical diagnostic systems

7. **Manual DSS:** Decisions are made by people rather than computers in this system. A professional team assesses the benefits, drawbacks, possibilities, and risks that their project or organisation may encounter. Some analyses still require a human review at each level, even if a manual DSS moves considerably more slowly than a computer-based DSS. Managers, executives, and economists can all use a manual DSS.

Some examples of manual DSS are as follows:

- Analyses of the cost-benefit ratio.
- Matrixes for making decisions.

A hybrid DSS combines elements from other DSS types to provide a complex result. Large-scale problems in sectors like banking and healthcare may call for the use of tools from several decision support systems, including knowledge-driven and data-driven DSSs. To make these components function together, a hybrid DSS can employ extra software. The outcomes of each DSS are occasionally analysed and combined by a person. A system in which a person collaborates with a DSS to extract and alter data may also be referred to as a hybrid DSS. A hybrid DSS may be used by researchers, financial decision-makers, and medical professionals.

Examples of hybrid DSS software include:

- Assessing the risks
- DSS in clinical settings
- An intelligent-based DSS

The use of decision support systems to create a competitive advantage
Processes involved in decision-making include:

- The utilization of resources
- Assessing the impact of various courses of action
- Taking a closer look at previous actions
- Foreseeing future trends based on past and present trends

In the case of simple decisions, you can make them instantly without thinking about them. The complexity of a decision, however, makes it more important to prepare for its impact of it on a business's bottom line. By using a support system, the decision-maker can streamline the process and decide what course of action to take.

- The following are a few examples of how a decision support system stays competitive:

Streamlined decision-making:

- The goal of most decision support systems is to make things easier and save time by simplifying processes.
- With a decision support system, a business can quickly analyze its pros and cons. Comparing possible courses of action and analyzing data saves a great deal of time. In order to reduce the time to market, businesses can respond quickly to an individual situation by keeping their decision cycles shorter.

Enhancement of data accuracy: Prior to the implementation of the DSS, businesses had multiple versions of the truth. A decision support system is not necessary for those who have not started using one.

- Because of human bias, the analysis and interpretation of data are subject to error.
- A universal truth cannot exist since every evaluator thinks differently. In a decision support system, data is analysed and presented accurately without bias. As a result, decision-making becomes more effective.

Strategic significance: The use of decision support systems alters how businesses function. "Value chain management" is a key idea that highlights the function of computerised decision-making. A decision support system evaluates economic factors as well as historical and current trends to calculate the costs, earnings, and total value. It gives a number of economically distinct outcomes or actions that produce diverse values. By enhancing value while spending less money, it makes the decision-maker choose the best course of action. The success of a business and the value it produces outweigh the costs it incurs giving a company a competitive edge.

A sense of direction and nimbleness: Businesses may stay competitive by making as much progress as feasible in the correct direction. In actuality, this is what keeps businesses flexible and forward-thinking. Adapting to market changes requires swift action. Data processing takes longer if it is done manually, negating the point of being quick. An analysis of the facts at hand allows a decision support system to forecast

revenue figures and market trends for the next few years. DSS can be used by a real estate company, for instance, to determine how to price apartment units so that maximum revenue is generated.

- It's essential that businesses get off on the proper foot in the current global marketplace.

Reduced cost of decision making: Collecting, sorting, processing, and evaluating data takes less time and is less costly when using a decision support system. Increasingly, managers are aware that automated decision assistance isn't niche industry. In reality, hardware, internet, and computer technology costs are going down significantly. As a result, lower hierarchy levels will have a lower cost to implement decision-making technology.There will be no more limiting factors when it comes to DSS. Businesses will stand out from the competition thanks to quicker decision-making at all management levels.

V. QUICK SOLUTION PROBLEM

Every choice carries some level of risk [10]. Too much knowledge can be sought for and obtained, which can lead to one or more issues [11]. (1) The time needed to gather and analyse the additional information causes a delay in the decision-making process. The decision or solution's effectiveness could be harmed by this delay. (2) There will be an information overload. Forgetfulness is a serious issue brought on by information overload. (3) The data will be used in a selective manner. That is, the decision-maker will select only those facts from all the information available that support their chosen course of action or viewpoint. (4) Mental exhaustion occurs, which slows down or lowers the quality of work. (5) Decision fatigue happens when the person making the decision grows weary of doing so. There is often a lack of conclusions resulting from fast, careless decisions. It has been demonstrated that computerised decision support can save significant amounts of time [11].

VI. ADVANTAGES OF A DSS

- An effective and efficient decision-making process is enhanced by a decision support system. DSS is capable of collecting and analyzing real-time data.
- It encourages an organization's employees to take part in training because it requires specialized skills to deploy and manage a DSS.
- Because repetitive managerial tasks are automated, managers may devote more time to making decisions.
- Internally, it enhances interpersonal communication.

VII. DISADVANTAGES

- In order to increase efficiency and speed in decision-making processes, companies may become dependent on a DSS
- The cost of deploying and building a DSS makes it difficult for smaller enterprises.
- Due to the fact that an information system attempts to cover every aspect of a problem, it may result in information overload. The subjective aspect of decision-

making is lost when managers rely too much on the system. As a result of the wide range of options available to end customers, they find themselves in a bind.

- It is possible for lower-level employees to become fearful of a DSS and react negatively to its implementation. The majority of them are hesitant about using new technology due to concerns about losing their jobs.

VIII. APPLICATION OF DSS

The use of decision support systems (DSS) can help make decisions more quickly and effectively. They are employed in a variety of fields, including the medical field, where the use of DSS helps doctors make diagnoses based on the symptoms given, and the usage in banks to confirm a borrower's eligibility for a loan.

Specific use of e-learning: Due to the COVID-19 pandemic's current lack of face-to-face interactions. In order to better understand their students' identities, behaviours, potential problems, and preferred learning styles, instructors may find it challenging without the usage of DSS. The system could examine a student's profile, including things like gender, age, how many hours they spent in a course, how much time they spent on average each week, etc. For instance, this might aid in classifying pupils based on shared learning preferences[14].

To recommend a suitable area of study, a decision support system can be set up to evaluate the students' academic prowess, character traits, abilities, and interests. This could be achieved by having the student respond to a series of questions, which the system then analyses and compares to a set of pre-defined fields and values in the system database that are relevant to various fields of study, courses, jobs/careers, etc. After a thorough examination, the system should eventually be able to recommend the area of study that is most appropriate for the applicant or student [13]. Student admissions would be prioritized using DSS according to the number of seats available in the desired field of study, the capacity of the college/ university, and the resources available to them once enrolled [15].

DSS software provides a variety of benefits to managers. Planners typically develop DSSs in accordance with their requirements and use them to evaluate specific processes. Using DSS solutions, management can predict how changes in sales, and inventory will affect outcomes and receive advice on how to structure chain movements.

Inventory management: In order to make money by itemizing assets, DSSs can be useful in assessing inventory.

Optimize and project sales: It is also possible to use technology for decision support for forecasting sales trends, analysing historical data, and monitoring current patterns.Using various decision support tools, planners can leverage technology to address sales figures.

To optimize industry-specific systems: This robust software option can also be used to acquire a comprehensive view of events that affect an organization's development or to make accurate future estimates for a corporation. This might be helpful in challenging circumstances when extensive financial prediction may be required when estimating expenses and revenues.

- **Agriculture:** In crop planning, DSS tools are used to determine the best planting and fertilization times, as well as harvest times.

- **Medicine:** Clinical DSSs are those used in medical practice. The technology can be utilised for a number of purposes, including keeping track of research data on chemotherapy procedures, providing preventive and follow-up treatment, and keeping an eye on medicine orders. Furthermore, DSSs are used for medical diagnosis with software.

- **Forecasting of weather**: Some jurisdictions use DSSs to warn citizens of potential dangers, such as flooding. The system provides current meteorological information as well as potential historical and current data on county flood statistics and the boundaries of floodplains.

- **Real estate:** DSSs are frequently used by real estate organizations to manage comparative home price and domain data.

- **Education:** To determine the number of enrolled students, universities and colleges rely on DSSs. This aids in their ability to forecast enrolment numbers for specific courses or determine whether there are enough students to cover the costs associated with running the university.

REFERENCES

[1] Introduction To Decision Support System (DSS) | PDF (scribd.com)
[2] Qian Yang, Aaron Steinfeld and John Zimmerman "Critical, Clinical Decision-Making Processes", Proceedings of the 2019 CHI [3] Conference on Human Factors in Computing Systems, Paper No.: 238, 2019.
[3] Decision Support System (DSS) - Overview, Components, Types (corporatefinanceinstitute.com)
[4] Introduction To Decision Support System (DSS) | PDF (scribd.com)
[5] Decision Support Systems – Introduction, Categorization, and Development (managementstudyguide.com)
[6] What Is the Role of Decision Support Systems? - Expliquant
[7] Gaining Competitive Advantage with Decision Support Systems (managementstudyguide.com)
[8] Application of Decision Support Systems and Its Impact on Human Resources Output: A Study of Selected Universities in Zimbabwe (sciepub.com)
[9] Alter, *Information Systems: a Management Perspective*, (2nd ed). The Benjamin, USA (1996).
[10] R. Harris, *Introduction to Decision Making,* 2009.
[11] D.J. Power, *An Empirical Assessment of Computer-Assisted Decision Analysis*, 2007.
[12] Decision Support System Examples To Guide Decision-Making | Indeed.com
[13] Evaluating the intended use of Decision Support System (DSS) via Academic Staff: An Applying Technology Acceptance Model (TAM). (2019). International Journal of Engineering and Advanced Technology, 8(6S3), 565–571. https://doi.org/10.35940/ijeat.f1099.0986s319
[14] Zorrilla, M., García, D., & Álvarez, E. (2010). A decision support system to improve e-learning environments. Proceedings of the 1st International Workshop on Data Semantics - DataSem '10, 9. https://doi.org/10.1145/1754239.1754252
[15] Gorgan, V. (2015). Requirement Analysis for a Higher Education Decision Support System. Evidence from a Romanian University. Procedia - Social and Behavioral Sciences, 197, 450–455. https://doi.org/10.1016/j.sbspro.2015.07.165