

Introduction To Decision Support System

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PREFACE

Praise belongs only to God Almighty, who has given His grace and guidance so that this textbook with the title "Decision Support System" can be completed. The author would also like to thank several parties who have helped in the completion of this paper.

This book is expected to help students, especially students in the field of information technology or related fields with informatics who are currently taking this course. This book discusses technology for developing decision support system applications to support management in making decisions. Decision-making is not only supported by the intuition of the leadership but is supported by the results of analyzing a set of data using certain methods.

The author realizes that this book still has some in-depth discussions. This is because the theory and implementation of the Decision Support System are very broad in shaping human activities in all fields of society. Therefore, the author expects criticism and suggestions both in writing and orally. so that the author can develop knowledge, especially in the field of decision support systems.

Malang, July 2022

Authors

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CHAPTER 1

OPENING INSIGHT

A. The Need for Decision Support System

In an organization, the decision support system has a priority in planning various things that have to do with manager decisions in overcoming semi-structured or unstructured problems. Managerial matters are the main things in an organization to be considered and look for the root of the problem and what kind of solution to the problem. For example, in managerial organizational matters, the decision support system can be used to solve sales or marketing problems, inventory problems, land clearing problems, and other things.

Decision support systems have the flexibility of time and place to provide decision recommendations. This is interesting because the conditions of the era that demand information quickly, have distance barriers, recommendation conditions that cannot be decided directly, the need for data confidentiality, and access anytime anywhere can be overcome by the decision support system. For example, there are problems regarding timeliness if data access is done in real time. Several things in the field of organization require conditions like this, for example, in the field of handling sales or marketing problems. Customers need certainty quickly and precisely because they have limited time for their respective activities. So, this is where the role of the decision support system can be seen.

A decision support system is a form of unified computer and decision logic that is arranged in such a way that it can solve problems effectively and efficiently. From this one circle, the form of an unorganized managerial arrangement can be neater and not only become information but also become a recommendation for a decision. The recommendations are also strongly influenced by subjective data or things in accordance with the conditions and policies that were in effect at the time the decision was made. Since in the beginning, the decision support

system handled organizational problems related to managerial matters, many business organizations have used decision support systems to support problems in their organizations.

Decision support systems are not new but increasing year after year. The technology used is also constantly being upgraded and the amount of data involved can also increase and even be associated with big data, which not only handles information in bytes or kilobytes, but can be up to terabytes and petabytes. It is conceivable, for data of such large size, how much information can be collected, organized, and processed so that it can become sub-recommendations that can be used in solving overall problems within an organization. In addition, the data that is processed as decision support also has time series information that can reveal trends that are very useful for the progress of the organization in the future.

The idealistic form that is expected with decision recommendations can lead to maximum profits, minimal losses, saving resources, selecting the right expenses, expanding sales networks, increasing collaboration relationships, and also other things that were unexpected before if an organization did not use a decision support system.

The input data in the decision support system has the form of alternative weights and criteria. Alternatives are several options that will be decided as a solution and are usually sorted in ascending order. While the criteria are the determining factors or attributes in the selection of the selected alternative, The criteria also have their own weights that are adjusted to the decision maker's priorities in choosing alternatives. It should be noted that subjectivity is very influential in determining decision recommendations using a decision support system. The form of presentation of input data varies depending on the logic of the calculation method used. various, but all share the same concept of alternative weights per criterion and/or criterion weights. The output, or what is expected from the decision support system, can be stated clearly. It is hoped that it will provide recommendations to the decision maker regarding which alternative has a tendency to be chosen in order until the

last data point is recommended to be selected. After the recommendation is complete, it can be continued with a final decision by the decision maker to choose an alternative in accordance with the recommendation of the decision support system or not. Because human intuition can still not be replaced by technology.

The concept and implementation of the decision support system are quite simple and easy to do. Therefore, now other fields are also interested in making recommendations for solving their respective problems using the decision support system. The following is an explanation of simple examples that are often encountered when discussing decision support systems. Even in other sub-chapters in this chapter, their role in important fields in our society is explained.

A brief explanation of some examples of implementing a decision support system are as follows:

1) Hotel selection

Hotel recommendations are needed for domestic and foreign tourists who do not have knowledge of tourist destinations or already have knowledge of tourist attractions but want to try hotel destinations that have never been visited. The selection of this hotel has various criteria, it can even be different from one person to another. Therefore, it is necessary to consider how the form of the user interface developed to decide support system regarding the selection of hotels will be considered.

2) House selection

Choosing a house is not an easy thing. Confusion often occurs because of the limitations or many determinants of home buying. Road conditions, budget, facilities, and many other things can be considered when buying a house. So, for individuals or families who are going to buy a house, to help them solve these problems, a decision support system is needed that can provide quick recommendations to potential

buyers. Making a system with interactive user dialog is needed in this case.

3) Selection of Majors in Higher Education

The more modern times, the more reforms that are carried out by universities both domestically and abroad as an effort to answer the challenges of the times in the field of education. In addition, career needs in accordance with job vacancies are also a core consideration in the selection of majors for prospective college students. To help recommend a suitable place, a dynamic decision support system is also needed which is adapted to the curriculum and the needs of today's industry.

4) Selection of Tourist Places

The selection of tourist attractions has a relationship with the selection of hotels that have been described previously. The selection of these tourist attractions can also be determined by the purpose of the tour and the number of people who participate in tourism activities. The more people involved, the more criteria or considerations in deciding the best tourist attractions according to them. Decision support systems can also provide a solution to this problem.

5) Employee Performance Assessment

Each organization that employs employees has different standards in terms of providing salaries to employees. Therefore, a decision support system is needed with a different set of criteria that supports the problem of evaluating employee performance. This can also be modified not only in terms of money, but also the position of an employee in a particular company or organization.

6) Teacher Certification Assessment

At different times, it could be that the prerequisites for assessing teacher certification may vary. However, they have similarities in the complexity of the assessment

because it involves quite a lot of determining factors. Many criteria or determining factors, as well as many teachers also require a decision support system in terms of teacher certification assessments so that they can be carried out quickly, and although there is a decision maker subjectivity, they are limited fairly because each criterion already has a standard range of assessment. pre-arranged and agreed upon.

7) Toddler Health Handling

The health of toddlers is also very important to be assisted with a decision support system. This is due to the condition of toddlers who are still prone to disease and as an indication if there are abnormalities or severe conditions can also be known since toddlers. Therefore, there is also a government posyandu program which is carried out regularly once a month for checking the condition of toddlers (no need to wait for illness). From this kind of activity, information is obtained for toddlers including the criteria for determining the condition of toddlers' health.

8) Appointment of principal

The principal as the highest position in terms of school management is very core to be assisted with a decision support system. Determining factors such as achievement, discipline, firmness, and other things really need to be considered in the selection of the principal position. This selection is certainly not easy and complicated and will become lighter with the recommendations provided by the system.

B. Difference between Management Information System and Decision Support System

Management information system is a unit consisting of people, procedures, software, databases that give and receive

information or exchange information in a single environment and the same routine. The information in this environment can be used as the basis for taking an action for all users involved, especially for the highest managers or decision makers.

Management information systems are very important in a company or institution, especially in terms of managing operations. Management, and other Steps to a condition encountered. An example can be seen in Figure 1.

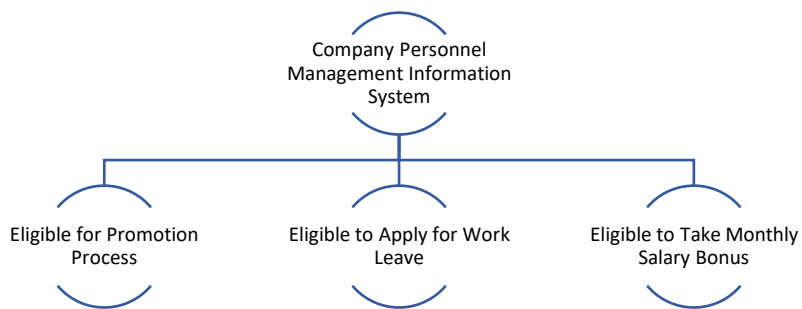


Figure 1. Overview About Company Personnel Management Information System

Figure 1 describes the Company's Personnel Management Information. Some information is available there, including information on the condition of personnel so that promotions can be processed, data on personnel discussing the terms and conditions for allowing employee leave; and information on determining employee monthly bonuses. These three things are examples of a lot of information available in the company's personnel management information system.

A decision support system can also be defined as a collection of people, procedures, software, and databases that

are also supported by tools related to information technology that support a decision. The application of a decision support system in the life of a company organization, for example, is very much needed in supporting decisions to solve employee problems or other management strategies, for example in terms of marketing or cooperation.

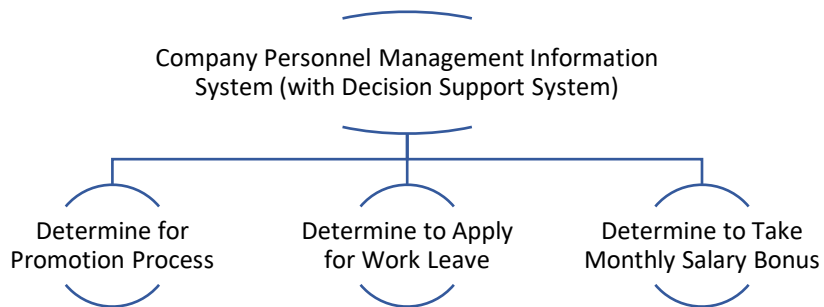


Figure 2. Overview About Company Personnel Management Information System

Figure 1 and Figure 2 are related if the first picture is an example of the things or information available in the Management Information System in a company, especially in terms of staffing. The first picture focuses on the use of information in the Management Information System to be used as a supporter to decide on several things, such as determining the Employee Promotion Process, determining to apply for work leave, and determining to take a monthly salary bonus. So, if it is abbreviated, actually a decision support system is something that can be added to the Management Information System by utilizing existing information. It is processed by certain methods so that it the relationship between the feasibility of the production decision support system, as illustrated in Figure 3.

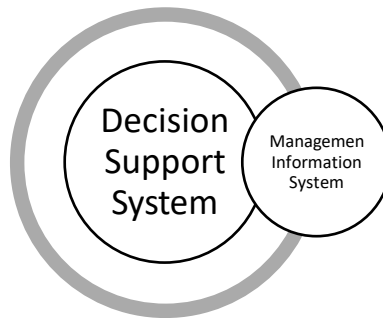


Figure 3. The Relationship Between The Feasibility of The Production Decision Support System

C. Clinical Decision Support System

A clinical decision support system (CDSS) is very much needed, especially when a pandemic hits the world early in 2018. Knowledge of patient health information as well as clinical knowledge of patient care history is needed to decide the right steps to take for patient care. in advance. This type of decision support system integrates patient information so that it is useful for health workers, including doctors, to get recommendations on what steps or actions can be taken based on the information available in the system.

The combination of the knowledge possessed by the doctor and the decision recommendations from the CDSS enables the final decision on the patient's action to be carried out more quickly. A series of CDSS systems involves computer technology, websites, and database settings that are connected to each other to be able to get output recommendations for patient care. But again, the CDSS recommendation can't beat the intuitive role of a doctor. Therefore, combining with the doctor's subjectivity, the use of both kinds of information is very necessary.

According to Sutton et al., health service providers have improved services due to CDSS. Health services are of high quality thanks to advances in information technology that utilizes electronic medical record information, which affects several factors such as speed, ease of disseminating information, and the absence of space and time limitations in exchanging information on patients' medical records. According to Figure 4, CDSS not only have rules that come from expert knowledge or rules that are determined by artificial intelligence technology.

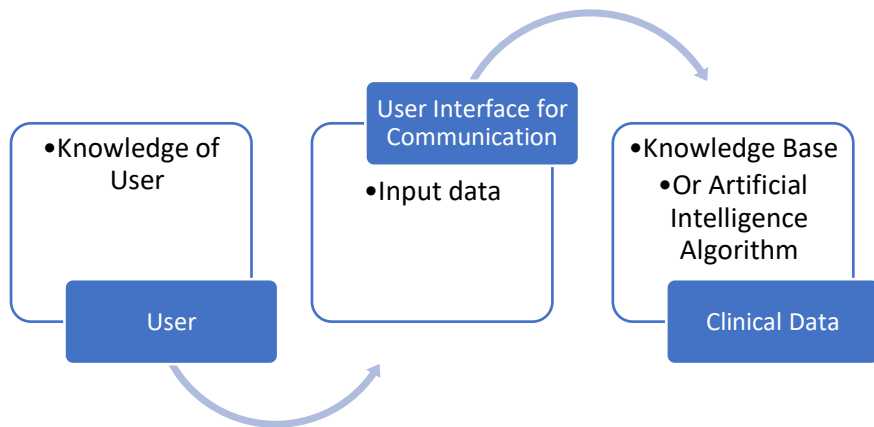


Figure 4. Clinical Decision Support System Overview

CDSS has the following functions and advantages:

- 1) Patient safety
Patient safety in CDSS is defined by possible outcomes of strategies to reduce the rate of medication errors.
- 2) Clinical management
Clear standards in the CDSS help with patient management as well as the care process.
- 3) Cost containment

CDSS can have the effect of reducing the number of hospitalizations and can also suggest cheaper treatment in conditions where it is still possible.

- 4) Administrative functions
Administrative functions in the form of clinical coding, diagnostics, ordering procedures and tests as well as patient triage.
- 5) Diagnostics support
Provide a computerized patient consultation place so as to produce an output of possible diagnoses.
- 6) Patient-facing decision support
Using personal health records, information about patients is integrated as a supporting tool for making joint decisions between patients and providers.

D. Decision Support System for Business Intelligence

Information technology associated with business practices can be said to be data warehousing. Management of data related to business data is indeed very large and certainly requires management techniques that are clearly targeted so that they can be converted into good information and be distributed at any time. Business is closely related to time and cannot wait because the process and competition quickly move every day. Slow conditions in business can have fatal effects, even to losses, because as we know, business, especially the sales department, of course, every day, every hour, even at any time can be carried out or transactions occur.

As a solution, a business data repository is needed to support this need. New data settings or historical data can be used as useful reporting material. Information in the form of linguistic, numeric, categorical, or other forms can also be the basis for determining the layout, arrangement, and form of data storage in the database. Another thing that needs to be ensured

is that the regulation of incoming and outgoing data in the database that is passed should be able to occur smoothly.

Handling these solutions can be found in the business intelligence decision support system. The relationship between these two things can be seen in Figure 5. In the business intelligence or data warehouse environment, there are several decision factors that are then included in the decision support process that is supported by decision support tools. After the materials and tools are ready, the result can be processed, considering the interrelationships between the determinants of the desired solution. Then the outcome will be in the form of recommendations for the desired business problem.

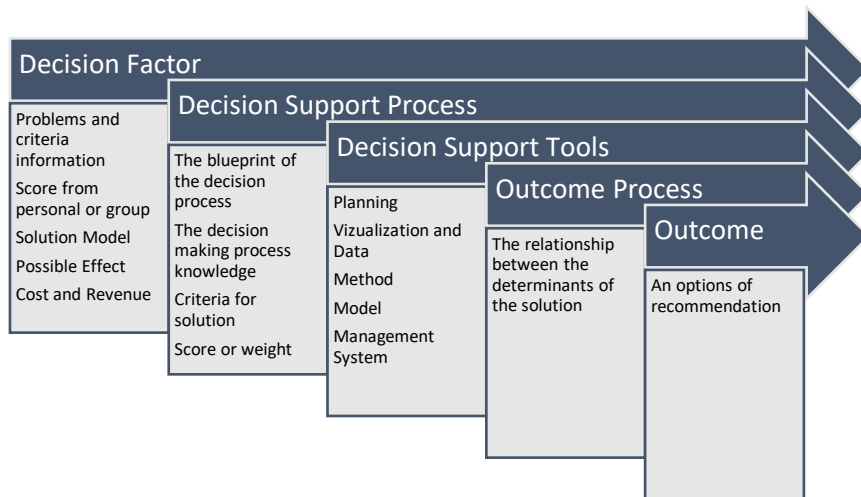


Figure 5. Decision Support System for Business Intelligence Overview

E. Relation of Decision Support System with Artificial Intelligence

Decisions are taken by considering the influence of bad or good. The best decision for the decision maker is the one with the highest hope. Before deciding, it is necessary to study the characteristics of the decision by considering the category of decisions, including unstructured or semi-structured decisions. Only two types of categories were mentioned, because only these two categories were resolved by the decision support system. Problem-solving techniques in decision support systems are quite diverse. Using basic techniques in overcoming the conditions of multi-criteria decision making or using other techniques Another way that can be done is by utilizing artificial intelligence. This method imitates human intelligence in solving a problem. Artificial Intelligence is included in the field of Computer Science, which consists of Expert Systems, Fuzzy Logic, Neural Networks, Natural Language, Digital Image Processing, or Robotics.

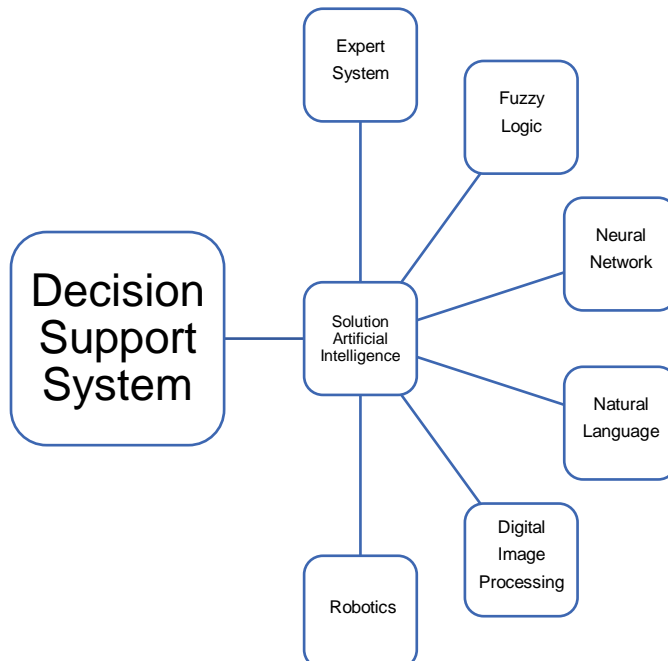


Figure 6. Decision Support System with Artificial Intelligence Overview

Combining decision support systems and artificial intelligence according to Figure 6 gives the system extra capabilities to solve problems in real time and intelligently. Problems that have a large number of solutions and require a complex solving process can be overcome by this merger.

F. Decision Support System for Forest Management

The stability of the biophysical system so that the results of natural resource management can meet the community's needs for goods and services. Therefore, in order to regulate and study the trend of the data, a decision support system is needed. This is very useful because we know that forest land in certain countries and even throughout the world is very large and the existence of information in it also needs to be managed and also given certain recommendations quickly to meet the needs of the community. Some examples that can be seen are ecosystem management decision support and also landscape management systems.

CHAPTER 2

INTRODUCTION

A. Definition

Decisions are decisive steps to find out what steps to take. According to experts, the decisions are:

- 1) What is mentioned in connection to a plan must be addressed by the decision. A totally different action from the original plan's implementation could also be taken in response to the decision (Ralp C. Davis).
- 2) The decision is a law or a law of the situation, claims Mary Follett. It is not the same as obeying an order if all the relevant information can be gathered and all parties, including implementers and supervisors, are prepared to abide by the law or its provisions. The exercise of authority continues, but it is now based on the applicable legal requirements.
- 3) A decision, in the words of James A.F. Stoner, is a choice among options. There is a decision based on reasoning or consideration, according to one of the three definitions in this phrase. There are various options available, and the best one is selected. The decision is moving in the right direction toward a goal that needs to be accomplished.

Management decisions to overcome problem conditions that have more complexity so that special handling and special strategies are also needed. According to the management hierarchy, according to Figure 7, the problems are hierarchically divided into: strategic management, tactical management, operations management. Operations management is at the lowest level because the things that are included in this level of management have the greatest number. However, it is in the lowest position because even though there are many things to

handle, the decision-making is easier than the 2 management levels above it. Problems at the lowest level are related to everyday things or routines in an organization. The second level, namely tactical management, can solve quite complex problems and requires special handling. The number of problems at this level is less than in operations management. The top level of the management hierarchy is strategic. Problems at this level are at least very complex and require special handling in solving. Decisions taken at this level can be the core of the sustainability wheel of an organization.

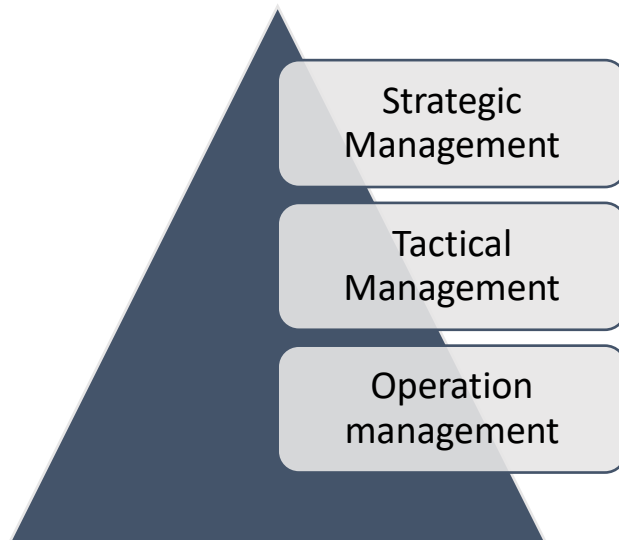


Figure 7. Management Hierarchy

Decisions have 3 types, namely: structured, semi-structured, and unstructured. The following is a brief definition and example of the three types:

- ❖ **Structured Decision**
Decisions that have already been faced by the organization are referred to as structured or programmed decisions. Additionally, the staff is experienced in handling these issues. For instance, a company might

hire new IT expertise. Many analysts divide decisions into different categories based on how structured the decision-making process is. A structured choice is one in which the facts, procedure, and evaluation are all predetermined, according to business experts. In commercial settings, structured judgments are frequently made, therefore it makes sense to set up a relatively tight framework for the decision-making process.

❖ **Semi-structured Decision**

decisions that fall in between structured and unstructured, requiring some human judgment but also having some consensus on the approach. area of most DSSs' attention. Semi-structured decisions fall in the middle of the continuum, and this is where the majority of what are regarded as real decision support systems are concentrated. These decisions are defined by some degree of consensus regarding the data, procedure, and/or evaluation to be employed, but they are also characterized by an attempt to retain some degree of human discretion in the decision-making process. Understanding where the decision maker's limits may manifest is the first step in determining which assistance system is necessary.

❖ **Unstructured Decision**

Unstructured decisions are located at the other end of the spectrum. There is little consensus regarding the nature of these, even though they share the same elements as structured ones data, procedure, and evaluation. For instance, when making unstructured judgments, each decision-maker may utilize several sources of information and thought processes. There may also be a small number of individuals within the organization equipped to analyze the decision according to the decision's nature.

Decision-making by the manager has a basis or guidelines in the process. According to George R. Terry, the basics of decision making are as follows:

1. Intuition
Making decisions based on feelings or intuition is very susceptible to influence.
2. Experience
Based on practical knowledge, making decisions based on experience offers benefits. One can quantify the benefits and drawbacks of the decisions that will be taken because one's expertise allows one to foresee how something will turn out.
3. Facts
Fact-based decision-making can result in strong and good conclusions. The level of confidence in making decisions can be increased with facts, allowing people to accept the decisions made voluntarily and cheerfully.
4. Authority
Authority is typically exercised by the leader over his superiors or subordinates, and persons in higher positions toward those in lower positions.
5. Rational
Decisions made as a result are more rational, clear, and consistent with maximizing

In addition, John D. Miller states in Imam Murtono (2009) that the factors that affect decision-making are restricted capacity, decision-making role, and male or female gender.

Three primary aspects—individual values, personality, and propensity for taking risks—have an impact on how an individual makes decisions.

The fundamental assumption that a person employs when he is presented with a dilemma and must make a decision is the value of the individual decision maker. Since early childhood, these values have been taught through a process of learning from the family and social surroundings. In many cases, the person is more lured by the possibility to win and does not even consider accumulating or judging the bad.

Personality comes next. Psychological aspects like personality can also have an impact on a person's decisions. Decisions are influenced by two major personality traits, such as the conflict between ideology and power and the tension between emotion and objectivity. Some decision-makers are ideologically oriented, which indicates that their choices are shaped by a certain ideology or set of values. In the meanwhile, those making decisions or other people base their choices on factors that will improve their political influence.

Third, a propensity towards taking chances. Nurses must distinguish between risky and unclear scenarios in order to develop their decision-making abilities because each condition calls for a different type of decision. Risk is the absence of control over the outcome of the action and the assumption that the decision-maker knows the outcome of the action even though he cannot control it. Uncertainty is the lack of knowledge of the outcome of the action. Making decisions is more challenging in uncertain situations than in dangerous ones. When faced with uncertainty, the decision-maker lacks a rational foundation for selecting one tactic over another.

As with other references, personal circumstances have an impact on decision-making as follows :

- Cognition, which refers to one's level and breadth of information. For instance, the capacity for logical thought, the capacity for reasoning, etc.
- Motive is a psychological pressure that influences, sustains, and guides action toward a goal.
- Attitude, how courageous we are when making judgments, selecting the appropriate emotional setting and timing, and taking into account potential outcomes.

A decision support system or decision support system is an information system that combines data and sophisticated analytical models or data analysis tools to support semi-structured and unstructured decision making.

A decision support system or decision support system (DSS) is generally defined as a system that can provide problem solving and communication skills for semi-structured problems (Turban, 2005).

A Decision Support System (DSS) is part of a computer-based information system, including a knowledge-based system to support decision making in an organization or company (Asfi, 2010: 2). A DSS is a computer-based information system that can utilize data and models to solve problems and provide alternative solutions to facilitate decision-making on a problem.

B. Decision Making Process

Decision-making is the process of determining among several actions for the purpose of achieving a target or multiple targets. According to Herber A. Simon (1977), managerial decision-making is the same as using all management processes in the company. To illustrate the point, it is very crucial to plan managerial functions. Planning involves a series of decisions. What to do? When? How? Where? By whom?

Another part of the managerial process, such as organizing and controlling, also involves making decisions.

According to the Figure 8, conflict occurs when a system does not fulfill its intended purpose, does not provide output such as what is needed, or does not operate as desired. Case resolution is not only concerned with the area of solution according to the dispute but also examines the opportunities that may occur. Understanding decision making and conflict resolution can be confusing. One way to tell the difference is to use testing at each stage according to the decision-making process. The decision-making stages are intelligence, design, choice, and implementation.

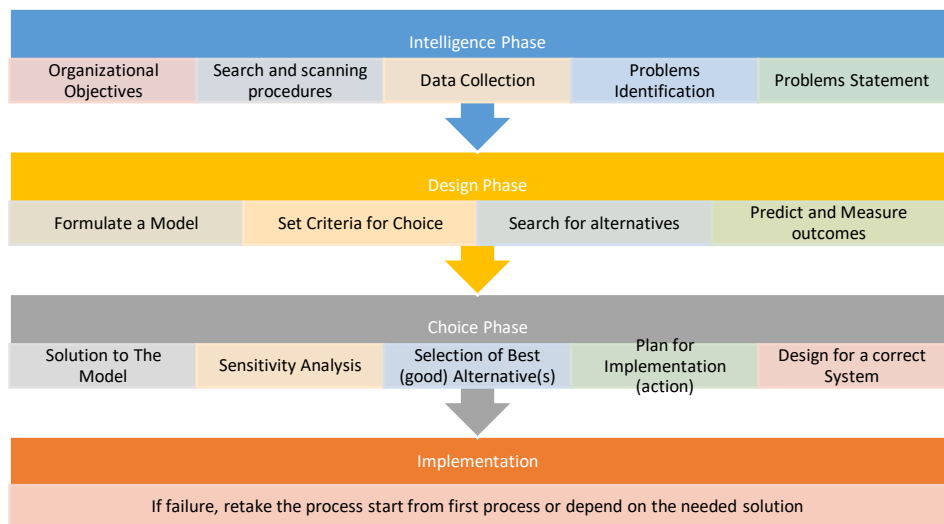


Figure 8. Decision Support System Process

C. Decision Support System Phase

The development approach utilized is called FAST (Framework for the Application System Techniques) Figure 9, which offers a variety of projects and tactics within a framework that is comparatively adaptable.

During the design phase, a decision maker works to develop alternatives and analyses the options to offer

knowledge about their pertinent implications. During this step, the decision-maker may learn that more information is needed. To fix the problems before moving on to the design step, the intelligence stage must be revisited.

During the choosing phase, the decision-maker selects one of the suggested alternatives that were considered during the design phase. The conditions of the decision as well as the decision maker's personality traits and eccentricities have an impact on the choice's outcome. It's possible that none of the solutions are suitable (return to the design phase), that several competing options obtain high grades, or that the situation has drastically changed.

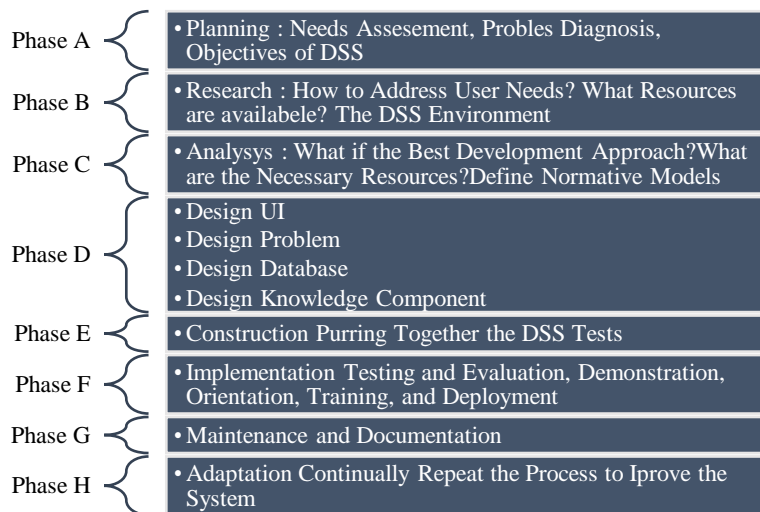


Figure 9. Decision Support System Phase

The FAST phases are as follows:

1) *Preliminary Investigation Phase*

In this stage, the author establishes the case, develops the scope, selects the methodology, and plans the research utilizing

methods for gathering data such interviews, observations, and documentation, while using PIECES of senses (Performance, Information, Economics, Control, Efficiency, and Service).

2) *Problem Analysis Phase*

An evaluation of the current system will be done at this phase. This step provides a deeper knowledge of the five conflicts that are present, including case analysis, goal selection considering system restoration, and business process analysis.

3) *Requirements Analysis Phase*

In this stage, the author understands and evaluates the system user's requirements before updating and improving the plans.

4) *Logical Design Phase*

By using illustrative system examples to describe the new system requirements, this design phase explains how the advanced system design will be created. Examples of use-cases, logical data flow diagrams, data dictionaries, and ERD are the senses employed in this phase.

5) *Decision Analysis Phase*

This stage updates the project plan, suggests changes to the plan, and suggests a system fix.

6) *Physical Design and Physical Integration Phase*

A combination of physical design specifications, design prototypes, and business procedures are established during this

phase. Physical Data Flow Diagram (DADF), data dictionaries, and ERD are the senses that are utilized.

7) *Construction and Evaluation Phase*

In this sense, both the system and its individual components are tested. When this test is successful, the system can start to be used. Flowcharts, Microsoft Visual Basic 6.0 programs, databases from SQL Server 2000, ADO connections (ActiveX Data Control), and Crystal Reports are the senses employed.

8) *Installation and Delivery Phase*

The authors carry out testing and updates, install new databases and events, provide user training, and transition to the new system during this phase.

9) *Operation and System Offer Phase*

Once the system is running, ongoing system maintenance is necessary for residues with a useful and productive life cycle.

D. Decision Support System Components

Decision support system, several components of which are also included in the information system components. The database management, model basis, and software system/user interface make up the Decision Support System's three main building blocks.

1. Database Management

is a database-organized data subsystem. Information that supports decisions and can come from either the internal or external environment. DSS requires that information that is pertinent to the current issue be resolved through simulation.

2. Model Base

is a quantitative model that represents the problem as a basis for simulation or retrieval (mathematical models, for example) decisions, including the objectives of the problem (objective), the components related to it, existing constraints (constraints), and other related matters. Base Model allows decision makers to conduct a thorough analysis by developing and comparing alternative solutions.

3. User Interface / Dialog Management

It is sometimes referred to as the conversation subsystem and is made up of the two preceding components, database administration and model base, which were previously presented as computer-understandable models and combined into a third component (user interface). The Decision Support System gets input from the user through the User Interface, which also displays the system output for the user.

Based on the type of help, Daniel Power proposed another grouping for the DSS. He classifies DSS into several categories, including model-driven DSS, data-

driven DSS, document-driven DSS, and communication-driven DSS.

1) Communication-driven

Collaboration is supported by DSS, allowing multiple people to work collaboratively. Examples include programs that are integrated, like Microsoft Groove or Google Docs.

2) Data-driven

Access to and manipulation of internal time series data firms, as well as occasionally access to external data sources, are key components of data driven DSS.

3) Document-driven

The management, retrieval, and manipulation of structured information in multiple electronic formats are all made possible by document driven DSS.

4) Knowledge-driven

Specialized problem-solving abilities are provided by knowledge-driven DSS and can be stored as facts, rules, procedures, or other comparable structures.

5) Model-driven

Model-driven DSS places a strong emphasis on model access and manipulation in the areas of finance, optimization, and simulation. User-provided data and

settings are used in this kind to assist decision makers in analyzing situations.

GLOSARIUM

A

Algorithm

A method or set of guidelines that must be followed while performing calculations or other problem-solving tasks, particularly by a computer.

Alternative

One or more items that having a different potential outcome.

Artificial Intelligence

A system with artificial intelligence has intelligence that may be configured in a scientific environment.

B

Benefit

A benefit or gain resulting from anything.

Business

A person's regular occupation, profession, or trade.

C

Categorical

unambiguously clear and straightforward

Clinical

involving the observation and care of real patients as opposed to theoretical or laboratory research.

Combination

A combining or merging of various elements, wherein each component part is unique from the others.

Comparison

An evaluation of the similarities and differences between two things or individuals.

Components

A component, especially one found in a machine or vehicle, that makes up a bigger total.

Computer Science

The research of computer usage and theory.

Consistency

Conformity in the use of something, usually what is required for the purpose of reason, truth, or justice.

Cost

A sum that must be spent or paid in order to purchase anything.

Criteria

A guideline or benchmark by which something can be assessed or determined.

D

Data Warehouse

Computers. a sizable, central repository for digital data acquired from various organizational units

Database

A thorough compendium of connected data arranged for easy access, typically in a computer.

Decision

The act or process of deciding resolution of a query or doubt by passing judgment:

Diagnostics

Medicine/Medical (used with a singular verb).

Distributed

Having or having to do with a single database that is shared across this network, particularly one that incorporates several smaller databases

E

Ecosystem

Any system or network of components that interact and are interconnected, such as in a business

Employee

A person receiving compensation while working for another individual or a company.

Errors

The state of holding an untrue belief

Expert Systems

A computer program that, using the information at hand, provides diagnoses, answers, or solutions by going through steps meant to mimic the methods and knowledge used by experts in each subject.

F

Feasibility

The likelihood, capacity, or potential for something to be done or accomplished (frequently used in an attributional sense)

Fuzzy Logic

A branch of logic created to allow levels of knowledge and reasoning imprecision, exemplified by words like "extremely," "very probably," and "unlikely," to be represented in a way that the data can be processed by computers.

H

Hierarchy

any system of persons or things ranked one above another.

Hospitalizations

I

Information System

a computer system or set of components for collecting, creating, storing, processing, and distributing information, typically including hardware and software, system users, and the data itself:

K

Knowledge

knowledge of facts, truths, or principles, as gleaned from research or study; general erudition

Linguistic

Of or belonging to language

M

Manager

A person who has control or direction of an institution, business, etc., or of a part, division, or phase of it.

Matrix

Something that constitutes the place or point from which something else originates, takes form, or develops

N

Natural Language

A language used as a native tongue by a group of speakers, as Arabic, English, Mandarin, etc.

Neural Networks

Any group of neurons that conduct impulses in a coordinated manner, as the assemblages of brain cells that record a visual stimulus

Normalized

To cause (something previously considered abnormal or unacceptable) to be treated as normal:

Numeric

Of or relating to numbers; of the nature of a number.

O

Operation

An act or instance, process, or manner of functioning or operating.

Organization

The state or manner of being organized.

P

Patient

A person who is under medical care or treatment.

Planning

The act or process of planning or plans.

Preference

The favoring of one country or group of countries by granting special advantages over others in international trade.

R

Rank

Several persons forming a separate class in a social hierarchy or in any graded body.

Ratio

The relation between two similar magnitudes with respect to the number of times the first contains the second

Recommendation

Representation in favor of a person or thing.

Records

To set down in writing or the like, as for the purpose of preserving evidence.

Robotics

The use of computer-controlled robots to perform manual tasks, especially on an assembly line.

S

Safety

The state of being safe; freedom from the occurrence or risk of injury, danger, or loss.

Scale

A cause of blindness or ignorance, as regarding the true nature of a person, situation, etc:

Semi-Structured

Having and manifesting a clearly defined between structure and unstructured on organization.

Solution

A particular instance or method of solving; an explanation or answer:

Storage

The act of storing; state or fact of being stored

Strategies

The use or an instance of using this science or art.

Support

To bear or hold up (a load, mass, structure, part, etc.); serve as a foundation for

Synthesis

The combining of the constituent elements of separate material or abstract entities into a single or unified entity (opposed to analysis,) the separating of any material or abstract entity into its constituent elements.

System

An assemblage or combination of things or parts forming a complex or unitary whole

T

Tactical

Of or relating to a maneuver or plan of action designed as an expedient toward gaining a desired end or temporary advantage

Transactions

Something that is transacted, especially a business agreement.

U

Unstructured

Lacking a clearly defined structure or organization

User Interface

The interface features through which users interact with the hardware and software of computers and other electronic devices

V

Vector

Such a quantity with the additional requirement that such quantities obey the parallelogram law of addition.

W

Warehousing

An act or instance of a person or company that warehouses something.

Weights

The amount or quantity of heaviness or mass; amount a thing weighs

INDEKS

A

Algorithm 74, 92, 100

Alternative

Artificial Intelligence

B

Benefit

Business

C

Categorical

Clinical

Clinical Data

Combination

Comparison

Components

Computer Science

Consistency

Cost

Cost

Criteria

D

Data Warehouse

Database

Decision

Diagnostics

Distributed

E

Ecosystem

Employee

Errors

Expert Systems

F

Feasibility

Fuzzy Logic

H

Health Service

Hierarchy

Hospitalizations

I

Information System

K

Knowledge

L

Linguistic

M

Manager

Matrix

N

Natural Language

Neural Networks

Normalized

Numeric

O

Operation

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Patient

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Preference

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User Interface

V

Vector

W

Warehousing

Weights

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Catatan :