Changing Paradigms of Business Decision making with the help of Specialised Decisional tools and Information Systems

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Abstract

For the Manager of the 21st century the market space, market place and the dynamics of the organisations are constantly changing at very speedy pace and the more the technology we have the more challenging and precise decision making has be for the managers, to facilitate that, there are a number of information systems available such as DAS, KWS, MIS, DSS, DBMS, ES, GDSS, CSCWS, etc. In this paper I have selected two main information systems mainly, MIS and DBMS. First I have discussed the decision making process in each process, its characteristics, and their respective connection to the overall decision making process has been given. Various figures and diagrams have been presented to facilitate the easy understanding of the concepts and their overall place in organisational decision making.

Keywords: Management Information System, Database Management System, Decision making Process.

INTRODUCTION

With the advent of Computers and tremendous increase in data processing capability in the last two decades, decision making has become about precision and timeliness then intuition. There are different kinds of informational systems available to business depending upon their need. Transaction Process System (TPS), Decision Support System (DSS), Knowledge Management System (KMS), Learning Management System (LMS), Database Management System (DBMS) and Office Information Systems (OIS). Informational Systems are transforming every aspect of business right from the worker to top management level (Figure-1).
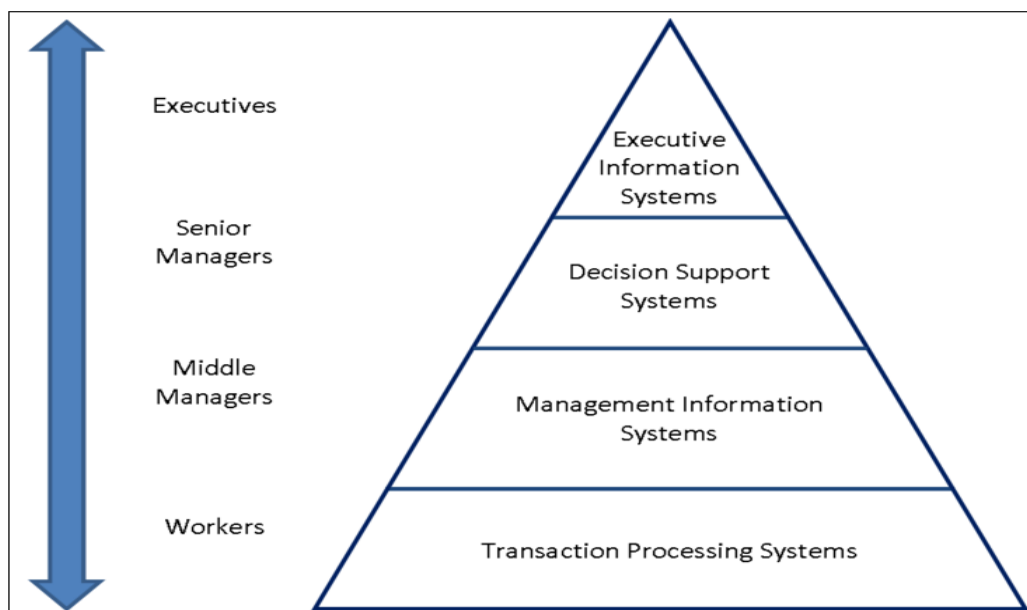

Figure 1

In this paper I have discussed two kinds of information systems namely Management Information Systems (MIS), Database Management System (DBMS), and their characteristics, interrelationships and their overall relationship with decision- making process in the organisation.

Decision Making Process

Step1: Identify the decision to be made. You realize that a decision must be made. You then go through an internal process of trying to define clearly the nature of the decision you must make. This first step is a very important one.

Step 2: Gather relevant information. Most decisions require collecting pertinent information. The real trick in this step is to know what information is needed, the best sources of this information, and how to go about getting it. Some information must be sought from within yourself through a process of self-assessment; other information must be sought from outside yourself-from books, people, and a variety of other sources. This step, therefore, involves both internal and external "work".

Step 3: Identify alternatives. Through the process of collecting information you will probably identify several possible paths of action, or alternatives. You may also use your imagination and information to construct new alternatives. In this step of the decision-making process, you will list all possible and desirable alternatives.

Step 4: Weigh evidence. In this step, you draw on your information and emotions to imagine what it would be like if you carried out each of the alternatives to the end. You must evaluate whether the need identified in Step 1 would be helped or solved through the use of each alternative. In going through this difficult internal process, you begin to favor certain alternatives which appear to have higher potential for reaching your goal. Eventually you are able to place the alternatives in priority order, based upon your own value system.

Step 5: Choose among alternatives. Once you have weighed all the evidence, you are ready to select the alternative which seems to be best suited to you. You may even choose a combination of alternatives. Your choice in Step 5 may very likely be the same or similar to the alternative you placed at the top of your list at the end of Step 4.

Step 6: Take action. You now take some positive action which begins to implement the alternative you chose in Step 5.

Step 7: Review decision and consequences. In the last step you experience the results of your decision and evaluate whether or not it has "solved" the need you identified in Step 1. If it has, you may stay with this decision for some period of time. If the decision has not resolved the identified need, you may repeat certain steps of the process in order to make a new decision. You may, for example, gather more detailed or somewhat different information or discover additional alternatives on which to base your decision.

Areas where Decisional tools can be helpful

There are a number of areas in business where decisional tools can be helpful, according to http://smallbusiness.chron.com they can be –

Market Research

Market research is the process of gathering information about a certain market, such as the preferences of potential customers, the presence of competitors and the current state of the market. Market research is an essential strategic planning tool because insight into the needs of customers can help managers create a mission, goals and strategies that better fulfill those needs.

Cost-Benefit Analysis

A cost-benefit analysis is a common type of strategic decision-making tool that consists of assessing the costs and potential benefits associated with different courses of action and choosing the course of action that results in the greatest net benefit. For example, if managers expect that a certain project would cost $100,000 and result in a $110,000 benefit while a second project would cost $90,000 and result in a $105,000 benefit, managers would pursue the second project, as it is expected to produce a net benefit that is $5,000 greater than the other project.

SWOT Analysis

A SWOT analysis is a strategic planning tool that consists of assessing the strengths and weaknesses of a business and the threats and opportunities a business faces. A SWOT analysis can help managers take advantage of company

strengths and implement strategies to reduce weaknesses or turn them into strengths. Assessing external threats and opportunities can aid in the strategic decision-making process, as it allows managers to plan for things like the presence of new competitors or the impact of new government regulations.

Feasibility Study

A feasibility study or feasibility analysis is a business-planning tool that involves assessing whether a certain project or goal can actually be created or achieved and whether the project can make a profit. A feasibility analysis can help entrepreneurs in the beginning planning stages of launching a company decide whether to pursue a certain opportunity or not. For example, if an inventor creates a new type of television display technology that is expensive to produce and does not provide significant benefits over existing technologies, a feasibility study might reveal that products that use the technology would be too expensive to attract customers, making a business based on selling the product unfeasible.
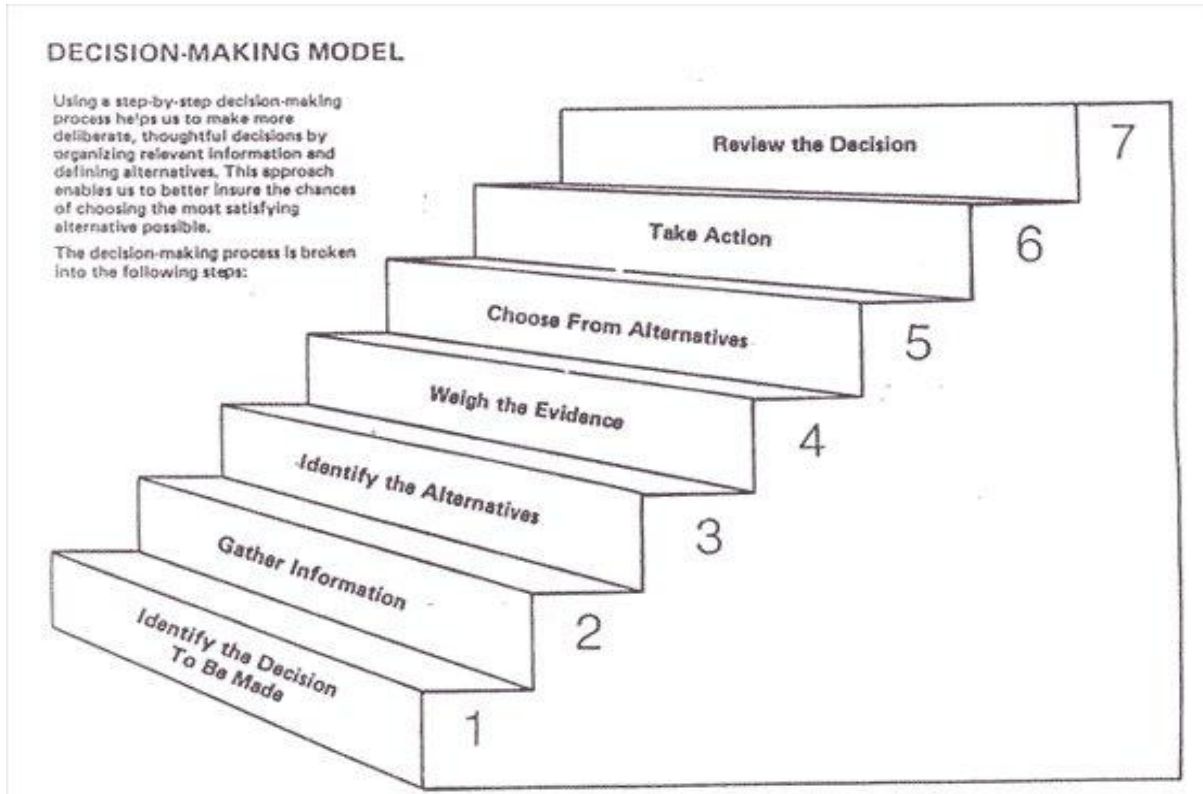

Figure-2

Management Information System(MIS)

Management Information System (MIS) Management information system (MIS) is one of the major computer based information systems. Its purpose is to meet the general information need of all the managers in the firm or in some organizational subunit of the firm. Subunit can be based on functional areas on management levels. There are many definitions for MIS, but one of the most appropriate definitions describes management information system (MIS) as "an organizational method of providing past, present and projected information related to internal operations and external intelligence. It supports the planning, control and operation functions of an organization by furnishing uniform information in the proper time frame to assist the decision makers"(Waston, 1987). The information in MIS describes the firm or one of its major systems in terms of what has happened in the past, what is happening now and what is likely to happen in the future. The information is made is available in form of periodic reports, special reports and output of mathematical simulations. All managers use the information output as they make decisions to solve the firm's problems (Raymond, 1990).

An MIS Model

An MIS model is illustrated in Figure 3. The database contains the data provided by accounting information system. In addition, both data and information are entered from the environment. The data based content is used by software that produces periodic and special report, as well as mathematical model that simulate various aspects of the firm operations. The software output is used by people who are responsible for solving the firm's problems. Note that some of the decision maker might exist in the firm's environment. The environment will involve once the firm bonds

together with other organizations such as suppliers to form an Inter Organizational Information System (IOS). In such case, the MIS supplies information to the other member of the IOS (Raymond,1990)
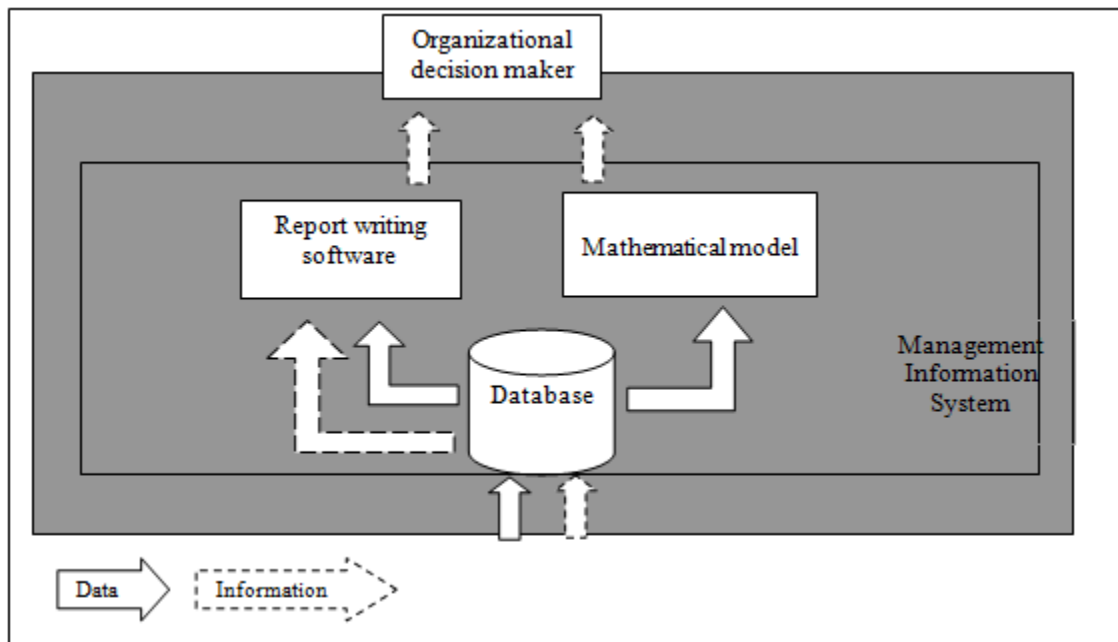

Figure-3

MIS Characteristics

In general, management information systems have a number of characteristic, which include the following:

Report with fixed and standard formation. For example scheduled reports for inventory control may contain the same type of information placed in the same location on the reports.

Have report developed and implemented using information system personnel, including systems analysts and computer programmer. Typically analysts and programmers are involved in developing and implementing MIS reports. User is normally involved in the design of the reports, but they are not typically involved in writing the computer programs to produce them.

Require formal request from user. Because information systems personnel typically develop and implement MIS reports, a formal request to the information systems department for report is usually   required.

Produce scheduled and demand reports. The major type of reports produced by an MIS is scheduled demand reports (Stair, 1992).

External data is not captured by the organization but is used by the MIS. (i.e., customer, supplier and competitor information).

The role of MIS in decision making process

The MIS and its organizational subsystems contribute to decision making process in many basic ways.
Nowadays, some of the organizations use MIS to assist managers for decision making. For example, to assist decision-makers in extracting synthesized information from a massive database such as the Current Public Transport Record (CPTR) of Durban (CPTR), the Durban Unicity Council decided to make use of a Public Transport Management Information System (PTMIS) developed by Stewart Scott. This system is for use by transport planners and managers (Louw et al, 2001).Power (2002) has stated that making decisions is an important part of working in business environment. Companies often make decisions regarding operational improvements or selecting new business opportunities for maximizing the company's profit. Companies develop a decision-making process based on individuals responsible for making decisions and the scope of the company's business operations. A useful tool for making business decisions is a management information system (MIS). Historically, the MIS was a manual process used to gather information and funnel it to individuals responsible for making decisions.
Organization–wide information resource

The MIS is an organization – wide effort to provide decision making process information. The system is a formal commitment by executive to make the computer available to all managers. The MIS sets the stage for accomplishments in the other area, which is DSS, the virtual office and knowledge based systems.

Situation analysis, problem identification and understanding

The main idea behind the MIS is to keep a continuous supply of information flowing to the   management. Afterward by data and information gathered from MIS system, make decisions.
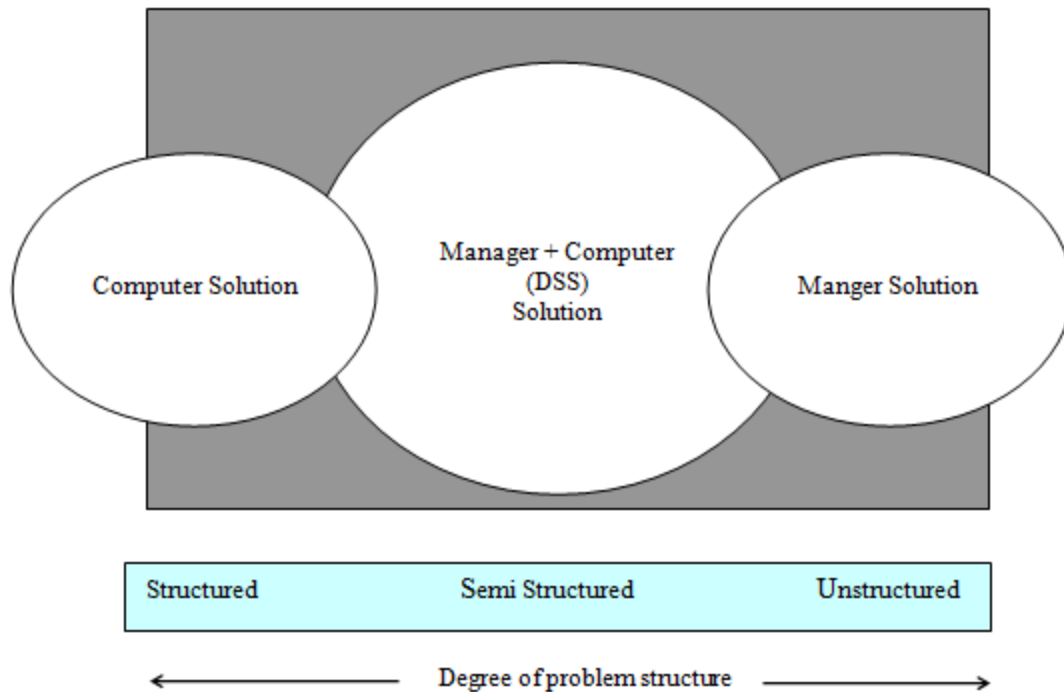

Figure-4

Database Management System (DBMS)

A decision support system or DBMS is a computer based system intended for use by a particular manager or usually a group of managers at any organizational level in making a decision in the process of solving a semi structured decision (Figure 7). The DBMS produces output in the form of periodic or special report or the results of mathematical simulations (Raymond, 1990). It is difficult to pinpoint that are completely structured or unstructured. The vast majorities are semi structured. This means that the DBMS is aimed at the area where most semi structured decision is needed to be made.

A DBMS Model

A DBMS model includes four parts as follows (Figure 5) (Raymond, 1998).

- **Data base** produces both internal and environmental data, which are stored in the database.

- **Report writing software** produces both periodic and special reports. Periodical reports are prepared according to a schedule and typically they are produced by software, which is coded in a procedural language such as COBOL or PL/I. The special report is prepared in response to unanticipated information need and takes form of database by users who use the query language of a DBMS or fourth generation language.

- **Mathematical model** produces information as a result of either simulation that involves one or more components of the physical system of the firm or facts of its operations. Mathematical models can be written in any procedural programming language. However, special model languages make this task easier and have the potential of doing a better job.

- **Groupware** enables multiple decision makers, working together as a group, to reach solutions. In this particular situation, the term GDSS, or a group decision support system is used. Perhaps the decision makers represent a

committee or a project team. The group members communicate with one another both, directly and by means of the group ware. The reports writing software and mathematical model have always been regarded as necessary DBMS ingredients. As the DBMS concept was broadened to provide support to two or more decision maker working together as a team or committee, the idea of special group oriented software or groupware, became a reality.
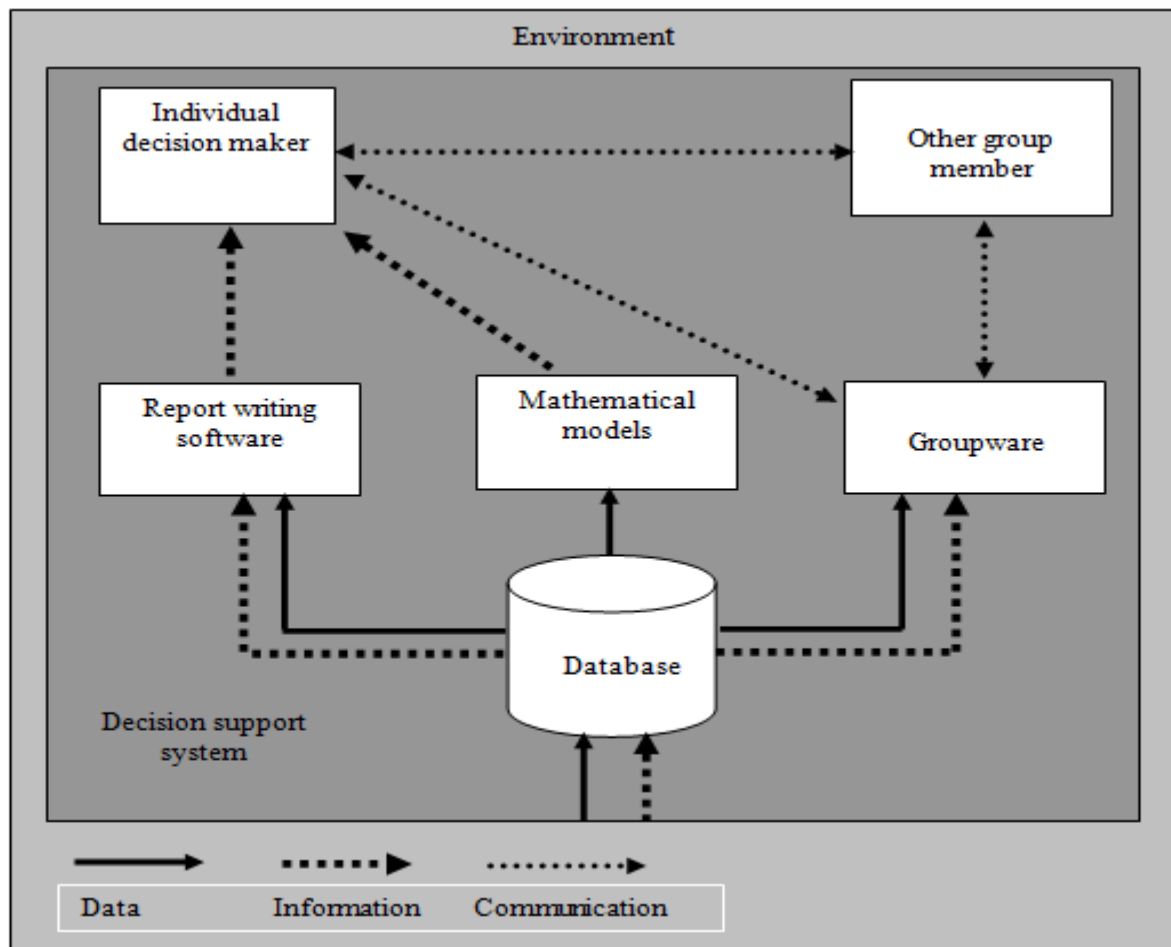

Figure-5

DBMS Characteristics

Database Management system has a number of characteristics, which include following:

- **DBMS provide support for decision maker mainly in semi structured and unstructured situations** by bringing together human judgment and computerized information. Such problem can not be solved (can not be solved conveniently) by other computerized systems, such as MIS.

- **DBMS attempts to improve the effectiveness of decision-making** (accuracy, timeliness, quality) rather than its efficiency (cost of making the decision, including the charges for computer time) (Davis &Olson,1985).

- **DBMS provides support to individuals as well as to groups.** Many organizational problems involve group decision-making. The less structured problem frequently requires the involvement of several individuals from different departments and organizational levels.

- **Advanced DBMS are equipped by a knowledge component**, which enables the efficient and effective solution of very difficult problems (Turban & Aronson, 1998).

- **A DBMS can handle large amount of data** for instance advanced database management package have allowed decision makers, to search database for information. A DBMS can also solve problems where a small amount of data is required.

- **A DBMS can be developed using a modular approach.** With this approach, separate functions of the DBMS are placed in separate modules - program or subroutines-allowing efficient testing and implement of systems. It also allows various modules to be used for multiple purposes in different systems.

- **A DBMS has a graphical orientation**. It has often been said that a picture is worth a thousand words. Today's decision support systems can help managers make attractive, informative graphical presentations on computer screens and on printed documents. Many of today's software packages can produce line drawing, pie chart, trend line and more. This graphical orientation can help decision makers a better understanding of the true situation in a given market place.

- **A DBMS support optimization and heuristic approach**. For smaller problems, DBMS has the ability to find the best (optimal) situation. For more complex problems, heuristics are used. With heuristic, the computer system can determine a very good-but not necessarily the best- solution. This approach gives the decision maker a great deal of flexibility in getting computer support for decision making activities.

- **A DBMS can perform "what – if" and goal – seeking analysis.** "What – if "analysis is the process of making hypothetical change to problem data and observing impact of the results. In with" what – if "analysis, a manager can make changes to problem data (the number of automobiles for next month) and immediately see the impact on the requirement for subassemblies (engines, windows, etc.) (Stair,1992).

The role of the DBMS in the process of decision making

Previously it was mentioned that the MIS is best suited in identifying problems and helping managers understanding them to make suitable and correct decisions, but the main weakness of MIS is that it is not aimed at the specific need of the individual and group decision makers. Very often the MIS does not provide exactly the information that is needed to solve problems for individual and group decision making. DBMS is tailored to the specific need of the individual and group managers. Therefore, the DBMS can extend this support through the remaining steps (in objective and criteria setting, alternative search, alternative evaluation, making the decision and decision review) of the decision making. Finally DBMS has more roles in decision-making and problem solving than MIS (Raymond, 1998). The other researches such as the following confirm this idea: Uma (2009) has stated that a Database Management System is an integrated set of computer tools allowing a decision maker to interact directly with computer to retrieve information useful in making semi structured and unstructured decisions. Example of this decisions include such things as merger and acquisition decisions, plant expansion, new product decisions portfolio management and marketing decisions. Nokhbatolfoghahaayee et al (2010) have introduced a fuzzy decision support system (FDSS) with a new decision making structure, which can be applied to manage the crisis conditions in any large scale systems with many parameters. After receiving both functional variables of the system and fault signals, the FDSS makes proper decisions to make up and repair the distorted situation and the affected elements of the network according to its data base established through experience gathered from expert managers and decision models properly developed. These decisions are expressed in the form of some scenarios with different desirability degrees, which are determined by some properly developed fuzzy multi-criteria decision making methods, helping the manager choose the best one according to his discretion. Alonso et al (2010) have presented an implemented web based consensus support system that is able to help, or even replace, the moderator in a consensus process where experts are allowed to provide their preferences using one of many types (fuzzy, linguistic and multi-granular linguistic) of incomplete preference relations. These studies show the important and role of MIS during managers decision making process.

CONCLUSION

Apart from variety of information system in business world, MIS and DBMS were the main concern of present article. It was found that MIS is best suited to identify problems and help management to understand them to make suitable decisions. At the same time, MIS is not aimed to help particular and specific need of the individual and group decision making. On the other hand DBMS are tailored to the specific need of individual and group managers. Therefore, it could be concluded, that DBMS can extend its support to the same steps of decision making process and has more roles in decision-making and problem solving than MIS. Due to some practical limitations, may be some of steps of decision making process to be chosen and the others to be removed. It is important to consider which ones are preferred to the other ones. In future works can study on the role of other information systems for managers' decision making and comparative it to DBMS and MIS.

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