

## **The Role of Management Information Systems in the Effectiveness of Managerial Decision Making in Greater Irbid Municipality<sup>1</sup>**

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### **Abstract**

*This study aimed to highlight the reality of using management information systems in managerial decision making in greater Irbid Municipality and to explore its role in the effectiveness of managerial decision making. In order to verify the study hypotheses, t-test was used as well as some of the descriptive statistics tools such as arithmetic averages and standard deviation to measure the dispersion in the opinion of individuals of the sample of the study using the statistical package SPSS. The analysis of the study and the testing of its hypotheses have revealed a set of results, most importantly the followings: Management information systems have a medium to high effectiveness role in greater Irbid municipality. Management information systems have a role in providing the required information to make managerial decision that their degree of convenience range from moderate to high. There is a relationship between the uses of management information systems and the effectiveness of managerial decision making. Improving management information systems impacts the effectiveness of managerial decision making.*

**Keywords:** management information systems, managerial decision making, Greater Irbid Municipality.

### **Introduction**

Information is considered without any doubt a main and foundational in managerial decision making in all organization, due to current challenges in this century the concept of management information system has received an observable and increased attention in different fields of modern human life whether on the individual or organization level. Information is a major resource for the organization and an important source of its success. It is also a factor in increasing the efficiency and effectiveness of the various administrative activities. This has made management information systems in the various organizations particularly important, helping organizations to perform their functions successfully and efficiently. The organization needs information so that it can connect its different parts to achieve its objectives as well as it can successfully adapt to the surrounding environment. Information is valuable whenever it is of greater use in managerial decision-making and operations. There are five basic characteristics of the information to be valuable to the organization: appropriateness, accuracy, quantity, timeliness, and accessibility of the information used in the organization. The changes in the various environmental factors, the growth and the development that took place in the economic organizations, and the complexity of the problems they faced, increased the need for the means of collecting and processing the enormous data, which was difficult to deal with by traditional means. This was made easy due to the modern technological revolution that led to means that have facilitated and accelerated the processing of those data and their timely delivery to decision-making centers. The process of managerial decision-making depends mainly on the information system used to gather and process information in a scientific manner. The more reliable and timely the information is, the more correct and beneficial the decision is. Consequently there should be an integrated information system that provides the organization with the current and future data helping in correct managerial decision making.

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### **The problem of the study and its questions**

The problem of the study is to measure the importance and the role of management information systems in managerial decision-making in the Greater Irbid Municipality.

In view of the ambiguity surrounding this role due to the continuous and rapid development of information technology and the attempt to give the real picture of the role of management information systems in managerial decision-making and the correction of the mechanism of decision-making because of its importance in various fields, this research attempts to answer the following question: What is the importance and role of management information systems in managerial decision-making in the Greater Irbid Municipality?

The sub-questions are as follows:

1. Is there a relationship between the quality of information provided by management information systems and the effectiveness of managerial decision-making in the Greater Irbid Municipality?
2. Is there a relationship between the uses of management information systems and the effectiveness of managerial decision-making in the Greater Irbid Municipality?
3. Does the development of management information systems contribute to the increase and effectiveness of managerial decision-making in the Greater Irbid Municipality?

### **Study hypotheses:**

In order to address the problem of the study and to answer its questions, the main hypothesis was formulated and developed as follows: The main hypothesis: There is no importance or role of management information systems in managerial decision-making.

The sub-hypotheses are as follows:

The first sub-hypothesis: There is no relationship between the quality of information provided by management information systems and the effectiveness of managerial decision-making.

Sub-second hypothesis: There is no relationship between the uses offered by the management information systems and the effectiveness of managerial decision-making.

Sub-third hypothesis: development of management information systems does not contribute to increase the effectiveness of managerial decision-making.

### **The importance of studying:**

The decision-making process is an important managerial process. Due to the importance of effective decision-making in management and the importance of the information, this study has been conducted. The study came at a time when organizations at the global and local levels are somehow moving towards a reliance on management information systems to make managerial decisions at various managerial levels. The issue of managerial decision-making utilizing information systems is one of the topics that has been and continues to be of interest to management, psychology and many other sciences scientists.

Therefore, the importance of this study lies in the following matters:

1. Study the subject by providing a theoretical framework that defines the concept of the nature of information systems and decision-making.
2. To highlight the role of information systems in providing the necessary information for managerial decisions-making.
3. To highlight the role of information systems in providing the necessary uses for managerial decisions-making.
4. Determine the contribution of the development of management information systems in managerial decision-making.

### **Objectives of the study**

In light of identifying the problem of the study and its importance, the objectives are determined according to the following:

1. Identify the nature of the relationship between management information systems and managerial decision-making.
2. To reach some conclusions and suggestions that will contribute to increasing the efficiency of information systems in the effectiveness of managerial decision-making.

### ***Study variables***

The decision-making process is characterized by problem identification, modeling, making, implementation and follow-up of the decision, while the information system is described by modeling and providing the necessary information for managerial decision making. Independent Variable: Management Information System. The dependent variable: the decision making process.

### ***Methodology and tools used***

This study adopted the analytical descriptive approach, which allowed explaining the dimensions and horizons of management information systems and their role in managerial decision making. The method of personal interviews was also used to collect data and information related to this study, a questionnaire was used to collect data and analyze it in order to test the hypotheses of the research, after reviewing various studies and researches related to the subject of the study. The questionnaire was presented to specialists in the field of scientific research as well as the questionnaire was distributed to a selected sample more than once to ascertain the veracity and reliability of the questionnaire. Data was downloaded to the computer using the Statistical Analysis Program (SPSS).

### ***The population of the study and its sample***

The population of this study included the employees of Greater Irbid Municipality, and to select the sample of the study, the complete survey method was adopted due to the small size of study population composed of all the senior managers, their deputies and the heads of the units and departments in order to reach the largest number of correct forms to represent this institution. (88) Copies of the questionnaire were distributed, (82) Copies were recovered with a percentage of (93.18%), which represents the number of completed forms. In order to answer the study questions, the standard values of the scale were determined using the arithmetic mean of the responses of the individuals of the sample from Greater Irbid municipality. The criterion for discussing the results according to the grades given to the answer categories was as follows: from 1-1.80 Strongly disagree, 1.81-2.60 disagree, 2.61-3.40 neutral, from 3.41 to 4.20 agree, from 4.21-5 strongly agree.

### ***Previous studies***

Al-Nadhari Study (1990): The study aimed to determine the efficiency of information systems in Jordanian commercial banks and to what extent these systems contribute to reaching more rational decisions; also to reveal the weakness points in the information systems used in Jordanian commercial banks and how to treat them then to be developed and enhanced. The researcher found the following results:

There is a positive relationship between information systems and the effectiveness of decision-making in Jordanian commercial banks, but this relationship is not statistically significant. It is not necessarily that the banks using information systems are more efficient than others on the basis of higher profitability ratios, but the efficiency of the system reflects the quality and speed of service provided to the public. The results of interviews conducted by the researcher with stakeholders in information systems showed that the introduction of advanced information systems led to the diversification of banking activities and the creation of new jobs, and to the granting of further delegation to the lower administrative levels. While at the same time increasing the capacity of senior management to control the work of other levels, and to intervene as required. Shannak study (1994): The sample of the study included 53 companies out of 103 companies listed in Amman Stocks Market. This study aimed to reveal the availability of management information systems in the Jordanian public shareholding companies, and to what degree it impact the organizational performance of these companies.

The study concluded with several results:

- "53.24%" of companies have a special management information department, and these departments have but a little impact in the organizational performance.
- The interest in information systems is low in most companies.
- Computers and software do not affect organizational performance.
- There is no positive impact of MIS on organizational performance.

Al-Dhonaibat Study (2003): The study aims at identifying the relationship between accounting information systems and performance of employees also demonstrating to degree Accounting Information Systems have been utilized from individuals' of the sample point of view.

The study found that there is a positive relationship between computerized management information systems and employee performance, as well as a positive relationship between the modernity of the devices and the used software, the characteristics of the information provided by the information systems, and the performance of the employees. Khalid Study (2004): This study aimed at evaluating the performance of computer-based accounting systems and their suitability to meet management needs.

A questionnaire was designed to survey the views of a sample of industrial companies in Jordan on the performance of these systems. The results of the study showed that the majority of Jordanian industrial companies rely on computer-based accounting information systems and the applicable systems meet the objectives of users of financial and administrative data significantly as well as the ease and speed of response to those systems in meeting the needs of the users of this data. Al-Mahasneh Study (2005): this study aimed at identifying the impact of the efficiency of information systems in the effectiveness of decision making in Customs Department, by identifying the trends of individuals of the sample towards the efficiency of information systems, the effectiveness of decision making and analyzing the impact of the efficiency of information systems in the effectiveness of decision. The researcher concluded that Management Information Systems in Customs Department has high quality and efficiency also the decision making process in this department is highly effective moreover there is a significant correlation between the independent variable (the efficiency of information systems) and the dependent variable (the effectiveness of decision making process.)

Al-Bashabsheh Study (2005): The study aimed to identify the effect of the quality of administrative information in raising the level of job performance in Jordanian Social Security Institution. It also aims to identify the reality of the quality of management information systems in this institution, and the level of job performance. The study concluded that there is an important impact of the quality of information systems in raising the level of job performance. Eidfarahyiah Study (2006): The study aimed at shedding light on the marketing information system and its role in providing accurate and comprehensive information for the planning and controlling of marketing activity. The most important recommendations of the study are linking the various sections of the company with an effective information system to improve the company's performance, recruiting specialized competencies and conducting training courses on the use of information technology. Al-Moasher and Al-Khasbeh Study (2006): The study aimed at identifying the effect of organizational and technical factors in the applications of management information systems. The study concluded that there is a statistically significant effect of technical factors and organizational factors in the applications of management information systems. the study recommended to involve employees in the process of design and use of MIS, due to its importance in achieving psychological satisfaction, raising morale, and informing employees of their importance in the organization.

Al-Saudi Study (2006): The study aimed to identify the effect of Computerized Information Systems in the performance of employees. The study reached the following results: The respondents' perceptions about the requirements of operation of information systems were high, and their perception towards job performance were moderate and the main requirements for managing the operation of computerized information system are: (physical, software, human and organizational) have an impact in job performance. Boonmak Study: (2007) the study aimed to examine whether management information systems and IT has affected the assessment of firm performance and business strategy. Data from 170 executive managers, who work in various business firms, were collected. Questionnaires were used to assess firm performance and business strategy. Descriptive statistics, correlations, and multiple regression analysis were used to analyze and evaluate data. The study found that Management information systems and IT increase firm performance and business strategy. The more volume of information (MIS) needed, the more advanced the IT that should be provided. Business strategy will be more successful if organizations have enough and more reliable advanced IT. The more use of advanced IT and information (MIS) provided, the more successful firm performance is. IT can change and improve the efficiency and effectiveness of firm performance, while both management information systems and IT also improve and change the culture of firm performance to be more efficient and effective. Zawie and Tommy Study (2010): The aim of the study was to investigate the subject of the information system and its role in the performance of human resources by following the various approaches and policies of human resources information systems. It concluded that the human resources information system in the organization always needs development so as to be able to develop the tasks assumed and make the evaluation process of the performance of human resources more effective, the study recommended to stimulate and to encourage the culture of change in working methods. Information systems were defined as a set of components that receive, treat, store and retrieve the

required information to execute a managerial process (Robert &Satzinger, 2003: 6). Al-Sabbah defined it as elements that are connected to each other by logical relationships i.e., they integrate and react with each other to achieve certain goals by transforming inputs to outputs (Al-Sabbah, 1998, 20). it was also defined as the components that interact to carry out a certain goal (Alert, 1999: 37) and (Ghorab and Fadia,1999:72) while Al-Taa'I defined it as the integrated and interactive structural compound of equipment and hardware, software, rules and working force which is eligible to get and treat data to provide the necessary information to be delivered to beneficiaries.

Then store, renew, retrieve in due time.Information systems are a group of human, material and software elements that work together to collect data, classify, sort, process and transform it into information that helps the administration to complete its work and make the necessary decisions in a timely manner, at the appropriate cost and quantity. Alert (1999:14) referred that the information is "data that has a form and content that is appropriate and convenient for its users." Al-Kilani et al. (2000: 15) defined it as the facts and concepts that pertain to any subject that is intended to develop and to increase human knowledge. Information is data processed and transformed into a useful form in the decision making process.

### ***Components and elements of information systems***

The information system in general has components that are interrelated with each other and the degree of interconnection of these components gives the system the required efficiency (Al-Rabia, 1993: 24). Each of the components of this system contains elements that are assigned to perform the duties of these sub-components and helps to understand how the system works. In all cases, the operations of the information system do not fall outside the framework of the following processes:

1. Data collection: In this process, data are obtained from different sources, taking into consideration the availability of reliability (correctness, accuracy, and comprehensiveness), flexibility and appropriateness of cost and value. The organization is also provided with data on future trends and environmental prospects for the use of environmental monitoring (prediction and analysis) (Ansoff & Igor, 1990: 66).
  2. Data Processing: Data is transferred from its initial structure to meaningful and valuable information. This process is divided into data classification, collation, summarization, processing and testing (Curtis, 1995: 41). As well as extracting results so that they are ready for timely use by beneficiaries.A key concern of this process related to information systems is the addition of the (future horizon) component to raw data, and to achieve purpose appropriate prediction methods should be used as an integral part of any formal information system. Digman (1990: 275 - 278) has clarified that the rare resource today is not the availability of information, but the ability to process that information. The information system that provides managers with huge amounts of information provides bad services. As it is required to clear that information and ensure that only the important of them to those managers.
  3. Storage of information: The need for information does not end simply because it is used for a certain period, since there is some information that is not used once it is extracted, it is very important to store it until the need arises (Al-Rabia, 1993: 36).
  4. Updating: The information continuously generated is updated according to the changes in activities. Updating means the following: (Al-Ta'ai, 2000: 36):
    - A. Adding information that did not exist.
    - B. Make adjustments to information commensurate with the change.
    - C. Delete old information that will no more be needed
  5. Information retrieval: it is the process retrieving the stored information when needed by the users; the time element should be taken into consideration in order not to lose the anticipated benefit of it due to delay. The organization that produces information and distributes it to appropriate decision centers faster than its competitors has a competitive advantage especially in turbulent environments (Thompson, 1997:336).
- Output: In information systems, output involves producing useful information, usually in the form of documents and reports.Peter (1988:4) describe information and the individual data that match with the subject and the importance of the decision.

Output derives its value from to what degree it impact the decision and the other hand what is the cost of getting it, so if the output of the information system does not improve the decision or impact it then information will be of negative value.

To be valuable to managers and decision makers, information should have the characteristics described in the following (Curtis 1995: 23):  
**Comprehensiveness:** Information should cover the variable of external environment and internal environment to include all sides of the problem.  
**Accurate:** Information should be error-free which means that data should be collected and recorded and processed in an accurate manner consequently input, processing and output should be error-free.  
**Reliable:** Reliable information can be trusted by users. In many cases, the reliability of the information depends on the reliability of the data-collection method. In other instances, reliability depends on the source of the information.  
**Economical:** Information should also be relatively economical to produce.

Decision makers must always balance the value of information with the cost of producing it.  
**Complete:** Complete information contains all the important facts, thus lead to a less false and more effective decision making.  
**Timely:** Timely information is delivered when it is needed.  
**Flexible:** Flexible information can be used for a variety of purposes. The ability of the system to adapt to the changing needs of the beneficiaries, as well as the high flexibility in the multi-purpose use of information outputs by decision makers.  
Any system is assumed to provide integrated information from both internal and external environments, Radford (1978: 12) indicated that the role of information system is represented by acquiring information from internal and external environments and process it according to the usage requirement and presenting it in reports or storing it to be retrieved when needed.

The concept of managerial decision and its importance; managerial decision is considered the substance of managerial process and its basic means to achieve the objectives of the organization, the success of the organization depends on the management's effectiveness in decision making. What characterizes an efficient management is its ability to deal successfully with the problem facing it. Decision in its simple form is reaching a solution for a present problem or achieving planned objectives, the word decision means judging in a certain issue (Allawi, 1991:11). From an administrative point of view one refers to decision as a selection between alternatives to solve a problem or to achieve a certain objective. Nawaf (2003:83) defined decision as the perceived selection between the available alternatives in a certain situation. Zawailef and Quaroti defined it as a means to perceived selection of the best available alternative which achieves the maximum return and the lowest cost or achieves the desired goal. Al-Ajlouni (1998: 551) defines decision-making as the flexible process of choosing the appropriate alternative or alternatives after examining all aspects of the problem within the available information taking into account the time period and the cost to reach the maximum expected benefit to achieve the desired goal. The managerial decision in this sense is closely related to the future forecasting process and the availability of accurate and appropriate information to reach the correct decision. The steps of decision making: managerial decision is the process of selecting the best alternative available after evaluating the results of each alternative and its impact in achieving the desired objectives, the nature of the decisions and the degree of efficiency in the adoption depends on the quality of information used and its accuracy (Al-Taa'i, 2000: 182). Since the decision is an intellectual choice based on an information system for the decision-maker, decision and information are inseparable elements and constitute the content of the decision-making process. The steps of managerial decision-making process: There is an agreement on scientific steps of managerial decision-making but there is a disagreement on the number of these steps. However, five basic steps of the decision-making process will be identified (Al-Shammagh and Hamoud, 1989: 270).

- A. To identify and define the problem: The first step in decision making is to identify and define the problem. "This is a stage of information gathering, information processing, and deliberation. It is also where goals are clarified to specify exactly what a decision should accomplish. The more specific the goals, the easier it is to evaluate results after implementing the decision.
- B. Search for and develop alternative solutions: After identifying the problem and its dimensions in the light of the information provided, one must be directed to the search for solutions and tests leading to the achievement of the goal (solving the problem), which is to be able to solve the problem in a timely manner and within the limits of the available physical resources.
- C. Evaluating the expected results of each alternative: This process determines the pros and cons of each alternative, i.e., identifying the advantages and disadvantages of each alternative, and evaluating the alternatives in light of the potential benefits achieved by each alternative, compared with the costs, thus focusing on the alternatives which gives the greatest benefits.
- D. The choice of the best alternative: In light of the economic, social and environmental considerations on the one hand and the degree of knowledge of the decision-maker on the other hand, one of the alternatives will be selected based on the pros and cons.

- E. Implementation of the decision and follow-up: The decision-making process does not end until the implementation of the decision and ensure that the decision taken has already achieved a comprehensive solution to the problem through feedback information to ensure the integrity of the decision and the safety of its implementation and to address any impediments to the implementation process as they arise which may require the cancellation of the decision or replacing it.

### **Information Systems and Decision Making:**

The relationship between information systems and decision-making is a strong one. The availability of information in large quantities means power, provides organizational options, and an effective decision maker can determine the best options at a tremendous speed, but sometimes the decision maker cannot obtain information due to lack of availability or lack of access. Because the prices and the cost of collection is very high, the less information the greater the ambiguity and increased the degree of risk and the increased risk of non-decision (Amin, 2001: 162). But after the adoption of the modern scientific method in management, the decision is no more made by intuition or guessing or even based on the experience of the manager, but depends on the exact search which could not be achieved except by collecting data on all aspects of the problem then analyzing, interpreting and translating it into reality to help making the decision (Ali Hussein, 2008: 44). The importance of information management systems in all organizations has increased due to the increasing importance of information in them, especially in managerial decision-making. The increased competition between organizations and the size and complexity of their work have increased the importance of information systems. The high rates of environmental and technical change and the widespread use of information technology making it an ideal tool for data processing, which led to increased attention to management information systems and increased importance of their role in the work of the organization and its decisions (Gharab and Fadia, 1999: 8).

### **Presentation, analysis and interpretation of study data**

1. Analysis of the items of the dimension "the relationship of the quality of information provided by information systems to the effectiveness of decision-making:" The mean and standard deviations of the responses of the study sample were calculated for the first dimension. The results were presented in Table (1).

**Table (1) Relationship of the quality of information provided by information systems to the effectiveness of decision-making**

No.	Item	Mean	S.D.	Degree of Approval
1	Information provided by your organization's information systems is accurate	3.03	1.09	Moderate
2	The information systems of your organization help to provide you with appropriate information for decision-making	3.12	1.13	Moderate
3	Information systems provide most of the information necessary for decision making	3.21	1.08	Moderate
4	Information systems provide timely information for decision making	3.01	1.14	Moderate
5	Information systems are useful in providing information that has occurred in the past and is reliable for future decisions	3.48	1.03	High
6	Information systems provide predictive information for decision making	3.26	1.08	Moderate
7	The introduction of information systems has given a better form of information making it easier to deal with	3.93	0.75	High
8	Information provided by information systems is concise	3.32	0.93	Moderate
9	Information provided by information systems meets the needs of their users	3.42	0.86	High
10	Information systems used to provide clear information for decision-making	3.50	0.91	Moderate
	Arithmetic mean of all of the items	3.33	0.60	Moderate

It is clear from table (1) that the general arithmetic mean of the relationship between the quality of information and the effectiveness of decision-making was 3.33, which is moderate and lies in the third category of the five-scale (2.61-3.40), which indicates a moderate degree of approval, which means that the individuals of the sample of the study moderately agree that information systems provide information with the specifications required to make their decisions.

It is also clear that the arithmetic averages of the role of information systems in decision-making ranges between 3.01 and 3.93, that there is a variance in the degree of approval of the role of information systems in decision making. Some agree with a high degree and some agree moderately with regard to the items of the study sample is high: Item (7) which states "The introduction of information systems has given a better form of information making it easier to deal with," has got an arithmetic mean of 3.93 and a standard deviation of 0.75 which indicates that the used information systems provide information that is easy to deal with in making decisions so the quality of the decision will be increased. Item (10) which states "Information systems used to provide clear information for decision-making," has got an arithmetic mean of 3.50 and a standard deviation of 0.91. This is because the information systems used provide clear information of the decision to be taken, which supports the decision-making process. Item (5) which states "Information systems are useful in providing information that has occurred in the past and is reliable for future decisions," has got an arithmetic mean of 3.48 and a standard deviation of 1.03, because information systems contain historical work related information, including a detailed explanation of the time periods in which the information has passed, contributing to the provision of historical information on what work needs to help in making future decisions. Item (9) which states "Information provided by information systems meets the needs of their users," has got an arithmetic mean of 3.42 and a standard deviation of 0.86.

The following items have got a moderate degree of approval by the individuals of the sample: Item (8) which states "Information provided by information systems is concise " has got an arithmetic mean of 3.32 and a standard deviation of 0.93. Item (6) which states "Information systems provide predictive information for decision making" has got an arithmetic mean of 3.26 and a standard deviation of 1.08. Item (3) which states "Information systems provide most of the information necessary for decision making" has got an arithmetic mean of 3.21 and a standard deviation of 1.08. Item (2) which states "Information systems provide most of the information necessary for decision making" has got an arithmetic mean of 3.12 and a standard deviation of 1.13.

This means that the provided information has got a medium degree of approval, because information systems provide information to the decision-makers about the reality of work, especially with respect to routine non-recurring decisions that require a certain amount of information to reduce risk and uncertainty. Item (1) which states "Information provided by your organization's information systems is accurate" has got an arithmetic mean of 3.03 and a standard deviation of 1.09, this means that there are medium-efficient hardware and software in the process of organizing and arranging work-related information, which provides accurate information. Item (4) which states "Information systems provide timely information for decision making" has got an arithmetic mean of 3.01 and a standard deviation of 1.14, that is, the flow of information has been characterized by a moderate degree of approval. The reason for this is the multiplicity of managerial levels in the organization under study, which leads to delaying the time of communicating the information to the decision maker, reducing its value and delaying completion of tasks. From the above, information provided by information systems contributes moderately to the effectiveness of decision-making. 2. Analysis of the items of the dimension "the relationship between uses provided by information systems and decision-making effectiveness: To identify the relationship between the uses of information systems for effective decision-making in the organization under study, the arithmetical averages and standard deviations of the responses of the individuals of the study sample were calculated as shown in table (2).



**Table (2) the relationship between uses provided by information systems and decision-making effectiveness**

No.	Item	Mean	S.D.	Degree of Approval
1	MIS helps to provide periodic reports that facilitate problem search activities	3.28	1.05	Moderate
2	Expert systems help to accomplish various stages of decision making	3.32	0.99	Moderate
3	Decision support systems are used at all stages of decision-making	3.19	0.61	Moderate
4	Decision support systems help solve complex problems	3.31	0.99	Moderate
5	Information systems contain quantitative decision-making methods such as operations research and others	3.39	0.88	High
6	Information systems reduce the use of personal judgment in decision making	3.13	1.08	Moderate
7	Information systems provide information in graphical or mathematical forms	3.37	0.89	Moderate
	Arithmetic mean of all of the items	3.28	0.61	Moderate

It is clear from table (2) that the general arithmetic mean of the relationship between uses provided by information systems and decision-making effectiveness was 3.28, which is moderate and lies in the third category of the five-scale (2.61-3.40), which indicates a moderate degree of approval, which means that the individuals of the sample of the study moderately agree that information systems help in achieving the stages of decision making and the usage of mathematical methods. It is also clear that the arithmetic averages of the uses of information systems in the effectiveness of decision-making range from 3.39 to 3.13, meaning that all respondents agree moderately on the use of information systems in decision-making. The items were arranged as follows: Item (5) which states "Information systems contain quantitative decision-making methods such as operations research and others," has got an arithmetic average of 3.39 and standard deviation of 0.88, which indicates that Information systems use quantitative methods to make routine decisions only. Item (5) which states "Information systems provide information in graphical or mathematical forms," has got an arithmetic average of 3.37 and standard deviation of 0.89, this information has the flexibility, ease and ability to determine the results of the decision and its advantages and disadvantages in a scientific way. Item (2) which states "Expert systems help to accomplish various stages of decision making," has got an arithmetic average of 3.327 and standard deviation of 0.99, which shows that the organization under study has expert systems represented by computerized information systems which is fed by a group of experts to be able to make inferences and conclusions and then provide advice and solutions to the problems of managers on a specific field similar to that provided by the human expert. Item (4) which states "Decision support systems help solve complex problems," has got an arithmetic average of 3.31 and standard deviation of 0.99, which indicates that the organization under study has decision support systems, which are computer-based systems to support un-programmed and semi-programmed decisions of that help managers in determining the problem.

Based on this result, it can be said that the decision support systems are moderately used. Item (1) which states "MIS helps to provide periodic reports that facilitate problem search activities," has got an arithmetic average of 3.28 and standard deviation of 1.05, where information systems work to gather information that helps to make decisions. Item (3) which states "Decision support systems are used at all stages of decision-making," has got an arithmetic average of 3.19 and standard deviation of 0.61, this indicates that the organization under study has decision support systems that assist managers in identifying alternative solutions, evaluating them and selecting the best, in addition to predicting the results of the alternatives that will be used in the solution. Item (6) which states "Information systems reduce the use of personal judgment in decision making," where the analyst focuses on the quantitative facts and the corresponding data of the problem, where the problem is identified, analyzed and solved in a logical and scientific form, and in an effective, structured manner based on information and facts and not on speculation. As a result of the above, the uses of information systems that contribute to the effectiveness of decision-making in a moderate degree are the completion of various stages of decision-making, where information systems help to provide periodic reports that facilitate the search for problems, It also assists expert systems in completing various decision-making stages, using decision support systems at all stages of decision-making, solving complex problems easily, and information systems contribute to the use of mathematical methods that contribute to effective decision-making.

The information system contains quantitative methods of decision making, such as operations research, etc. The information systems provide information in graphical or mathematical form, thus information systems reduce the personal use in decision making.<sup>3</sup> Analysis of the items of the dimension "the impact of information system development on increasing the effectiveness of decisions:" In order to understand the effect of the development of information systems on increasing the effectiveness of decision making in the organization under study, the arithmetical averages and standard deviations of the responses of the sample individuals were calculated and the results are presented in Table 3.

**Table (3) the impact of information system development on increasing the effectiveness of decisions**

No.	Item	Mean	S.D.	Degree of Approval
1	Modern information systems contribute to identifying the problem more accurately than before	3.92	0.88	High
2	Modern information systems contribute to providing appropriate information to identify the real problem	3.86	0.81	High
3	Modern information systems help to identify the real problem more quickly	3.84	0.89	High
4	Modern information systems offer alternatives and solutions to the problems that are better and more efficient than the old information systems	3.62	1.03	High
5	Modern information systems contribute to the selection of the best alternative as a solution	3.18	1.03	Moderate
6	Modern information systems contribute to better results than planned	3.95	0.85	High
	Arithmetic mean of all of the items	3.73	0.68	High

It is clear from table (2) that the general arithmetic mean of the relationship between uses provided by information systems and decision-making effectiveness was 3.73, which is high and lies in the fourth category of the five-scale (3.41-4.20), which indicates a high degree of approval, which means that the individuals of the sample of the study highly agree that the development of information systems increases the effectiveness of decision making. This impact ranges from 3.95 to 3.18, meaning that all respondents agree highly that development of information systems increases the effectiveness of decision-making. The items were arranged as follows: Item (6) which states "Modern information systems contribute to better results than planned," has got an arithmetic average of 3.95 and standard deviation of 0.85, This stems from the ability of information systems to achieve faster access to information, which contributes to the development of the organization under study on the operation, growth and creativity, and transforming these capabilities into a part that integrates with the decision-making process and thus achieve the desired results. Item (1) which states "Modern information systems contribute to identifying the problem more accurately than before," has got an arithmetic average of 3.88 and standard deviation of 0.88, This underscores the important role of information systems in identifying a clearer vision of problems, thus increasing the effectiveness of decision-making. Item (2) which states "Modern information systems contribute to providing appropriate information to identify the real problem," has got an arithmetic average of 3.86 and standard deviation of 0.81, Indicating that modern information systems provide appropriate information to identify the real problem.

Item (3) which states "Modern information systems help to identify the real problem more quickly," has got an arithmetic average of 3.88 and standard deviation of 0.88, which shows that modern information systems contribute to detecting the problem more quickly. Item (4) which states "Modern information systems offer alternatives and solutions to the problems that are better and more efficient than the old information systems," has got an arithmetic average of 3.62 and standard deviation of 1.03, this is due to the fact that the modern information systems of information about the internal and external environment allows to choose the best alternatives to solve problems. The following items have moderate response by the individuals of the sample:

Item (5) which states "Modern information systems contribute to the selection of the best alternative as a solution," which shows that the use of modern information systems enabled the selection of the best alternative to a medium degree. from the previous results, it is clear that the individuals of the study sample strongly agree that the development of information systems affects and increases the effectiveness of decision making, through the contribution of modern information systems in providing information to identify the real problem more quickly and accurately than before, Modern information systems also offer alternatives and solutions to the problems.

That are better and more efficient than old information systems. This achieves the goal of knowing the impact of information systems on the effectiveness of decision making in the organization under study.4. Testing the hypotheses of the study: The hypothesis of the study will be tested as follows:4.1 The main hypothesis test: It was as follows "There is no importance or role of management information systems in managerial decision-making."Table (4) shows that the value of the general arithmetic average of the importance and role of information systems in decision making is 3.42, which are greater than 3. The calculated t-value is 8.570, which is greater than the tabulated value of 1.674 and the significance is 0.000is less than 0.05. Thus, the null hypothesis is rejected and the alternative hypothesis is accepted which means that "information systems have an importance and a role in decision-making in the Greater Irbid Municipality."

**Table (4) t-test of the importance and role of information systems in decision making**

Item	Mean	S.D.	D.o.F	Sig.	Resolution
The main hypotheses items	3.42	8.570	81	0.000	significant

Test of the first sub-hypothesis which states "There is no relationship between the quality of information provided by management information systems and the effectiveness of managerial decision-making." The results of this hypothesis test are in Table (5). The general arithmetic average of the subtotal subtraction clauses, which is 3.33, is greater than 3. The calculated t-value is 5.577, which is greater than the tabulated t-value of 1.674, and the significance level is 0.000, which is less than 0.05. Thus, the null hypothesis is rejected and the alternative hypothesis is accepted which means that. This means that there is a relationship between the quality of information provided by the information systems and the effectiveness of decision-making in the Greater Irbid Municipality. "

**Table (5) t-test of the relationship between information systems and effectiveness of decision making**

Item	Mean	S.D.	D.o.F	Sig.	Resolution
The main hypotheses items	3.33	5.570	81	0.000	significant

Test of the second sub-hypothesis which states "There is no relationship between the uses offered by the management information systems and the effectiveness of managerial decision-making."The results of this hypothesis test are in Table (6). The general arithmetic average of the subtotal subtraction clauses, which is 3.28, is greater than 3. The calculated t-value is 4.263, which is greater than the tabulated t-value of 1.674, and the significance level is 0.000, which is less than 0.05. Thus, the null hypothesis is rejected and the alternative hypothesis is accepted which means that. This means that there is a relationship between the uses offered by the management information systems and the effectiveness of managerial decision-making."

**Table (6) t-test of the relationship between information systems and effectiveness of decision making**

Item	Mean	S.D.	D.o.F	Sig.	Resolution
The main hypotheses items	3.28	4.263	81	0.000	significant

Test of the third sub-hypothesis which states "development of management information systems does not contribute to increase the effectiveness of managerial decision-making."The results of this hypothesis test are in Table (7). The general arithmetic average of the subtotal subtraction clauses, which is 3.73, is greater than 3. The calculated t-value is 9.682, which is greater than the tabulated t-value of 1.674, and the significance level is 0.000, which is less than 0.05. Thus, the null hypothesis is rejected and the alternative hypothesis is accepted which means that. This means that development of management information systems does not contribute to increase the effectiveness of managerial decision-making. "

**Table (7) t-test of the relationship between information systems and effectiveness of decision making**

Item	Mean	S.D.	D.o.F	Sig.	Resolution
The main hypotheses items	3.73	9.682	81	0.000	significant

**Results**

The study concluded that information systems are important and effective in decision-making in the Greater Irbid Municipality:

1. Information systems provide information happened in the past and rely on them to make future decisions, and the introduction of information systems led to giving a better form of information, which facilitates the handling

- of decision-making, in addition to the information provided by the information systems meet the needs of the beneficiaries to take decisions.
2. Information systems provide the user with clear information for decision making, but through the answers of the sample we concluded that the organization finds some difficulties in obtaining information in terms of accuracy, quantity, objectivity, timelines, brevity and productivity.
  3. The uses of information systems moderately help in the effectiveness of decision-making, as we noted that there is a lack in using quantitative methods in decision-making by the studied information systems.
  4. Information systems, expert systems and decision support systems moderately help to achieve the various stages of decision making, indicating that there is a relationship between the uses of information systems and the effectiveness of decision-making at Greater Irbid Municipality.
  5. The continuous development of information systems with the emergence of new and more effective techniques and methods in the processing of information enables the identification of the problem more accurately than before. It contributes to providing the appropriate information to identify the real problem more quickly and contributes significantly to the crystallization of a clearer vision of problems and alternatives to solutions more than old information systems.
  6. Modern information systems contribute to achieving the planned results better than before thus produce more accurate decisions, flexibility, efficiency, effort and less time, which means that the development of information systems contributes to increase the effectiveness of decision-making in Greater Irbid Municipality.

### ***Study Recommendations:***

The study recommends the following:

1. Conducting awareness campaigns to familiarize users of information systems in facilitating their administrative processes and increasing the effectiveness of their decisions.
2. The pursuit of keeping abreast of the development of the systems and information technology used in the institutions.
3. Maintain the level of security and control enjoyed by the current system and work on the development of safety procedures according to the evolution of the information system.
4. Establishment of comprehensive databases and information that contribute to the provision of necessary and appropriate data and information in the efficient and effective application of the entrances of modern information systems in institutions to respond to the purposes of modern management.
5. Holding training and field courses and seminars to familiarize users of the information system in facilitating their administrative processes and increasing the effectiveness of their decisions.

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