

## The Influence of Management Information Systems on Business Decision Making in Small Business: A Conceptual Model

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**Abstract:** In the current era, information has become the main driver for the success of business organizations. Management information systems are concerned with providing sufficient and timely information to managers in order to take appropriate decisions and improve performance in business organizations. Small businesses are increasingly becoming an essential part of a nation's economies; this means that the success of small businesses has a significant impact on the economy. The adoption of management information systems in small businesses can generate significant competitive advantages for small businesses which will positively impact the economy. The business environment is dynamic and involves risks and uncertainty about the future. These risks and uncertainties lead to many important, critical and complex decisions to survive in the market, especially small businesses. Since small businesses need to gain market share, improve profitability and achieve long-term success, they cannot do without relying on MIS to make decisions. This study aims to review the organizational, technological and human factors associated with the use of management information systems in business organizations. This study also serves to contribute to a better understanding of the influence of management information systems on the decision-making process in small businesses. The results of the study showed that management information systems have a positive effect in identifying the problem, the speed of problem discovery, the analysis of decision-making steps, the speed of decision-making and the quality of decision-making in small businesses.

**Key words:** Management information systems, MIS, IT, small businesses, decision making

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### INTRODUCTION

Decision making is an essential part of any business, most processes in a business revolve around the decisions that management takes to achieve its goals. For the purposes of making the right decision, a good management information system has to be in place, since right decisions are usually based on the quality of the information available.

It is difficult for many companies to complete administrative work successfully without using management information systems. Given the importance of the role of information in choosing the decision at the administrative level, companies, especially small ones, must ensure that they have a good management information system.

Just as a good MIS contributes to making the right decisions, in return, failure to take advantage of the capabilities of management information systems leads to inappropriate decisions.

Petter *et al.* (2013) indicates that the utilization of information technology and the adoption of a management information system in business enterprises depend on a set of factors, including organizational factors specific to the nature of the enterprise, technological factors, personal factors related to employees and social factors related to the surrounding environment. Although, these factors

must be taken care of, many small-sized businesses ignore them. One of the limitations associated with management information systems is the lack of clarity of vision towards MIS, as many companies look at management information systems from a technical angle only, while ignoring the administrative factors and their role is the success of management information system in achieving its goals in any business organization.

Management information systems are of great interest to large and medium-sized companies. However, small-sized companies are less interested in MIS for various reasons, including a lack of awareness of the importance of a management information system in small companies, as well as an unwillingness to invest money in information systems due to the limited capital available for small companies and also concerns about system downtime and the consequences of business disruption.

Historically, management information systems were limited to large and medium companies due to their dependence on large systems that operate on central computers but this vision needs to be reconsidered, A computer connected to the Internet may have integrated software that suits the needs of a small business, where appointments can be set easily, supplier accounts and cash flows can be set up, customer program can be set up, an accounting software can prepare financial and

administrative reports, in short, this is a realistic system for managing information in small businesses (Imre, 2016).

Rapid developments in the world of technology are pushing management information systems to become an essential part of small businesses. Based on initial interviews with some officials in small-sized companies in Egypt, it has been shown that some of these small businesses depend on the family management style due to the small size and this administrative style is accompanied by a lack of awareness of the importance of the quality of information, the quality of service provided and the support expected from the management information system to improve organizational performance and so on.

Based on the above, this paper will focus on the characteristics that lead to the effective use of management information systems in small businesses. The study will also examine the relationship between management information systems and decision-making in small businesses and explore the relationship between management information systems and correct decision-making in small businesses that lead to progress and improvement in company operations.

The study proposes a set of hypothesis that aim to determine the relationship between management information systems and decision-making capabilities through a set of variables within the research model, including the accurate identification of the problem, the speed of problem discovery, analysis of the decision-making steps, speed of decision-making and quality of the decision made.

## **LITERATURE REVIEW**

Through a review of the literature, it was found that some studies dealt with the role of management information systems in business and discussed opportunities and challenges, while other studies examined the relationship between the use of management information systems and the quality of decision-making in large companies.

Kumar (2006) explained that management information systems use information in a way that ensures the proper management of business. All components of the management information system work simultaneously to achieve the efficiency of the entire system. He divided management information systems into three components: Management, Systems and Information. He explained that management is a process by which managers plan, organize, initiate and control the processes within their business. As for systems, they are a group of elements that unite to achieve a unified goal. Information systems may consist of a set of subsystems and their nature varies

from organization to organization according to the requirements of the organizational process, work environment, business volume and other factors.

Kumar also found that in the absence of management information systems, it will be difficult for companies to make correct decisions continuously, as a result of having to make decisions sometimes based on questionable information due to a lack of verified information. In contrast, management information systems are used to analyze data and access information useful for making business decisions. He explained that the information produced by management information systems in the business world is the result of accurate data analysis processes in accordance with recognized business theories and laws.

Al-Zhrani (2010) pointed to the great role of MIS in the decision-making process as an inherently vital aspect for both business and employees, these decisions greatly affect the competitive business situation.

Ifinedo (2011) pointed out that a management information system that uses easy-to-use techniques such as: the graphical user interface leads to easy-to-understand information outputs for users and decision-makers which means effective use of the company's management information systems.

UStudy.inc. (2010) concluded that the quality of business decision-making depends directly on the quality of information produced by the information system. Business decision-makers must create an environment that stimulates the achievement of information quality.

Allen *et al.* (2010) dealt with the ability of management information systems to update based on actual events within the company, as these immediate updates benefit business decision-makers to take action as soon as possible, the significance of this appears more clearly in the detection and management of crises, this leads to a clear prosperity and improvement in business processes as a result of the ability to make timely decisions which is very important for small businesses because any delay in decision-making may lead to losses that are difficult to compensate.

He also indicated that decision makers can redirect the resources that have been saved as a result of using MIS in business. Instead of using resources in tracking or solving problems, these resources are redirected into other operating activities of the businesses.

Allen emphasized that the routine programming of MIS will lead to actions being taken to properly direct time and resources towards thriving business results. He also explained that the ability of management information systems to perform multiple tasks simultaneously increases the efficiency of completing activities in the business, as many business processes can be executed simultaneously, the system's ability to multi-task ensures

quick decision-making in a way that benefits business enterprises. Rhodes (2010) dealt with management information systems from the standpoint of quick access to information. It is clear that comparing the strategic objectives of business with the practical decisions of decision makers allows management to determine the suitability of their decisions to the strategic goals of the business. Rhodes also concluded that MIS has a great role in obtaining detailed information from companies.

The lack of awareness of some business organizations of the value of information produced by MIS has led to limited improvement in the decision making process in those companies.

It is clear from the above that some studies have dealt with the importance of management information systems for business organizations, some of which discussed the relationship between management information systems and decision-making in large and medium companies. However, there is a gap in the literature regarding the study of the role of management information systems in various aspects of decision-making in small businesses. This is what this current paper seeks to study in appropriate detail.

## **MANAGEMENT INFORMATION SYSTEMS AND DECISION MAKING**

Management information system is concerned with collecting, processing, storing and communicating information in the form of reports that help the management in making decisions. Good decision making depends primarily on available information and partly depends on the functions that make up the components of the decision-making process.

Since, the primary purpose is that the administrative process is to make good decisions, management is in constant need of support from MIS.

On the other hand, if the management lacks a management information system and there is not enough information, the decision-making process will be confused and thus the decisions taken may not contribute to achieving the objectives of the organization.

Management information systems allow companies to provide the right information at the right time to the right employees in the different departments according to the organizational structure.

Management information systems are concerned with workflow cycles, as they determine how information flows through the system which is ultimately reflected in improving the performance of administrative work within companies.

The importance of management information systems has emerged recently because of its pivotal role in providing the correct information at the right time

according to the needs of different administrative levels. In simplified terms, a management information system is a system that receives data and processes it in a specific way, so that the output is information, the information is communicated in the form of reports to the managers at various organizational levels. Management information systems play an essential role in taking appropriate managerial decisions (Patterson, 2005).

Management information systems include appropriate data collection, data processing, information storage, retrieval and communication to specialists at all administrative levels in order to support administrative decisions and effective business planning.

Management information systems can also regulate how information flows between the different departments of the company, thus reducing the need for employees to meet or the need to hold meetings between them, thus saving time and effort for management.

A management information system is very important in providing company employees with information that is understandable, accessible, verifiable and reliable (Al-Mamary *et al.*, 2014c, d).

Making appropriate decisions is the essence of the managerial process, depending on a set of factors like the accuracy and adequacy of the information available.

Management information systems attach great importance to internal information sources where data is obtained, processed and then summarized in a group of management reports.

Managers and other users, through management information systems, can make appropriate decisions, solve managerial problems, oversee all project activities and measure progress in business completion.

The outputs of management information systems come in the form of various reports aimed at improving management decision-making.

Management information systems are related to the decision-making process, as they convert data into information and then present information in the form of reports suitable in making administrative decisions.

As shown in Fig. 1, the data collected is processed by the MIS, so that, the output is in the form of information and that information is delivered in the form of reports to help the management make rational decisions.

There is no doubt that companies aiming to successfully achieve the goals for which they were established need to make appropriate management decision. The success of companies is not limited to their ability to provide their products and services to customers only but rather to make decisions that lead to the stability and growth of companies, this is what drives us towards taking advantage of the capabilities of management

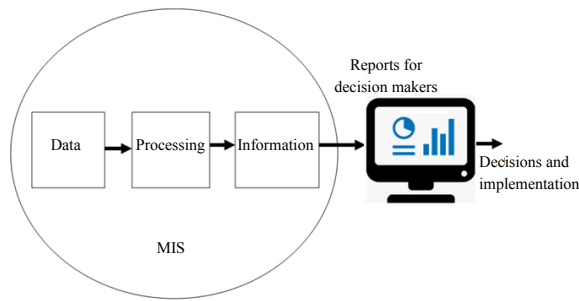


Fig. 1: The relationship between management information systems and managerial decision-making

information systems to ensure that administrative decisions are in line with the company's goals and future plans.

**Factors affecting the adoption of management information systems in the field of business:** The factors that affect the adoption of management information systems in business include: organizational factors, technological factors and human factors. This can be illustrated as follows:

**Organizational factors:** Organizational factors include both support and training (Al-Mamary *et al.*, 2014a). Administrative support means the level of support provided by the top levels of management in small businesses. As a result of the top management's awareness of the advantages that can be used by using the information system, the management motivates employees to use the information system at work, the management provides the necessary resources to enable employees to use the system, the management provides quick access to the hardware resources required by the work, the management provides quick access To the software applications associated with the system and the management is keen to achieve job satisfaction from using the system.

As for training, it refers to training plans for system users that are carried out by specialists from inside or outside the organization, such as training system users on using operating systems or using word processing, spreadsheets or other application packages.

**Technological factors:** Technological factors include the quality of the management information system, the quality of the information produced and the quality of service. The quality of the management information system and the quality of the information produced can be considered one of the main factors that affect the acceptance of the information system and contribute to raising the efficiency of organizational performance (Al-Mamary *et al.*, 2014b).

According to Petter *et al.* (2013), system quality means characteristics related to the management information system such as ease of use, reliability, flexibility of information system, ease of learning, in addition to system-specific formulas such as scalability and response time.

As for the quality of information, it is the expected results of the system outputs, such as suitability of information for decision-making purposes, appropriate reliability, ease of understanding, accuracy of information, completeness and so on.

As for service quality, it is represented in the level of support that users receive for the management information system, including accuracy, efficiency, technical performance, responsiveness and reliability.

**Human factors:** Human factors include user experience and technology utilization efficiency. Technology utilization efficiency refers to possessing the skills and capabilities necessary to accomplish a task using technological means (Zhao, 2010).

As for user experiences, it means an individual's previous experience in dealing with a specific technology, such as the use of systems, the use of word processing, the use of spreadsheets, the preparation of computerized feasibility studies, experience in programming languages, the ability to technical analysis and the use of financial modeling and design of computerized information systems, etc.

Through the previous presentation, it becomes clear that the factors affect the adoption of management information systems in business include organizational factors, technological factors and human factors. These factors that should be taken into account when developing a concept for the use of management information systems in small businesses.

**Management information systems in small businesses:** Some people may ask, how do we classify a company as a small business affiliate? The European Union defines small businesses as those with less than fifty employees and whose budget is less than 10 million Euros (Dulcic *et al.*, 2012).

In Australia, according to the Fair Labor Act 2009, a small business is defined as a company with fewer than fifteen employees. With regard to Egypt, the Central Bank of Egypt issued in March 2017 a bulletin amending the definition of micro, small and medium enterprises to correspond with the economic variables associated with the floatation of the Egyptian pound. For already existing companies, small companies are those whose businesses range from one million pounds to less than 50 million pounds. For newly established companies, small companies are those whose sales range from 50,000

pounds to less than 5 million pounds for manufacturing companies and less than 3 million pounds for companies in other sectors. In all cases, the number of workers in small companies does not exceed 200 employees (Urbach *et al.*, 2010).

Taking into account testing the proposed model on small enterprises in Egypt, the researcher used the definition of the Central Bank of Egypt for small businesses.

Small businesses can benefit from management information systems as a tool for competitive advantage. Due to the large businesses market saturation with information systems solutions, developers have tended to focus on the small business market. Developers have benefited from technological development in providing management information systems solutions that suit the capabilities of small companies.

Competition between large and small businesses may appear to be in the favor of large businesses as a result of the limited resources available to small businesses, but the practical reality is that competition is not settled, there is a great opportunity for small businesses, organizations with limited resources can achieve competitive advantages by improving the quality of decisions based on management information systems, especially if we take into account that the operating cost structure for small businesses is less inflated than for large businesses.

According to Pedarpur *et al.* (2013) management information systems can be applied in many areas in small businesses such as problem solving. Also, adapting management information systems to small businesses will lead to more profit opportunities because MIS will result in providing accurate and easily accessible information.

**Advantages of using management information systems in small businesses:** The use of management information systems in small businesses has many advantages, including the following (Mojtaba *et al.*, 2015; Abounajmi, 2016).

One of the advantages of using an MIS in a small business is that it helps maintain important business data and run that data to aid in making decisions.

Since, small business management needs forecasts for strategic planning purposes, management information systems provide accurate reporting of market trends and also use mathematical models to analyze current market trend and predict future trends based on this available data.

For a small business, goal setting is critical to knowing whether or not the project will succeed and since MIS reports are based on careful analysis of existing data, it is difficult to neglect MIS.

The MIS report also provides information about all activities that take place in small businesses. If a problem

arises, MIS Reports are important in making the appropriate decision to solve the problem. Because MIS reports help evaluate performance, they have an essential role in increasing the efficiency of small businesses. The use of management information systems in small businesses has many advantages including the following:

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Because MIS reports help evaluate performance, they have an essential role in increasing the efficiency of small businesses.

Because MIS database maintains data and information about the company, it provides the possibility to compare achievement between financial periods for small businesses.

**Challenges of using management information systems in small businesses:** Small businesses face a number of challenges associated with the use of management information systems, the most prominent of which are the following (Caniels and Baken, 2012):

**Management Information System Cost:** The cost of a computerized information system is a problem for small businesses due to the cost of purchasing, in addition to the costs of updating the information system over time.

**The cost of implementing an information system in the company:** In this regard, the successive technological developments in the world of software applications represent one of the obstacles facing small businesses, as applications need to be continuously updated which lead to an increase in the cost of the information system.

**Staff resistance to adopting an information system in small companies:** When using new technology, employees are quick to reject or avoid the change as a precaution, for fear of losing their jobs.

**Personnel development:** The employees must have the necessary skills to interact with the information system so that the company can maintain a good competitive position in the dynamic changing business environment.

**The conceptual model:** The use of information and its application is closely related to its value. Through a review of the relevant literature, the relationship between the quality of information used in management decision-making and the ability of businesses to achieve success becomes clear.

Looking at small businesses, they must make the right decisions that help them grow, because mistakes in decision-making can be devastating for small businesses where corrective action is difficult to take, unlike medium and large companies, where they can absorb mistakes and correct the course.

The use of management information systems is very beneficial when there is a large amount of information available to decision makers, as management information systems facilitate the way in which decision makers can make important and critical decisions.

Management information systems can achieve this by helping decision makers determine the most appropriate information that contributes to making the right decision. The more complex the decision-making process, the greater the need for small businesses to rely on management information systems.

To study the relationship between management information systems and the accurate identification of a problem within the decision-making process in small businesses, the following hypothesis was made:

- H<sub>1</sub>: Management information systems have a positive effect on the accurate identification of a problem in the decision-making process in small businesses

After defining the problem, the process of collecting the information required for decision-making begins. Some researches has indicated a positive relationship between the speed of discovering the problem and reducing losses resulting from delayed decision-making, with a focus on the role of management information systems in this regard.

Also, management information systems have an effective role in anticipating developments in competition, market trends and the surrounding environment. It can be said that the development of information technology has contributed to the speed of problem discovery and thus access to information which is important for the operation of management information systems in the decision-making process.

One of the advantages of management information systems is the superior ability to deal with the big amount of data available for use in decision making:

- H<sub>2</sub>: Management information systems have a positive effect on the speed of problem discovery in the decision-making process in small businesses

The acquisition of competitive advantages is crucial to small businesses, because these competitive advantages may be reflected in an increase in sales volume or an increase in the firm's market share, thus enhancing the chances of success of small companies and contributing to the achievement of their long-term goals.

The importance of computer-based information systems used in decision-making is of great importance as one of the magic keys to business success if businesses make good use of these systems.

A management information system can assist decision-makers in developing appropriate solutions to the problems facing small businesses, as the management information system collects different types of information at different stages of decision-making and performs various analyzes of the decision-making process in small businesses.

Decision making analytics are important in small businesses because of the impact of the decisions made on the life of the organization itself.

Since, the analysis of decision-making is a complex process, management information systems can play an effective role in this context, MIS can greatly reduce the burden of decision-making, thus reducing the routine work of officials at top management levels:

- H<sub>3</sub>: Management information systems have a positive effect on the analysis of the decision-making steps in small businesses

The importance of using computerized management information systems has escalated recently, as many specialists believe that computerized management information systems can make a big difference in the managerial decision-making process.

Decision-makers in small businesses can enhance their decision-making capabilities through management information systems; they can also verify the relevance of the decisions made to the company's goals and future plans which is a guarantee of good business execution. The use of management information systems in small businesses can speed up managerial decision-making by enabling decision makers to filter out irrelevant information:

- H<sub>4</sub>: Management information systems have a positive effect on the speed of decision-making in small businesses

One of the steps in making rational management decisions is to examine the information whose use leads to a specific conclusion. Related to the foregoing is the exclusion of the rest of the information that is not related to making this decision and focusing only on information relevant to the required decision.

Management information systems for small businesses contribute to the selection of appropriate information in the shortest possible time and increase the quality of the decision which can be of great benefit in using the limited human and material resources available in other activities that contribute to increasing the profitability of the small businesses.

In this context, management information systems determine the appropriate information for administrative decision-making and present it to decision makers.

Making a decision to solve a problem facing the management requires choosing one of the available alternatives (Visser *et al.*, 2013). Good decision-making includes a combination of factors such as helping to reduce decision times, helping to allocate company resources better, using better performance budget and efficiently monitoring company activities (Caniels and Baken, 2012).

Specialists focus on the advantages of management information systems in excluding information that is not related to decision-making and focusing only on information relevant to the required decision which allows improving the quality of decision-making.

- H<sub>5</sub>: Management information systems have a positive effect on the quality of the decision-making in small businesses

Based on Fig. 2, the hypothesis that this study tests include:

- H<sub>1</sub>: Management information systems have a positive effect on the accurate identification of a problem in the decision-making process in small businesses
- H<sub>2</sub>: Management information systems have a positive effect on the speed of problem discovery in the decision-making process in small businesses
- H<sub>3</sub>: Management information systems have a positive effect on the analysis of the decision-making steps in small businesses
- H<sub>4</sub>: Management information systems have a positive effect on the speed of decision-making in small businesses
- H<sub>5</sub>: Management information systems have a positive effect on the quality of the decision-making in small businesses

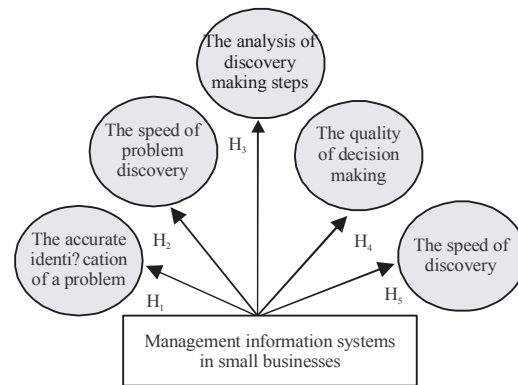


Fig. 2: The conceptual model

**Data collection:** The study relied on a simple stratified random sampling approach. The main objective of the research is to test the research hypothesis based on the conceptual framework of this study.

The questionnaire was designed and then the questionnaire was initially presented to a group of five judges who are faculty members in the field of information systems. They suggested some slight modifications to the questions and accordingly the questionnaire was modified to be ready to use. The questionnaire was distributed to the research sample and a five-point Likert scale was used to collect the questionnaire data. The answer was starting at 1 = strongly disagree, moving to 5 = strongly agree.

The researcher relied on Intentional sampling due to the limited number of small businesses that have a Management Information System.

A total of 125 usable questionnaires were collected from decision makers and system analysts from 15 small companies in the fields of small industries and contracting activities in Egypt.

**Data analysis:** Data analysis is the process of systematic application of statistical methods to describe, clarify, condense and evaluate data. The data were analyzed as follows:

**Validity test:** To ensure that the questionnaire list measures what it was created to measure; that is, determining the extent of the correlation of the questions to each other and the correlation of those questions to the research topic, the Pearson correlation coefficient was used to measure the extent of the correlation of the question to the axis to which this question belongs. Table 1 shows the validity test to the questionnaire axes.

Table 1 shows the questionnaire list measures what it was designed to measure, where there is a correlation between each question and the all correlations significant at 1%. The highest correlation coefficient in the

Table 1: Validity test to questionnaire axes

Qes.	The first axis	Qes.	The second axis	Qes.	The third axis
Q1		Q4		Q7	
Pearson correlation	0.397**	Pearson correlation	0.686**	Pearson correlation	0.579**
Sig. (2-tailed)	0.000	Sig. (2-tailed)	0.000	Sig. (2-tailed)	0.000
Q2		Q5		Q8	
Pearson correlation	0.545**	Pearson correlation	0.702**	Pearson correlation	0.463**
Sig. (2-tailed)	0.000	Sig. (2-tailed)	0.000	Sig. (2-tailed)	0.000
Q3		Q6		Q9	
Pearson correlation	0.764**	Pearson correlation	0.644**	Pearson correlation	0.661**
Sig. (2-tailed)	0.000	Sig. (2-tailed)	0.000	Sig. (2-tailed)	0.000
Qes.	The fourth axis	Qes.	The fifth axis		
Q10		Q13			
Pearson correlation	0.507**	Pearson correlation	0.632**		
Sig. (2-tailed)	0.000	Sig. (2-tailed)	0.000		
Q11		Q14			
Pearson correlation	0.653**	Pearson correlation	0.682**		
Sig. (2-tailed)	0.000	Sig. (2-tailed)	0.000		
Q12		Q15			
Pearson correlation	0.505**	Pearson correlation	0.483**		
Sig. (2-tailed)	0.000	Sig. (2-tailed)	0.000		

\*\*Correlation is significant at the 0.01 level (2-tailed)

questionnaire axes 76.4% (q3), 70.2% (q5), 66.1% (q9), 65.3% (q11) and 68.2% (q14) respectively. The lowest correlation coefficient of questionnaire axes 39.7% (q1), 64.4% (q6), 46.3% (q8), 50.5% (q12) and 48.3% (q15).

**Reliability test:** The reliability test is used to determine the consistency of the questionnaire responses. It is the degree to which an assessment tool produces stable and consistent results. Cronbach’s Alpha is the most famous and commonly used test for reliability and how closely related a set of items are. Cronbach’s Alpha value for the total questionnaire items is 71.2% (15 items), this implies there is consistency in responses because the value is >70%.

**Hypothesis testing:** To test the five study hypothesis, the SPSS package was used. The following tests will be conducted for each hypothesis from hypothesis: mean, standard deviation, variation coefficient and One-sample t test. The last test is used to determine whether the responses mean is >3 or not which is a constant reference value that describes the neutral opinion. The null hypothesis to this test indicates the sample mean is equal to the fixed value (3) and is accepted if the significant level is >5%. The alternative hypothesis of this test indicates that the sample mean is not equal to the fixed value (3) and is accepted if the significant level less than 5%.

**The first hypothesis:** Table 2 shows the mean, standard deviation and variation coefficient of the first axis questions and the one sample t-test results for the first hypothesis.

It is evident from Table 2 that the trends of the study sample responses tend to agree on the positive effect of

MIS on the accurate identification of a problem in the decision-making process in small businesses, with a total mean of (4.49) and a standard deviation of (55.3%). The first question is considered one of the most important questions that express the first axis, as it obtained the lowest variation coefficient of 14%, while the third question is considered one of the least expressive questions about the first axis, as it obtained the highest variation coefficient of 28%.

Also based on the results in Table 2, the alternative hypothesis is accepted, as the significance level of all questions is less than 5%, this implies that the mean is not equal to 3 but is >3 because the t-values are positive. In addition, positive values of t indicate respondents' confirmation that the Management information systems have a positive effect on the accurate identification of a problem in the decision-making process in small businesses.

**The second hypothesis:** Table 3 shows the mean, standard deviation and variation coefficient of the first axis questions and the one sample t-test results for the second hypothesis.

It is evident from Table 3 that the trends of the study sample responses tend to agree on the positive effect of MIS on the speed of problem discovery in the decision-making process in small businesses, with a total mean of (4.43) and a standard deviation of (67.9%). The sixth question is considered one of the most important questions that express the second axis, as it obtained the lowest variation coefficient of 18%, while the fourth question is considered one of the least expressive questions about the second axis, as it obtained the highest variation coefficient of 28%.



Table 2: Descriptive statistics and one sample t test results (first hypothesis)

Number	Mean	SD	Variation coefficient (%)	t-value	Sig. (2-tailed)
Q1	4.67	0.632	14	29.571	0.000
Q2	4.51	0.912	20	18.527	0.000
Q3	4.30	1.192	28	12.161	0.000
Problem identification	4.49	0.553	12	30.195	0.000

Table 3: Descriptive statistics and one sample t test results (second hypothesis)

Number	Mean	SD	Variation coefficient (%)	t-value	Sig. (2-tailed)
Q4	4.29	1.183	28	12.169	0.000
Q5	4.45	0.987	22	16.395	0.000
Q6	4.57	0.826	18	21.215	0.000
Speed of problem discovery	4.43	0.679	15	23.625	0.000

Table 4: Descriptive statistics and one sample t test results (third hypothesis)

Number	Mean	SD	Variation coefficient (%)	t-value	Sig. (2-tailed)
Q7	4.34	1.086	25	13.838	0.000
Q8	4.56	0.893	20	19.539	0.000
Q9	4.14	1.162	28	11.008	0.000
Analysis of decision-making	4.35	0.603	14	25.021	0.000

Table 5: Descriptive statistics and one sample t test results (fourth hypothesis)

Number	Mean	SD	Variation coefficient (%)	t-value	Sig. (2-tailed)
Q10	4.00	0.793	20	14.097	0.000
Q11	4.42	1.001	23	15.808	0.000
Q12	3.75	0.964	26	8.719	0.000
Speed of decision-making	4.06	0.515	13	22.945	0.000

Also based on the results in Table 3, the alternative hypothesis is accepted, as the significance level of all questions is less than 5%, this implies that the mean is not equal to 3 but is >3 because the t-values are positive. In addition, positive values of t indicate respondent's confirmation that the Management information systems have a positive effect on the speed of problem discovery in the decision-making process in small businesses.

**The third hypothesis:** Table 4 shows the mean, standard deviation and variation coefficient of the first axis questions and the one sample t-test results for the third hypothesis.

It is evident from Table 4 that the trends of the study sample responses tend to agree on the positive effect of MIS on the analysis of the decision-making steps in small businesses, with a total mean of (4.35) and a standard deviation of (60.3%). The eighth question is considered one of the most important questions that express the third axis, as it obtained the lowest variation coefficient of 20% while the ninth question is considered one of the least expressive questions about the third axis as it obtained the highest variation coefficient of 28%.

Also based on the results in Table 4, the alternative hypothesis is accepted, as the significance level of all questions is less than 5%, this implies that the mean is not equal to 3 but is >3 because the t-values are positive. In addition, positive values of t indicate respondents' confirmation that the Management information systems have a positive effect on the analysis of the decision-making steps in small businesses.

**The fourth hypothesis:** Table 5 shows the mean, standard deviation and variation coefficient of the first axis questions and the one sample t-test results for the fourth hypothesis.

It is evident from Table 5 that the trends of the study sample responses tend to agree on the positive effect of MIS on the speed of decision-making in small businesses, with a total mean of (4.06) and a standard deviation of (51.5%). The tenth question is considered one of the most important questions that express the fourth axis, as it obtained the lowest variation coefficient of 20%, while the twelfth question is considered one of the least expressive questions about the fourth axis, as it obtained the highest variation coefficient of 26%.

Also based on the results in Table 5, the alternative hypothesis is accepted, as the significance level of all questions is less than 5%, this implies that the mean is not equal to 3 but is >3 because the t-values are positive. In addition, positive values of t indicate respondent's confirmation that the Management information systems have a positive effect on the speed of decision-making in small businesses.

**The fifth hypothesis:** Table 6 shows the mean, standard deviation and variation coefficient of the first axis questions and the one sample t-test results for the fifth hypothesis.

It is evident from Table 6 that the trends of the study sample responses tend to agree on the positive effect of MIS on the quality of the decision-making in small

Table 6: Descriptive statistics and one sample t test results (fifth hypothesis)

Number	Mean	SD	Variation coefficient (%)	t-value	Sig. (2-tailed)
Q13	4.33	0.948	22	15.654	0.000
Q14	4.26	1.007	24	13.941	0.000
Q15	4.06	0.749	18	15.891	0.000
quality of decision-making	4.22	0.549	13	24.758	0.000

businesses with a total mean of (4.22) and a standard deviation of (54.9%). The fifteenth question is considered one of the most important questions that express the fifth axis, as it obtained the lowest variation coefficient of 18%, while the fourteenth question is considered one of the least expressive questions about the fifth axis, as it obtained the highest variation coefficient of 24%.

Also based on the results in Table 6, the alternative hypothesis is accepted, as the significance level of all questions is less than 5%, this implies that the mean is not equal to 3 but is >3 because the t-values are positive. In addition, positive values of t indicate respondent's confirmation that the Management information systems have a positive effect on the quality of the decision-making in small businesses.

Based on hypothesis testing, the results showed a positive relationship in all research hypothesis which means that management information systems have a positive effect in identifying the problem, speed of problem discovery, analysis of decision-making steps, speed of decision-making and quality of decision-making in a small business.

## CONCLUSION

Management information systems greatly affect the efficiency of implementing operations in companies and one of the most prominent contributions in this area is the effect of MIS on the decision-making process.

Some studies focused on the impact of management information systems on decision-making, especially on large and medium-sized companies, taking into account the financial and technical ability to own and operate information systems and concluded that management information systems contribute to improving the decision-making process.

It can be concluded that the management information system is an important factor in the success of work as a result of providing accurate and timely information to decision-makers in organizations which supports them in making rational decisions.

Despite these advantages, small businesses lose an important part of the critical success factors, due to their inability to bear the costs of acquiring and operating an information system, or by unaware of the importance of using MIS.

Since, small businesses need to gain market share, improve profitability and achieve long-term success, they

cannot do without relying on MIS to make decisions. Small businesses are increasingly becoming an essential part of the nations economies, meaning that the growth of small businesses has a major impact on the economy.

The adoption of management information systems in small businesses can generate significant competitive advantages for small businesses which will positively impact the economy.

As a result of the tremendous technological development, it has become possible to use software for management information systems at reasonable costs within the reach of many small businesses which leads to providing information quickly and in a timely manner for decision-making.

Given the importance of management information systems in decision-making, especially in small companies, the present study aimed to analyze the impact of management information systems on the decision-making process in small companies.

Through, the research model, the paper proposed a set of hypothesis for the purpose of determining the relationship between management information systems and the decision-making process in small businesses.

The variables included in the research model were: problem identification, speed of problem discovery, analysis of decision-making steps, speed of decision-making and quality of decision-making.

The hypothesis were tested after collecting 125 usable questionnaires from decision-makers and system analysts from 15 small businesses in Cairo Governorate, Egypt, where the results showed a positive relationship in all the research hypothesis which means that management information systems have a positive effect in problem identification, speed of problem discovery, analysis of decision-making steps, speed of decision-making and quality of decision-making in a small business.

Small business owners are advised to learn to benefit from management information systems, given their ability to make positive progress in decision-making and thus small businesses can succeed and thrive.

For research, more research is needed in order to bring more information about MIS into public knowledge. Research can also be directed towards the use of management information systems in predicting the risks that small businesses may encounter in the future and developing appropriate strategies.

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