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The Utilization of Education Management Information System (EMIS) to Predict Future Maintenance Plans for Buildings: A Case Study of Karak Governorate Schools

Sattam Allahawiah[1], Sultan Altarawneh[2], Aola Altarawneh[3]
[1] Abalqa Applied University, Jordan, s.allahawiah@bau.edu.jo
[2] Motah University , Jordan, sultant@mutah.edu.jo
[3] Karak governorate, Jordan, aolatrawneh@yahoo.com.

ABSTRACT

This study aims to analysis the role of Open EMIS in predicting future maintenance plans for buildings departments. To achieve this goal, Karak governorate was adopted as a case study. for the methodology, the interview and questionnaire methods were used as a study tools in this study , and the validity and stability of the tool were verified. The sample of the study included (3) directorates from Karak governorate, (20) schools divided into (7) male schools (3) female schools (10) mixed schools.

The results showed improved planning efficiency for the maintenance of public school buildings to provide adequate information on existing buildings for decision makers, shows that the range means for some basic barriers to schools that lead to poor infrastructure items between (4.23 – 3.79), by high level for all items and the Open EMIS system provides accurate data on classroom and non-classroom equipment" by mean (4.10). Which helps to build a plan to facilitate maintenance tasks related to them. This is reflected positively on the educational process and quality. The results also showed that the Open EMIS system can be used to predict future maintenance plans for Karak buildings, finally there were no statistically significant differences in the estimates of the sample members and the use of the OpenEMIS system to predict future maintenance plans for the buildings in Karak governorate due to the (School sex, Experience, School Stage and Academic qualification).

The study recommended the importance of developing the Open EMIS system in such a way as to allow the building departments to predict the future of the school infrastructure and the priorities of the future maintenance. The study also recommended the need to follow up the maintenance work in the schools through communication with the liaison officer in the school in addition to the need to activate the OpenEMIS system of the building departments in each directorate. Furthermore the importance of linking the system to the department of civil status and passport, so that the ministry can obtain accurate and comprehensive data on all students and human cadres working in the ministry.

Key words: Information system, Open EMIS, Karak governorate, maintenance plans, schools.

1. INTRODUCTION

As time and developments in all areas of life change, requirements are urgently needed for proper planning and management [1]. These changes included institutions of all kinds, with more pressures and challenges of the work in an unbelievable speed. It becomes impossible to guess what the future situation would be. These institutions include schools and their buildings that correspond to life's developments.

In order to achieve the success of infrastructure projects, management and engineering schemes must be based on the correct and planned basis. These schemes help to succeed and deliver them on the determined time[2] .When the plans are bad or inaccurate and not based on the correct basis, it will lead to the failure of the project in all aspects, in terms of time, which will take longer, a double effort in addition to material loss and poor quality[3].

According to what has been mentioned before, the subject of this research focuses on some techniques in which the efficiency of planning and maintaining public school buildings can be improved. The study also focuses on providing adequate information to the decision makers about the situation of the current buildings of the schools to take into account the suitable way to maintain them based on well studied and correct planning. As the preparation of such schemes will have a positive impact on the quality of the educational process. To achieve the desired goals, and to provide accurate and immediate statistical information, this study proposed the inclusion of computerized systems, like Open EMIS, where this system provides a special article under the title of "infrastructure", which shows the construction status of the school building, the total and partial area of the building, the type of infrastructure of each building with a specific coding according to the floor and within a certain order.

This research focuses on the development and integration of the work of planning departments and building departments in schools to obtain the best and most efficient services. The aim of this study is to prioritize, maintain and establish a good schedule for the tasks of the buildings. Based on these goals, the study attempts to develop the Open EMIS system. Figure 1 presents the correlation between open EMIS, plan, and maintenance.

1.1. Types of School Buildings

The school buildings are important for the general benefits students and the whole society. As they are public properties achieved by the state in its development plans, it must maintain their appearance and essence as the educational environment frequented by the students. Schools help the students complete their education, guide their behavior and their awareness towards the values that develop their sense of belonging, strengthen their attachment to the homeland and society. Thus, many educators discussed the importance of the school building in several aspects. It is considered one of the cornerstones on which the educational process depends on in its four components: curriculum, teacher, student, and educational means. The school building helps to achieve the objectives of education in the best ways and the most successful educational means through activating the role of education and activities. Which contributes to enhancing the role of the teacher in delivering information to students in the easiest methods and the latest means and modern scientific equipment, and also contributes to attract, motivate and thrill students for educational programs, and develop a sense of belonging to the school see figure 1.

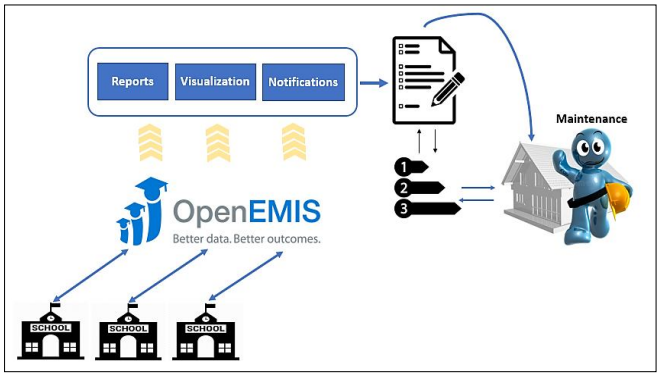

Figure 1: Open education management information system.

Thus, it is a component of the infrastructure on which the comprehensive development plans are based, provided that the school building is designed according to the educational specifications including the educational plans and success.

The design of the school building with typical specifications provides the students with an atmosphere of peace of mind and psychological comfort. It helps in their development in an integrated manner from the psychological, physical, professional, behavioral and social aspects. It also contributes to satisfying the needs and desires of the students and their tendencies and helps in the formation of generations capable of the renaissance of society. In addition to its contribution in satisfying the cultural, social and recreational needs of the members of the community. This is done when the facilities of the school building are used in social events involving members of the community surrounding the school, such as the library, stadiums, theatres, halls, closed playgrounds, and others.

2. RESEARCH PROBLEM

The problem of the existing study lies in finding the appropriate way to take the correct measures that are concerned with managing the various building departments in the directorates of education. These departments are interested in following up the construction projects in terms of developing classrooms and dividing them according to specific criteria, as well as establishing proper infrastructure and following-up in terms of maintenance in all directorates of the Ministry of Education. This requires a lot of effort, follow-up and continuous organization at the school level in general. Another task is assigned to these departments is to provide the Ministry of Education with the conditions of schools in general in terms of maintenance and needed facilities. Since these tasks have a direct relationship with the student and affect him negatively or positively, they had to be arranged according to priorities, some of them cannot be postponed or neglected because it can lead to real disasters for students or the educational process.

3. RESEARCH IMPORTANCE

During the last period of the 20th century and the beginning of the twenty-first century, the world witnessed tremendous developments resulting from modern technological developments in information and communications technology. Those developments cannot be monitored and pursued due to its evolution. In a short period, practical changes have been made in all aspects of living, service, industrial and recreational [4].

Education is one of the areas that have undergone many developments because of the modern technologies, computers, the information revolution and global communication capabilities, which have directly reflected all the educational requirements (either curriculum, teacher, management, means or buildings). Since the educational environment has a direct impact on the future generations, as it is the start of their lives, an urgent topic is not likely delays due to the rapid developments that the world witness is day after day. The subject of the research will focus on the ability to rely on educational sites, especially modern ones such as Open EMIS, to facilitate the tasks of the building departments to keep up school buildings with and accommodate recent developments.

This research highlighted how to organize tasks with a schedule of procedures for installation and maintenance work, taking into account the technical errors that could occur as well as improving the level of the school as a whole. The following points summarize some of the main motives of this study:

1. Learn about the main reasons that led to the decline in the level of infrastructure in the schools of Karak governorate, based on open EMIS.
2. Relying on open EMIS and the reports from it to focus on the dimensions of the problem and its seriousness in Karak.
3. Trying to solve infrastructure problems by providing decision-makers about the school conditions.

4. Provide researchers and interested people in a detailed study about the classrooms and school's conditions in Karak governorate in order to find appropriate solutions to improve the situation and solve some problems related to school construction.

School buildings are the main element on which education is based. Its importance stems from its being a place that combines several educational elements, from education, activities and social relations between all members of the school, from workers, administrators, and students. Where the school represents the student community or the environment through which they acquire many social, educational and moral values.

The world is living a great development in all areas, including educational areas in the design, construction and equipping of school buildings. It is obvious that the educational process will not be carried out and integrated properly unless school construction is taken into consideration. When existing schools and the constructions are considered, it will be noticed that they are not suitable for education, involve some problems and cause greater ones, such as the escape of students from schools.

There is a strong relationship between the school building and the level of education. the school building affects the psychological side of the educational family of the student and teacher and even the society as a whole. There are some problems with school buildings. These problems and mistakes in old buildings should be avoided in new ones, according to international standards that provide students with complete comfortable and an appropriate learning environment.

4. RESEARCH QUESTIONS

The Questions of the study can be summarized as follow:

Q1: The main task of the Open EMIS system is to provide adequate statistical information on the directorates of the Ministry of Education and its schools. Is it possible for this system to facilitate the implementation of tasks related to school buildings and improve the maintenance of its facilities?

Q2: There are some basic barriers to schools that lead to poor infrastructure. What are the most important of them?

Q3: Some problems related to the building department can have a negative impact on its work, in term of completion within the time limit. What are the most important problems?

Q4: Does poor timing affect maintenance at the general level of the school infrastructure? And how is that?

5. RESEARCH OBJECTIVES

The main objective of the research is to answer the previous four questions. To answer these questions, we will shed light on recent developments affecting education and supervision of the possibilities of existing school buildings. To achieve this goal, the presented methodology depends on the analytical study of recent developments and the study of the reliability of feedback generated by the Open EMIS system. Where feedback is put forward of existing school buildings and their potential to accommodate recent developments to reach conclusions and recommendations that help rehabilitate existing school buildings.

This research aims to develop the functions of the Open EMIS system. Where the system works on coordination between the Ministry of Education with the schools and sections of buildings electronically. This system updates the information about the schools, their facilities, and circumstances and provides it to the concerned people, thus saving time and effort in performing the tasks and coordinating them. In this thesis, a daily or weekly update of the system is recommended. Planning departments and buildings are then provided with detailed reports and graphs about the conditions of the schools and the tasks required and arranged according to priorities with a timetable. In this case, the building sections perform the tasks entrusted to them in their chronological order and on time. Which facilitates the work of different departments in the ministry and provides service to the student. Key objectives can be inferred from the following points:

1. To integrate information related to the management of educational activities and to make it available in comprehensive yet succinct ways to a variety of users. These include teachers, principals, curriculum planners, inspectorate officials, financial controllers, planners, policy advisers and political leaders, as well as parents and students.
2. To combined information resources of the EMIS are at the service of the entire community.
3. To improve capacities in data processing, storage, analysis and supply of educational management information so that education planners and administrators can avail themselves of reliable and timely data
4. To coordinate and further improve dispersed efforts in the acquisition, processing, storage, transmission, analysis, repackaging, dissemination and use of educational management information.
5. To facilitate and promote the use of relevant information by various agencies and individuals at all levels for more effective educational planning implementation and management.
6. To streamline the flow of information for decision-making by reducing and eliminating duplications as well as filling information gap.
7. To provide information for policy dialogue and scenarios for development of the education system.
8. To examined the technical, organizational, and institutional conditions that must be met in order to enable information-based decision-making for effective system management.
9. An EMIS unit needs a clear vision to see and know what to produce, who the product is designed to support, and which departments and units to include. The policy must be supported by evidence or analysis of the evidence. EMIS is developed to provide that evidence. They stressed that this is the support that Ministries of Education need and policymakers in the Ministries of Education deserve.

6.RESEARCH HYPOTHESES

According to the statement of the study, the following proposed hypotheses are to be tested:

1. There are no significant differences at significant level ($\alpha \leq 0.05$) due to school sex variable.
2. There are no significant differences at significant level ($\alpha \leq 0.05$) due to stage variable.
3. There are no significant differences at significant level ($\alpha \leq 0.05$) due to qualification variable.
4. There are no significant differences at significant level ($\alpha \leq 0.05$) due to experience variable.

7. REVIEW OF LITERATURE

There are many researchers who studied issue of predicting and future plans and planning for buildings. Some of them aimed to study the specifications that should be available in the typical school building, like the location, design, service system, activities, classroom specifications and others in the rented school buildings compared to the public-school buildings [5]. Others studied the grant funding on the distribution of spending across schools [6].

Also, the EMIS was described in terms of targeted educational goals, the usefulness of an EMIS for the rational organization and management of an educational system, and the impact that the availability and sound use of data can have on improving quality provision [7]. In addition, the political and educational circumstances of Palestine till the start of the Intifada in September 2000 were also discussed.. It was also studied to provided information for decision makers which will be helpful for improving the effectiveness of using information technology in school's administration, [8] the conditions that should be met in order to enable information-based decision making for effective system management was discussed [9] .

The purpose of designing an EMIS is to support the information-based decision-making processes. They stressed that the development of EMIS involved nurturing a new management culture more than establishing a data and information system and that the culture of data sharing, information use, and organizational management that lead to the effectiveness of the EMIS development. Also, they focused on the facts that EMIS development is not IT development and that EMIS provides the supporting evidence for policies, which is the support that Ministries of Education and the policies makers in those ministries need [9].

The information technology represents the lifeblood of different organizations, it is the window through which organizations overlook the interior surrounding and outer world and looks at their future. The Management Information System provides accurate and appropriate information about different activities and meets the management needs of different information. For that, the field of information technology has attracted researchers such as Kadham[10] who studied the effect of management information system in the implementation processes of the projects of the Iraqi Ministry of Construction and Housing. He stressed that MIS provides accurate and appropriate information about the different activities and meets the management needs of various information. The results of his study showed that management information system plays an important role in the success of implementing the construction projects through the following; transforming information into software and computerized systems that represent a design for building and preparing in successful companies and designing of advanced systems and structures adapted to the environment and in line with the requirements of the community culture.

Another study in the field of construction was done by Al-Diri[11] who studied the impact of poor planning on the duration of construction projects in Dubai, UAE between 2006 and 2010. The research sample included 42 project managers in the project management companies out of 50 of the target population. The sample also included 40 project managers in construction companies out of 50 of the target group of the different categories. The study [11] concluded that the delay of construction companies in the completion of projects is due to the lack of awareness and significance of these companies to the concept of planning a project, and the failure of the contracting companies to adopt the elements of management planning and effective engineering as the basis for the success of their plans. One of the recommendations of this study is that contracting companies rely on modern software in the field of project planning such as (Primavera) which saves time and effort, which indicates the significance of information technology in this regard.

Also, Radwan[12] studied the elementary education buildings in Yemen cities (Al-Mukalla city as an example) because, in the opinion of researchers, the school building is the educational environment that is most important in terms of educational services provided by the community. Their study aimed to identify the reality of elementary education buildings in Al-Mukalla city in order to reveal the appropriateness of these buildings to educational needs by extrapolating the views and perceptions of its users. The research was based on a field survey that included a survey and questionnaire for a number of elementary schools in Yemen. The researchers concluded that solutions to the existing problems need to be provided in order to achieve developed and integrated school buildings that are able to meet the needs of the educational process in its comprehensive perspective and achieve the educational goals of the children of Yemen. Two of the recommendations of the study were defining planning and design criteria for school buildings as a basic step for future work in the field of educational buildings and conducting good studies that combine design and planning considerations, especially those that study the future expansion of the school in integration with the existing building. Those two recommendations stress the significance of good planning for the school building.

Many researchers have studied EMIS and its implications such as Hua & Herstein[9] who studied EMIS and its implications for educational management. They stressed that Successful management of today's education systems requires effective policy-making and system monitoring through data and information. For that, countries around the world have

invested significant resources into collecting, processing, and managing more and better data through education management information systems (EMIS). However, all too often EMIS design and development has been limited to information technology enhancements, and/or data storage and maintenance, with insufficient attention paid to the management environment in which EMIS operates and data utilization for policy decisions. In their research, they examined the technical, organizational, and institutional conditions that must be met in order to enable information-based decision-making for effective system management. They focused on the fact that technical capacity building must be accompanied by the creation of the demand for information and the nurturing of a culture of open communication, information sharing, and information use. They concluded from their study that the development of an Education Management Information System (EMIS) is essential in the modern management of education systems. It is designed to support information-based decision-making processes. However, an EMIS unit needs a clear vision to see and know what to produce, whom the product is designed to support, and which departments and units to include. The policy must be supported by evidence or analysis of the evidence. EMIS is developed to provide that evidence. They stressed that this is the support that Ministries of Education need and policymakers in the Ministries of Education deserve.

Another study was conducted by Chitolie-Joseph[13] who investigated the use of the Education Management Information System (EMIS) at the Bocage Secondary School in St. Lucia. She used constructive grounded theory as her theoretical framework. This approach allowed her to accept the influence of her prior involvement with the EMIS on the research. The research findings suggested that the EMIS was underutilized and that technical, economic, training and personal, software and organizational factors contributed to the limited use of the system. In conclusion, she presented the possible implications of these findings to the future use of the EMIS in St. Lucia and the wider Caribbean. These implications included management, budgeting, recruitment, human resource development, EMIS selection and the formulation of policies that benefit developing countries.

The education sector has a special place in the agenda of any government due to its importance for the well-being of the citizens and the country as a whole. Education Management Information System (EMIS) plays an important role in developing appropriate plans, strategies, and policies for improving the education system. For that, Aldarbesti & Saxena[14] explained the concepts of data, information and Management Information System (MIS). Their research also explained the importance of MIS, its rapid growth, and latest trends in MIS. In addition, they briefly discussed case studies of EMIS of Nigeria and Zambia in order to learn lessons from their experiences. In their conclusion, they suggested the desirable EMIS for better management in the education sector.

Jordan is one of the countries that implemented EMIS. Community Systems Foundation, 2016, explained Jordan's Education Management Information System, OpenEMIS Jordan, which allows Jordan's Ministry of Education to establish evidence-based policies, based on real-time education data from individual schools, staff, and students. The Government of Jordan, as part of its Education Reform for the Knowledge Economy program (ERFKE II), aims to systematize the usage of evidence-based planning to address education challenges. In 2014, Jordan's Ministry of Education began to apply an upgraded Education Management Information System (EMIS), with support from UNESCO and financing from the EU Delegation in Jordan. Together with large-scale institutional, human and technical capacity building operations across the country, the tool allows the Ministry to collect precise information and indicators and formulate effective policy responses. The project was officially launched in August 2016 by His Excellency Professor Mohammad Thneibat, Deputy Prime Minister and Minister of Education.

Despite the large entry of technology into every area of life, especially the educational areas, the previous studies indicate the lack of integration between educational sites and their reflection on the planning management and buildings, despite the presence of special sections for planning and buildings in the directorates of education, however, there is a gap between the reality of the schools and the reports available on them, this gap was caused by the inability of the engineers to keep on following the realities of the schools which is the main reason behind this study.

8. THE POPULATION OF THE STUDY

The study population consists of the directorates, public schools and private schools in Karak Governorate. The total number of directorates is (4), (304) schools, (103) male schools, (39) female schools and (162) for unisex schools

8.1. Study Sample

8.1.1. First: Sample of Schools

There are specific statistical equations used to select the appropriate number for a sample of a society under study, including the equations of Richard Geiger, Robert Mason, and Stephen Thampson. World Wide Web [17].

In this study, we will use the equation of Richard Geiger

$$n = \frac{\left(\frac{z}{d}\right)^2 \times (0.50)^2}{1 + \frac{1}{N}\left[\left(\frac{z}{d}\right)^2 \times (0.50)^2 - 1\right]}$$

Figure 2:- the equation of Richard Geiger

z = the standard score corresponding to the level of significance of 0.95 which is equal to 1.96 N = community size= (304) schools

d = error ratio= (5%)

n= $((1.96/0.05)^2 x (0.05)^2/(1+(1/304)$ $((1.96/0.05)^2 x (0.05)^2 -1)=20$

When applying the above equation, the sample ratio of schools is 20. This percentage is also confirmed by the following website, where it is a specialist to find this value:

A sample consisting of (3) directorates and (20) schools were selected from the community of the study as was displayed in Table 1. It represents (7%) of the total study community. This sample is distributed according to the directorate, the gender of the school and the school's stages (Secondary\ primary schools).

Two people from each school answered the questions of the study, namely the school director and the system liaison officer at each school. For each Directorate, three persons

Who answered the questionnaire are the head of the building department, a member of the building department and a member of the planning department who cares about the system.

Table 1:- Distribution of the Study Sample by Male, Female and Mixed Schools.

School Name	Directorate	Number of Students	Number of Teachers and Administrators
Alqaser basic boy	Alqaser	138	19
Hayi mashhur basic boy	Alqaser	122	13
Alqaser secondary comprehensive girls	Alqaser	238	37
Alqaser first mixed primary	Alqaser	335	32
Alqaser second mixed primary	Alqaser	177	26
Hayi mashhur basic mixed	Alqaser	338	31
Khansaa mixed basic	Alqaser	72	9
Arwa secondary vocational girls	Karak	200	7
Prince hassan secondary boys	Karak	288	31
Principle rahma basic mixed	Karak	619	50
Iiskan almaraj basic mixed	Karak	330	35
Al karak secondary	Karak	228	24
Al Karak secondary boys	Karak	221	34
Dhat ras basic mixed	Southern almazar	236	19
Majra basic mixed	Southern almazar	171	25
Almatal basic mixed	Southern almazar	213	23
Mutuh basic first	Southern almazar	456	37
Husseini secondary for boys	Southern almazar	225	29
Jafar secondary for boys	Southern almazar	715	60

8.1.2 Second: Sample of Directorates

A sample consisting of (3) directorates was selected as was displayed in table 2. Data were collected on the possibility of developing a special software unit in the Open EMIS system to facilitate the maintenance and construction tasks. This was done in both schools and building departments. In order to do so, the researcher proposes to interview four related classes.

Table 2:- Distribution of the Study sample by Directorates of Education and Heads of Departments

Directorates	Head of the Buildings Department	Member of the Buildings Department	Member of the Planning Department	Director of Education
Al Karak Directorate	1	1	1	1
Southern Almazar Directorate	1	1	1	1
Alqaser Directorate	1	1	1	1

8.1.3 Study Tools

The tools used in this study varied the study tool was built based on a review of the educational literature on the use of the educational management system to predict future maintenance plans for the buildings: a case study for the schools of Karak governorate. Where the interview model and questionnaire model were used. The interview and questionnaire was also presented to a number of Mutah university professors and number of members of Directorate of Education. The arbitrators were asked to rule. On the paragraphs of the tool in terms of language integrity, and the relevance of the paragraph to the field, the paragraphs that the arbitrators gathered as appropriate were selected, the paragraphs proposed by the arbitrators were reformulated and the paragraphs that did not have the consent of the arbitrators were replaced by other paragraphs.

The questionnaire included (24) a collection of information from the sample of the study, which consisted of (52), samples of the study, the individual then collected and analyzed the data and tested the hypotheses through the use of SPSS. Others used the principle of developing the views and impressions of user schools through a questionnaire and questionnaire for a number of basic education schools in Yemen [15].

The study tool has been divided: It includes demographic variables, namely:

School sex: It has two levels: (male) (female).

Experience: It has three levels: (less than 10 years), (10- 15) (16-20) (more than 20)

School Stage: It has 3 levels: (Basic) (Secondary) (Mixed).

Academic qualification: It has three levels: Bachelor + Diploma + Master + PhD.

8.1.4 Tool Validation:

In order to verify the validity of the tools(interview and questionnaire), the logical truthfulness of the tool was extracted by the arbitrators by using a method of arbitration by a group of Mutah university professors: Prof. Salloom al juboor, Prof. Sulaiman tarawneh in addition to a group of the Ministry of Education: the head of planning department Dr. Dergham Algaraleh, liaison officer the planning department: Mr. Hussein Al-Sarayrah and the liaison officer of the building department Mr. Mohamed Bostengi . The tool was distributed in its preliminary form as Appendix (1) to Three arbitrators, Appendix (2) lists the names of the arbitrators, including the judgment of the validity of the instrument and the validity of its paragraphs in the measurement of what was set for measurement.

8.1.5 Tools Reliability

Due to insure of stability of questionnaire item, Cronbach' alpha was applied, table 3 shows that:

Table 3:- Variables Reliabilities (Cronbach' alpha for each Domains of Questionnaire Questions).

Domains	No. of Items	Cronbach' Alpha
Open EMIS system to facilitate the implementation of tasks related to school buildings and improve the maintenance of its facilities.	6	0.89
Basic barriers to schools that lead to poor infrastructure.	6	0.90
Problems related to the building department can have a negative impact on its work, in term of completion within the time limit.	6	0.93
Poor timing affect maintenance at the general level of the school infrastructure.	6	0.78
Total	24	0.88

Table 3 reveals that Cranach' alpha values for each domains of questionnaire, range between (0.78 – 0.93) , this indicate to acceptable for each domains which acceptable value for Cronbach' alpha increased more than (0.70), and Cronbach' alpha value for total items of questionnaire reached (0.96).

9. DATA ANALYSIS AND DISCUSSION

This section includes a discussion and a presentation of the results of the study aimed at revealing the use of the educational management system to predict future maintenance plans for the buildings: a case study for the schools of Karak governorate.The results of the study were presented according to the study questions.

9.1 Study Sample

The study sample included (3) directorates of Karak governorate and (20) schools divided into (7) male schools, (3) female schools, (10) mixed schools, table (4) shows sample distribution on demographic variables.

Table 4 shows as a following:

Table 4: Sample Distribution on Directorates Variables

Variables	Category	Frequency	Percentage
Job	In directory	12	23.1
	In school	40	76.9
	Total	52	100.0

For directory variable, Karak directory percent was (34.6%), then Gasser and Mazar directories percent (32.7%) for each one.

Table 5: Sample Distribution on Job Variables

Variables	Category	Frequency	Percentage
Directory	Karak	18	34.6
	Gasser	17	32.7
	Mazar	17	32.7
	Total	52	100.0

As shown in table 5 for job variable, director frequency (12) by percent (23.1%), and manager frequency was (40) by percent (76.9%).

Table 6: Sample Distribution on Gender Variables

Variables	Category	Frequency	Percentage
Gender	Male	24	46.16
	Female	28	53.84
	Total	52	100.0

As shown in table 6 for gender variable, male frequency was (24) by percent (46.15%), and female frequency (28) by percent (53.84%).

Table 7: Sample Distribution on School Gender Variables

Variables	Category	Frequency	Percentage
School gender	Male	14	0.27
	Female	6	0.12
	Mixing	20	0.38
	Director	12	0.23
	Total	52	100.0

As shown in table 7 for School gender variable, female frequency was (26) by percent (50%), then mixing school frequency was (14) by percent (26.9%), and other percent (23.1%) for directors.

Table 8:-Sample Distribution on School Stage Variables

Variables	Category	Frequency	Percentage
Stage	Elementary	28	53.8
	Secondary	12	23.1
	Directory manager or boss	12	23.1
	Total	52	100.0

As shown in table 8 for educational stage variable, elementary school frequency was (28) by percent (53.8%), then secondary school frequency was (12) by percent (23.1%), and other percent for (23.1%) for directors.

Table 9:-Sample Distribution on Qualification Variable

Variables	Category	Frequency	Percentage
Qualification	Diploma	8	15.4
	BA.	30	57.7
	Master	8	15.4
	Ph.D	6	11.5
	Total	52	100.0

As shown in table 9 for qualification variable, the higher percent for (BA) (57.7%), then diploma and master degree frequencies reached (8) by percent (15.4%) for each one, and (Ph.D) degree was (6) by percent (11.5%)

Table 10: Sample Distribution on Experience Variable

Variables	Category	Frequency	Percentage
Experience	Less than 10 years	8	15.4
	10 – 15 years	20	38.5
	16- 20 years	12	23.1
	More than 20 years	12	23.1
	Total	52	100.0

As shown in table 10 for experience variable, the higher frequency for experience category (10-15 years) was (20) by percent (38.5%), then for both categories (16-20 years and more than 20 years) reached (23.1%) for each one, but the lowest frequency was (8) by percent (15.4%) for experience category (less than 10 years).

9.2 Answer of Questions.

Q1: The main task of the Open EMIS system is to provide adequate statistical information on the directorates of the Ministry of Education and its schools. Is it possible for this Open EMIS system to facilitate the implementation of tasks related to school buildings and improve the maintenance of its facilities?

To answer this question means and standard deviations for items which indicate to open EMIS system to facilitate the implementation of tasks related to school buildings and improve the maintenance of its facilities and total of them were computed, table (11) shows that.

Table 11: Means and Standard Deviations for Elements of Questionnaire and Total of them

No.	Items	Means μ	Standard Deviation б	Coef of Variation б/ μ	Rank
1	The Open EMIS system provides accurate statistics for the number of classrooms, public facilities,and pavilions.	4.23	0.78	0.184	1
2	The Open EMIS system provides periodic reports	4.04	0.95	0.235	3
3	The Open EMIS system provides accurate data on classroom and non-classroom equipment.	4.10	0.89	0.217	2
4	The Open EMIS system provides accurate data on school facilities, toilets and water tanks.	4.02	1.00	0.248	4
5	The Open EMIS system provides accurate information on the area of the plot on which the school is located.	3.83	0.98	0.255	5

No.	Items	Means μ	Standard Deviation б	Coef of Variation б/ μ	Rank
6	The Open EMIS system provides accurate details of the classroom, non-classroom and other facilities.	3.79	1.00	0.263	6
	Average	4.02	0.93	0.232	

Table (11) shows that the range means for some basic barriers to schools that lead to poor infrastructure items between (4.23 – 3.79), by high level for all items. The higher means for item (1) which indicates to " The Open EMIS system provides accurate statistics for the number of classrooms, public facilities and pavilions", then mean for item (3) which indicates to " The Open EMIS system provides accurate data on classroom and non-classroom equipment" by mean (4.10), but the lowest mean was (3.79) for item (6) which indicates to "The Open EMIS system provides accurate details of the classroom, non-classroom and other facilities".

The total mean for all basic barriers to schools that lead to poor infrastructure items reached (4.02) by high degree. The differences for average of items which indicate to basic barriers to schools that lead to poor infrastructure due to demographic variables:

9.3 Analysis of Variance

To explore the differences in items average above due to demographic variables, analysis of variance (ANOVA) was applied, So hypothesis is created

H_0 : There are no statistically differences at (α =0.05) according to following respondent's demographic profile variables (director, work experience years, educational level, school sex and schooh stage). Survey questions was taken from question (1) to question (24).

H_1 : there are differences at (α =0.05) according to above variables.

Table 12 shows that.

Table 12: The Differences in Average of Items (which Indicate to open EMIS System to Facilitate the Implementation of Tasks Related to School Buildings and Improve the Maintenance of its Facilities due to Demographic Variables).

Variable	Sum of Square	Degree Freedom	Mean Square	F.Value	Sig.
DIRECTOR	2.65	2	1.33	2.49	0.10
SCHOLSEX	0.04	1	0.04	0.08	0.78
STAGE	1.85	1	1.85	3.47	0.07
QUALIFIC	1.43	2	0.71	1.34	0.28
EXPER	0.13	2	0.06	0.12	0.89
Error	16.53	31	0.53		
Corrected Total	23.490	39			

Analysis of variance (ANOVA) can determine whether the means of three or more groups are different. ANOVA uses F-tests to statistically test the equality of means. F-tests are named after its test statistic, F, which was named in honor of Sir Ronald Fisher. The F-statistic is simply a ratio of two variances. Variances are a measure of dispersion, or how far the data are scattered from the mean. Larger values represent greater dispersion Variance is the square of the standard deviation. For us humans, standard deviations are easier to understand than variances because they are in the same units as the data rather than squared units. However, many analyses actually use variances in the calculations.F-statistics are based on the ratio of mean squares. The term “mean squares” may sound confusing but it is simply an estimate of population variance that accounts for the degrees of freedom (DF)used to calculate that estimate.

Despite being a ratio of variances, you can use F-tests in a wide variety of situations. Unsurprisingly, the F-test can assess the equality of variances. However, by changing the variances that are included in the ratio, the F-test becomes a very flexible test. For example, you can use F-statistics and F-tests to test the overall significance for a regression model, to compare the fits of different models, to test specific regression terms, and to test the equality of means.

A. Using the F-test (ANOVA) Analysis

To use the F-test to determine whether group means are equal, it’s just a matter of including the correct variances in the ratio. In one-way ANOVA, the F-statistic is this ratio:

F = Variance of treatment / Variance of error

B =MSTr/ MSE

F-distributions and Hypothesis Testing

For one-way ANOVA, the ratio of the between-group variability to the within-group variability follows an F-distribution when the null hypothesis is true.

Because the F-distribution assumes that the null hypothesis is true, we can place the F-value from our study in the F-distribution to determine how consistent our results are with the null hypothesis and to calculate probabilities.

The probability that we want to calculate is the probability of observing an F-statistic that is at least as high as the value that our study obtained. That probability allows us to determine how common or rare our F-value is under the assumption that the null hypothesis is true. If the probability is low enough, we can conclude that our data is inconsistent with the null

hypothesis. The evidence in the sample data is strong enough to reject the null hypothesis for the entire population.

This probability that we're calculating is also known as the p-value!

Table12 shows that there are no significant differences in average score of items which indicate to open EMIS system to facilitate the implementation of tasks related to school buildings and improve the maintenance of its facilities due to demographic variables, whereas (F. values) were as a following:

For directory variable (F.Value) was (2.49) by significance value (0.10), this indicates to there are no significant differences at significant level ($\alpha \leq 0.05$) due to directory variable.

For school sex variable (F.Value) was (0.08) by significance value (0.78), this indicates to there are no significant differences at significant level ($\alpha \leq 0.05$) due to school sex variable.

For stage variable (F.Value) was (3.47) by significance value (0.07), this indicates to there are no significant differences at significant level ($\alpha \leq 0.05$) due to stage variable.

For qualification variable (F.Value) was (1.34) by significance value (0.28), this indicates to there are no significant differences at significant level ($\alpha \leq 0.05$) due to qualification variable.

For experience variable (F.Value) was (0.12) by significance value (0.89), this indicates to there are no significant differences at significant level ($\alpha \leq 0.05$) due to experience variable.

Q2: There are some basic barriers to schools that lead to poor infrastructure. What are the most important of them?

To answer this question means and standard deviations for items that indicate to some basic barriers to schools that lead to poor infrastructure and total of them were computed, table 13 shows that.

Table 13: Means and Standard Deviations for Elements of Some Basic Barriers to Schools that Lead to Poor Infrastructure and Total of them.

NO.	Items	Mean μ	Standard Deviation б	Coef of Variation б/ μ	Rank
1	The Open EMIS system facilitates the implementation of tasks related to school buildings and improving the maintenance of its facilities.	4.21	0.82	0.195	1
2	Lack of communication between the school and the Directorate leads to increased problems in the infrastructure.	4.04	0.88	0.218	3
3	The weakness of the ministerial plans that concern the maintenance of the infrastructure of schools is due to the lack of modernity of the information available to them.	4.13	0.89	0.215	2
4	The Open EMIS system provides accurate information on the geographical location of the school in terms of latitude and longitude, which will assist in making the appropriate decision regarding the establishment of new schools.	3.98	1.04	0.261	4
5	Give school principals and education managers in the field more permissions to carry out maintenance directly within the Open EMIS system of technology without the need to return to the Ministry reduces the problems of infrastructure	3.85	0.89	0.231	5

NO.	Items	Mean μ	Standard Deviation б	Coef of Variation б/ μ	Rank
	in schools.				
6	The Open EMIS system provides a method of technical and modern communication to improve and activate communication between schools and departments of buildings and planning and the ministry at the same time.	3.88	0.86	0.222	6
Average		4.01	0.896	0.223	

Table 13 shows that the range means for questionnaire items between (4.21 – 3.85), by high level for all items. The higher means for item (1) which indicates to "The Open EMIS system provides accurate statistics for the number of classrooms, public facilities and pavilions", then mean for item (3) which indicates to "The Open EMIS system provides accurate data on classroom and non-classroom equipment " by mean (4.13), but the lowest mean was (3.85) for item (5) which indicates to "The Open EMIS system provides accurate information on the area of the plot on which the school is located". The total mean for all questionnaire items reached (4.01) by high degree.

The differences for average of items that indicate to open EMIS system to facilitate the implementation of tasks related to school buildings and improve the maintenance of its facilities due to demographic variables:

To explore the differences in items average above due to demographic variables, analysis of variance (ANOVA) was applied, table 14 shows that.

Table 14: The Differences in Average of Items, which Indicate to Basic Barriers to Schools that Lead to Poor Infrastructure due to Demographic Variables.

Variable	Sum of Square	Degree Freedom	Mean Square	F.Value	Sig.
DIRECTOR	1.623	2	0.812	1.147	0.331
SCHOLSEX	0.415	1	0.415	0.586	0.450
STAGE	0.240	1	0.240	0.340	0.564
QUALIFIC	0.555	2	0.278	0.392	0.679
EXPER	0.104	2	0.052	0.074	0.929
Error	21.932	31	0.707		
Corrected Total	26.056	39			

Table 14 shows that there are no significant differences in average score of items which indicate to basic barriers to schools that lead to poor infrastructure due to demographic variables, whereas (F. values) were no significant differences at significant level ($\alpha \leq 0.05$) due to each one of demographic variables.

Q3: Some problems related to the building department can have a negative impact on its work, in term of completion within the time limit. What are the most important problems?

To answer this question means and standard deviations for items which indicate to problems related to the building department can have a negative impact on its work, in term of completion within the time limit and total of them were computed, table (15) shows that.

Table 15: Means and Standard Deviations for Elements of some Problems Related to the Building Department can have a Negative Impact on its Work, in Term of Completion within the Time Limit and Total of them

No.	Items	Mean μ	Standard Deviation б	Coef of Variation б/ μ	Rank
1	The Open EMIS system provides detailed reports on the real need for building departments in schools, which supports the amendment of the allocations and put them clearly on the organizational structure.	3.96	0.91	0.227	1
2	The Open EMIS system shall determine the necessity of preparing cadres for immediate maintenance in the buildings section and training them in a specific area based on the reports issued by them.	3.77	1.06	0.281	5
3	The Open EMIS system limits the problems related to surprises from the increase in the number of students in public schools, as they provide updated information	3.83	1.13	0.295	4

No.	Items	Mean μ	Standard Deviation б	Coef of Variation б/ μ	Rank
	for the buildings department.				
4	The Open EMIS system consolidates the problems related to the weakness of regular maintenance of schools, because it regulates the work of the building department according to the correct order of priorities.	3.74	1.01	0.270	6
5	The data provided by the Open EMIS system can be used to predict future problems and suggest solutions.	3.85	1.02	0.264	3
6	The Open EMIS system is a suitable working environment for the planning and building departments together in the management and construction of new schools and distributed to regions in a balanced manner.	3.92	0.90	0.229	2
	Average	3.85	1.00	0.261	

Table 15 shows that the range means for problems related to the building department can have a negative impact on its work, in term of completion within the time limit items between (3.96 – 3.74), by high level for all items. The higher means for item (1) which indicates to " The Open EMIS system provides detailed reports on the real need for building departments in schools, which supports the amendment of the allocations and put them clearly on the organizational structure", then mean for item (5) which indicates to the data provided by the Open EMIS system can be used to predict future problems and suggest solutions" by mean (3.85), but the lowest mean was (3.74) for item (4) which indicates to "The Open EMIS system consolidates the problems related to the weakness of regular maintenance of schools, because it regulates the work of the building department according to the correct order of priorities".

The total mean for all problems related to the building department can have a negative impact on its work, in term of completion within the time limit items reached (3.85) by high degree. The differences for average of items that indicate to problems related to the building department can have a negative impact on its work, in term of completion within the time limit due to demographic variables:

To explore the differences in items average above due to demographic variables, analysis of variance (ANOVA) was applied, table 16 shows that.

Table 16: The Differences in Average of Items which Indicate to Problems Related to the Building Department can have a Negative Impact on its Work, in term of Completion within the Time Limit due to Demographic Variables

Variable	Sum of Square	Degree Freedom	Mean Square	F.Value	Sig.
DIRECTOR	2.385	2	1.192	1.212	0.31
SCHOLSEX	0.256	1	0.256	0.260	0.61
STAGE	0.062	1	0.062	0.063	0.80.
QUALIFIC	0.831	2	0.415	0.422	0.65 9
EXPER	1.65	2	0.825	0.838	0.98.
Error	30.497	31	0.984		
Corrected Total	35.55	39			

Table 16 shows that there are no significant differences in average score of items which indicate to problems related to the building department can have a negative impact on its work, in term of completion within the time limit due to demographic variables, whereas (F. values) were not significant differences at significant level ($\alpha \leq 0.05$) due to each one of demographic variables.

Q4: Does poor timing affect maintenance at the general level of the school infrastructure? And how is that?

To answer this question means and standard deviations for items which indicate to poor timing affect maintenance at the general level of the school infrastructure and total of them were computed, table 17 shows that.

Table 17- Means and Standard Deviations for Elements of Poor Timing Affect Maintenance at the General Level of the School Infrastructure and Total of them

No.	Items	Mean μ	Standard Deviation б	Coef of Variation б/ μ	Rank
1	Lack of a technical Open EMIS system leads to delays in the maintenance of infrastructure, which negatively affects schools.	4.02	1.00	0.248	1
2	The Open EMIS system provides a clear outline of the building sections on the status of infrastructure in schools and their needs and maintenance.	3.98	0.92	0.231	2
3	The Open EMIS system helps the building departments to organize the time to manage the maintenance files of classroom classrooms	3.79	1.02	0.269	4
4	The Open EMIS system provides an effective environment for the organization and management of the file maintenance times for schools.	3.69	0.98	0.265	6

5	The Open EMIS system provides a timetable for the proposed building sections to start the maintenance of schools based on the number of students and the seriousness of the situation in them.	3.75	0.97	0.258	5
6	Dealing with the Open EMIS system in the building sections reduces the catastrophic problems that may occur as a result of delays in the maintenance of the infrastructure.	3.90	1.03	0.264	3
	Average	3.86	0.98	0.225	

Table 17 shows that the range means for poor timing affect maintenance at the general level of the school infrastructure items between (4.02 – 3.69), by high level for all items.

The higher means for item (1) which indicates to " Lack of a technical Open EMIS system leads to delays in the maintenance of infrastructure, which negatively affects schools", then mean for item (2) which indicates to The Open EMIS system provides a clear outline of the building sections on the status of infrastructure in schools and their needs and maintenance " by mean (3.98), but the lowest mean was (3.69) for item (4) which indicates to " The Open EMIS system provides an effective environment for the organization and management of the file maintenance times for schools".

The total mean for all poor timing affect maintenance at the general level of the school infrastructure items reached (3.86) by high degree.

The differences for average of items which indicate poor timing affect maintenance at the general level of the school infrastructure due to demographic variables:

To explore the differences in items average above due to demographic variables, analysis of variance (ANOVA) was applied, table 18 shows that.

Table 18: The Differences in Average of Items which Indicate to Poor Timing Affect Maintenance at the General Level of the School Infrastructure due to Demographic Variables.

Variable	Sum of Square	Degree Freedom	Mean Square	F.Value	Sig.
DIRECTOR	2.843	2	1.421	2.697	0.083
SCHOLSEX	0.240	1	0.240	0.456	0.505
STAGE	0.179	1	0.179	0.341	0.564
QUALIFIC	0.206	2	0.103	0.195	0.824
EXPER	0.103	2	0.051	0.097	0.907
Error	16.334	31	0.527		
Corrected Total	21.13	39			

Table 18 shows that there are no significant differences in average score of items which indicate to poor timing affect maintenance at the general level of the school infrastructure due to demographic variables, whereas (F. values) were not significant differences at significant level ($\alpha \leq 0.05$) due to each one of demographic variables.

10. DISCUSSION OF FINDING

The results of the study showed the means and standard deviations to reveal the use of the educational management system to predict future maintenance plans for the buildings: A case study for the schools of Karak governorate.which showed that the educational management system can be used to predict future maintenance plans for buildings in Karak governorate.

The results also showed no statistically significant differences in the estimates of the sample members due to the demographic variables (management experience, school sex, school stage and qualification).

The questionnaires questions were answered by interviewing the people who were given the questionnaire at the end of the interview. This questionnaire is intended to describe the effectiveness of the Open EMIS system and its main functions and the ability of this system to provide sufficient statistical information about the directorates of the Ministry of Education and its schools, and the possibility of the system to facilitate the implementation of tasks related to school buildings and improve the maintenance of its facilities.

For the first question, the sample agreed that the system provides accurate data about the schools and infrastructure in such a way that makes this system capable of building plans that improve the performance of the work of the building sections in the directorates of education.

For the second question was answered: There are some basic barriers to schools that lead to poor infrastructure. What are the most important of them? It was found that there is a major obstacle to the poor receiving and sending information to the concerned departments in the buildings department in the directorates and found that the system gives an immediate update of the information and communicates the information to the concerned, which speeds up its maintenance, which enhances the role of the building department towards the schools.

As for the third question, it was: Some problems related to the building department can have a negative impact on its work, in term of completion within the time limit. What are the most important problems? Attention was paid to the head of the building department and a member of the building department. About the extent to which the system can provide information that makes it easier for them to play their role in a better way, and they responded because the system affects the recent information on the reality of schools and how to arrange priority to address their problems.

The last question is: Does poor timing affect maintenance at the general level of the school infrastructure? And how is that? Where the answer of all parties that the system provides modern data and accurate information to help schools and

directorates to carry out their tasks to the fullest, as this information has the best role in the order and organization of priorities between schools as necessary, which is reflected positively on schools and students.

11. CONCLUSION

The results showed that the range means for some basic barriers to schools that lead to poor infrastructure items between (4.23 – 3.79), by high level for all items and the Open EMIS system provides accurate data on classroom and non-classroom equipment" by mean (4.10). Based on the discussion of the findings displayed earlier, it is now possible to draw some conclusions out of the conducted research. The most important conclusion that can be reached from this research is:

1) The Open EMIS provide sufficient information for construction engineers and help them to create effective future plans that facilitate organization and maintenance.
2) The utilization of the Open EMIS system to be the coordinator of the work will save the time and effort and facilitate the work. The Open EMIS system is one of the best new methods of high efficiency that makes it easy to obtain accurate information about schools and their infrastructure.
3) The Open EMIS system is able to handle and communicate information electronically between departments and schools, and this facilitates the performance of these departments.
4) The use of information technology based on the Open EMIS system increases the knowledge of individuals and units responsible through the exchange of information between different users and thus achieving sustainable human development.
5) The Open EMIS system is rich in the qualitative characteristics of the statistical information, which is characterized by clarity, completeness and synthesis information that improve the quality of this information and in line with the continuous acceleration in the preparation of schools and students.
6) The Open EMIS system provides timely information, as this does not lose the importance of this information to decision makers. In addition, the system is characterized by high quality in the employment of information technology.
7) The decisions of the building departments in the directorates depend on the information in general and the statistical information in particular for the establishment of large investments in public projects, and with the presence of the system of the Opens EMIS, this task becomes easier.

11. RECOMMENDATIONS

Based on the results, the study recommended several recommendations:

1. Follow-up maintenance work at the schools through the news of the liaison officer located in the school about the most important problems that must be solved by the Department of buildings
2. Activation of the OpenEMIS system for the building department in each department and follow it through the ministry.
3. Linking the system with the Civil Status and Passports Department, so that the Ministry can obtain accurate and comprehensive data on all students and human cadres working in the ministry, in addition to data on children of school age and did not attend school.
4. Open EMIS can be linked to any other database system either as a source of data input or as a recipient. This feature is integrated with the e-government system.

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