

## Information Technology and its Application in the Area of IT Management Information and Decision Support Systems

Mir Siyavash Asbaghi\*, Isa Abedini\*\*, Seyed Jamal Hosseini\*\*\*

\*University Instructor, Ph.D. Student of Urban Socio-Economic Management & Mayor of Gookan City, Azarbaijan-e Sharghi Province, I.R. of Iran. Email: Asmir49@yahoo.com

\*\*Lecturer at Payame Noor University of Tabriz, Member of Education Research Committee, Region

\*\*\* Faculty Member and Chancellor of Zanooz Payam-e Noor University, Azarbaijan-e Sharghi Province, I.R. of Iran

### ABSTRACT

The importance of determining a top management supportive strategy in the systematic process of strategic planning for decision support is such that it has attracted the attention of many researchers. So far, various methods have been identified and the prioritization of the macro strategies (such as aggressive, repulsive and fixation ones) and the formulation of micro strategies have been presented. However, while prioritizing and selecting a proper systemic necessary strategy, organizations are facing a huge dilemma and that is the large volume of raw data for decision making process. These data cannot help with the managers in their decision making. Thus, individuals are always seeking systems which could convert data into positive necessary processed information. The main faults with the existing method are lose of a considerable part of the collected data during the process, insufficient attention to the condition of unreliability and precise formulation of issues whose nature are complex and inexact. Another limitation is the involvement of the decision maker's mind in many factors in the course of decision making concurrently and sometimes those of pure political ones. Decision Support System (DDS) is an analytical system in the set of commercial intelligence systems in enterprise architecture.

**KEY WORDS:** Decision Support System, Decision Making Styles, Decision Making Processes.

### 1. INTRODUCTION

Decision making, as the essence of the main body of managers' activities in organizational levels in all of their duties is of great significance. Managers select their style of decision making with regard to different individual, organizational and environmental factors. The main objective of this research is to study the decision support system and the artificial intelligence which is the review of methods for the conversion of computer into a machine which could perform the human role to support the decision making process.

X.....

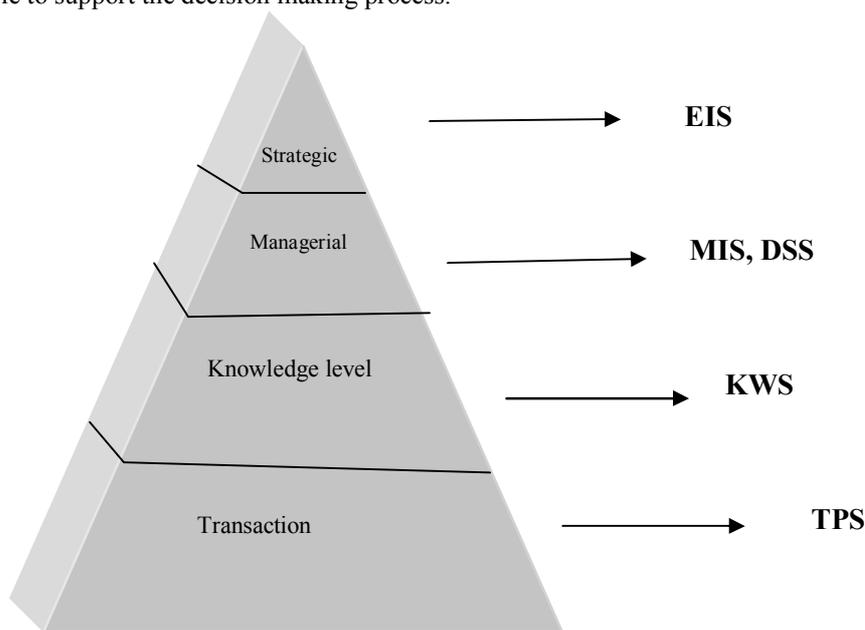


Figure 1: Information System in an Organizational Pyramid

\*Corresponding Author: Seyed Jamal Hosseini. Faculty Member and Chancellor of Zanooz Payam-e Noor University, Azarbaijan-e Sharghi Province, I.R. of Iran. Email: pnu\_zonoz@yahoo.com

**1.1 Management Information System (MIS)**

MIS is a computer-based system which presents data to the users with similar data needs. The users are usually the official staffs of an organization. It describes what has happened in the past and focuses on practical output and helps managers to do the jobs properly.

**1.2 Decision Support System (DDS)**

For the first time, this system was innovated by Scott Morton and Gorry in 1971. It is a data system which assists a manager or a small team of managers to solve a semi-constructed problem by providing data or giving suggestions[1]. It provides the possibility of establishing an easy link between the user and system. All types of decisions can be made. The formed problem which can be solved by an algorithm or decision making rules. Also, the non-constructed problems settlement does not have a specific structure and lastly the semi-built problems are comprised of both constructed and unconstructed parts.

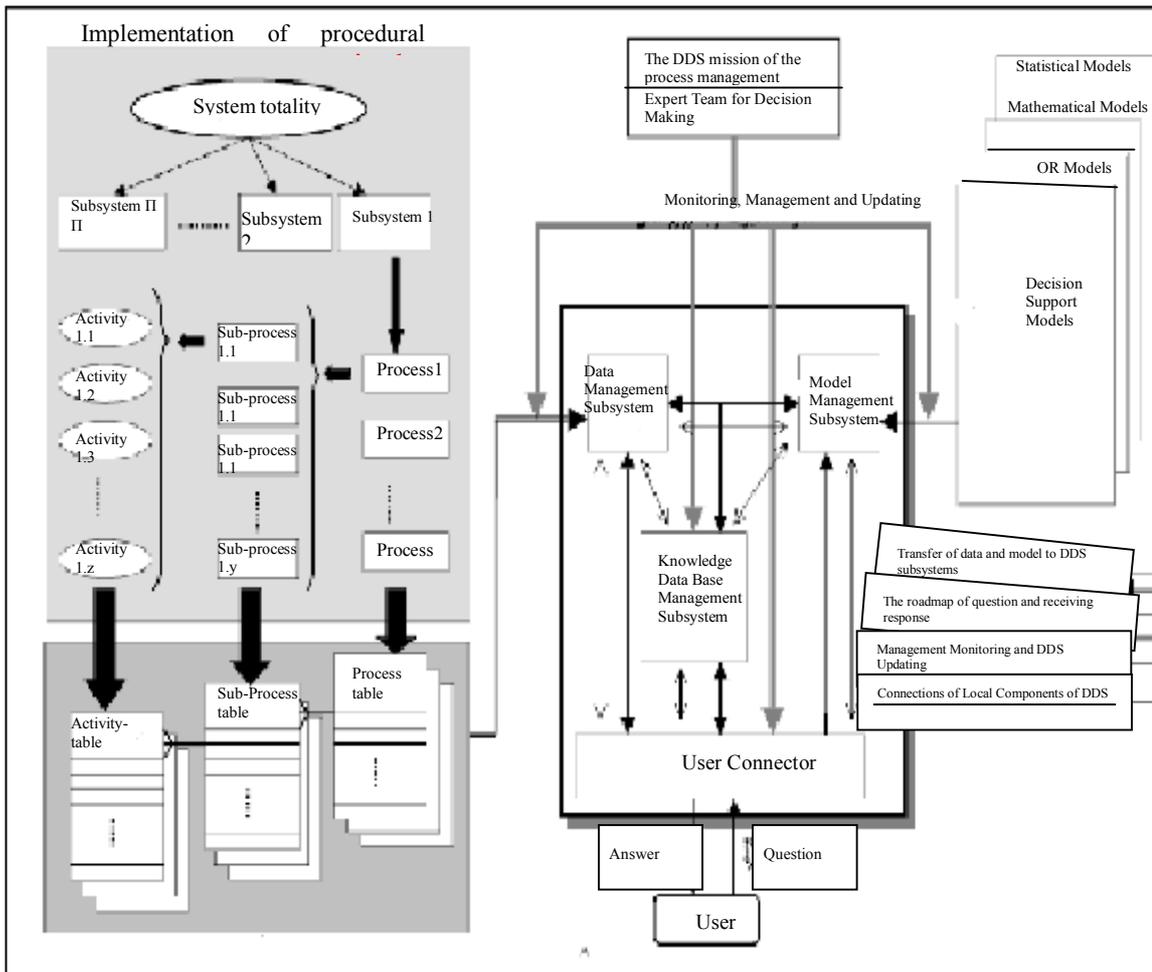


Figure 2- DDS conceptual Design

**1.3 Executive Information System**

EIS is a specific type of DSS which helps with decision making at organizational high levels. EIS shows to the senior managers of the organization a precise image of the organization performance and a summary of the activities of rivals. Working with this system is easy. It presents data such that it can be received easily. (In the form of graph, diagram, etc)

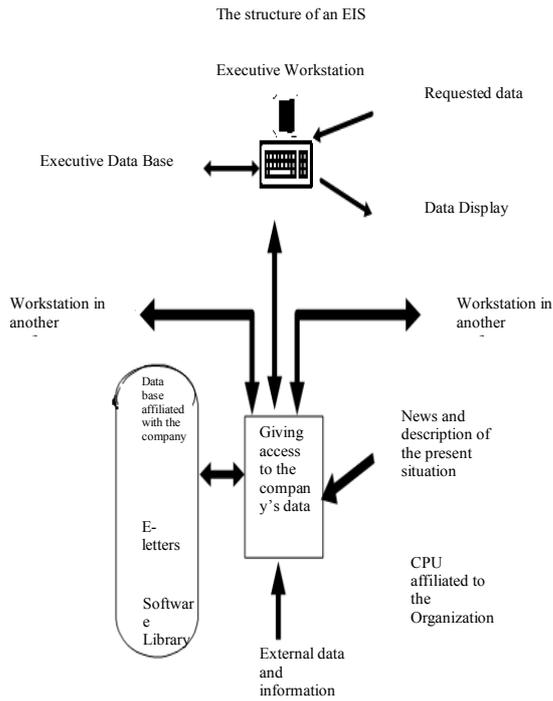


Figure 3: The Structure of an EIS

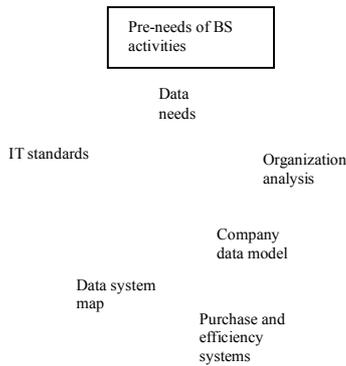


Figure 4: Pre-needs of BS activities

**2. Decision Making Process in the Times of Crises and the Role of Media**

Despite different types, crises have many things in common such as a short time for decision making and high pressure in a little time.

The process of decision making is a process in which for the purpose of solving one or some specific problems, certain options are put forth. Then out of them, the most ideal ones are selected following various assessments. Decision making in critical conditions is very sensitive and has a potential of a higher risk as compared with normal conditions. The critical special conditions sometimes lead to the prevention of decision making. If it occurs intentionally, then it is considered a decision by itself. In a crises-inflicted system, media can undertake a positive or negative role directly or indirectly. On the other hands, in necessary occasions, mass media can make the events and critical conditions transparent; thereby prevent of the misuse by the government or that of the influential groups and individuals[2]. Also by going to extreme in dissemination of information and influencing individuals or specific groups, they may bring the decision makers under pressure, to the extent that they make the condition critical or consider themselves in crises or lose the possibility of taking proper decision.

### **2.1 When teams are hindered from making decisions**

Those categories of leadership teams who can not reach a consensus will wait for the executive managers to say the last word and make the final decision. Sometimes, they become disappointed with the executive manager's decision. Ferish has termed this phenomenon as the "innocent despotism event". Many enterprises tend towards team building and practicing understanding and establishing communication to remove this abnormality. But according to Ferish, these methods can not solve the problem. Because, the problem is not the individuals, it lies in the every process of problem solving. Making effort to reach the foundations of individual beliefs is problematic in its essence. When the leadership teams learn that the mathematics of the voting system are the main factors and culprits, then they can give up losing time with irrelevant and meaningless psychological practices. Instead, they can choose practical measures which are designed to break and open the deadlock.

Work should be started by accepting the existence of a problem and identifying its causes. When more than two options are put forth, the scene is ready for the innocent despotism of the executive manager. Even the two options of Yes or No will be problematic, because they usually have an implicit third option: i.e. the option of neither this nor that. When the executive manager and leadership team know that they have a problem in decision making, then they can use the following techniques to minimize this shortage:

Expressive and clear expression of a favorable result, creation of a spectrum of choices to reach a favorable result, testing protective grids (which are portable) and walls (which are immovable), early divulging of the selected ones, expressing the benefits and damages of each choice, innovation of options which include the best features of the existing choices.

The teams which use such kind of tactics should remain faithful to two basic principles: Firstly, consultation and reviews should be done secretly, because the secure atmosphere for dialogue makes the members of team discuss freely and comfortably and then decide. Secondly, the individuals should be given sufficient opportunity to assess the options and evaluate opposing reasoning. The real co-direction will be the result of the materialization of these two principles.

### **2.2 Reform in the Economic Decision Making System (in margin)**

More than ten years ago, integrated studies were conducted on the correction of decision making system, but as expected, the government did not have a necessary will to make important and big changes. It preferred the continuation of the status quo. Fortunately, the present government has no problem as far as the change-oriented will is concerned. But all concerns are centered on the direction of changes. The present condition makes necessary that the future government to give more attention to making reform in decision making system. The reason is that the oil revenue has intensively decreased. Also government can not play the role of the distributor of oil income and define its role in meeting the budget needed for provinces and different bodies. The reduction of oil income and the start of high volume of developmental projects in different provinces in the past will force the government role changes from a generous government into a mean one. In that case, the main preoccupation of the government will be to finance itself. So, the attitude of the government should be directed at establishing local discipline and improvement of procedures. At the time of the management of Mr. Ahmadinejad in municipality, there was much attention given to the reduction of bureaucracy in municipalities. It was expected that this trend to be continued in the present government, but it was fully ignored. So, the financial conditions of the government and international situations have given hands to hands and will move the government to reconsider its structure. This will be a blessing opportunity if it is being associated with rationality and intelligence, and on that case reforms can be made in an ideal direction.

In line with this, certain proposals are here put forth which are not definitely based on deep and detailed studies, but they are presented from the viewpoint of a journalist and a student whose concern is to make a reform in economic affairs. It can hold proper points.

Many years ago, I made some suggestions for the integration of some ministries which were received warmly. This gives hope that some other proposals could be effective.

Since the past times, the integration of the Ministry of Energy [Power] and Ministry of Oil under one united ministry, i.e. Ministry of Energy has been under investigation. This integration can help with the reduction of costs resulting from repetitive jobs. More importantly, it can create more harmonization in energy policymaking at national level. It can eradicate some of the disputes among these two ministries. In addition, there is a structural problem in the Ministry of Oil and that is to say that the position of the Minister of Oil is not so clear. Because, almost all affairs of the ministry are managed by the executive manager of the oil company. With the establishment of the Ministry of Energy, the position of the Minister of Energy will be clarified and that is to regulate different relationship among different components of ministries such as electricity, water, gas and oil.

Another point which demands further contemplation is the role of the Ministry of Economics. Ministry of Economics should basically determine the financial policy or government budget. Whereas since pre-Islamic revolution era, this duty has been transferred to the Management and Planning Organization. Then the position of the Ministry of Economics has been diminished into a tax collector, involvement in the duties of Central Bank in monitoring the banks and interfering in monetary policy and other trivial affairs.

Whereas it is clear that the revival of the Management and Planning Organization is not at the blueprint, then the unification of the mentioned duties should be considered. Dispute concerning the detachment of the duties of the former Management and Planning Organization and Ministry of Economics has a long history. Now with the dissolution of the respective organization, the mentioned duties should be concentrated in one organization.

Another point refers to the Ministry of Cooperatives. It has been many times said that despite the passage of many years, this Ministry has not defined its main mission yet and can not do so. But standing on ceremony resulting from insistence on the formation of a third nature, apart from private and governmental sector has caused the formation and continuation of such a ministry. Decisiveness in determining the mentioned assignment will be critical[3].

It should be admitted that there is no precise understanding of the nature of the duties and authorities of Ministries of Labour and Social Affairs and Housing and Urban Development. I have no specific claim for these two areas but it should be discussed whether or not it is necessary to have two independent ministries for the two areas. Is it possible to summarize their performances into the framework of one council or organization? Also the case of integration of Ministry of Education and Ministry of Science, Research and Technology and as likes which can be useful. It is obvious that the main objectives of these changes are to downsize the body of the government (the cabinet) and to reduce the number of the ministries for ideal decision making. Though it seems it will be necessary to establish Ministries for Physical Education, Martyrs Foundation and Devotees Affairs, Cultural Heritage and Tourism.

### **2.3 The Analysis and Dissemination of Information and its Effectiveness on Managers' decision Making**

There was a time in which human was seeking data. Scientists and researchers were doing researches to find data for days and years. Today we live in a data-based society and it is clear that how important is the role of data to solve problems, to make decision and to spend the simple daily life. Now, information science can lay down a firm base for the future development by expanding its knowledge base. This base will be useful when it can analyze and disseminate the data frequency produced by centers. Working on the development of intelligence system by taking inspiration from the nature (intelligences-apart from human intelligence) is nowadays one of the highly welcomed areas in artificial intelligence. The genetic algorithm being suggested by using the evolutionary idea of Darwin and Natural Selection is a good method to find a response toward efficiency issues[4]. Thus, other methods such as evolutionary strategies of evolutionary algorithms have been proposed in this area. In this field, each corner of the nature which has found an efficient response for these issues will be investigated. Fields such as human body immune system, in which numerous patterns of aggressive viruses are intelligently stored or the method of finding the shortest way to the food sources by ants (ant colony) all indicate some parts of biologic intelligence. Another major of artificial intelligence has more emphasis on a practice knowledge modeling (symbolic modeling). This tendency does not restrict itself too much on ability of biologic deepening on the presented systems. Reasoning case-based is one of the active majors in this branch. For example, the trend of reasoning by a physician at the time of diagnosis is fully similar to CBR. Thus the physician has a great number of evidences of the identified disease in his mind. He must only compare his own observations with existing samples in his mind and find the most similar samples as disease. Therefore, qualifications, needs and abilities of CBR have been given attention as a general framework for research on artificial intelligence.

### **2.4 Center for Decision of Information in America**

The American government keeps the data bank and servers of the network in places with a high security in order to promote the security co-efficiency of its own information centers. Some of these venues are broad campuses in the depth of Rocki Mountains, in the hidden spots of the depth of Nevada and Arizona under Alaska icebergs and in the depth of oceans and Bermuda gulf.

These spots are intensively preserved. On the other hands, safety forecasting for the physical threats such as fire and natural disaster have been minimized as much as possible. The protective equipments have reduced the possibility of theft or intelligence physical damage. In these premises, the various optical fiber lines with high band width, supply the highest rate of data transfer. The high speed equipments such as super computers (main frame) and very fast and parallel processors present the highest speed for access to data. The advanced systems of adjusting temperature, humidity and control of environment air prepare condition for the working of the equipments. The exact monitoring equipments control and reconsider different situations every moment. The stable foundations in the depth of the land not only bear the harsh earthquakes, but also are resistant against the strongest existing nuclear bombs. The supportive systems prepare supportive versions of the data in specific time intervals in accordance with the most up-to-date techniques. The strong electricity generators (UPS) are ready to supply necessary electricity in case of disturbance. Special coverage protects equipments against different waves such as microwave and external electro magnetic fields or produced by the equipments.

Each of these centers is called a data center. Beside each data center, there are two other centers ready to operate. One is disaster recovery center whose activities are within the general format of data recovery. It is an important issue which is one of the most necessary needs of each organ or association related to data.

The second center is the center for control and commanding which undertake the human management of data center. In this center, staffs with high expertise and high payments are working. The data bank and servers related to the infrastructures of this country such as electricity network, water and also data of the sensitive public or private companies such as army manufacturing companies of data bank are kept in these centers.

The idea of data center has been implemented in lower levels and levels with a less sensitivity. It is such that today there are companies which provide places with the above mentioned advantages. They host individual or organizational data in form of receiving a renting fee and give the requested services with a better quality to the customers. The external sites of the office are also located in such environments.

In summary, the advantage of using such centers is as follows:

A high physical security, a high electronic security, confronting with increase and repetition of data, presenting the highest processing speed in one place, presenting the highest speed of data transfer, purchasing only one version of software's, centralized backup, if a data center is not used, and each organization has its own data bank in the network. (In that case, equal to the number of back up team, we will need separate software, separate hardware, separate band width, separate security etc, which will impose a high total cost).

It seems that the idea of data center is an efficient idea in materializing objectives such as electronic government due to the efficiency and high security, prevention from addition, easy maintenance, management and many other technical aspects.

### 3. RESULTS

Types of data needs of the manager and degree of their backup by the decision support system (Nikoo Eghbal, 18, 13, p. 381)

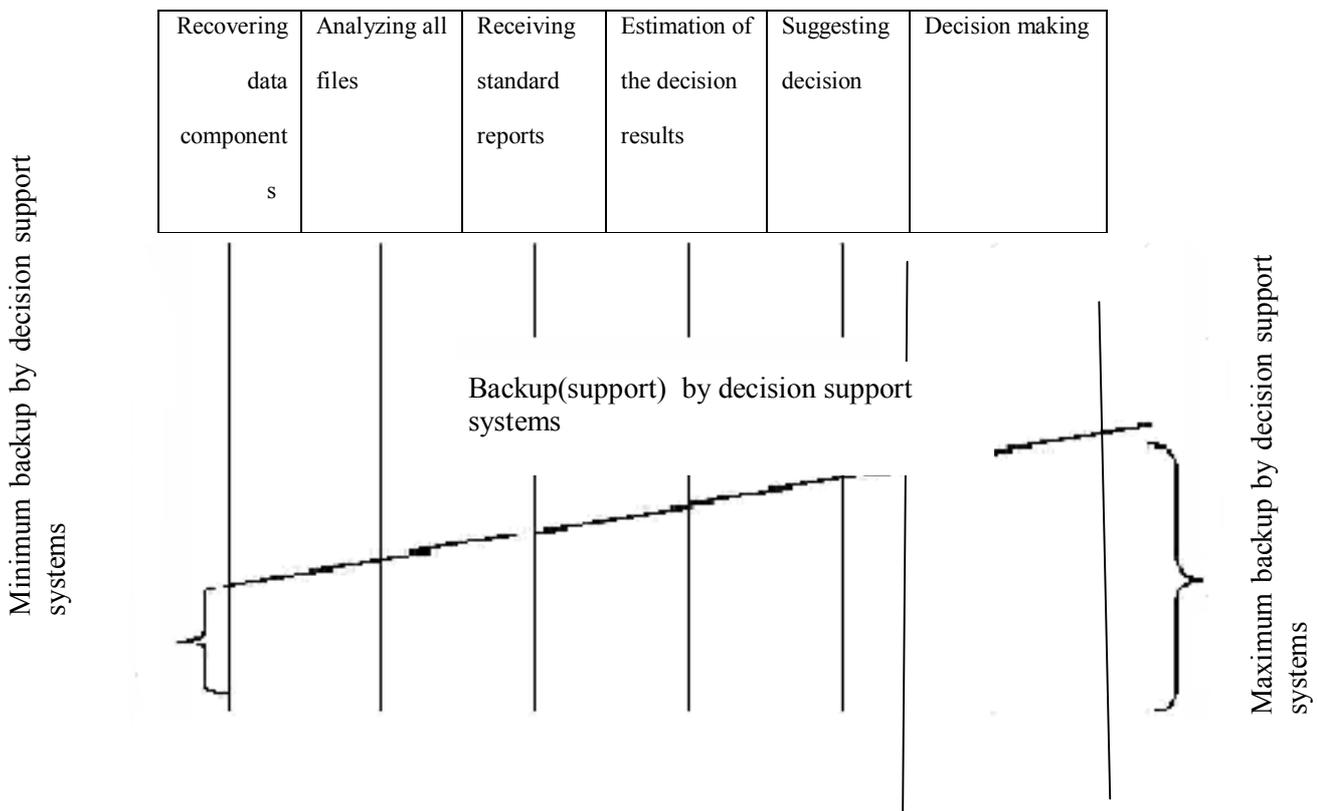


Figure 5: Decision Support System

In an age in which the fast and complex changes are its main characteristics, and efficient data has a determining role in solving the complex organizational and non-organizational issues, the decision supportive systems (as consultants) can interact with users and are inevitable needs of managers. These systems make analysis fast and precise as much as possible (Loit and Kanz, 2003).

Also through quick dialogue, they can formulate specific issues[5]. They identify possible solutions. Assessing their results, they can take optimal decisions for the semi-constructed or non-constructed positions. The decision supportive systems support various interconnected or successive decisions.

A decision support system will backup different managerial levels (individual and group) ranging from the senior managers to the operational lines. They support all decision making processes along with various styles and procedures of decision making. The decision support systems are equipped with advanced components of knowledge which makes effective solutions be presented in critical situations. Of course, the successful application of these two systems, if being intended to help with the decision support will depend on their compatibility in the respective affairs.

### 3.1 Suggestions:

- 3.1.1 -The independent or non-connected decision-making to be presented in different methods
- 3.1.2 -This should be based on specific and applied flexible model.
- 3.1.3 -It should have the power of processing the semi-built data for the team decision making.
- 3.1.4 -It should have a learning generative capability for the evolution and application intermediate for the public use.

### REFERENCES

- [1] Turban, “*Decision Support System and Intelligence System*”, 6<sup>th</sup> Edition, Milan, (2004)
- [2] Chris Thomas, *Designing a Data Warehouse: Supporting Customer Relationship Management*, Prentice Hall, Professional Technical Reference, *Decision Support System (DSS)*, (2000)
- [3] Stanley A. Brown, *Customer Relationship Management: Strategic Imperative in the World of E-Business*, Wiley, John & Sons, Inc., (1999)
- [4] Avraham Shtub, *Enterprise Resource Planning: The Dynamic of Operations Management*, Kluwer Academic Publishers, (2000)
- [5] Feizi Kamarn., Moghadasi, alireza, *Application of Decision System*, *Quarterly of Management Studies*, No. 45; (2004)