



The Effect of Using Decision Support Systems Inside Companies

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ABSTRACT

This study aims to know the impact of using decision support systems in identifying and selecting projects within engineering companies, as decision support systems are systems that rely on the computer by conducting mathematical or mathematical operations that help in making decisions, a properly designed decision support system is software An interactive system-based system designed to help decision makers gather useful information in the form of a combination of raw data, documents, personal knowledge, or business models to identify and solve problems and make decisions. In this study, we focused on the stages that the decision support process goes through and the collective decision support system.

Keywords: decision support system , engineering companies , decision making , data analysis

1. Introduction

A decision support system helped create a kind of connection between three main elements: Databases and available information, quantitative models (mathematics, statistics, operations research), and decision makers (individuals or groups involved in the development process). Systems of this type are closely linked to computers and input operations that are important in the preparation and processing of that information, whether mathematical or not. This system has therefore played a key role in helping, supporting and streamlining the decisions managers make to create this kind of interdependence.

Information and its systems play an important role in formulating decisions and ensuring that they meet the requirements of the decision-making process. The developed information systems work to provide data in order to support the provision of the required data in order to support and manage the functions of the project programs for the excellence of what they present with accuracy, modernity, integration and brevity in presenting the facts to be closely related to the problem to which it relates. Direct decision. The computer plays an important role in the process of rationalizing decisions through software and mathematical and accounting operations, which can be accomplished quickly and accurately. Several assistive systems have been linked to it, including decision support systems. Semi-structural, by merging between database elements and quantitative models (statistical, mathematical, operations research) in addition to taking the decision maker's point of view. The researchers differed in setting a specific definition of decision support systems, so we rarely find an information system that does not have a role to play in supporting and rationalizing the decision-making process. And we can put a procedural definition to the effect that: - The decision support process: - It is the systems that depend on the computer through the conduct of mathematical or mathematical operations aimed at helping the decision-maker and rationalizing his destination. It is a process of linking the decision-maker with data, statistical and mathematical operations. The decisions that are supported by this type of system can be classified into two types: 1- Constructive decisions: These are the immediate decisions that are taken in response to various preset policies that are fed from what is called a "decision base". 2- Non-structural decisions: These are those that are taken to deal with unspecified, interrelated or non-structural problems, where part of the transactions can be accurately identified and the other part is of a probabilistic nature that is often difficult to identify and identify its behavior, and then it cannot be prepared in advance due to the scarcity of decisions. Or its lack of clarity or the speed of change in these decisions, as it often takes a great deal of time from the decision-maker

2. Stages of decision support

The decision-making support process goes through three different phases, which were clarified by the "Herbert Simon" 1960 model as a basis for the decision-making support process. This model can be used to describe quick and short-term decisions in addition to long-term strategic decisions.

Simon's model is divided into three main phases: the intelligence phase, the design phase, and the selection phase:

1- The first stage: intelligence

The intelligence phase of the decision support process begins with two principles:

A- Finding the problem:

It is intended to identify anything that does not agree with the previously defined plan or with the standard standards set. Thus, the goal for which the decision maker seeks is clear.

B- The pursuit of available opportunities:

It means creating some conditions that seem to be presented to the decision-maker to achieve a better return. After discovering the problem and formulating it in the previous stage, the problem that has a single solution is not considered a problem in itself, but rather it is a fact that must be recognized. But if the problem has more than one solution, then there are many points of view regarding it, and they vary in strength and weakness.

During this stage, the decision-maker or his assistants must prepare a general summary of possible alternative solutions, using modern scientific methods and design tools used in systems management, analysis and design sciences. An important part of the decision-making process is extracting alternatives:

The task of extracting alternatives is creative work and creativity that can be learned. The creative process requires accurate knowledge of the scope and limits of the problem, in addition to the motives for solving the problem. Creativity can be enhanced by means such as scenarios, brainstorming, checklists, and decision process templates.

The design stage of the decision support system contains several steps: it begins with planning, then research and analysis of the system, then access to the design and configuration of the system, and finally the implementation of programs and follow-up of changes to come up with the required modification, as a result of lessons and facts of actual implementation.

The third stage: selection

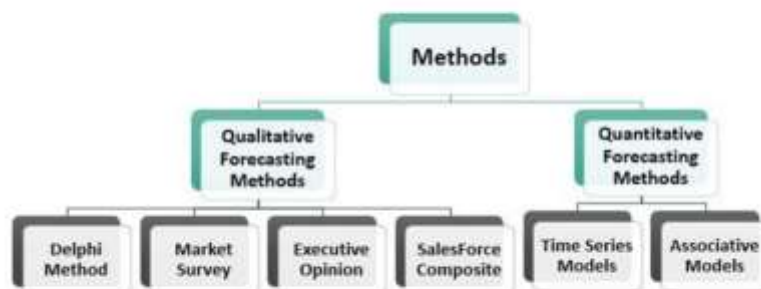
This stage is the essence of the decision-making process, as the decision-maker faces a set of multiple alternatives, and one of them must be chosen that will be applied and adhered to by the members of the organization or institution. This may seem easy, but in reality there are many difficulties that make the selection stage a complex process, including: multiple preferences, uncertainty, conflict of interests, oversight, and collective decision-making.

Forecasting and simulation models and decision support systems The essence of decision support systems is prediction, early warning and the formulation of scenarios based on simulation models.

Below are the general features and different applications of the two models.

1- Forecasting model: Forecasting models play an important role in providing decision makers with forecasts and important information well in advance of the occurrence of crises resulting from risks, whether risks resulting from natural phenomena or were human-induced but unintentional.

Forecasting Methods



Quantitative methods (mathematical and statistical) and computer technology, as well as communication technology and remote sensing, play an essential role in the forecasting process. These technologies allow measurement, control and monitoring, and thus provide the decision support team with warnings and predictions of possible crises. Hence, the negative effects can be avoided or the necessary precautions should be taken to mitigate the risks. Statistical methods are often used to analyze and study the available historical database and benefit from it in predicting the possibility of similar crises in the future.

2- Simulation model: On the other hand, there are other uses for mathematical models through maintaining the necessary scenarios to create a set of alternatives from which the decision-maker can choose an alternative.

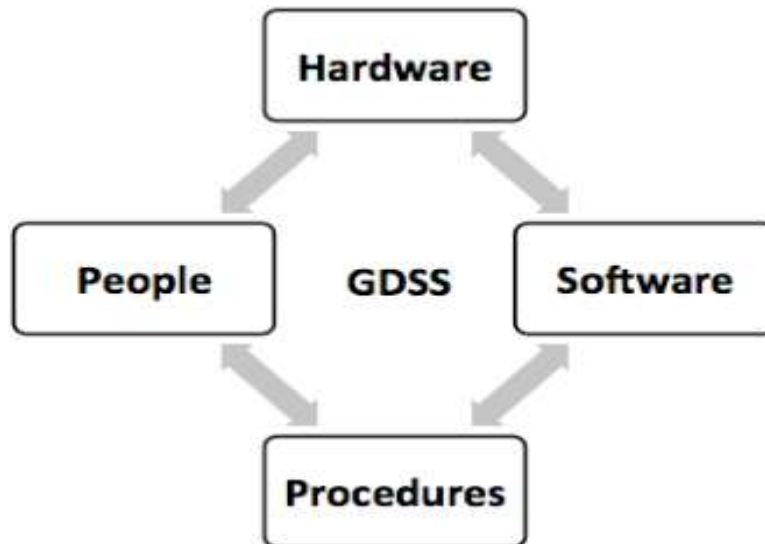
3. Collective decision support systems

A collective decision support system is an interactive, computer-based system that facilitates finding solutions to complex, unstructured problems. The decision-making process in this case is characterized by the fact that the decision-makers work together as an integrated team, brought together by a meeting, a conference, or a specific problem, and the purpose is to reach a unified decision that combines different experiences. There is one party

concerned with procedures related to loss of life, another concerned with security measures, and a third concerned with financial compensation and social affairs, or the media aspect of a crisis. All of these work within the framework of the crisis, which is entrusted to them with the responsibility to take the necessary decision to confront it. In order to ensure coordination, there must be only one tool that provides support for all of them.” In our case, this is the collective decision support system. It aims to create an effective work environment for decision-makers involved in managing a crisis.

A group decision support system has the following characteristics:

- 1- A collective system, not an individual one.
- 2- Uses communication technology "extensively".



- 3- It aims to reduce negative behaviors, such as wasting time and trying to impose one's opinion.
- 4- It aims to support positive behaviors such as sharing opinions and stimulating scientific thinking.

The collective decision support system consists of a set of different physical components, the most important of which are:

- 1- Decision making rooms
- 2- A communication network for decision making
- 3- Remote conferencing technology.
- 4- Decision making from afar.

The collective decision support system is an extension of the traditional decision support system in the direction of more effective support. Hence, the collective system is a decision-making support system, with the following modifications added to it:

- 1- Supporting it with an extensive communications network
- 2- Supporting it with means to increase effectiveness. Intellectual participation through models of proposal, arrangement and grades, all aiming to reach a unified general opinion.
- 3- Supporting it with more reliable and credible means than provided by the individual decision support system.

4. Conclusion

In this study we studied the effect of decision support systems in identifying and selecting projects within engineering companies, decision support systems help in making more informed decisions. Often used by upper and mid-level management, decision support systems are used to make actionable decisions, or produce multiple possible outcomes based on current and historical company data. The system can also improve planning and increment the board achievement. Many decision support systems offer exact designs for executing strategies in light of their information, making it simpler for professionals to correct mistakes or start new processes.

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