The impact of Decision support systems on decision-making quality: Evidence from Jordanian banks

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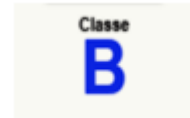**DAYYAT Rasha**

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The impact of Decision support systems on decision-making quality: Evidence from Jordanian banks

أثر أنظمة دعم القرار على جودة القرار: دراسة حالة البنوك الأردنية

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Abstract:

This study investigates the impact of the decision support system (DSS) on the quality of decision-making, by addressing the effect of these variables (effectiveness, efficiency, perceived effort, perceived ease of use, and usefulness) on the decision-making quality. 500 self-questionnaires were distributed in Jordanian banks and the data were analyzed using the (SPSS) software. Finally, the study findings reveal that the use of DSS, which are effective, easy to use and useful with minimum efforts, helps in making high quality decisions. Also, the study finds that there is no effect of an efficient DSS on decision-making.

Key words: Decision Support System; Decision-making; SPSS; Jordan.

JEL classification: D81; C44 ; C83;

الملخص

هدفت هذه الدراسة إلى تحديد أثر استخدام نظام دعم القرار على جودة القرارات وذلك بدراسة الفعالية والكفاءة والفائدة والجهد المبذول وسهولة الاستخدام وتأثيرها على جودة صنع القرارات. حيث تم توزيع 500 استبيان في البنوك الاردنية وتم تحليل النتائج باستخدام برنامج(SPSS) . وفي الاخير خلصت الدراسة الى أن استخدام نظم دعم القرارات التي تمتاز بسهولة الاستخدام والفعالية والفائدة ولا تحتاج إلى جهد كبير في الحصول على المعلومات تساعد على اتخاذ قرارات عالية الجودة. في حين تبين أن الكفاءة ليس لها دور في تحسين جودة هذه القرارات.

الكلمات الدالة: نظام دعم القرار، اتخاذ القرار،SPSS الأردن.

تصنيف جال: D81; C44 ; C83

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INTRODUCTION

Decision-making is a core activity for managers as it presents a problem of choosing among several alternatives. A somewhat more sophisticated view includes the process of building alternatives (i.e providing an outline of the problem and developing a list of options). The full picture includes opportunities in decision-research models (Druzdzel& Flynn, 2002).

Moreover, the decision-making can be considered as the heart of a manager's mission and a significant component of institutions' life for making decisions about complex systems (such as managing organizational operations, industrial operations, or investment portfolios; command and control in military units or control of nuclear power plants) often strains our cognitive capabilities.

Earlier, the decision-making was developed depending on intuition and judgment of the decision-makers which after deteriorates even further with complexity and stress. However, actually there is an increasing need to make decisions in teams either for personnel or for professional levels. This makes it difficult for decision makers to meet at the same time and the same place, accordingly, many types of computer-based information systems (IS) have been developed to support decision-making, including decision support systems.

Decision Support System (DSS) is an interactive computer-based system that helps users in assessment and selection activities. It provides data storage and retrieval but enhances traditional information access and retrieval functions while supporting the model building and model-based logic. Also, it aids in framing and solving problems as well as data modelling. Moreover, it is considered as computer-based systems that help decision-makers to address poorly structured problems through direct communication with data and analysis models(Nokhbatolfoghahaayee, Menhaj, & Shafi, 2010).

Decision support systems are becoming increasingly popular in various fields such as business, engineering, military, and medicine. They are especially valuable in situations where the amount of information available is prohibitive to the intuition of an unsupported human decision-maker where accuracy and optimality are important. Decision support systems can help decision-makers by providing many information sources, offering smart access to appropriate awareness, and aiding in the process of structuring decisions. The decision support systems are designed to

provide a systematic analysis of complex problems by the decision-maker and help him to organize his thoughts and structure the decision problem, thus clarifying the understanding of the problem in the palm.

The current study seeks to analyse the effect of the efficiency, effectiveness, perceived ease of use, perceived usefulness, and the perceived effort of the DSS on the quality of the decision-making. Besides, the researcher seeks to empirically identify the reasons behind the likelihood that DSS-users may not make better quality decisions than non-DSS users. Accordingly, the main problem of this study can be formulated as follows: ***What are the main characteristics of the Decision Support Systems that may affect the quality of the decision-making?*** To answer this problem the researcher conducts an empirical study in the Jordanian context from the viewpoints and opinions of employees.

Through conducting the central concern, the researcher aims to achieve several objectives in relation. Thus, a full acknowledgment of the subject treated is highlighted. The following objectives are addressed to:
1. Examine the most important components and characteristics of the DSS and investigate the effect of these factors on the quality of the decision-making.
2. Enhance the awareness concerning the consequences of using the DSS in organizations generally and banks especially on making efficient strategic decisions.
3. Look over the patterns and trends of using the DSS in Jordanian banks.

1.1 Previous Studies

This section provides a review of related previous studies. We start with a short review of the literature on strategic decision-making and continue with a review of the current and relevant literature on the DSS and its components and characteristics. Resolution Support Systems (DSS) was first developed in the 1970s and has been widely used since the PC revolution of the 1980s. DSS can be described as 'computer-based systems that help decision-makers cope with unregulated problems through direct interaction with data and analysis models.

The decision-making process is not a one-time process; rather it is a mechanism consisting of several different activities that occur at different times. Therefore, the decision-maker should be familiar with the problems and understand them, as soon as they arise, as he provides solutions and offers all options about a specific solution. Finally, the solution must be implemented. Four different stages in decision-making

are intelligence, design, choice, and implementation. (Fuglseth &Grønhaug, 2003) study the computerized market models and their role in developing strategic decision-making. The researchers claimed that the use of such systems supports decision-making. They focus on the use of a specially designed DSS system by experienced managers in a realistic strategic development. They prepared a report on an exploratory study, where an administrative team at a large oil company assessed the consequences of the company for an important market event, first without DSS and then with DSS found that the use of DSS meant a shift in the direction of making more rational decisions, but also focusing on system variables only.Another work of (Bharati & Chaudhury, 2004), intended to understand factors that influence the satisfaction of decision-making in web-based decision support systems. Researchers employ the Structural Equation (SEM) approach. They found that information quality and system quality influence satisfaction with decision-making, whereas presentation of information does not affect decision-making satisfaction. The decision-making process depends on many factors including 'the context in which the decision is made, the way the decision-maker perceives and understands the signals, and what the decision-maker or judges value as important. However, (Martinsons& Davison, 2007) studied the information system (IS) issues that arise from the discovery of distinctive American, Japanese, and Chinese methods of strategic decision-making. International differences in the analysis and conceptualization of strategic decisions raise doubts about the applicability of IS globally, such as decision support systems and operational information systems. The success of knowledge and information management systems in different countries and cultures will depend decisively on the extent to which information technology applications adapt to their users' decision-making methods. (Song, Jones, &Gudigantala, 2007) investigated the impact of integrating compensatory selection strategies into consumer decision support systems on the Internet when using decision-making theories and user satisfaction to develop three realistic DSS web strategies that support different decision strategies and experiments to compare them. The results, as they assumed, suggest that the two strategies supporting DSS (added weighted or equally weighted), compared to DSS that support non-compensatory strategies (elimination by side), were considered more accurate, less effortful, more effective, more satisfying, and had a superior consistency with declared preferences.(Cowie & Burstein, 2007) addressed the quality of data that is an important factor affecting the results or quality of the decision to be

made through a research study to implement the mobile decision support system. In their study, it is felt that the mobile decision-maker would benefit if provided with measuring the quality of the data used in deriving a decision when they suggested the quality of the data model taking into account the static and dynamic characteristics of the mobile decision context, and used multi-standard resolution analysis to represent the decision model and the quality of data measurement. A model of the mobile decision support system has been developed to examine the usefulness of data quality. Another work of (Alnajjar & Al-Zoubi, 2012) intended to determine the level of application of DSS and the commission in Jordanian universities and analysis of the impact of decision supporting systems own. the study developed a conceptual framework consisting of two parts that simulate the study trumps. the scope of study consists of several studies in all member faculties of the faculty of economics and business in Jordanian universities (public and private). matches the 5,000-year stratified random sample (5) private universities were conducted on (150) surveys distributed and included (142) surveys. Analysis: (38) paragraphs were made in the previous studies to achieve the objectives of the study. The study results revealed that DSS generators had a significant effect on the level of organizational ability in Jordan, moreover, the study found a statistically significant effect of DSS generators on personal and collective empowerment in the studied universities.

In the study of(Hashem, 2016) the researcher tired to explore the extent to which Jordanian commercial banks use the decision support system to reach the marketing creativity, to achieve this end a questionnaire was developed and distributed to a sample of 19 marketing manager. The study concluded the following: first, Jordanian commercial banks utilize the DSS to achieve the marketing creativity. Second, the marketing manager's qualifications don't cause any statistical difference in using the decision support systems to reach the marketing creativity. Third, the marketing practical experience of managers doesn't make any statistical difference in achieving the marketing creativity using the decision support systems.

The implementation of the decision support system in groups may create some challenges, these challenges and barriers are addressed by (Carneiro, Alves, Marreiros, & Novais, 2021) in their work they propose aconceptualdefinition   of   a   Web-based decision   support system that seeks to   eliminate   the   existing confinements and offer assistance to assert as   a dependable and valuable means.Moreover, other important subjects are discussed, like perception and communication, that

are basic and important for decision-makers. A key conclusion is reached in this research, limitations still exist, mostly in terms of models and applications, which makes it difficult to design systems with high quality.

In this study, the researcher attempts to examine the effect of using the DSS by addressing the impact of its characteristics – which are effectiveness, efficiency, perceived ease of use, perceived usefulness and perceived effort – on the decision-making quality. After the theoretical framework development, the researcher performs an empirical study to test the impact of the preceding factors on the quality of the decision-making in Jordanian banks.

1.2 Study Model

The model summarizes the relationship between the quality of decision-making as a dependent variable and effectiveness, efficiency, perceived ease of use, perceived usefulness and perceived effort as independent variables. This model will help in developing the hypotheses to test the relationship between the previous variables. The following figure illustrated the study variables:

Figure 01: study model
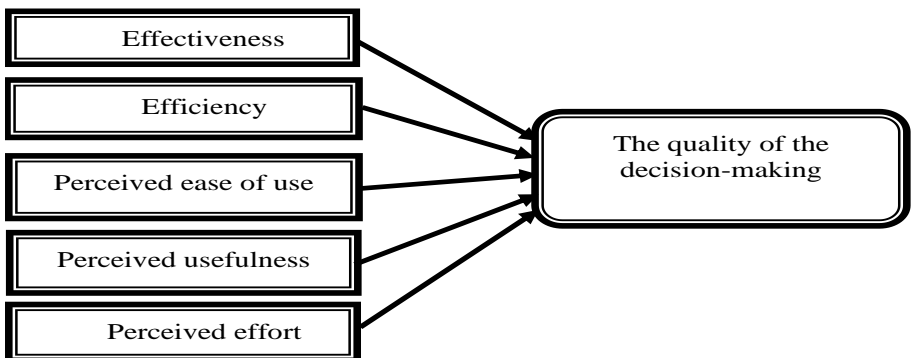
Source: prepared by the researchers based on the previous studies

1.3 Study Hypotheses

According to the variables generated from the previous studies and the proposed model in the previous section, the researcher will develop the following hypotheses and try to test them later in the empirical study:

H1: There is a positive effect of DSS's effectiveness on the quality of decision-making.

H2: There is a positive effect of DSS's efficiency on the quality of decision-making.

H3: There is a positive effect of DSS's ease of use on the quality of decision-making.

H4: There is a positive effect of DSS's usefulness on the quality of decision-making.

H5: There is a positive effect of perceived effort to perform DSS on the quality of decision-making.

2. THEORETICAL FRAMEWORK

Before identifying the research variables, the researcher clarifies the main concepts of DSS and decision-making:

2.1 Decision support systems "DSS"

In this section the researcher provides some insights about the DSS as follows:

2.1.1 A brief history of DSS

(Keen & Scott Morton, 1978) claims that the concept of decision support has evolved from two main angles of research: theoretical organizational decision-making studies conducted at the Carnegie Institute of Technology during the late 1950s and early 1960s, and technical work on interactive computer systems, which was implemented mainly at the Massachusetts Institute of Technology in the 1960s.

The decision support systems enter the field of research in the middle of the 1970s, earlier than gaining in intensity during the 1980s. In the mid-to-late 1980s, operational information systems, collective decision support systems, and organizational decision support systems evolved from a model-oriented documentary support system. Beginning around 1990, data storage and on-line analysis processing (OLAP) began expanding the DSS range. As the millennium approached, new analytical applications were introduced on the Internet.

2.1.2 Decision Support Systems' definition

DSS can be defined as a computer-based method that can be utilized to aid in making strategic and complex decisions. Therefore, the DSS is a set of computer-based tools that offer the decision-maker with interactive capacities to increase the perception and base of information concerning options during the use of models and data manipulation. This viewpoint enables decisions to be reached by making a combination of individual judgment and information provided by these models.

Another definition of (Wöber&Gretzel, 2000) mentions that DSS is

seen as computer systems that help the user solve complex problems or make decisions. It is also an integrated approach to address old problem of assisting people to make the right decisions. Decision Support systems frequently have quantitative output and focus on the end-user to solve the final problem and make decisions

Furthermore, (Klein &Methlie, 1995)refers that Decision Support Systems can be considered as software that gives information in a particular area of application through analytical decision models and databases' access, to support decision-makers in effective decision-making in complex and unstructured (un-programmed) tasks.

Hence, the researchers can conclude thatDSS is "a system that supports technological and managerial decision-making by assisting in the organization of knowledge about structured or unstructured issues".

2.1.3 Fundamental components of DSSs

(Druzdzel& Flynn, 2002) Found that DSS is composed of:
- **Database management system (DBMS):**
DBMS acts as a data bank for DSS. It stores large amounts of data related to the category of issues for which DSS is designed and provides logical data structures (as opposed to physical data structures) with which users interact. The DBMS system separates users from the physical aspects of the database structure and processing. They should also be able to inform the user of the types of data available and how to access them.
- **Model-base management system (MBMS):**
The role of MBMS is the same as that of DBMS. Its main function is to provide special models used in DSS from the programs that use them. The purpose of the MBMS is to turn the data from the DBMS into useful information in decision-making. Because many DSS user problems can be disorganized, the MBMS must also be able to help the user build the model.
- **Dialog generation and management system (DGMS):**
The main result of the interaction with DSS is insight. Since its users are often managers who are not familiar with the computer, DSS systems must be equipped with intuitive and easy-to-use interfaces. These interfaces help build the form, but 'interact with the form, like configuring an idea about it to get suggestions. DGMS primary responsibility is to increase the system user's ability to use DSS.

2.1.4 Benefits of DSS

The use of decision support systems in banks as well as financial

institutions provides them with the following benefits:
- Enhances individual efficiency;
- Accelerates and speeds up the problem-solving procedure in banks;
- Facilitates internal and external communication;
- Improves risk management operations;
- Helps for training and educating employees;
- Helps banks to get and maintain a competitive advantage;
- Generates new facts in support of a decision;
- Reduces time and efforts for decision-makers;
- Supports exploration and detection for decision-maker;
- Brings new approaches for problem-solving;
- Helps to automate the banks' management and operations.

2.2 Research variables

The research variables are presented and defined as follows:

2.2.1 Perceived effectiveness

The effectiveness, which means 'doing the right thing', can be defined as a measure of the capability of a plan, mission, or situation to produce a precise, qualitatively quantifiable effect or result. Effectiveness is also considered as a measure of the quality of collection in achieving objectives. Moreover, effectiveness relates to some of the organization's objectives and not to the outputs' technical quality. Consequently, the measures of the effectiveness of the work process can be indicated with the input of resources needed to produce a level of project outcomes.

In the DSS context, the concept of effectiveness is similar to accuracy. Thus, the effectiveness of DSS is a positive factor for making good decisions in a period of increased user considerations for decision precision; signifying that user may put more weight on accuracy and do more to achieve their objectives when they appreciate the benefits of improved decisions to build accuracy (Chan, 2009).

2.2.2 Perceived effort

The perceived effort can be viewed as an exercise of power, either physical or mental, in acting or in targeting an object; More or less an exhausting attempt, but a struggle directed at achieving an object. Thus, the use of the development services management system can increase when the development services management system reduces the effort needed to implement a stressful strategy, and when the use of the development services management system increases decisions' quality and accuracy (Chan, 2009).

2.2.3 Perceived efficiency

Whereas efficiency is 'doing the right thing'; Efficiency opinions are built on the concept of 'waste'. A fairly efficient process either needs less input or produces more output with comparison to another procedure, to achieve process objectives.

In the context of DSS, a system is efficient if it helps users make their decisions at the right time. Rapid advancements in computing technology, particularly dispensation speed, are reducing user acceptance for any delays in internet applications

2.2.4 Perceived usefulness

Perceived usefulness is the perceived interest and it can be defined as the extent to which an individual assumes that using a certain technique will improve his or her job performance. Employees tend to utilize or not utilize the application as much as they think will help them do their job better (Abu-Assi, AL-dmour, & Al-Zu'bi, 2015). This includes reducing the time needed to do the job and increasing efficiency and accuracy. Within the regulatory context, people are generally promoted to good performance through increases, promotions, rewards, and other offers. The high-interest system, in turn, is a system in which the user believes there is a positive relationship between use and performance (Davis & Arbor, 1989).

In the context of DSS, Perceived usefulness is a measure of how well the DSS will improve a user's decision-making capacity, that is, the time required to do a certain task.

2.2.5 Perceived ease of use

The perceived ease of use refers to the degree to which extent individual perceptions that utilize a certain technique will be free of effort. Users thought that a particular application was useful, but at the same time, they might think that the use of technology is extremely difficult and that the performance benefits of using it outweigh the efforts to use the application. Moreover, from the definition of 'ease': 'freedom from difficulty or great effort', the effort is a limited resource for which a person may devote to the various activities for which he or she is responsible (Davis & Arbor, 1989). Everything else is equal, we claim, that an app that finds it easier to use than another application is likely to be accepted by users. Thus, the perceived ease of use illustrates the user's perception of how much effort is required to use the system or to what extent the user believes that using a particular technique will be easy.

In the context of DSS, Perceived ease of use is a measure of the reduction (or increase) in physical or mental effort to use the DSS.

2.2.6 Decision-making and decision quality

In this section some insights about the decision-making and the decision quality will be provided:

a. Decision-making:

To understand how DSS may enhance the quality of decision-making, it is first necessary to understand the decision-making process and define this concept:

Therefore, the decision-making process is about a whole range of decision-making activities. Also, there is general agreement in the administrative literature that the decision is an option. This option is a choice for a business strategy or an option that leads to a desirable goal. On the other hand, the resolution was also defined as an experiment, ranging from the organization's first conception of stimulating or difficulty of interest, to a successful attempt at implementation, or a failed implementation attempt.

So, the decision process is concerned with the whole range of activities involved in making a decision. Besides, there is general agreement in the management literature that a decision is a choice. It is variously regarded as a choice of strategy for action, or a choice leading to a certain desired objective. On another hand, the decision also was defined as an experience beginning when the organization first became aware of a motivating concern or difficulty and ending with a successful or unsuccessful implementation attempt(Elbeltagi, 2002).

Moreover, Decision-making signifies selecting the most suitable solution to the problem among a large number of alternatives. It is one of the most important activities in the organization. An efficient and effective decision-making process leads to the organization's long-term success in each round. This process includes identifying the problem, developing and analyzing alternative solutions, selecting and implementing the best solutions, and assessing the quality of the decision.

b. Decision quality

Decision quality is doing the right thing with the right people in light of uncertainty. A poor decision is unlikely to achieve the right result from good execution, or even worse, from doing the wrong thing with efficiency.

c. The impact of DSS on Decision Quality

Any decision case has the ability to logical, mechanical, and omission errors. One of the justifications for using the ombudsman

system is to make decisions in reducing the incidence of these types of errors (Todd & Benbasat, 1999). Thus, DSS tries to minimize logic and omit errors by leading the user through the decision-making process in a simple, step-by-step spontaneous manner that may require little cognitive effort.

3. DESIGN AND METHODOLOGY

In this study, the research methodology is described in terms of design, methods, population, instruments, and procedures used for data collection as well as procedures used during the data analysis. The research design chosen enabled the researcher to achieve the study objective:

3.1 Research Design

After clarifying the research problem and objectives, the researcher focuses on selecting the most appropriate research design. Accordingly, this study takes a conclusive approach (deductive), since the objective is to test specific hypotheses and examine relationships rather than generating new theories and understandings. The design is quantitative because the research strategies used to collect data are in numerical form. That is, by employing a deductive approach with a quantitative research method, the researcher has been able to measure and analyze the relationship between the independent variables (effectiveness, efficiency, perceived ease of use, perceived usefulness, and perceived effort) with the dependent one(the quality of the decision-making). The methodological approach in this study is descriptive that is also called Statistical Research, the main goal of this type of research is to describe the data and the characteristics of what is being studied.

3.2 Research Method

A survey approach employed in this study as it allows the researcher to collect a large amount of information that is used after to test the hypotheses. The researcher can contact large numbers of people quickly, easily, and efficiently using a questionnaire.In this study, survey research involved the collection of quantitative data from a sample of elements drawn from a well-defined population through the use of a questionnaire. This research method will be used to measure respondents' views about the use of DSS. Selected respondents were asked questions and their answers were collected in a structured, precise manner; this information enables the researcher to test the research hypothesis.

The used questionnaire consisted of two major sections incorporating demographics (gender, age, education level, job level), and the use of the DSS with is measured by the following dimensions:

effectiveness, efficiency perceived ease of use, perceived usefulness and perceived effort), and the quality of the decision-making. The questionnaire is used because questionnaires are relatively quick and easy to create code and interpret. A questionnaire is easy to standardize.

3.3 Research Population and sample

The population in this study comprises all Jordanian banks' employees. A convenience sample of employees in Jordanian banks is selected. The researcher uses convenience sampling because it is easy to use. But, the convenience sample is usually used because it allows the researcher to obtain basic data and trends regarding his study without the complications of using a randomized sample. Then (500) questionnaires are distributed, the returned questionnaires are carefully checked for completeness.

3.4 Data Analysis Technique

According to the chosen methodological research approach, the quantitative data was analyzed using a system designed for statistical analyses, SPSS 16.0 technique. Some descriptive analyses are performed to extract relevant points. Besides, an independent sample t-test and regression analyses were chosen, it fit the hypotheses testing and analysing how independent variables (effectiveness, efficiency, perceived usefulness, perceived ease of use, perceived effort) can be used to predict a dependent variable (decision-making quality), finally, the data are organized and presented in a table forms-based on the researcher's discretion.

3.5 Operational Definitions

Before a scale of measurement is developed, the researcher will determine exactly what it is to be measured. Concepts or variables in this study were not directly observable. So they have to be operationalized in a way that enables the researchers to measure them. Operational definitions of variables measured in this study were borrowed and were slightly modified from previous studies. These definitions are presented in Table (1).

Table1: variables' operational definitions

Variables	Operational definition
Perceived effectiveness	A measure of the ability of a program to produce a specific desired effect or result that can be qualitatively measured.
Perceived effort	The exertion of strength or power, whether physical or mental, in performing an act or aiming at an object.
Perceived efficiency	The achievement of the objectives with minimum inputs or produces more outputs at a given level of inputs.
Perceived usefulness	The degree to which a person believes that using a particular technology will enhance his or her job performance.
Perceived ease of use	The extent to which a user believes that using a particular technology will be effortless.
Decision-making quality	Doing the right thing right with the right people in light of uncertainty.

Source: Prepared by the researchers depending on the SPSS outputs.

4. RESULTS AND DISCUSSION

The results of the analyses are presented in the following:

4.1 Sample Characteristics

This section of the study describes some personal data included in the questionnaire to get a precise description of the source of collecting data. The following tables show the frequencies and percentages of respondents according to their (gender, age, education level, job level).

Table02: Frequencies and Percentages of respondents according to their gender

Gender	Frequency	Percent %
Male	290	58.0
Female	210	42.0
Total	**500**	**100**

Source: Prepared by the researchers depending on the SPSS outputs.

As shown in table (02) 58.0% (290) of respondents were males, and 42.0% (210) were females. As it's obvious, the largest percentages of respondents were males.

Table03: Frequencies and Percentages of respondents according to their age.

Age	Frequency	Percent %
18-29	210	42.0
30-39	170	34.0
40-49	120	24.0
Total	**500**	**100**

Source: Prepared by the researchers depending on the SPSS outputs.

According to the results presented in table (03), 42.0% of respondents were of the age between 18 and 29 years old. While 34.0% of

respondents were between 29-39 years old, 24.0% of respondents were of the age between 40 and 50years old. Finally, the largest percentage was for those respondents aged between 18 and 29 years old, because of the youth of Jordanian society. And the lowest percentage is those who aged between 40 and 49 years. But there is no `respondent for more than 50 years.

Table (04): Frequencies of respondents according to their education level

Education level	Frequency	Percent %
Secondary	20	4.0
Bachelor	430	86.0
Master	40	8.0
Diploma	10	2.0
Total	**500**	**100**

Source: Prepared by the researchers depending on the SPSS outputs.

As shown in the table (04), 4.0% of respondents (20) have gotten a secondary degree. Followed by 86.0% (430 respondents) have gotten a bachelor's degree, 8.0% (40 respondents) have a master's degree. And finally, 2.0% (or 10 respondents) has a diploma degree. Thus, it is evident that most respondents were those who have a bachelor's degree, whereas the lowest percentage of respondents was those who have a diploma.

Table (05): Frequencies and Percentages of respondents according to theiroccupation

Job	Frequency	Percent %
Manager	20	4.0
Financial	10	2.0
Accountant	10	2.0
Technician	180	36.0
Teller	280	56.0
Total	**500**	**100**

Source: Prepared by the researchers depending on the SPSS outputs.

Table (05) shows that 4.0% of respondents were managers. While 2.0% of respondents Table (05) shows that 4.0% of respondents were managers. While 2.0% of respondents were financial manager, 2.0% of respondents were accounting manager. 36.0% of the respondents were technicians. Finally, 56% of respondents were tellers.

Several pre-assumptions should be tested before conducting the multiple regressions to ensure the accuracy of results, where the most important are normality, the fitness of the model, the auto-correlation, and the investigation of the items' reliability:

4.2 Reliability

Reliability "is the degree to which test measures are free from error and therefore, yield consistent results over time and across situations"

(Zikmund, 2003). The reliability can be assessed on two dimensions; repeatability and internal consistency. Reliability scores are expressed numerically as a coefficient. A coefficient score will be 1.00 if a test is perfectly reliable. A high coefficient of at least 70 is required to indicate an acceptable degree of reliability (Baumgartner, Strong, & Hensley, 2002). (Nunnally, 1978) has suggested that a minimum alpha of 0.60 sufficed for the early stages of research. Reliabilities are calculated with the famous coefficient "Cronbach Alpha" that indicates how well the items in a set are positively correlated to one another. Concerning this study, Cronbach's alpha of the variables is acceptable (it varied from 0.791 to 0.81) as appeared in (Table 06).

Table (06) Cronbach's Alpha results

Independent variables	Cronbach's alpha
Effectiveness	0.805
Efficiency	0.811
Perceived usefulness	0.805
Perceived Ease of use	0.791
Perceived effort	0.80

Source: Prepared by the researchers depending on the SPSS outputs.

Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. It is concerned with the study's success at measuring what the researchers set out to measure. According to the results that appeared in the table (07), approximately all items used to measure the impact of the independent variables on the dependent one is representative which can lead to conclude that the model as a whole is valid.

Table (07) Validity Test Results

Variables	Item	Sig. (2-tailed)	Correlations item to total
Effectiveness	Effectiv1	0.000	.712**
	Effetiv2	0.000	.763**
	Effetiv3	0.000	.718**
	Effetiv4	0.000	.686**
Perceived Ease of use	Ease 1	0.000	.842**
	Ease2	0.000	.866**
	Ease 3	0.000	.837**
	Ease 4	0.000	.551**
Perceived usefulness	Useful 1	0.000	713**
	Useful 2	0.000	.732**
	Useful 3	0.000	.749**
	Useful 4	0.000	.725**
	Useful 5	0.000	.542**
	Useful 6	0.000	.569**
	Useful 7	0.000	.111
Efficiency	Effic1	0.000	.781**
	Effic2	0.000	.856**
	Effic3	0.000	.822**
	Effic4	0.000	.740**
Perceived Effort	effort1	0.000	.910**
	Effort2	0.000	.563**
	Effort	0.000	.689**
	Effort	0.000	.669**
Quality of the decision-making	QDM1	0.000	.650**
	QDM2	0.000	.549**
	QDM3	0.000	. 689**
	QDM4	0.000	. 581**
	QDM5	0.000	. 701**
	QDM6	0.000	. .698**
	QDM7	0.000	.713**
	QDM8	0.000	.709**
	QDM9	0.000	.726**
	QDM10	0.000	.689**

Source: Prepared by the researchers depending on the SPSS outputs.

4.3 Fitness of the model

Table (08) shows the fitness of the model as a whole when the linear regression analysis of the research model reveals that the R-square is 0.627, which means that the independent variables explain about 85.5% of the variance in the QDM (dependent variable) which is considered as an acceptable rate. The model is statistically significant (F = 14.778, Sig-F = 0.000) at 1% significance level. Moreover, the Durbin Watson statistic is

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.
1	,925a	,855	,815	,81072	1.997	14.778	.000

equal to 2 which indicates the absence of autocorrelation. So, it can be concluded that the proposed model is acceptable to investigate the effect of the independent variables on the dependent one.

Table (08): Fitness of the model for regression analysis

Source: Prepared by the researcher based on the SPSS outputs

4.5 Correlation results

The following matrix exhibits the correlation between the variables, computed using the "Pearson Correlation" coefficient, Hence, no more than 75% of correlation between variables is recorded, a value that gives a

signal about whether the variables measured are different (Sekaran, 2006). As it is shown in table (9) generally there is no significant correlation between the independent variable, so each variable refers to something different from the others.

Table 9: Correlation test results

		EFFECT	EASY	USFUL	EFFIEC	EFFORT	QDM
EFFECT	Pearson Correlation	1	.410**	.593**	.691**	.321*	.535**
	Sig. (2-tailed)		.003	.000	.000	.023	.000
EASY	Pearson Correlation		1	.439**	.452**	.498**	.482**
	Sig. (2-tailed)			.001	.001	.000	.000
USFUL	Pearson Correlation			1	.858**	.317*	.715**
	Sig. (2-tailed)				.000	.025	.000
EFFIEC	Pearson Correlation				1	.388**	.773**
	Sig. (2-tailed)					.005	.000
EFFORT	Pearson Correlation					1	.352*
	Sig. (2-tailed)						.012
QDM	Pearson Correlation						1
	Sig. (2-tailed)						

Source: Prepared by the researchers based on the SPSS outputs

4.6 Hypotheses testing

In this section the researcher tries to test the hypotheses that were developed in the previous section as follows:

After the researcher assures that the assumptions of regression models were met, the following section deals with hypotheses testing by using Multiple Regression analyzes to know if there is an impact of the independent variables on the dependent variable. According to the decision rule: we accept the null hypothesis (H0) if the significance level is greater than 0.05 significance level, and we reject (H0) if the significance level equals or is less than 0.05. As a result of this decision rule, the researcher has tested statistically the proposed hypothesis and found the following results:

As a large number of variables (5 independent and one dependent variable) were measured in this research, and as all of the proposed relationships (hypotheses) were not complicated and they were tested one at a time, it was deemed appropriate to use multiple regression estimations for testing the proposed hypotheses because it is desired to examine the effect of the independent variables on the dependent variables. The regression is used to test our hypotheses.

Table (10) multiples regression results

Model 1	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	21,406	1,659		12,906	,000
Effectiveness	2,019	,463	,578	4,357	,000
Efficiency	-,119	,065	-,215	-1,845	,081
Ease of use	,161	,049	,509	3,267	,004
Usefulness	,179	,068	,370	2,653	,016
Efforts	,303	,073	,627	4,154	,001

Source: Prepared by the researchers based on the SPSS outputs

From the results shown in table (10), the effectiveness of DSS has a positive and significant effect on the quality of the decision-making (sig = 0.000<0.05).

DSS' efficiency has insignificant effect on the quality of decision-making (sig=0.081>0.05)

DSS' Ease of use has insignificant positive effect on the quality of decision-making (sig = 0.004<0.05)

DSS' Usefulness has a significant positive effect on the quality of decision-making (sig = 0.016<0.05).

Finally, the perceived effort has no significant effect on the quality of decision-making (sig=0.001<0.05), Table (11) summarizes the results of hypotheses testing using Multiple Regression:

Table (11) Summary of the hypotheses testing results

Hypothesis	Accepted / Rejected
H1: There is apositive effect of DSS's effectiveness on the quality of decision-making.	Accepted
H5: There is a positive effect of DSS's efficiency on the quality of decision-making.	Rejected
H2: There is a positive effect of DSS's ease of use on the quality of decision-making.	Accepted
H3: There is apositive effect of DSS's usefulness on the quality of decision-making.	Accepted
H4: There is apositive effect of DSS'sDSS's perceived efforts on the quality of decision-making.	Accepted

4.7 Findings Discussion

The results reached in the current study that aims to investigate the impact of using the DSS on the quality of the decision-making by testing its effectiveness, efficiency, perceived effort, ease of use, usefulness which are all discussed in this section. So, depending on the study objectives and the test of the research hypothesis, the researcher gets the following as overall conclusions:

It is found that there is a significant positive impact of DSS' effectiveness on decision-making quality consistent with many studies that were performed for measuring the impact of DSS effectiveness on

decision-making as the study of(Sharda, Barr, & McDonnell, 1998)that investigates the effectiveness of a simulated organizational DSS, in two laboratory-based simulations when the groups with access to the DSS made significantly more effective decisions in the business; this result is consistent also to the results of (Newman, 1993).

This result may be explained by an evaluation of effective DSS that can serve multiple managers and functions. Also, DSS effectiveness upon managerial decision-making serves as the basis for a better or improved decision quality since it helps decision-makers to develop a better understanding of the essence of a decision problem and reduce errors. This means that the decision support system effectiveness improves the quality of the decision-making, based on the information and the support provided by the DSS.

The hypothesis concerning DSS perceived ease of use is also accepted, this means that the features of DSS are significantly linked to decision quality. This result is consistent with the findings of (Chan, 2009) in which the perception of managers indicates that DSS is a facilitator of decision-making activity. In addition, (Davis & Arbor, 1989) believe that the DSS is easy to use and that the performance benefits of usage are outweighed by the effort of using the application whichever the user's perception of the amount of effort required to utilize the system will be effortless.

The positive effect of DSS perceived usefulness can be considered as an indication of the ability of DSS to enhance a decision-makers' capability. It can help them in making better decisions by integrating information into a more useable form, decreasing the time for doing the job, and providing more accuracy. This result was consistent with the findings of (Davis & Arbor, 1989) who found that the most important factor in encouraging the usage of technology is perceived usefulness. This can explain the user's perception to the extent that this technology will improve the user's workplace performance by decreasing the amount of time it might take to perform a certain task or the user has a perception of how useful the technology is in performing his job tasks.

Concerning the level of effort required in performing a task, which has also been used as an indicator of the impact of a DSS on decision-making quality, and by testing the hypothesis concerning this issue; it was found that there is a positive relationship between the perceived effort and the quality of the decision-making. The less effort expected by the user to expend in completing the task the high quality the decision will be. This finding is consistent with many studies' results as (Keen & Scott Morton,

1978) who concluded that managers will use a DSS if it provides better solutions or permits more systematic of "rational" evaluation in addition to reducing the necessary time for performing a task, as a result, DSS will be accepted mainly because it provides adequate benefits with low effort.

Finally, the last hypothesis concerning the effect of the DSS efficiency indicates that the DSS efficiency doesn't enhance the quality of the decision-making. This can be explained, by the high cost of either creating or developing a new decision support system, but on another hand, DSS is considered as a long-term investment, and its results or contribution in making decisions will not appear immediately.

5.   CONCLUSION

Recently, with the fast advance of computer and internet technologies and the rapid growth of available information, the scope of decision support systems has expanded to satisfy organizational goals and decision-makers' needs. Because of the complex and dynamic environment, passive types of support are no longer sufficient to meet decision-makers' needs. So, Decision Support Systems are one of the most popular software components nowadays where there are many DSS in use in organizations.

This work is directed to assess the value of decision support systems by examining its effect on decision-making quality. From the findings of this study, the researchers have provided evidence that DSS allows the decision-maker to organize effective decisions and evaluate the quality of those decisions by helping decision-makers to use communication technologies, data, documents, knowledge, and models to identify and solve problems, complete decision process tasks, and make good decisions by exploring more alternative solutions.

The application of these systems can be greatly increased as shown in the previous studies, alongside with the finding of the current study that ensured and supported that DSS' ease of use encourages the use of DSS as a key to obtain high decision quality that leads to improvements in organizational performance as a whole.

Furthermore, this study finds that the DSS perceived usefulness also has a significant impact on the decision quality since it provides the decision-makers with a high level of accuracy in their decision-making process and according to the study results which reveals that the DSS feature performs to improve the productivity of organizations and enables them to reach the competitive edge. In addition, the evidence of perceived effort also supports proponents of DSS and ensures the finding of many

studies. The current study found that the DSS aid decision-makers to exert a low level of mental and physical effort to made effective decisions and therefore to take high quality decisions.

Finally, the increasing cost to develop and create DSS might be hindering the use of these software programs. This means that its costs outweigh the perceived gains, consequently, the decision-making quality cannot be reached through an efficient DSS.

The results of this study have implications for business as well as academic researchers. For businesses, this study provides evidence that DSS has a significant impact on the quality of decision-making. In another word an effective, ease of use DSS with minimal effort to get information make the decision easier and more effective. As a result, this program reinforces the need for a computing environment with decision-support capabilities and makes the case for continued DSS usage by executive and operational managers in making decisions.

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