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# **The Impact of the Application of the Management Information System in the Effectiveness of Strategic Control Ministry of Education in Libya: A Case Study**

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**Abstract** – This a study dealt with the impact of the application of the management information system in ministry of education, and aimed to highlight the factors that the impact the effectiveness of strategic control in ministry of education. In this study, the descriptive approach is used to analyses collected data on a sample with size of 140 using the statistical program (SPSS) to analyze and interpreting the results. The study reached a set of results to determine the statistically significant relationship between the effectiveness of strategic control and the management information systems (functional and service side (FSS), decision-making speed (DMS) and adequacy of information system (AIS)). The management information systems are the independent variables, while the effectiveness of strategic control (ESC) is the dependent variable. The results showed that there is a statistically significant impact of the requirements of management information systems on the effectiveness of strategic control in ministry of education. The results also showed the use of information systems facilitates the tasks and role of regulatory authorities on the level of departments in the Ministry of Education, due to its ability to accomplish tasks with tremendous speed and high efficiency to create a good MIS. At the end researcher recommended updating MIS continuously, training employees to use modern technologies in the field of management information systems to increase the production of their performance in the ministry.

**Keywords** – Management Information Systems, Effectiveness of Strategic Control, Service Side, Decision-Making Speed, Adequacy of Information, System, Ministry of Education in Libya.

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## **I. INTRODUCTION**

Nowadays the world witnessing rapid growth in all fields including economic, political, technological and social aspects, and this rapid growth has the use of management information system has increased by firms, individuals and even governments. Because of the today's global environment where competition is very high, it is the basic requirement of the organization to install management information system to compete the market and to earn more profitability, invest in innovation in their products, and to grow their businesses. All of these factors transformed the information system from data processing systems to decision support systems and became the foundation of the new business environment.

The MIS plays the important role of decision-making in strategic planning, management control, operational control and transaction processing in Institutions. James et. al (2003), define as information system consisting of people, equipment and procedures to collect, arrange, analyzed, assessed and disseminated timely information to decision receiver or as a formalized computer system that can collect, feed, process, and report data from various sources to provide the necessary information for management decision-making processes [1]. Baskerville and Myers (2002) describes it as the development, use and application of information systems by individuals, organizations and society [2]. The success or failure of organizations depends on their ability to

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achieve their goals and objectives, and this requires following modern control methods to protect and organize them to achieve their desired goals, with the aim of advancing the organizations' work.

Hence the importance of our study, which focused on the impact of the application of the management information system on the effectiveness of strategic control in the Ministry of Education in Libya. The Ministry of Education includes many offices such as the Information Office, the Office of Legal Affairs, the Office of International Cooperation, groups of educational offices for people with special needs, and the Office of Internal Audit and follow-up [3]. A questionnaire prepared and distributed to employees in the ministry, then the questionnaire analyzed using the statistical analysis program, and the results showed that, there is a statistically significant impact of the requirements of computerized management information systems on the effectiveness of strategic control in ministry of education as shown in the results section. This article will be further organized as follow: In the next section, we review some Literature review. In section 3, we explain Methodology. In section 4, we show results. Finally, in section 5, we conclude our study.

## **II. LITERATURE REVIEW**

MIS stands for management information system, which we define as the development and use of information system that help businesses achieve their goals and objective. This definition has three key elements: development and use, information system, and business goals and objectives.

A study for Akram Jalal Karim (2011). The research aims to evaluate the impact of current MIS models being developed at the selected organizations, and how far they practice this concept in order to enhance their tactical and strategic planning. The research adapted the quantitative research design to examine two research hypotheses. A total of 190 forms were equally distributed to those who are working at different management levels at the selected organizations. The results of the research showed that MIS was primarily used to enhance strategic planning in both financial institutions. The regression analysis revealed that Tactical planning is found to have no effect on Decision Making, while Strategic planning has a clear effect on the Decision Making Effectiveness in both organizations [4].

A study for shehadeh et al. al (2013), the study aimed to identify the impact of management information systems (MIS) on the performance of governmental organizations, Jordanian Ministry of Planning.

The study found that there is no impact of hardware and software equipment on the performance of governmental organizations, there is a significant impact of networks, individuals and procedures, and management information system as a whole on the performance of governmental organizations [5].

According to study of Bogabol1 et al (2014). This study explored the extent to which management information systems implemented make successful strategic planning process in the health service sector. The study examined whether the Libyan service organizations use Management Information Systems strategic planning. The results show that MIS was used to enhance strategic planning process in Libyan service organizations. However, it did not have very significant effect on the strategic planning process due to the lack of human resources and competence in information system, inadequacies of the capital components, and organizational constraints on labor availability, stakeholder involvement, and government policy [6].

Awan and Majeed (2015) provided empirical support for a positive relationship between business performan-

-ce and the alignment of business strategy and MIS strategy [7].

Abdul Ghafoor Awan (2016) under the title investigates the impact of management information system on the performance of the organization by analyzing 31 different organizations of Pakistan”. The objective of this study is to show how management information system gives positive impact on the performance of the organization and how it can increase the profitability, innovation, and growth of the organization. Regression and correlation test applied to measure relationship between variables Results show that there is positive relationship between performance of the organization and management information system [8].

Raymond Onyema Obinozie (2016) this study addressed the perceived relationships among management control systems, business strategy, and organizational performance in U.S. minority-owned manufacturing business. The result show that financial-and nonfinancial-based management control systems and differentiation strategies were significantly positively related to organizational performance. Low-cost leadership strategy was positively related to organizational performance but was not statistically significant. This study could promote positive social change by providing organizational finance managers with information regarding the appropriate mix of financial and nonfinancial management control system strategies necessary to achieve desired organizational performance [9].

A study for brahim (2019) this study aims to investigate that the direct and indirect effects of strategic Information Systems (IS) capability on organization’s competitiveness through its contribution on the effectiveness and efficiency of strategic design process on pharmaceutical manufactures’ companies in Egypt. The results indicate that: (1) the strategic Information System (IS) capability positively affect the effectiveness and efficiency of strategic design process; (2) the strategic IS capability positively affect organization’s competitiveness through affecting strategic design positively [10].

Thus, the current study seeks to define the effect of the application of the management information system on the effectiveness of strategic control and the extent of its contribution to the growth and performance of the ministry.

### **III. RESEARCH METHODOLOGY**

Primary data collected from respondents by the use of questionnaires as the instrument of data collection. This study a 40 items questionnaire had been conducted in five constructs, each of which contains a number of items, and then the questionnaire was translated to Arabic language and distributed to 140 of employees in ministry.

The questionnaire prepared for this paper divided into 2 sections, the first section concentrates on the general profile of the respondents including: Job title, qualification and experience as shown in Table 1.

In the second section provided the respondents with list of questions related to management information systems and the effectiveness of Strategic control as shown in Tables (3),(4).

Responses were indicated on a five-point Likert scale (Strongly Agree= 5, Agree= 4, Not sure/Neutral= 3, Disagree = 2, Strongly Disagree = 1) The collected data analyzed based on correlation analyses using the statistical package for social sciences (SPSS).

#### *1. Selected Variables*

Independent Variable: management information system (decision making speed, functional and service side and adequacy of information system).

Dependent variable: effectiveness of Strategic control.

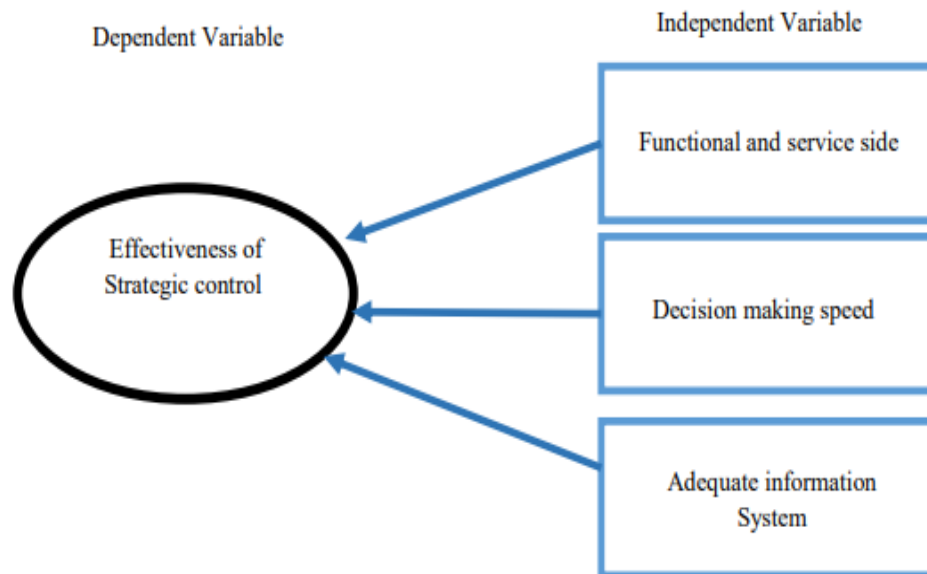


Fig 1. Theoretical model suggesting the relationships of the independent variables and the dependent variable.

#### IV. HYPOTHESIS

Two hypotheses are formulated and tested in this study.

Ho: MIS have no impact on the effectiveness of Strategic oversight.

H1: MIS have strong positive impact of the effectiveness of Strategic oversight.

#### V. DATA ANALYSIS

In the table (1) given below: the description about the responses as job title, qualification and experience.

Criterion	Participants	Percentage
Job title		
Employee	94	67 %
Head of department	44	31%
Administration Manager	2	2%
Total	140	100%
<b>Qualification</b>	<b>Participants</b>	<b>Percentage</b>
PhD	18	13%
Master	36	26%
<b>Bachelor</b>	56	40%
Other Qualification	30	21%
Total	<b>140</b>	<b>100%</b>

Experience (Years)	Participants	Percentage
1-5	20	14%
5-10	20	14%
10-15	26	19%
15-20	22	16%
More than 20	52	37%
Total	140	100%

It is clear from the above table that 67 % of the respondents are employee, 31 % of the respondents are head of department and 2 % of the respondents are administration manager.

It is clear also shown in the table that 13% of the respondents had PhD, 26% of the respondents had master, 40% of the respondents had bachelor and 21% of the respondents had other qualifications.

It is clear also shown in the table that 14% of the respondents had less than 5 years working experience , 14% of the respondents had less than 10 years working experience, 19% of the respondents had less than 15 years working experience, 16%.

From above table was concluded that majority of respondents were employee, they had bachelor and more than 20 years working experience.

## VI. VALIDITY AND RELIABILITY

Reliability testing has sent as a pilot study to 15 Ministry employees in order to ensure reliability of the questionnaire. Cronbach's alpha and was to be highly accepted ( $\alpha = 0.937$ ). All the values of different scales were in range from 0.882 to 0.966, for questionnaire which reflects acceptable high internal consistency reliability where Cronbach's alpha coefficient above 0.7 [11].

Table 2 Reliability testing.

Factors	Items	Cronbach's Alpha ( $\alpha$ )
Job and service side in the Ministry Education	7	0.966
Decision making speed	10	0.882
Adequate information System	8	0.902
All Axis Phrases		0.916
Strategic control	15	958.0
All Study Phrases		0.937

## VII. RESULTS AND DISCUSSION

In this section, presented discussion statistics on the dependent variable and independent variable. Tables 3 presents the descriptive statistics of the independent variable is management information system (Adequacy of information system, functional and service side and decision making speed), while table 6 presents the descriptive statistics of the dependent variable (The effectiveness of strategic control).

Table 3. Shows the answers of the study sample on the axis of the Management information systems.

Adequacy of Information System  Phrases	Five-Point Likert Scale					Statistics		
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N	M	SD
1. Management information systems help in achieving integration between the strategic	60	58	12	8	2	140	4.19	0.91
2. Necessary technical base must be provided for the establishment of electronic administration.	68	64	6	0	2	140	4.4	0.71
3. information systems affect the management of the communication and follow-up process in all the activities of the ministry	76	54	2	6	2	140	4.21	0.91
4. Information systems respond to changes in the external environment for work	64	52	16	6	2	140	4.4	0.71
5. Information systems are equipped with useful systems and easy to learn.	42	56	32	6	4	140	3.9	0.97
6. Information systems take a short time to process packets of data.	44	72	22	2	0	140	4.13	0.72
7. Effective in good performance.	48	68	14	10	0	140	4.16	0.73
8. The technology is stable.	44	74	14	6	2	140	4.19	0.91
	Mean						4.18	0.12
Functional and Service Side  Phrases	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N	M	SD
1. Does the Management Information System reduce the Operational cost of the organization?	74	42	14	4	6	140	4.24	1.03
2. Regular meetings should be held to identify Potential obstacles to the ministry.	54	52	26	6	2	140	4.17	0.93
3. Providing officials with smart.	50	66	16	2	6	140	4.19	0.95
4. Develop a program to protect information prevent loss	94	38	0	0	8	140	4.40	0.97
5. Supporting reports that are sent to officials with statistics and graphics	78	50	6	4	2	140	4.31	0.82
6. Employee training and development.	32	64	26	12	6	140	3.74	1.04
7. MIS users are qualified with sufficient technical skills to work on the system.	40	70	16	8	5	140	3.93	1
	Mean						4.14	0.19
Decision Making Speed  Phrases	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N	M	SD
1. Information systems contribute to providing alternatives for administrative decision-making.	48	60	26	2	4	140	04.4	92.0

2. Information systems affect the speed of completion of emergency decision-making well.	76	44	8	6	6	140	27.4	04.1
3. Use feedback in decision making	72	50	6	6	6	140	26.4	02.1
4. We have the ability to make decisions quickly.	48	54	28	6	4	140	05.4	99.0
5. The decisions made bring positive results.	42	64	10	18	6	140	84.3	12.1
6. There are usually alternative decisions ready.	56	70	8	4	2	140	24.4	8.0
7. Employees are involved in making collective decisions.	36	74	18	6	6	140	91.3	97.0
8. Decisions are not Conflict with Services.	50	58	20	8	4	140	06.4	99.0
9. Decisions must be high efficiency.	40	50	34	12	4	140	79.3	04.1
10. Does the Management Information System helpful in making decision timely.	47	55	28	5	7	140	12.4	02.1
							M = 4.05	SD = 0.16

From the data of Table 3, we find that the number of phrases about the axis of adequacy of information that exceed the overall mean is 5 out of 8 phrases, while phrases (5,6,7) averages range from 3.9 to 4.16 are slightly below than overall mean. This indicates that the majority of respondents agree on the axis of adequacy of information.

For the axis of functional and service side, we find that the number of phrases that exceed the overall mean is 5 out of 7 phrases, while phrases (6, 7) averages range from 3.74 to 3.93 are slightly below than overall mean. This indicates that the majority of respondents agree on the axis of functional and service side.

For the axis of decision making speed, we find that the number of phrases that exceed the overall mean is from 7 out of 10 phrases, while phrases (1, 5, 7, 9) averages range from 3.79 to 4.04 are slightly below than overall mean. This indicates that the majority of respondents agree on the axis of decision making speed.

We conclude from the table that there is a strong agreement of the respondents the axis dimensions of information systems.

Table 4. Shows the answers of the study sample on the axis of the effectiveness of strategic control.

Phrases	Five-Point Likert Scale					Statistics		
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N	M	SD
1. Strategic control contributes to the rapid detection of errors and deviations in the performance of the ministry.	44	74	14	2	6	140	.064	0.92
2. Strategic control aims to achieve employee discipline in their performance at all levels in the ministry.	46	60	26	2	6	140	3.99	0.98
3. There is relationship between Strategic control System with growth of the ministry	48	64	20	2	6	140	4.04	0.96

Phrases	Five-Point Likert Scale					Statistics		
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N	M	SD
4. Strategic control seeks to improve quality services in the Ministry.	42	70	18	4	6	140	3.99	0.96
5. The technology used aims to achieve the objectives of control	52	64	14	2	8	140	4.07	1.02
6. Strategic control is characterized by flexibility to keep with the development of work in the ministry	50	64	12	8	6	140	4.03	1.03
7. The appropriate system enhances the effectiveness of strategic control to enhance the performance of administrative systems in the administration.	50	68	14	4	4	140	4.11	0.9
8. MIS applied in the ministry are sufficient to achieve the Strategic oversight activities.	44	74	14	0	8	140	4.04	0.96
9. Administrators have sufficient knowledge about Strategic control.	40	84	4	6	6	140	4.04	0.93
10. Oversight activities support achieving common goals in the ministry.	40	64	22	8	6	140	3.89	1.02
11. Making decisions quickly are not consistent with the strategic control in the ministry.	50	72	14	2	2	140	4.19	0.78
12. The quality of information systems has an impact on the effectiveness of strategic control.	32	56	10	26	16	140	3.44	1.33
13. Strategic control has an important role in employee performance.	34	76	18	10	2	140	3.93	0.88
14. Not realizing the importance of censorship within the ministry leads to a deterioration in the performance.	32	74	18	12	4	140	3.84	0.97
15. Strategic control contributes to the development of staff skills.	46	68	16	6	4	140	4.04	0.93
							M = 3.98	SD = 0.11

It is clear from above table that phrases (1, 3, 4, 5, 6, 7, 8, 10, 11, 12, 15) averages range from 3.99 to 4.19 higher than overall average is 3.98, while 4 items (2, 9, 13, 14) averages range from 3.44 to 3.93 are slightly below than overall averages. This indicates that the majority of respondents agree on the axis of the effectiveness of strategic control.

Table 5. Shows Coefficient of Variation (CV) of the sample study.

MIS	M	SD	Coefficient of Variation (CV)	Arrangement	Direction
Adequacy of information system	4.18	0.12	%3	1	Strongly Agree
Functional and service side	4.14	0.19	%5	2	Strongly Agree
Decision making speed	4.05	0.16	%4	3	Agree



MIS	M	SD	Coefficient of Variation (CV)	Arrangement	Direction
Total	4.12	0.07	2%		Strongly Agree

The results showed that there is a positive agreement on the axis of the dimensions of management information systems. The adequacy of information systems item was the first ranked with an average of 4.18 and with a standard deviation of 0.12, while functional and service side was In the second rank with an average of 4.14 with a standard deviation of 0.19, and in the third ranked is decision making speed. The results also showed that from the table (5), that the mean of the dimensions of information systems is 4.05, the standard deviation is 0.16, and the variance coefficient is (2% (Which indicates that there is homogeneity and agreement by 98% about the management information system.

For the dependent variable, the mean was 3.98 and the standard deviation was 0.11 as shown table (4), most of the answers were on the option of agreeing and strongly agreeing to the Likert scale. This meant that there was a positive agreement on this axis, which indicates employee satisfaction with the effectiveness of applying the information system in the Ministry of Education.

This mean that there is a statistically significant impact of the management information systems on the effectiveness of strategic control in the Ministry of Education.

### 1. Correlations Analysis

The correlations analysis performed to check the effects of MIS variables on Effectiveness of Strategic Control (ESE) as shown in below table.

Table 6. Shows correlations results of variables.

DV	IV	R	R <sup>2</sup>	P
ECE	Adequacy of information system	.650	.423	0.00
	Functional and service side	.760	.500	.000
	Decision making speed	.73.	.544	.000
ECE	MIS	.764	.584	0.00

### 2. The Result

As the result of Correlation analysis (reference to table 6) we can say that, decision making speed and the side of functional and service in the ministry have the biggest impact on effectiveness of strategic control and they are moderately strong in association ( $R = 0.760$ ,  $R = 0.73$ ), and the relationship between them is a positive one.

While the variable the adequate information system ( $R=.650$ ) has less effect on effectiveness of strategic control, while the impact of information systems in its three dimensions strategic control forms a strong correlation that is 76.

Hence, H1 is supported i.e. all the Independent variables (AIF, FSS and DMS) are positively related to the depended variable (ESC).

## VIII. CONCLUSION AND FURTHER WORKS

Management information systems is the formal methods of providing exact and timely information to facilitate the decision making process of the managers during the planning, control and taking effective and optimum decisions of the organization [12].

This paper concluded to know the effect Management information system on strategic control. Two variables were described in the study of management information systems as an independent variable, while strategic control as a dependent variable.

The results showed that the mean of the dimensions of information systems is 4.12, the standard deviation is 0.07, and the variance coefficient is %2 that indicates that there is homogeneity and agreement by 98% about this axis.

For strategic control axis, most of the answers were on the option of agreeing and strongly agreeing on the Likert scale. This mean that conclude form the study that all the Independent variables (AIF, FSS and DMS) have positively related on the depended variable (ESC).

In the future work, infrastructure needs to be improved and integrating ICT in all institutions, integrating information systems with strategic control to facilitate the task of regulatory authorities at the level of departments and state institutions.

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