

# The Impact of Management Information Systems on Decision Making in Jordanian Private Universities

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This study aims to determine the impact of Management Information Systems on decision making in Jordanian Private Universities. The study population represents the employees of the private universities in Jordan. To achieve the objectives of the study, destructive methods and a questionnaire were developed for the collecting and distributing of data to the study population through the use of a comprehensive sample method. The questionnaire was distributed to a sample of 315 employees and 290 were retrieved with 65% of the total statistical society, the descriptive statistics and statistical analysis were used in the analysis of the study data. The results of the study showed that there are clear ways and plans for automating the functioning of these system and there is a relationship between the accuracy of the information provided by the management information systems in Jordanian private universities and the use of these systems by university officials. This was demonstrated by the relative weight (80%), which is a high percentage and therefore indicates the strength of the relationship between the accuracy of information and the use of these systems by decision-making officials in Jordanian private universities. The study also recommends developing, enhancing and increasing the efficiency of information systems on an ongoing basis and following up the continuous technological development and updating of data, in addition to increasing interest in providing statistical information to these universities through the external statistical centres.

**Key words:** *Management Information Systems, University*

## Introduction

Organizations in this modern age are considered one of the most important drivers of life, as these organizations form the basic platform for our working, dealing, and learning. Recently, there has been a huge and significant increase in these organizations and their problems, as well as an increase in their work and an increase in their goals, workers, and individuals who deal with these organizations. Therefore, this study notes that the old methods are no longer effective in managing these organizations. Where the old methods used the guesswork and traditions of management of these organizations, these became ineffective in ensuring that these organizations achieve their goals. The effects of technological superiority and development in the present day are reflected in all fields of life, as well as in all sectors of work and production. This technological development has affected the management of organizations through the emergence of the need for information systems commensurate with the development of modern organizations. Experiments have demonstrated that the use of information systems helps in making decisions that are highly efficient in achieving the goals at the lowest cost and in the right way. In this manner, decision-making can be defined as the process by which an alternative is chosen from several possible methods of achieving a goal, as well as how various problems are solved within a certain period and certain environmental conditions are met based on specific organizational resources.

Due to huge technological development, it has become possible to collect large amounts of information precisely and rapidly to utilize, treat, store, and restore it in due time and in ways that were not previously available. This could be justified by the availability of various computer equipment, networks and communication systems. Information has become so significant in improving the different aspects of life, especially the management of businesses. Consequently, information systems have become the major provider of information for organizations (Ghorab, 1995, pp. 1-2).

Information and information systems have taken a new dimension these days, as they have become an organizational resource. Management Information Systems (MIS) are systems capable of collecting and analysing data from different sources to provide the information necessary to make managerial decisions (James, 1987, p. 36). These highly efficient managerial decisions rely on the availability of adequate, accurate, and high-quality information that could not be available without information systems. Decision-making is one of the most important issues in the lives of all peoples, and the importance and seriousness of decisions are positively related to the number of people and the size of the organization. Decisions are the backbone of organizations and the availability of information and the power of these systems influence decision-making. Information systems have become increasingly important because different types of organizations need it. Information systems are no longer limited to business organizations but rather to non-profit organizations, such as Universities

and Hospitals. Such organizations, like business organizations, need information systems to enable them to make decisions on a sound basis. Information is wealth; the importance of information pervades not only the decision-making process but also other managerial processes, including plan development, policy formulation and modification, control, performance appraisal, etc. However, using information systems in decision-making is its most important usage since without information, decision-making becomes arbitrary.

### **The Problem of the Study**

Jordanian private universities are considered one of the most important organizations in Jordanian society. They rely on the information generated by management information systems to make managerial decisions. Therefore, these educational institutions were chosen to evaluate the role of management information systems in decision-making. Since the decisions made by these universities directly affect the performance of a large proportion of Jordanian society, this study tries to answer the following question:

Do the concepts of MIS affect the decision-making process in Jordanian private universities?

### **The Objective of the Study**

This study aims to achieve the following objectives:

- 1- Identifying the extent of the differences between the physical components of the MIS in Jordanian private universities.
- 2- Identifying the effectiveness of management information systems in managerial decision-making in Jordanian private universities.
- 3- Identifying the relationship between the structural level of the Department of Management Information Systems and the use of the necessary information in the managerial decision-making related to the development of performance in Jordanian private universities.
- 4- Identifying the relationship between the structural level of the Department of Management Information Systems and the validity, accuracy, relevance, timeliness, and adequacy of the information provided by MIS in Jordanian private universities.

### **The Importance of the Study**

The importance of this study can be summarized as follows:

- 1- Although there is a general hypothetical that accepts that management information systems have great importance in business organizations, especially in making important

managerial decisions to improve performance, this is not enough to prove the validity of the hypothesis in a precise scientific manner and at the level of private universities in Jordan. The reason for this is the lack of references, research, and books that examine the role of administrative information systems in making managerial decisions in those universities and organizations.

- 2- This study is part of a few studies that link the concepts of management information systems and the managerial decision-making process, which are related to performance development in Jordanian private universities through the field study conducted by the researcher, which opens the door for other researchers to discuss this topic in other organizations.

### **Hypotheses of the Study**

First hypothesis H<sub>01</sub>: There is no statistically significant correlation ( $\alpha \leq 0.05$ ) between the structural level of the Department of Management Information Systems (MIS) and information adequacy, relevance, timeliness, and adequacy of management information systems in Jordanian private universities.

Second hypothesis H<sub>02</sub>: There is no statistically significant correlation ( $\alpha \leq 0.05$ ) between the validity, accuracy, convenience, timeliness, and adequacy of information provided by management information systems and the use of management information systems in decision-making.

Third hypothesis H<sub>03</sub>: There are no statistically significant differences ( $\alpha \leq 0.05$ ) between the physical components and management system components in Jordanian private universities that can be attributed to the University variable.

This hypothesis is divided into the following sub-hypotheses:

H<sub>03-1</sub>: There are no statistically significant differences ( $\alpha \leq 0.05$ ) between the physical components and computer equipment of Management information systems in Jordanian private universities that can be attributed to the University variable.

H<sub>03-2</sub>: There are no statistically significant differences ( $\alpha \leq 0.05$ ) between the physical components and databases and telecommunications of Management information systems in Jordanian private universities that can be attributed to the University variable.

H<sub>03-3</sub>: There are no statistically significant differences ( $\alpha \leq 0.05$ ) between the physical components and software used in Management information systems in Jordanian private universities that can be attributed to the University variable.

Fourth hypothesis H<sub>04</sub>: There is no statistically significant correlation between the structural level of the management information systems department and the effectiveness of information needed to make managerial decisions in Jordanian private universities.

### **Previous Studies**

This section provides an overview of the concept of information systems and decision-making and its performance in the public teaching sector. It also reviews relevant prior studies, as follows.

Korac-Kakabadse, Kouzmin, and Knyght's study (2000), entitled "The Impact of Information Technology on the Ethics of Public Sector Management in the Third Millennium", is a comparative study of the theories of Socrates, Plato, Aristotle and Kant and revolves around the question: "What ought one do?" The study concluded that there is a strong likelihood that ethics will become an additional administrative tool and that there is a need to modify the ethics of the organization to specific administrative roles so that there will be a central characteristic of the Organization represented by the clarity of its governing values. The policies and procedures of the organization must reflect the social reality and community commitment towards building an organization with clear and well-known values and ethics, such as adhering to the principle of maximizing profits. Henceforth, public sector organizations need to apply policies that reflect the current reality of society.

Winterman, Smith, and Abell's study (1998), entitled "Impact of information on decision making in government departments", concluded that Respondents consistently recognized and valued the positive role of "information" in decision-making. The significance of internal and local information networks is emphasized throughout the study, and information centres/services are perceived as part of the local network. The value of information, from whatever source, was perceived as having a very positive impact on the decision-making process. The results showed increased confidence in making a better-informed decision from relevant, accurate, timely, and valuable information, and a perception that this saved time and money. The study also stressed the value of the information being continuous and accurate. Decisions made by government departments are heavily dependent on a complex mix of requirements and the diversity of their information sources reflects this complexity. The study recommended further studies on this subject.

Ashcroft and Maggie's study (1998), entitled "The impact of information use on decision making by physiotherapists", measured the impact of British physiotherapists' use information in Decision-Making. This study was applied to 1460 workers in this field. The study concluded that information has an impact on Decision-Making in terms of patient treatment, quantity, standards, and advice given to patients. The study also demonstrated that



the information enabled physiotherapists to avoid dealing with large numbers of patients, large quantities of periodic dates, and unregulated reviews.

Naama Abbas Khudair's study (1995), entitled "Information System and its relationship to technology and leadership behaviour", aimed to answer the following questions: Does the change in technology lead to a change in the information system? and Does leadership behaviour respond to change in the information system? The study sample consisted of 25 managers from two financial and development organizations in Iraq. The study found that change in technology does not necessarily lead to change in the information system, and that change in leadership behaviour depends partially on the change in the information system.

Al-Farhan and Tarawneh's study (1996), entitled "The extent to which Information and Control Systems are available in Jordanian Public and Private Corporation", aimed to explore the availability of these systems in Jordanian Corporations and to what extent these corporations benefit from the available systems. The study showed that the availability of Information and Control Systems is at a low level in Public corporation and that these systems offers a low level of contribution compared to what is expected from them. On the contrary, they found that private corporations that concentrate on Information and Control Systems experienced an increased contribution to the achievement of the corporation's goals. The study also showed a significant relationship between the degree of availability of systems and their ability to achieve their objectives.

Yaser Sokkar's Study (1999), entitled "Using Management Information System in the Decision-Making Process in Business Sector", aimed to identify the use of Management Information Systems in the Decision-Making processes of the Business Sector. The researcher applied his study to two organizations, one in the Petroleum Industry and the other in the Information field in Egypt. The study concluded that the application of MIS directly affects the productivity of organizations and helps to generate profit by improving the processing of information and knowledge at the administrative level, and improving the understanding of the importance of information at the lower levels of the organization. The private sector knows the impact and importance of the application of MIS in their organizations but considers it to be a kind of administrative expense and in some cases considers it to be less important than fixed assets and cannot be recovered. The study proposes that this view is incorrect; if organizations knew the advantages that management information systems can provide, they would plan differently and divert more attention to these systems. The study urges organizations to pay particular attention to apply Management Information Systems at the administrative and technical levels and to implement them according to the Organization's plan. This is because the value of MIS significantly adds to the whole organization, not just the department for which it is designed. The study also recommended establishing an administrative information systems unit, under the supervision

of the government, to disseminate sufficient knowledge and training to concerned organizations and establish administrative information systems units within ministries and authorities, which will help reduce the administrative expenses that burden the government budget.

The study of Yusuf Al-Shantaf (2000), entitled “The Role of Computerized Management Information Systems in the Process of Decision-Making in Commercial Banks Working Gaza Strip”, evaluated the role of computerized management information systems in the decision-making process of commercial banks operating in the Gaza Strip. The study also highlighted the huge opportunities offered by these systems, which would enable banks to improve their competitiveness. The study highlighted the urgent need to upgrade the computerized management information systems of banks and recommended the development of the organizational structures for these systems. The study concluded that there is a weak correlation between computerized MIS and its components (hardware, software, personnel, procedures, communications, and databases) and the decision-making process. It also concluded that there is a direct correlation between communication, databases, software, and the quality of information.

### The Study Population

The study population included the administrative and academic staff in Jordanian private universities who have a role in making decisions at the university. The researcher chose four universities, regardless of the region where the university is located. The sample of the study included 561 individuals representing various job positions such as Dean, Director, Head of Department, and Head of Division. The researcher conducted several interviews with some administrative staff in the four universities to obtain the required numbers.

The following table represents the distribution of the study population of Jordanian private universities.

**Table 1:** Distribution of the study population of Jordanian private universities

No.	University	Dean	Director	Head of Department	Head of Division	Sum
1	Isra University	16	15	11	194	236
2	Applied Science Private University	14	19	22	84	139
3	Philadelphia University	9	7	18	44	78
4	Irbid National University	1	6	3	98	108
Total		40	47	54	420	561

## The Study Sample

The study sample was randomly selected and consisted of (211) individuals. The sample comprised (18) deans, (20) directors, (22) heads of departments, and (143) division heads from the four Jordanian universities. The sample represented 38% of the original study population of (561). The sample of the study is represented in the following table

**Table 2:** The Population of the Study and its Sample

Job title No.	university	Dean Total	samp le	Director Total	sampl e	Head of Dept. Total	sampl e	Division Head Total	sample	Population Total	Sample Total
1	Isra University	16	7	15	7	11	4	194	69	236	87
2	Applied Science Private University	14	5	19	7	22	8	84	31	139	51
3	Philadelphia University	9	5	7	4	18	7	44	16	78	32
4	Irbid National University	1	1	6	2	3	3	98	35	108	41
Total		40	18	47	20	54	22	420	151	561	211

## Study Instrument (questionnaire)

*Reliability: is statistically meant to give approximately the same results if applied to the same subjects in the same conditions again. The Reliability of the scale was measured using Cronbach's Alpha method. This method is used to calculate Cronbach's Alpha coefficient to verify the veracity of the items of the questionnaire as in the following table (3).*

**Table 3:** Cronbach's Alpha of the main dimensions of the tool of the Study

No.	Item	No. of Items	Cronbach's Alpha
1	The adequacy of information resulting from management information systems	6	0.8777
2	The validity and accuracy of information resulting from management information systems	7	0.6435
3	The extent to which management information systems provide information in time	6	0.7236
4	Organizational Structure of the Department of Management Information Systems	8	0.7405
5	The efficiency of computerized management	8	0.8499

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	information systems in decision-making		
6	The convenience of information provided by management information systems	11	0.6552
7	The extent to which databases and communications work efficiently in the system	8	0.8999
8	The extent to which individuals work efficiently in the system	6	0.8834
9	The efficiency of hardware used in the system	7	0.7989
10	The efficiency of software used in the system	7	0.8632

It has been shown through the previous values in the previous table that the items of the scale have a high-reliability rate, this indicates the validity and reliability of the scale, and therefore the questionnaire has become ready to apply to the study sample.

### ***Distribution and Collection of the Copies of the Questionnaire***

The researcher applied the questionnaire to the four Jordanian private universities as follows:

1. The researchers distributed copies of the questionnaire to clarify the objectives of the study and its items.
2. The researcher collected the copies of a questionnaire from the individuals to whom the questionnaire was distributed.

A total of (203) copies were retrieved from the original sample (211). Thus, the size of the sample of the study was 203, with a 95.9% response rate. The high response rate is attributed to the keenness of the researcher in following up on the filling of the questionnaires and the people who completed the questionnaire. However, the researcher faced some problems, such as the lack of cooperation by some people in filling out the questionnaire, which in most cases may be attributed to a respondent's lack of time or lack of interest, or to the size of the questionnaire.

### ***Statistical Methods Used in the Study***

The Spearman correlation coefficient and Cronbach's Alpha coefficient were used to find the validity coefficient of the questionnaire.

The Pearson correlation coefficient was used to find the internal consistency of the questionnaire.

The *Kolmogorov–Smirnov Test* was used to assess normality and to know the type of data distribution. It was found that the data does not follow a normal distribution.

The Spearman and Chi-Squared Tests were used to test the hypotheses and to examine the independence and quality of conformity. And the *Kruskal-Wallis test* was used for hypothesis testing.

The binominal test was used for testing whether a proportion from a single dichotomous variable was equal to a presumed population value. It was also used to analyse the questionnaire sections and to support the mathematical averages of the analysis.

### Field I: Adequacy of Information Resulting from Management Information Systems

The researcher used this field to determine the adequacy of the information resulting from the management information systems: the need of decision-makers to have data that helps them in making decisions and developing performance; whether or not the system provides these data; whether or not the system provides external information about universities and statistical centres; and the extent of statistical information needed by decision-makers. The mean, the standard deviation, the percentages, and the sign test for each item of the field is shown in the table below.

**Table 4:** Working to provide evidence on management information systems helps to identify these systems and how to use them and take advantage of everything available.

No.	Working to provide evidence on management information systems helps to identify these systems and how to use them and take advantage of everything available.	Strongly Agree	Agree	I do not know	Disagree	Strongly Disagree	Arithmetic Average	S.D.	Sig.
9	The ability of the system to provide information for decision-making	0.00	8.7	7.5	75.1	10.2	4.1	0.70	0.000
10	The ability of the system to provide information reports commensurate with the problem of decision-making	0.01	25.2	11.4	60.1	6.6	3.00	0.89	0.000
11	The ability of the system to provide information that includes alternatives to solutions to the problem	0.00	31.1	21.0	40.1	5.3	3.16	0.98	0.990

12	The system provides easy ways to transfer and share data	0.00	4.3	6.0	74.2	18.5	4.00	0.60	0.000
13	The ability of the system to provide information on foreign universities	12.8	50.0	18.5	12.9	5.1	2.50	1.10	0.000

The previous table illustrates the results of the items in the first field, "Adequacy of information resulting from management information systems."

1: The ability of the system to provide information for decision-making. The mean for this item is 4.1, and the significance level is 0.000, which is less than 0.05. This indicates that the respondents have an almost complete consensus that the information system provides the information needed by the decision-makers. The ratio (85.3%) is also high.

2: The ability of the system to provide information reports commensurate with the problem of decision-making. The mean for this item is 3.00, and the significance level is equal to 0.000, which is less than 0.05, while the approval ratio for this item is 66.7%

3: The ability of the system to provide information that includes alternatives to solutions to the problem. The mean for this item is 3.16, and the significance level is 0.990, which is greater than 0.05. This indicates that it is not statistically significant, and through the arithmetic mean, we find that the information system provides insufficient information for all alternatives to the problem. The approval ratio was 45.4%.

4: The system provides easy ways to transfer and share data. The mean of this item was 4.00 and the significance level was 0.000, which is less than (0.05). This indicates that the sample members have a semi-consensus that the system provides methods for transferring and exchanging data conveniently and easily and the approval ratio is very high (92.7%).

5: Ability of the system to provide information on foreign universities. The mean for this item is 2.50, and the significance level is 0.000, which is less than (0.05) and the approval ratio is (18%). This low percentage indicates that management information systems at private Jordanian universities do not provide external information about foreign universities or statistical centres, which may be attributed to the lack of direct contacts between them and those universities or the statistical centres.

## Field II: The Validity and Accuracy of Information Resulting from Management Information Systems

The researcher used this field to understand the validity and accuracy of information resulting from management information systems, through the qualification of information in terms of validity, accuracy, freedom from error, comprehensibility, availability, clarity of reported issues, and absence of duplicate information. The mean, the standard deviation, the percentages, and the sign test for each item of the field are shown in table (6)

**Table 5:** The validity and accuracy of information resulting from management information systems

N0.	The validity and accuracy of information resulting from management information systems	Strongly Agree	Agree	I do not know	Disagree	Strongly Disagree	Arithmetic Average	S.D.	Sig.
14	Provide updated information commensurate with the work of the system	0.00	0.6	0.00	59.9	40.1	4.40	0.51	0.00
15	Provide the system is the accurate and correct information	0.00	9.0	12.0	64.2	16.1	4.01	0.80	0.00
16	The clarity of the reports issued by the system so that they are easy and clear	0.00	6.9	5.7	59.9	26.1	4.33	3.00	0.00
17	Provide sufficient non-redundant information, none of which is deleted	0.00	4.1	5.3	73.0	17.2	4.00	0.50	0.00
18	Do not repeat the information contained in the reports	1.00	20.0	8.1	53.2	17.1	4.33	1.0	0.00

The previous table illustrates the results the items of the second field, "The validity and accuracy of information resulting from management information systems."

1: Provide updated information commensurate with the work of the system. The mean for this item is 4.40, and the significance level is equal to 0.000, which is less than 0.05, indicating that the respondents have a semi-consensus that the information provided by the system is correct and accurate. The approval ratio was 99.5%, which is very high.

2: Provide the system is the accurate and correct information. The mean is 4.01, and the significance level is equal to 0.000, which is less than (0.05). This ratio indicates that individuals agreed the system provides accurate and correct information.

3: The clarity of the reports issued by the system so that they are easy and clear. The mean of this item is 4.33, and the level of significance is 0.000, which is less than (0.05), where the approval ratio is 86%.

4: Provide sufficient non-redundant information, none of which is deleted. The mean of this item is 4.00. The level of significance is 0.000, which is less than 0.05. The approval ratio is 90.2%. This is a high percentage and indicates that the information system provides sufficient information that is not redundant.

5: Do not repeat the information contained in the reports. The mean of this item is 4.33, and the significance level is 0.000, which is less than 0.05, indicating that the respondents have

almost a consensus that reports issued by the information system do not contain any duplicate information. The approval ratio is 70.3%.

### Field III: The extent to which management information systems provide information in time

**Table 6:** The extent to which management information systems provide information in time

No.	The extent to which management information systems provide information in time	Strongly Agree	Agree	I do not know	Disagree	Strongly Disagree	Arithmetic Average	S.D.	Sig.
19	Easy access to the Information Systems Centre	0.00	27.0	0.00	60.1	39.1	5.2	0.70	0.000
20	Speed to contact the Information Centre	0.00	14.0	5.0	50.2	32.4	4.11	0.80	0.000
21	Continuous contact with the Centre	0.00	15.3	4.0	50.8	27.2	4.00	0.95	0.000
22	Fast response to any query without any delay	0.00	20.0	13.1	60.0	9.9	4.0	0.90	0.000
23	Access information from the Centre on time without any delay	0.00	17.0	12.9	60.2	10.0	4.3	0.89	0.000

The previous table illustrates the results of the third field.

1: Easy access to the Information Systems Centre. The mean of this item is 5.2, and the significance level is 0.000, which is less than 0.05. This indicates that the sample members have a semi-consensus that confirms the ease of communication with the Information Systems Centre, as shown by the high approval ratio (99.2%).

2: Speed to contact the Information Centre. The mean of this item is 4.11, and the significance level is 0.000, which is less than 0.05. This indicates that the respondents confirmed the speed of communication, as shown by the high approval ratio (83.4%).

3: Continuous contact with the Centre. The mean of this item is 4.00, and the significance level is 0.000, which is less than 0.05. This indicates that the sample members confirmed that contact with the information systems centre is continuous. The approval ratio for this item was 78%.

4: Fast response to any query without any delay. The mean of this item is 4.00, and the significance level is 0.000, which is less than 0.05. This indicates that the sample members emphasized the speed of answering any query without any delay. This item had an approval ratio of 69.9%.

5: Access information from the Centre on time without any delay. The mean of this item is 4.00, and the significance level is 0.000, which is less than 0.05. This indicates that the members of the sample confirmed the arrival of information from the Centre on time with an approval ratio of 70%.

#### Field IV: Organizational Structure of the Department of Management Information Systems in Jordanian Private Universities

The researcher used this field to understand the extent of communication between the structural level of the Department of Management Information Systems and the organizational positions occupied by administrative and academic affairs.

To illustrate this, the researcher calculates the mean, the standard deviation, the percentage, and the sign test for each of the items of the field. The following results were observed in Table (8).

**Table 7:** Organizational Structure of the Department of Management Information Systems in the University

N0	Organizational Structure of the Department of Management Information Systems in the University	Strongly Agree	Agree	I do not know	Disagree	Strongly Disagree	Arithmetic Average	S.D	Sig.
24	Direct communication between the Department of Information Systems and Academic and Administrative Affairs	0.00	0.00	5.5	70.1	24.0	4.4	0.52	0.00
25	Suitable location of the department to all beneficiaries	0.00	0.01	0.1	48.9	49.0	4.50	0.53	0.00
26	There are clear ways and plans for automating the functioning of the system	0.00	5.9	14.0	46.1	21.3	3.42	0.79	0.00
27	Holding training courses for employees in the system to increase their abilities	1.00	16.3	25.2	50.3	7.5	3.45	0.90	0.00
28	There are no objections to the development of the	0.00	19.0	28.1	50.2	6.3	3.40	0.89	0.154

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The previous table illustrates the results of the items of the fourth field.

1: Direct communication between the Department of Information Systems and Academic and Administrative Affairs. The mean of this item is 4.4, and the significance level is 0.000, which is less than 0.05. This indicates that there is a communication between the Department of Information Systems and Administrative and Academic Affairs, as the approval ratio equals 94.2%.

2: Suitable location of the department to all beneficiaries. The mean of this item is 4.50, and the significance level is 0.000, which is less than 0.05. This indicates that the respondents confirmed the suite

3: There are clear ways and plans for automating the functioning of the system. The mean of this item is 3.42, and the significance level is 0.000, which is less than 0.05. This indicates that there exist clear plans for the functioning of the management information system, as the approval ratio equals 67.4%.

4: Holding training courses for employees in the system to increase their abilities. The mean of this item is 3.45, and the significance level is 0.000, which is less than 0.05. This indicates that the sample members almost unanimously agree that training courses for employees increase their abilities in running the system.

5: There are no objections to the development of the system. The mean of this item is 3.4, and the significance level is 0.154, which is greater than 0.05 and statistically insignificant. This indicates that the members of the sample have no desire to modernize management information system, as the approval ratio equals 56.5%, meaning that it negatively affects the development and the progress of the system.

### Hypotheses Testing

First hypothesis H<sub>01</sub>: There is no statistically significant correlation at the level of  $\alpha \leq 0.05$  between the structural level of the Department of Management Information Systems (MIS) and the accuracy, validity, relevance, timeliness, and adequacy of management information systems in Jordanian private universities.

The Spearman correlation coefficient was used to test this hypothesis to determine the relationship between the structural level of the MIS and the accuracy, relevance (convenience), timeliness, and adequacy of the information generated by the MIS and to know the role it plays in making performance development decisions in Jordanian private universities. Results are shown in Table 9 below:

**Table 9:** Measuring the relationship between the validity, accuracy of the information, relevance of information, timeliness, and adequacy of information provided by MIS and the structural level using the correlation coefficient (SPEARMAN)

Information	Correlation coefficient	Sig.
Accuracy and Validity of Information	0.180	0.010
Relevance of Information	0.416	0.000
Timeliness of Information	0.366	0.000
Adequacy of Information	0.370	0.000

It is indicated from the previous table that there is a statistically significant relationship ( $\alpha \leq 0.05$ ) between the structural level of the management of information systems department and the accuracy, validity, relevance, timeliness, and adequacy of information to make decisions in Jordanian Private Universities. From the table, it appears that the correlation coefficient of accuracy and validity of information equals 0.180 with Sig. level of 0.015, which is less than 0.05. The correlation coefficient of Relevance of information equals 0.416 with a Sig. level of 0.000, which is less than 0.05. The correlation coefficient of timeliness of information equals 0.366 with a Sig. level of 0.000, which less than 0.05. The correlation coefficient of adequacy of information equals 0.370 with a Sig. level of 0.000, which is less than 0.05. So, the null hypothesis will be rejected and the alternative hypothesis will be accepted, which states that there is a statistically significant correlation at the level of  $\alpha \leq 0.05$  between the structural level of the Department of Management Information Systems (MIS) and the accuracy, relevance, timeliness, and adequacy of management information systems in Jordanian private universities.

This hypothesis helped in discussing and illustrating the field related to the structural level of the Management Information Systems Department, as shown in the table of accuracy, relevance, timeliness, and adequacy of management information systems. The overall average of this field (the structural level of the Information Systems Department) was (4.04) with 81%, which proves that this level of attention helped and affected the managerial decision-making process. This level affects the information systems in producing accurate and good quality information that helped decision-makers make important managerial decisions in Jordanian private universities.

Second hypothesis  $H_{02}$ : There is no statistically significant correlation at the level of significance of  $\alpha \leq 0.05$  between the validity, accuracy, convenience, timeliness, and adequacy of information provided by management information systems and the use of management information systems in decision-making.

The Spearman correlation coefficient was used to test this hypothesis to determine the relationship between the use of management information systems in decision-making and the

accuracy, relevance (convenience), timeliness, and adequacy of the information generated by the MIS and to know the role it plays in making performance development decisions in Jordanian private universities. Results are shown in Table 10 below:

**Table 10:** Measuring the relationship between the validity, accuracy, relevance (convenience), timeliness, and adequacy of information provided by the concepts of management information systems in the decision-making performance development in Jordanian private universities using the Spearman coefficient

Information	Correlation coefficient	Sig.
Accuracy and Validity of Information	0.660	0.010
Relevance of Information	0.669	0.000
Timeliness of Information	0.560	0.000
Adequacy of Information	0.240	0.000

It is indicated in the previous table that there is a statistically significant relationship ( $\alpha \leq 0.05$ ) between the use of management information systems in decision-making and the accuracy, validity, relevance, timeliness, and adequacy of information generated by the MIS. From the table, it appears that the correlation coefficient of accuracy and validity of information equals 0.660 with a Sig. level of 0.010, which is less than 0.05. The correlation coefficient of relevance of information equals 0.669 with a Sig. level of 0.000, which is less than 0.05. The correlation coefficient of timeliness of information equals 0.560 with a Sig. level of 0.000, which is less than 0.05. The correlation coefficient of adequacy of information, equals 0.240 with a Sig. level of 0.000, which is less than 0.05. So, the null hypothesis will be rejected and the alternative hypothesis will be accepted, which states that there is a statistically significant correlation at the level of significance of  $\alpha \leq 0.05$  between the validity, accuracy, convenience, timeliness, and adequacy of management information systems and the use of management information systems in decision-making.

This agrees with the study of Al-Nadhari (1990), which concluded that there is a positive relationship between the quality of information (accuracy, validity, relevance, timeliness, and adequacy) and the effectiveness of decision making in Jordanian commercial banks.

Third hypothesis H<sub>03</sub>: There are no statistically significant differences at the level of  $\alpha \leq 0.05$  between the physical components and management systems components in Jordanian private universities that can be attributed to the University variable.

To test this hypothesis, it was divided into 4 sub-hypotheses, and the researcher calculated the arithmetic averages and used the Kruskal-Wallis test to test the difference in the components of Management Information Systems in Jordanian Private Universities that can be attributed to the University variable, as shown in the following table.

**Table 8:** Testing Statistical Significance of the components of Management Information Systems using the Kruskal-Walis test, according to the University variable

<i>Components of MIS</i>	Arithmetic Average				$\chi^2$	Sig.
	Al-Isra	Applied Sciences	Philadelphia	Irbid		
<b>The efficiency of the computer hardware used in the system</b>	4.70	3.69	3.48	3.52	150.18	0.000
<b>The extent to which databases and communications work efficiently in the system</b>	4.43	3.48	3.51	3.80	138.90	0.000
<b>The efficiency of the software used in the system</b>	4.59	3.58	3.52	3.39	139.42	0.000
<b>Overall Average</b>	4.48	3.68	3.62	3.68		

This hypothesis is divided into the following sub-hypotheses:

H<sub>03-1</sub>: There are no statistically significant differences at the level of  $\alpha \leq 0.05$  between the physical components and computer hardware of management information systems in Jordanian private Jordanian universities that can be attributed to the University variable.

It is obvious from the previous table that the arithmetic averages of the efficiency of computer hardware are: Al-Isra University at 4.70, Applied Sciences University at 3.69, Philadelphia University at 3.48, and Irbid at 3.52. This indicates that Al-Isra University leads the other universities (Applied Sciences University, Philadelphia University, and Irbid University) in computer hardware, followed by Applied Sciences University, Irbid University, and finally Philadelphia University. When calculating the  $\chi^2$  of the efficiency of Computer Hardware, it was found to be less than the tabulated value of 150.18 at  $\alpha \leq 0.05$ . This indicates that the null hypothesis should be rejected and the alternative hypothesis should be accepted, which means that there are statistically significant differences at the level of  $\alpha \leq 0.05$  between the physical components and computer Hardware of Management information systems in Jordanian private universities that can be attributed to the University variable.

H<sub>03-2</sub>: There are no statistically significant differences at the level of  $\alpha \leq 0.05$  between the physical components, databases, and telecommunications of management information systems in Jordanian private universities that can be attributed to the University variable.

It is obvious from the previous table that the arithmetic averages to of the efficiency of databases and telecommunications are: Al-Isra University at 4.43, Applied Sciences University at 3.48, Philadelphia University at 3.51, and Irbid at 3.80. this indicates that Al-Isra University leads the other universities (Applied Sciences University, Philadelphia University, and Irbid University) in databases and telecommunications, followed by Irbid University, Applied Sciences University, and finally Philadelphia University. The  $\chi^2$  of the efficiency of Computer Hardware was found to be less than the tabulated value of 138.90 at  $\alpha \leq 0.05$ . This indicates that the null hypothesis should be rejected and the alternative hypothesis should be accepted, which means that there are statistically significant differences at the level of  $\alpha \leq 0.05$  between the physical components, databases, and telecommunications of management information systems in Jordanian private universities that can be attributed to the University variable.

H<sub>03-3</sub>: There are no statistically significant differences at the level of  $\alpha \leq 0.05$  between the physical components and software used in management information systems in Jordanian private universities that can be attributed to the University variable.

It is obvious from the previous table that the arithmetic averages of the efficiency of software used in management information systems are: Al-Isra University at 4.59, Applied Sciences University at 3.58, Philadelphia University at 3.39, and Irbid at 3.80. this indicates that Al-Isra University leads the other universities (Applied Sciences University, Philadelphia University, and Irbid University) in software used in management information systems, followed by Applied Sciences University, Philadelphia University, and finally Irbid University. The  $\chi^2$  of the efficiency of computer hardware was found to be less than the tabulated value of 139.42 at  $\alpha \leq 0.05$ . This indicates that the null hypothesis should be rejected and the alternative hypothesis should be accepted, which means that there are statistically significant differences at the level of  $\alpha \leq 0.05$  between the physical components and software used in management information systems in Jordanian private universities that can be attributed to the University variable.

## Conclusions

The results of the statistical analysis and the hypotheses testing can be summarized in the following items:

- 1) The researchers concluded that there are obvious differences between the components of management information systems (Hardware, Databases and Telecommunications, Software, Structural Level of information systems department and the extent to which individuals work efficiently in the system) in each university considered in the study. Al-Isra University is the university that leads other universities, followed by Applied

Sciences University, Irbid National University, and Philadelphia University. But the total of the components mentioned above is considered to be of a high level at (4.0) out of (5.0). This high level indicates the remarkable development of these universities in this field.

- 2) Technical development in the components of management information systems helped decision-makers in managerial decision-making for developing performance in Jordanian private universities, and this was demonstrated through the relative weight (80%), as well as through the following:
  - a) The software that was used facilitated the transfer and exchange of information; allowed more than one user to communicate simultaneously; stored, retrieved, and processed data; and obtained the results and information that helped decision-makers in making necessary decisions.
  - b) The study sample members agreed that the computer hardware is the basis on which an information system depends, and it must therefore be flexible and have high storage capacity.
  - c) Computerized information systems allow for the quick and efficient exchange and communication of data.
  - d) The databases are highly capable of storing, retrieving, deleting, modifying, processing and printing data. They are also able to identify a problem, find solutions to this problem, and provide the necessary protection.
  - e) Personnel working in information systems should specialise as technicians and engineers and should participate in training courses that help them in their work and raise their competence and abilities.
- 3) There is a positive relationship between the structural level of the Information Systems Department and the information needed in decision-making. There is also interest from Jordanian universities in this area, as its relative weight was (80.9%).
- 4) There is a positive relationship between the structural level of the Department of Management Information Systems and the validity, quality, accuracy, timeliness, and adequacy of information provided by the management information systems in Jordanian private universities, where such information is used to make decisions in the development of employees' performance, knowledge, and efficiency.
- 5) The use of management information systems by the decision-makers in Jordanian private universities helped in decision-making; where the relative weight was 78.5%. This indicates a great reliance on management information systems in decision making in Jordanian private universities, especially in conjunction with the desire of employees for career development, as shown below:
  - a) There is a relationship between the accuracy of the information provided by the management information systems in Jordanian private universities and the use of these systems by university officials, as demonstrated by the relative weight (80%). This high percentage indicates the strength of the relationship between the accuracy of information

and the use of these Systems by decision-making officials in Jordanian private universities.

- b) There is a relationship between the relevance of the information provided by the management information systems in Jordanian private universities and the use of these systems by the officials at the university, as demonstrated by the relative weight of (73.6%). This high percentage indicates the strength of the relationship between the relevance of information and the use of these systems by decision-making officials in Jordanian private universities.
- c) There is a relationship between the timeliness of the information provided by the management information systems in Jordanian private universities and the use of these systems by university officials, as demonstrated by the relative weight of (79.0%). This high percentage indicates the strength of the relationship between the timeliness of information and the use of these systems by decision-making officials in Jordanian private universities. In particular, it helps to harmonize with the university culture and its desire for performance development.

### **Recommendations**

- 1) Developing, enhancing and increasing the efficiency of information systems on an ongoing basis and following up on technological development. This is what was found at the University of Israa. The other universities should similarly follow up on their own material and administrative problems.
- 2) Continually developing the structural level of the Department of Management Information Systems to stay abreast of technological development and show the importance of the concepts of management information systems and their impact on decision making performance development in private Jordanian universities.
- 3) Jordanian private universities should continue to improve the validity of the information provided by their management information systems through their relevance, timeliness, and adequacy, which helps in making decisions and improving performance in a way that leads to high productivity and continuity.
- 4) The continuous development and updating of data and the increasing of interest in statistical information and communication with external statistical centres, which is of great importance to the provision of necessary information to Jordanian private universities.
- 5) Work on the continuous development of computerized information systems to provide the necessary information to help in the appropriate decision-making process and thus find solutions and possible alternatives to the problems faced by universities.



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