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Integrating DeLone and McLean and Task Technology Fit Models to Examine the Factors influencing Information Technology Managers to use Educational Management Information Systems

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Abstract

Objective: This study examines the level of response of Information Technology (IT) managers towards the intention to use Educational Management Information Systems (EMIS). **Method:** The Delone Mclean Model (D&M) and Task Technology Fit (TTF) were employed as the theoretical frameworks in this investigation. A research methodology was employed to collect and analyze data to achieve the research objective. **Results and conclusion:** The study yielded significant findings regarding the level of response of IT managers towards the intention to use EMIS. The analysis results provided valuable insights into the factors influencing the adoption and utilization of EMIS in educational institutions. Based on the findings, conclusions were drawn regarding the effectiveness and potential benefits of EMIS implementation. **Implications of the research:** The findings of this investigation have important implications for IT managers, educational leaders, decision-makers, and policy analysts. The study's insights can assist these stakeholders in understanding the importance of considering the opinions and desires of all individuals involved in the design and implementation of EMIS. Additionally, the research outcomes can guide IT managers and educational leaders in achieving their organizational vision and improving decision-making processes through using EMIS. **Originality/value:** This study contributes to the existing literature by examining the level of response of IT managers towards EMIS adoption using the D&M Model and TTF framework. The research provides valuable insights into the factors influencing the intention to use EMIS, thereby contributing to the understanding of technology adoption in the educational management. The originality and value of this research lie in its application of established theoretical frameworks to the specific context of EMIS and its potential to inform decision-making and policy formulation in educational institutions.

Keywords: EMIS, Systems Quality, Information Quality, Technology Characteristics.

Introduction

Information technologies have a considerably greater impact on our daily lives today, and humanity has adjusted to keep up. The appreciation and use of technology are equally important, even while the development of new technology is a crucial activity in and of itself (Noronha et al., 2023). The use of IT has long been a significant dependent variable in Management IT research, but it is still unclear what influences users' usage and adoption plans. New technologies

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open up new opportunities, but they also present challenges for both academics and practitioners in terms of uptake and acceptance (Koç et al., 2016).

Because of the growth of the global economy and technical innovations, Educational Management Information Systems (EMIS) has grown to importance across all industries, but particularly in administrative areas. Therefore, EMIS has developed swiftly and its applications have expanded to include all facets of institution management (Benmoussa et al., 2016; Hussein et al., 2023).

The EMIS is a system that collects, processes, and saves data using a combination of software, people, computers, and networks. The next step is to generate data for managers at the right time and in the right format and volume (Aidi et al., 2023). The Department of Admission, for instance, employs the Student Information Management System to centralize and standardize the enrollment, registration, and retention procedures for incoming students. Conversely, the Student Affairs Information System is working with the Department of Student Affairs to help with student concerns, loans, and financial aid follow-up. Similarly, the Human Resources Information System is being utilized by the Department of Human Resources Management to aid the university in human resource planning, its human resources, and related activities like training and development, wage and pay preparation, employee insurance, and similar responsibilities. Last but not least, the University relies on the Procurement and Supply Department and Purchasing and Supply to help them source, store, print, and distribute supplies to the many locations across campus.

Following established definitions and the author's viewpoint. Information management and transfer systems are employed (Abass et al., 2023). Often considered the forerunners to modern computing infrastructures, they form the backbone of the information management industry. To help businesses make the right decisions at the right times, EMIS generates reports based on collected data (Chen et al., 2013; Attia et al., 2018).

All managers and dealers use EMIS's findings to promote the university's mission, which is supported by EMIS's correctness, validity, independence from other systems, and results (Laudon & Laudon, 2015). The question of "Why do Information Technology (I.T.) managers avoid using EMIS?" has been the focus of a large body of research (Talab & Flayyih, 2023). This research employed the Delone Mclean Model (D&M) and the Task Technology Fit (TTF) to analyze how people embrace new technologies (Hadi et al., 2023). This study aims to examine the level of response of Information Technology (IT) managers towards the intention to use EMIS. So, The structure appropriately to his paper according to the following; the first section provides a research background and a synopsis of broad technology acceptance models. The acceptance and use of mobile applications in universities is then covered in detail, followed by the research model and hypotheses, methods, findings of hypothesis testing, consequences, and suggestions.

2. Literature Review

2.1. Educational Management Information Systems (EMIS)

EMIS is a system that assists management in making choices and formulating policies through the input, integration, processing, and maintenance of data related to the education system (Abdul-Hamid, 2014). EMIS functions as a sub-system inside the information system integration in the context of competition, involving coordination and integration with other sub-IF (Hussinki et al., 2017; Ali et al., 2023). EMIS is a collection of machine and human components that collaborate to gather, process, and analyze data by its rules and processes to assist decision-makers in the use of appropriate information (Wang et al., 2020).

Since EMIS is a term that is frequently used in universities, it might be challenging to discover a precise definition; however, several have arisen for EMIS (Saad & Daud, 2020). The first definition was provided by Elsharif (2019), which described EMIS as a component of an information system that needs to be coordinated with other systems, particularly when it comes to challenges with other institutions. EMIS, according to Hakimpoor and Khairabadi (2018), is a collection of parts or aspects that work together and in harmony to provide data and information that can be used to support decision-making and maintain control over the university. Like this, Shahreki et al., (2019) show that EMIS is a human-machine collaboration that gathers, processes, stores, analyses, and organizes data with rules for particular tasks and makes it accessible to the management of the business. Penn et al., (2019), also describe EMIS as a provider of information to university managers, and this information shows what is likely to happen in the past, present, and future. Reports and other analytical products that are used to make decisions or solve problems make information available.

There are various forms of EMIS because there are many different sorts of work in the education sector. Each system is accountable for carrying out administrative tasks. Usually distinct from the other tasks that systems perform. To accomplish the institute's objectives, it is possible to integrate the results of various systems' tasks. Decision Support Systems (DSS) are the first kind of EMIS, and both head sections and senior managers use them to solve problems and make decisions (Wiesche et al., 2017). IF now play a significant role in all areas of education, particularly in administrative zones, because of globalization, the mobility of new technology, and economic developments. Additionally, in the field of education, EMIS has developed several programs that support all administrative levels (Berisha-Shaqiri, 2014).

In addition, several colleges have been able to expand internationally as a result of the growth in student enrollment (Penn et al., 2019). Therefore, all universities should use EMIS to handle and administer their operations. EMIS is crucial for modern management to adopt to enhance its administrative functions as a result. Due to the vast amount of information available through

EMIS, which provides the university's departments with the speed and precision they require, management and decision-making have been linked to success.

Because of this, DeLone and McLean and Task Technology Fit were used in this study to assess how managers in the government of the United Arab Emirates and administrators at accredited universities responded to the desire to utilize EMIS. The second section compiles a list of studies that use Task Technology Fit, DeLone, and McLean. The discussion of additional research will then be presented.

2.2. DeLone and McLean plus Task Technology Fit.

To be successful in EMIS, the identification, and explanation of six dimensions of success must be presented. DeLone & McLean (1992) developed the model of success in IT. This model describes and explains the relations of system quality, service quality, information quality, individual impact, use, user satisfaction, and organizational impact. This model defined service quality as the result of customer expectations about the service, and information quality as outputs and quality of the system. Moreover, in 2003, the two authors added a new measure, which calls intention to use. This model shows an important role in explaining the factors influencing the use of EMIS. Three factors will be taken from this model to explain the intention to use EMIS, which are information quality, system quality, and intention to use.

Furthermore, Martins et al., (2019) defined technology fit as the tool that provides technology to the task that it is designed to it support. Additionally, the model of Task Technology Fit identifies how technology supports employees in a set of tasks. This model shows an important role in considering that technology adds value by acting as a device or an instrument in a group of tasks. Moreover, the user would reveal its importance when it comes to the evaluation.

The study by Hendri et al. (2022) explores the evaluation of Financial Management Information Systems (FMIS) during the COVID-19 pandemic. The authors modified the DeLone and McLean Model to assess the impact of FMIS on system quality, information quality, service quality, user satisfaction, use, and net benefits. The findings revealed that during the pandemic, FMIS played a critical role in supporting financial management processes. System quality, including factors such as reliability and usability, significantly influenced user satisfaction and usage behavior. Moreover, information quality, encompassing the accuracy and relevance of financial data, was found to be crucial in achieving net benefits and enhancing financial decision-making during this challenging period.

Sunarta and Astuti (2023) investigated the relationship between accounting information system quality, accounting information quality, and organizational performance. The study utilized a sample of organizations to examine how the quality of the accounting information system impacts the quality of accounting information, which in turn influences organizational

performance (Albderi et al., 2023). The findings revealed that a higher quality accounting information system led to improved accounting information quality, ultimately enhancing organizational performance. The study highlighted the mediating role of accounting information quality, suggesting that the accuracy, timeliness, and relevance of financial information mediated the relationship between the accounting information system quality and organizational performance.

Through sharing information and data with partners and acknowledging the goods, services, strategies, and best practices of their competitors, EMIS is a tool that can help the education sector to stay competitive (Attia & Salama, 2018; Hu & Zhang, 2016; Al-taee & Flayyih, 2023). Even though EMIS has several advantages, managers still, do not need it to the same extent. Consequently, numerous studies have been conducted to determine whether users accept systems with various techniques and goals. Table 1. Display a summary of the many studies that the researchers have conducted.

Table 1. Summary of Studies

Researchers	Study	Purposes	Approaches
He and Mykytyn (2007)	Factors Affecting the Adoption of Online Payment by Consumers.	Testing the effect of both vendor's and customers' s system characteristics, perceived benefits and perceived risk on the intention to use online payment system.	System characteristics, consumer characteristics, perceived characteristics, and adoption of the online payment system.
Gholami et al., (2011)	Factors Influencing the Adoption of Electronic Payment in Nigeria.	The use of the UTAUT model to examine the factors influencing the adoption of e-payment in Nigeria.	Social influence, trust, effort expectancy, Awareness, facilitating condition, performance expectancy, and the intention to adopt e-payment.
Huang, Encho and Chang (2012)	The Intention of Electronic Payment and Online Security Signs.	Testing the relations between risk avoidance, perceived benefits, legal protection, and satisfaction of e-payment.	Perceived benefits, perceived risk, confirmation, satisfaction, perceived legal, and continuance intention.

Tella and Olasina (2012)	The Use of the Technology Acceptance Model to Predict the Users' Continuance Intention Toward Electronic Payment System.	Using TAM to predict the intention of users to use e-payment systems.	Perceived satisfaction, perceived usefulness, enjoyment, perceived ease of use, speed, attitude, actual use, perceived benefits, and continuance intention.
Tam and Oliveira (2016)	Impact of m-banking on individual performance in Portugal.	Assess the impact of m-banking on individual performance	Use and user satisfaction, system quality, information quality, service quality, TTF.
Lian (2018)	Why self-service technology is unpopular in Taiwan.	To understand the reasons behind it, two models were used to explain the phenomena (D&M and personal characteristics marketing)	Information quality, enjoyment and design, system quality, usage of intention continue satisfaction, self-service technology.
Isaac et al., (2019)	Online learning usage of higher education in Yemen using D&M and TTF.	Investigated online learning usage in higher education.	Overall quality, Compatibility, user satisfaction, practical use, actual use, TTF
Yang & Chen (2022)	The integration of TAM and TTF	Examine the intention to use the services of Robo-advisor.	Perceived risk, perceived usefulness, perceived ease of use, attitude, technical characteristics and task characteristics, task-technology fit, TTF, attitudes, and information quality.
Gurendrawati et al., (2022)	Examine the use of DeLone and McLean's model	The development of the present system.	System quality Service quality and user satisfaction
Hendri, et al (2022)	Evaluation of Financial Management Information System Using Modification of the Delone & Mclean Model During the COVID-19 Pandemic	To evaluate the effectiveness of Financial Management Information Systems (FMIS) during the COVID-19 pandemic	Modified the Delone & McLean Model to assess the impact of FMIS on system quality, information quality, service quality, user satisfaction, use, and net benefits

Sunarta et al. (2023)	Accounting Information System Quality and Organizational Performance: the Mediating Role of Accounting Information Quality	To investigate the relationship between accounting information system quality, accounting information quality, and organizational performance	Examined the relationship between the quality of the accounting information system and accounting information quality, as well as the mediating role in organizational performance
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Source: Prepared by the authors (2023).

3. METHODOLOGY

Proposed Model

The model of factors influencing the use of EMIS is shown in Figure 1. The proposed model, which examines IT managers' intentions to employ EMIS in the education sector, is based on D&M and TTF. Numerous studies have been created and modified using D&M and TTF to create variables that matched the circumstances of their research. However, D&M has three additional external variables in our proposed model. System quality, information quality, and intention to use. Moreover, characteristics of the task, technology and TTF are significant aspects in the investigation of the intention to use EMIS. Therefore, there are introduced in this study.

Numerous studies resulted in those variables such as Information Quality, System Quality that can affect the TTF (Hu & Zhang, 2016; Liébana-Cabanillas et al., 2017a; Liébana-Cabanillas et al., 2017b). Moreover, according to Yen et al. (2010), Yamin and Alyoubi (2020), Yang and Chen (2022), and Wang et al. (2020) have resulted that Task Characteristics and Technology Characteristics have a direct effect on Task Technology Fit. Additionally, Lee et al. (2007), Lee & Lehto (2013), Narman et al. (2012), and Yen et al. (2010) have shown that TTF has a positive relationship with Intention to use EMIS.

The study attempts to discourse several gaps and make important contributions. First, the study spreads incomplete research on the understanding of the factors influencing IT managers to use EMIS. This study is among the first to consider Information Quality, Systems Quality, Task Characteristics, and Technology Characteristics as important factor of the intention to use EMIS by IT managers. Second, assess the relations role of the mentioned factors and Task Technology Fit. Thus, explaining the mechanism that helps in getting the whole picture of the point view of IT managers toward the Intention to use EMIS. Finally, to the best of the knowledge of the researcher, none of the previous studies has explored the effects of Information Quality, Systems Quality, Task Characteristics, and Technology Characteristics on Task Technology Fit toward the intention to use EMIS. Therefore, the model of factors influencing IT managers to use EMIS is presented below:

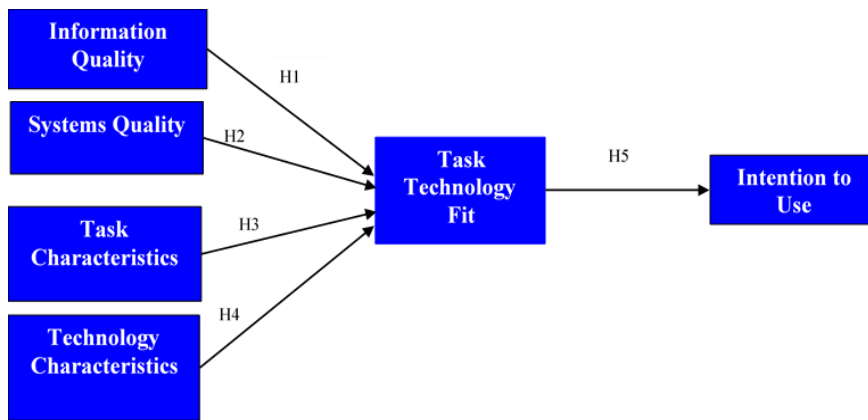


Fig. 1. A model of factors influencing managers’ intention to use EMIS.

4. RESULTS AND DISCUSSION

Hypotheses H1, H2, H3, H4, and H5 are being developed to support the model. Whereas H1 is Information Quality that has a positive relation with TTF. H2 is Systems Quality has a positive relation with TTF. H3 is Task Characteristics that have a positive relation with TTF. H4 is Technology Characteristics has a positive relation with TTF. Finally, H5 is TTF has a positive relation with Intention to Use. To prove these hypotheses, the proposed measurement is supported in Table 2.

Table 2. Measures formed on factors influencing IT managers’ intention to use EMIS.

Factors	Measures
Information Quality ²⁴ (IQ)	IQ1 Receive enough information from EMIS.
	IQ2 Gives me precise information.
	IQ3 Receive current information from EMIS.
	IQ4 The data is accurate.
Systems Quality ³⁴ (SQ)	SQ1 The system reacts quickly.
	SQ2 System performance is consistent.
	SQ3 Simple to utilize.
Task Characteristics ²⁹ (TAC)	TAC1 Provides services in real-time.
	TAC2 Provides safe services.
	TAC3 Provides all-encompassing services.
Technology Characteristics ¹⁴ (TC)	TC1 Complete my work from any location at any time.
	TC2 Provide information that is appropriate for me.
	TC3 Can distribute work-related information.

	TC4	Approach teachers, employees or students that are difficult to reach.
Task Technology Fit ¹⁹ (TTF)	T*TF1	Sufficient for me to finish my job's tasks.
	T*TF2	Assist me do my job's tasks.
	T*TF3	Perfect for my professional requirements.
Intention to Use EMIS ⁷ (IU)	IU1	I anticipate using EMIS in the future.
	IU2	In the future, I intend to use EMIS.
	IU3	Intended to utilize it now.
Quality Management System (QMS)	QMS1	Manage data and reanalyze
	QMS2	Reset all data in the system
	QMS3	Reassess any missed data

Source: Prepared by the authors.

First, apply SPSS (Statistical Package for Social Sciences) to check the validity of the existing data's accuracy. The characteristics of the data will then be summarized and reported using descriptive analysis. Following that, the researcher will perform regression while evaluating the study's assumptions using partial least square structural equation modelling (PLS-SEM). PLS-SEM will be used in the analytic process to verify the direct relationship between the observed variable and the latent variable. The relationships between latent variables will be demonstrated using the Evaluation of the Structural Model.

Conclusion

The proposed model will be used in this study to examine IT managers' intentions to use EMIS. It is based on D&M and TTF to investigate IT managers' willingness to use EMIS. TTF model now includes three external variables. System Quality, Information Quality, and Intention to Use are the external variables. Systems Quality will be used to clarify IT managers' perceptions of system features when deciding whether or not to use EMIS. Furthermore, Information Quality will be used to explain IT managers' evaluations of EMIS outputs. Finally, Intention to use will be used to assess IT managers' willingness to engage in a specific behaviour. However, to support the model of factors influencing IT managers' intention to use EMIS and provide an overview of the future study, the researcher proposed measurements that can do so. The model is anticipated to be utilized as a reference in connected research investigations as a result. Additionally, it is anticipated that the findings of this study will be put to use to assist IT managers, educational leaders, decision-makers, and policy analyzers, which view investing in science and technology as one of the primary factors boosting competitiveness and productivity. Finally, other psychological factors related to personality may limit or enhance one's ability to think.

These factors, such as Subjective Norms, Trust, and Subjective Norms, should be investigated further in the future.

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