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Comparison of Management Information System and Decision Support System and Its Role in the Decision-making Process of Managers of Economic Affairs and Finance of Zahedan

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ABSTRACT

Nowadays, the variety of information systems and their advantages are sometimes accompanied by common and interfering concepts and goals. This variety and dispersion have created complexity and instability in decision-making of organizations mangers and information technology development plans. Overall to solve this complexity, information systems are defined in two broad classes: Specific connection with the operational field and in general connection with the operational field. Management information system (MIS) and decision support system (DSS) systems are among the systems in general connection with the operational field, each of which plays a decisive role in the organizational hierarchy and decision-making process of the mangers. MIS system brings about the information needed to manage an organization, and DSS provides data, models, and analysis tools to help adopt decisions in non-routine cases in the organization. After discussion on decision-making process based on each concept, this study described its characteristics, relationships, and communication of each concept for the decision-making process. The results of regression analysis of data from 20 questionnaires received from the managers of Economic Affairs and Finance in Zahedan showed that MIS and DSS have a significant relationship with the decision-making process of managers and that rational decision-making process as the intermediary variable inferred and explained this effect.

Keywords: Management Information System, Decision Support System, Managers, Decision-making Process
JEL Classifications: D8, L1

1. INTRODUCTION

Traditionally, organizations have been divided and organized independent from each other based on operational or functional bases. The structure of most of these is designed based on independent and differentiated attitudes, so that all agents of the organization are focused on the work and expertise and experience in each of the autonomous and independent departments (Mostajeran, 2008). Unfortunately, organization based on tasks sometimes strengthens the look and attention to the inside of the organization, which leads to limited execution and limited task operations. This inner look pays the most attention to occasions within the task areas and reduces the coordination between task areas and pays less attention to increases customer value. With the development of information technology (IT) and its role in the economic and commercial development of organizations, the losses of independent and non-continuous, task-oriented structures were identified, and many organizations moved towards a processor's perspective to create a value-added loop. Thus, the use of information systems to develop and improve communication, decision-making and control of all processes inside and outside the organization found a critical state and role.

1.1. Problem Statement

Studies in the field of IT management can be divided into two major groups: (1) Studies dealing with the system's nature and (2) studies and on the effect of the information and support system on the rational decision-making process and the factors affecting it (Olson and Davis, 2015). Studies on the first group are many with good results obtained, but studies on the rational decision-making process and the factors affecting it, while being limited have often find yielded contradictory results (Laudon&Kenneth, 2009). Papadakis et al. believe that in spite of numerous studies, our knowledge of the rational decision-making process is truly

limited. This sample of results and discussions reflects the fact that past studies in the area of strategic decision-making process have not obtained an acceptable and vivid viewpoint, so selecting the proper decision-making process considering its effective factors to reach the goals of the organization are not well-known for managers (Archer, 1980). One of the factors probably effective in selecting the type of decision-making process for managers is the comparison between the management information system (MIS) and decision support system (DSS) and its effect on managers' decision-making.

1.2. Research Questions

Given discussions cited in previous studies and the above questions, the questions of this study are as follows:

- Are MIS and DSS effective in decision making?
- Does the rational decision-making process affect the quality of decision?
- Does the decision-making process interfere with the comparison of MIS and DSS as an intervening variable?

1.3. Research Goals

The goals of this study are:

A. Helping bridge the gap between existing studies in this case
B. Determining the probable relationship between MIS and DSS in this regard.

1.4. The Significance and Advantages of the Study

Based on the results of previous studies, it is concluded that:

- AS some studies on the effect of manager's characteristics on the choice of the decision-making process in Economic Affairs and Finance (EAF) have reached contradictory results, the results of this study can help to bridge the gap between these studies.
- The results of this study can help better understand the effect of managerial characteristics on selecting the decision process and its effect on decision quality in EAF.
- It appears that for the first time that this study examines the role of rational decision-making as an intervening variable between MIS and DSS.

1.5. Research Realm

This study is limited to EAF Organization in Zahedan. This study compared MIS, DSS, and its effect on decision-making of mangers.

1.6. Review of Literature

The degree to which a system works well depends on many factors such as the use type, equipment, technical capabilities of the human resources, the support of the high manager of the organization and its previous experiences (Donnelly et al, 1998).

Nonetheless, the following capabilities can be considered as desirable features of the more widely accepted information systems by users of MISs. They should provide accurate information to decision makers in a timely manner. The timeliness of the information is something that should be specified by the user. Accurate information is not provided when needed; it might lose its use or be of little use. This may seem obvious it is often neglected, though. Thus, the timely and accurate presentation of information is one of the purposes of each information system (Dean & Sharfman, 1996).

An information system should provide an exception-based report to the management. Managers are not interested in knowing hundreds of activities done satisfactorily, but they are interested in knowing the factors out of control or are soon out of control. When we consider the unlimited power of a computer in producing reports that lack meaningful content, the importance of the exception-based report becomes clear (Christen et al, 1982).

The need for speed in decision-making has increased nowadays as common data has increased too much. On the other hand, decision-making environments have become more complex, and due to increased competitive pressure, decision-making becomes more difficult. Human mind constraints on data processing and access to limited information and knowledge of individuals have set us at disadvantage, and if we use multiple experts to solve these problems, it will be so costly. Moreover, it will be difficult to establish coordination and communication between people. Studies have indicated that designing a computer-based DSS can facilitate real-life decisions. It can also improve the quality of decisions and the efficiency and effectiveness of the decision-making processes. Now, consider a bank that lends money to its customers. The customer goes to the bank and applies for a loan in order to buy a house. The bank employee collects information on how much loan will be given to the client under what circumstances. Information that is being compiled consists of customer employment status, income, history of loans and other economic information. As the loan is to buy a house, the clerk also collects a database of property. This information includes the legal description and market value of the appraisal. The bank also considers the status of the real estate market, including interest rates provided by other financial institutions. Finally, the bank considers its own economic situation, such as knowing how much money is available to give loans, how much loans have recently been adopted, and how it has been with the same customers.

A DSS can enable an employee make an informed decision based on data collected from external or internal sources (Feizi and Moghaddasi, 2010).

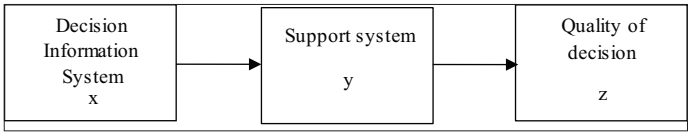
Three points are deduced from previous studies on the organization management:

A. All decisions of the managers of organizations are based on information.
B. Information and support systems such as capital, individuals, equipment, machinery, and so on are considered as organizational resources.
C. If information is optimized, analyzed, and then transmitted it will contribute to proper decisions and golden opportunities for the growth, development and survival of the organization.

1.7. Theoretical Framework

The most important variable for this study is the quality of decision, which is a dependent variable. Given the results of examining previous studies and the questions raised in this study, the theoretical framework of the study is described in Figure 1. The model is of a quantitative nature: (1) The effect of information

Figure 1: Theoretical framework of the study



system on decision making, (2) the effect of the support system on decision making, and (3) the role of the rational decision-making process in the relationship between the comparison of the information system and the support system.

1.8. Research Hypotheses

Hypothesis 1: MIS has a negative or inverse effect on decision-making.

Hypothesis 2: DSS has a positive effect on decision-making.

Hypothesis 3: The rational decision-making process is involved in the relationship between the comparison of information system and the support system.

2. METHODS

Various researchers have used several methods for conducting such studies, which are mainly laboratory methods, case study, scenario study, and field study.

Based on my theory of carlisle (1979), the laboratory method is not suitable for studying the effect of manager's characteristics and characteristics on the strategic decision-making process, especially in large and complex organizations. Case studies are limited to a specific case or subject research and not suitable for these studies unless many cases are studied, which itself requires a considerable amount of time and money. Eisenhardt and Bourgeois (1988) argue two unrealistic stages in the case study that can lead to a deviation of the data from the truth. First, the author should prepare a specific situation based on his own understanding in the form of a case, and that the researcher must study this and judge it according to his perception, both of which can lead to evaluation of the unrealistic data so unfavorable results. Scenario method, in which the questions are based on a fictitious or artificial subject, is not a suitable method for research related to strategic decisions and can divert the outcome of the studies from reality. Given the aforementioned points, field study was used in this study. Thus, what has been investigated and analyzed is the true processes of decision-making in the real environment of the organization, rather than hypothetical decisions or artificial and fictitious environments.

2.1. Population and Sample

The population of the study was 100 mangers of EAF Organization in Zahedan. We consider 20 managers and experts in the field of IT as the sample.

2.2. Sampling Method

The sampling method was random, so that all managers and experts of the organization of AEF Organization were randomly sampled in proportion to their volume. Instead of expanding the population, all AEF organizations of the country were limited to Zahedan population given the following reasons.

A. Student presence in this area

B. Considering the complexity and specific problems of this type of study, selecting one geographic region can help to track and receive responses. In order to encourage managers to participate in this preliminary research for the selection of 20 organizations were sent and asked to add to the value of the findings of this company by participating in this study and cooperating with them.

2.3. Data Collection Tools

Turning to the introductory letter, 20 questionnaires were sent to the relevant organization. In order to explain the keywords and how to answer the questions, the managers were asked to initially insert the last strategic decision of the organization that took place in the last 24 months at the place specified in the questionnaire.

2.4. Analysis

To collect information and data needed for this study, the participants were asked to identify and provide answers to the questions contained in the questionnaire, based on what was actually done in the last strategic decision. Thus, the analytical unit in this study was formed of individual responses or, in other words, the decision as the risk level of managers varies from person to person and thus cannot be related to the analytical unit to the decision team or organization (Sarfizadeh., 2009).

2.5. Designing the Questionnaire

The questions of the questionnaire were divided into four distinct parts: (1) The effect of the information system, (2) The extent of effect of the support system, (3) the quality of the decision of the managers, and (4) the general information of the managers. Researchers recommend that as much as possible questionnaires of the previous studies be used. Considering this and to contribute to the creation and increase of the questions of this kind of research, a number of questions were prepared from previous questionnaires and specific numbers for this study. All questions were ranked on a numerical scale using five-option Likert. Dean and sharfman(1996) considered five-point scale appropriated and recommended it.

2.6. Questionnaire Test

For studying the validity of the questionnaire and ensuring the clarity of the questions, their appropriateness, elimination of vague questions, and improving the form and content of the questionnaire, which ultimately leads to better understanding and analysis of the data, besides using standard questionnaires, the views of the professors and experts (other than the final sample) were received on the regulatory questionnaire and appropriate decisions were made according to their rational suggestions. In order to ensure the reliability of the corrected questionnaire, the Cronbach reliability of the questionnaire was determined using SPSS. The obtained Cronbach Alpha for the effect of information system on the decision was 86%, for the questionnaire of the effectiveness of the support system 87%, for the quality of the decision 76%, and for the whole questions 81%, which showed a high reliability for the questionnaire.

3. RESULTS

3.1. Demographic Features

From among the participants, 78% were male and 22% were women. The average age of respondents was 35 years and 85% of respondents were married. The majority of the managers participating in the study had a bachelor's and higher degrees (88%) and their years of service were 15 years.

3.2. Descriptive Statistics

Table 1 specifies minimum, maximum, mean, and standard deviations of the variables. The mean of variables was 1.4–2.6 indicating the normality of the data and the standard deviations of the variables represent the acceptable variations in them that specify the interaction between the variables. Thus, it is concluded that the research data is suitable for analysis and no unusual cases are seen between them.

3.3. Testing Hypotheses: Correlation Analysis

Correlation analysis was used to create a general and preliminary image of the relationship between research variables. According to the results of the analysis presented in Table 2, it is clear that there is a significant and negative correlation between the effect of information system and the quality of decision-making (−0.04, P < 0.05) and there is a significant and direct relationship between the effect of the support system and the quality of the decision (r = 0.145, **P < 0.1).

Table 1: Descriptive statistics

Variables	N	Min	Max	Sum	Mean±SD
The effect of information system X	15	1.00	5.00	100.518	2.0443±0.3044
The effect of support system Y	15	1.00	4.33	98.077	1.3547±0.1108
Quality of decision Z	15	1.44	5.00	160.118	2.5933±0.2720

SD: Standard deviation

Table 2: Correlation coefficient between variables

Variables	X	Y	Z
The effect of information system X			
Pearson correlation	1.000	−0.04*	−0.101**
The effect of support system Y			
Pearson correlation	−0.04*	1.000	0.145**
Quality of decision Z			
Pearson correlation	−0.101**	0.145**	1.000

Table 3: Regression analysis

Variables	The effect of support system Y	Quality of decision Z
The effect of information system X	0.4*	−0.101**
Quality of decision Z	0.145**	-

3.4. Regression Analysis

Regression analysis was used to specify and determine the effect of information system on the rational decision-making process, and how much the use of support system affects the quality of the decision.

As shown in Table 3, the effect of the information system on the use of the rational decision-making process is not reverse. In other words, the information system affects their desire to use the rational process in decision making. The Table 3 also shows that the rational decision-making process can significantly improve the quality of the decision, so this variable, rational decision-making process, has a direct effect on the quality of the decision.

3.5. Analysis of Ladder or Hierarchical Regression

Hypothesis 3 implies the rational decision-making process involved in describing the relationship between the comparison of the information system and the support system. To test this hypothesis, as suggested by researchers Astley et al. (1982) hierarchical or ladder regression was used. Based on the theory by Baron and Kenny (1986), when the effect of an intermediary or intermediate variable between independent and dependent variables can be examined and tested to satisfy the following conditions:

A. The independent variable should affect the intermediary variable.
B. The independent variable should affect the dependent variable.
C. The intermediary variable should affect the dependent variable.

The results of the hierarchical regression in Table 4 show that the rational decision-making process can significantly influence the effectiveness of the information system and the support system variables on the dependent variable, i.e., it can conceptualize and describe the effect between these variables. This description or intervention implies that improving the quality of the decision is more likely to happen when the manager uses the rational process in his decisions (ΔR = 0.139–0.110 = 0.029).

4. CONCLUSION AND IMPLICATIONS

This study obtained some expected and some unexpected results in analysis. The overview of the responses, attributes, and characteristics of the participating organization (EAF) in this study showed that the organizations (administration), information

Table 4: Ladder analysis: The effect of intermediary variable

Variables	Equation 1 Quality of decision	Equation 2 Quality of decision	R^2 change	Effect
The effect of information system X	−0.101**	-	-	-
Quality of decision and impact of information system X	-	0.169*	-	-
R^2	0.110	0.139	0.029	Effective

**Significant at the 0.01 level. *Significant at the 0.05 level

and support system play a decisive role in deciding rather than small organizations. Perhaps it is because large and medium size organizations have sufficient resources (labor, money, equipment, etc.) to further explore and implement the various stages of the rational process. On the other hand, managers in large organizations usually have a recruitment status, so they consider themselves responsible and accountable to the government, and consequently they make decisions more carefully for more certainty.

The data showed that the rationality of the decision has nothing to do with the different management categories, whereas senior managers tend to use more rational decision-making because the risk of young managers is greater than that of senior managers, so young managers prefer to decide more quickly and consequently use less rational decision-making process.

Most of the managers participating in this survey have university degrees (bachelor's degree or higher) and have an average working experience of about 15 years, which reflected their potential and capability.

One of the most important factors that make this happen is information systems. One can state that the realization of the goals and the correct implementation of the tasks of the state without the use of information systems are impossible. Due to the growing importance of information systems in the service delivery process, it is assumed that organizations are turning to more and more of these systems to expand the market and profit margin. The major benefits that these systems have created for organizations include:

- Timely response to opportunities and environmental threats
- Accelerating the processes of service delivery
- Accelerating organizational processes, including decision making
- Increasing confidence in the decisions adopted
- Reducing organizational costs.

Thus, considering the abovementioned points, it is suggested that organizations invest in the deployment and use of information systems and support systems to maximize the efficiency and effectiveness of their operations. Otherwise, an inverse relationship would be created between them.

Better quality of the decisions is obtained by the implementation of the support system and information system, so organizations should encourage managers to make the most of this process.

Managers with a long history are not interest in using the support system and information system so much, so in cases when the issue is important because of the importance of the issue, it is better for decision team members to be selected from young managers. This is because the more the managers use the process of information system and support in the organizations, the better the quality of the decisions will be.

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