

EVALUATING THE IMPACT OF MIS IN UNIVERSITIES: EMPLOYEE PERSPECTIVES

^aMANSOR ALOHALI

Department of Computer Science and Information, College of Science, Majmaah University, Al-Majmaah, 11952, Saudi Arabia : "m.alohali@mu.edu.sa

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Abstract: MIS has become an integral part of the success of universities. This research evaluates the impact of MIS on employees in universities. The findings of the study explain that system quality, information quality, and service quality have positive impact on usage and satisfaction; that satisfaction has positive impact on net benefits. Moreover, the study examines the factors that impact users' continuous use of MIS, thus improving and extending the impact of MIS on universities. This study provides insights into how employees in universities perceived MIS and its impact on the work progress in universities. Second, the study highlights the role of continuous improvement of MIS.

Keywords: IS success model, management information systems, universities, DeLone and McLean.

1 Introduction

A number of studies have suggested that management information systems (MIS) play a vital role in the daily operations of most universities (Sayaf et al., 2021). They indicated that MIS contributes to teaching and administration in universities (Wanyoike and Nzuki, 2022). Furthermore, they improve the effectiveness and efficiency of universities as they help in the distribution, execution, and monitoring of tasks (Ergado et al., 2021). Universities could also use MIS to improve communications (Moghaddasi et al., 2022), evaluate the performance of their employees (Al Shobaki et al., 2018) and gather valuable data about the daily operations of the universities which could be analyzed to help management better understand and solve complex issues in the operations of universities and help them in improving the work process and reducing the cost of operations (Rouhani and Mehri, 2018). MIS in universities could be utilized to monitor attendance, assess records, reporting, allocation of staff and recourses, budget management, and communication (Patimo, 2021).

Consequently, MIS has become an integral part of the success of universities (bin Masrek, 2007). The information system literature defines MIS as "a set of interrelated components that collect, process, store, and distribute information to support decision making and control in an organization." (Laudon and Laudon, 2014). The unique structure and culture of universities make it especially challenging to effectively and efficiently manage universities (Petrova et al., 2019). For instance, the fact that universities are non-profit organizations with different but well-defined roles for its employee (Stephens and Young, 2020). In addition to the different academic departments in the university, each with its unique characteristics and needs (Wu and Deng, 2022). Also, faculty members have professional autonomy, and some play several key roles in universities, teaching, research, community service and administrative duties (Griffiths, 2017). Such characteristics make managing a university challenging; thus, many universities are heavily reliant on MIS for its success (El-Ebiary et al., 2018).

Despite the fact that MIS is used widely in universities' daily operations, there is limited empirical evidence of the actual impact of MIS on the effectiveness and efficiency of employees in universities. Therefore, this research will aim to evaluate and understand the impact of MIS on employees in universities. The objective of this research is to investigate how MIS impacts the daily operations of an academic university. The study will build on Delone and McLean IS success model to better understand how MIS impact Universities (DeLone and McLean, 2003). Furthermore, the study will examine the success of MIS based on employees' perceptions and will examine it from a longer-term post-implementation perspective (5 years). In doing so, the

study will be able to examine the longer-term impact of MIS on universities.

Furthermore, at long term-post-implementation, MIS user direct interaction and actual experience with the system (Saeed et al., 2010) provide an opportunity to study the actual impact of MIS on universities. The study will aim to answer the research question: how do users of MIS evaluate its impact on the effectiveness and efficiency of universities? The study will have both practical and theoretical contributions: first, the study will help in improving our understanding of the impact of MIS on universities. Second, the study will offer some suggestions on how universities can further utilize MIS. Third, the study will offer recommendations for how universities could use current programs and technologies to improve MIS and help universities achieve their objectives. The study will contribute to theory-building by examining and extending the Delone and McLean's IS success model.

The remainder of this paper is structured as follows. The next section will review literature and theories that examine the impact of MIS on organizations. The methodology of the study is described in the third section. The fourth section presents the findings of the study. The fifth section is the discussion and implications of the study. The paper concludes with a conclusion and limitations section.

2 Literature review

MIS can improve the communications between employees in an organization (Chiang et al., 2018), which makes it possible for upper management to conduct the daily operations in the organizations (Owoc and Marciniak, 2013). A number of studies have shown that MIS can lead to significant improvement and reduction of bottlenecks in the management process (Munirat et al., 2014). furthermore, studies have shown that MIS could provide the necessary data for effective decision making by upper management (Wanyoike and Nzuki, 2022). As this study examined the impact of MIS on the university from an employee perspective, it is first necessary to review how IS literature understands the word impact of MIS. Several IS scholars have explained that impact could be explained as an improvement in the quality of service provided, outcome, or financial improvement (Abu-Shanab and Saleh, 2014), (Tabassum et al., 2019). There are a number of IS research theories that examine the impact of MIS in organizations (Guillemette and Paré, 2012) and individuals (Compeau et al., 1999). For instance, the theory of Critical success factors explain how to measure the success of MIS implementation by focusing on how MIS impacts the areas that make an organization successful (Thi and Swierczek, 2010). In addition, the Fit-Viability theory examines how factors such as task, technology, and organizations can impact fit and viability and impact the performance of an organization (Liang et al., 2007). Similarly, the Task technology fit theory explains how task and technology characteristics influence fit, which in turn impacts performance and utilization of technology (Goodhue and Thompson, 1995). Other theories, such as the Technology Threat Avoidance Theory, examine how IS could impact the work environment in organizations (Liang et al., 2007). Likewise, the Technology dominance theory explored how decision-makers could become reliant on technology or resist it based on task complexity, cognitive fit, and experience (Sutton and Arnold, 1998). When exploring how users' perception impact MIS, researchers have examined how attitudes toward IT, subject norm, perceived control, ease of use, and perceived compatibility could impact IS adoption, usage, and success (Teo, 2009). This research aims to build on and extend Delone and McLean's IS success model. Their model identified factors responsible for information systems and their impact on individuals and organizations (DeLone and McLean, 2003). They propose that System quality, information quality, and service quality are a significant contributor to MIS usage and user satisfaction with information systems (DeLone and McLean, 2003). Moreover, they identified that MIS usage and user satisfaction influence each other, and they both influence individual impact, which in turn influences organizational impact (DeLone and

McLean, 2003). This study will utilize Delone and McLean's IS success model to better understand how MIS impacts the effectiveness, efficiency, and work progress of a university. The study will also aim to extend this model by examining the success of MIS from employee perspectives and the longer-term factors that impact the long-term success of MIS. The following sub-section further discusses the constructs in Delone and McLean's IS success model and how they relate MIS success.

2.1 Relation between System quality and system Use and User Satisfaction

Previous researchers have indicated that technical factors impact user intention to use the system and their satisfaction with the system (Pitt et al., 1995), (Flack, 2016). For instance, the quality of the content and information provided in terms of their usefulness to the users' (Al-Fraihat et al., 2020), (Alksasbeh et al., 2019), ease of understanding (Alshurideh et al., 2019), reliability (Alkhwaja et al., 2022) and the ability of the user to get to the system on time to find the information needed (Jonathan et al., 2022), (Naveed et al., 2021). Furthermore, system quality has been found to have a similar impact as it positively affects users' Intention to use and their satisfaction (Al-Okaily et al., 2021), (Salam and Farooq, 2020). IS researchers have described system quality as ease of use, ease of learning, and user-friendly interface, (Kanaan et al., 2023). In addition, it is indicated that service quality, such as the functionality of the system, reliability, and responsiveness will have a positive impact on users' Intention to use the system and their satisfaction with the system (Al-Okaily et al., 2021), (Alshurideh et al., 2019). Hence it is hypothesized that the information, system and service quality provided by MIS will have a positive effect on users' Intention to use as well as their satisfaction with the system.

H1: the quality of the information provided in MIS positively affects users' Intention to use the system.

H2: the quality of the information provided in MIS positively affects users' satisfaction.

H3: MIS quality positively affects users' Intention to use the system.

H4: MIS quality positively affects users' satisfaction.

H5: the quality of service in MIS positively affects users' Intention to use the system.

H6: the quality of service in MIS positively affects users' satisfaction.

2.2 Relation between Intention to use and net benefits

Users' Intention to use a system has been discussed by many researchers, e.g. (Kalinic and Marinkovic, 2016), (Liu et al., 2019). It refers to the actual use of the system in terms of frequency, duration and utilizing the full capability of the system (Makkizadeh and Afshani, 2019). Delone and McLean's success model have identified users' Intention to use the system as one of the most important factors that affect net benefits (DeLone and McLean, 2003). Hence it is hypothesized that:

H7: users' Intention to use MIS positively affects net benefits.

2.3 User satisfaction and net benefits

Many studies have reported that users' satisfaction increases their morale and productivity e.g., (Tam and Oliveira, 2016). Some researchers consider user satisfaction as a measure of success for IS implementation. Factors such as system usefulness to the employee, and systems increasing the productivity of employees is considered by some researchers as a sign of users' satisfaction (Seta et al., 2018). If users perceive the system to be useful and help them to finish their tasks better and more quickly, then they are more likely to be satisfied with the system, which in turn has a positive impact on their performance and the overall performance of organizations. Therefore, it is hypothesized that:

H8: users' satisfaction with MIS positively affect net benefits.

2.4 Net benefits

As MIS represents a significant investment for the overall budget of organizations (Joia et al., 2014), it is essential to understand the factors that impact outcome of such investment. It is suggested by researchers that net benefits of system usage mean an increase in the quality of work and an improvement in job performance for individuals (Nygyieva et al., 2021). In this study, net benefits can be understood as the degree to which MIS has helped employee complete task quickly, improved communications, improved knowledge acquisitions and reduced errors (Gates et al., 2019).



Figure 1. The Delone and McleanIS success model

3 Research Methodology

The research strategy adopted in this study is mixed research methodology. The study was conducted at a university that uses a system called the Administrative Communication System (ACS) which allows management and all employees to send mandate, tasks, and requests and view the progress of their requests. The use of the system is mandatory for all employees, as all mandates, task assignments, and requests are made through the system. The study used mixed research methodology. The questionnaires for this study (abstract 1) were derived from the available literature that discusses The Delone and McleanIS success model e.g., (DeLone and McLean, 2003), (Aldholay et al., 2018), (Seta et al., 2018). (abstract 1). The questionnaires used the Likert scale of 1 to 5 to allow participants to express their perception and opinion of the system, where 1 represented strongly disagree and 5 represented strongly agree. In addition, at the end of the questionnaire, the participants were asked to write their opinion and any additional comments about the system. which will further help the researchers understand participants' perception of MIS and help in the theoretical development of this research.

Following the development of the instrument, the researchers started the data collection process by distributing questionnaires. The questionnaires were distributed online and were analyzed using statistics with multivariate techniques of Structural Equation Modeling (SEM)

4 Data analysis and results

4.1 Model Fit Evaluation

In order to test the research hypothesis, structural equation modelling was performed through AMOS. The researchers investigated the model fitness primarily. This analysis is examined to identify the extent of multi-variables to predict net benefits. The hypothesized framework is evaluated through the model fit output. With a 95% confidence interval, the output revealed CFI >.09, CMNI < 5.0, and RMSEA < .08, demonstrating that this model was good to fit for a hypothetical model in figure 2 (Grace, 2022). Three types of indices have been verified absolute fit indices (CFI = 1.00, NFI = 1.00, TLI = 1.04, Chi-square = .102, p = .950), parsimony indices (CMIN/DF = .051), and increment fit indices (RMSEA = .00). The indices in this study provide an indication that observed data, latent and constructs variables, matrix, and hypothetical model data are fitted very well (Ockey and Choi, 2015).

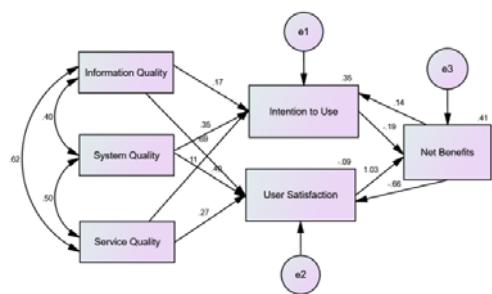


Figure 2. Structural Equation Modelling to test the Study Hypotheses

Figure 2 indicates the effect of information quality, system quality, and service quality on net benefits through Intention to use and user satisfaction. Service quality is significantly covariate with system quality ($r = .50$) and information quality (.62). The regression weights revealed that information quality ($\beta = .169$, $p = .087$, service quality ($\beta = .111$, $p = .248$, and net benefits ($\beta = .138$, $p = .192$) insignificantly affected the Intention to use ($p > .05$). While user satisfaction is found as the greater variable that affects net benefits ($\beta = 1.027$, CR, 8.473, $p = .001$). As the structural equation modelling analysis demonstrated that there is a huge effect of user satisfaction on net benefits. It is stated that user satisfaction explained 102.7% of the variance in net benefits. On the other hand, information quality, system quality, and service quality contributed with the variance of 68.9%, 40.5% and 26.95 respectively. On contrary, the Intention to use reversible affects net benefits ($\beta = -.189$, CR, 18.98, $p = .058$).

Table 1. Structure Equation Results

Effects of	Direct	Indirect	Total
Information Quality → Intention to use	.169	.055	
Information Quality → User Satisfaction	.689	-.262	
Information Quality → Net Benefits		.396	.396
System Quality → Intention to use	.111	.021	
System Quality → User Satisfaction	.269	-.099	
System Quality → Net Benefits		.150	.150
Service Quality → Intention to use	.347	.028	
Service Quality → User Satisfaction	.405	-.135	
Service Quality → Net Benefits		.205	.205
Intention to use → Net Benefits	-.189	.078	-.111
User Satisfaction → Net Benefits	1.027	-.424	.603
Net Benefits → Intention to use	.138	-.057	.081
Net Benefits → User Satisfaction	-.660	.273	-.387

Table 1 demonstrates the results to test all the research hypotheses. Hypothesis 1 theorized that information provided in MIS positively affects users' Intention to use the system. H1 is rejected as the result revealed an insignificant direct and indirect effect of information quality on users' Intention to use the system. H2 is confirmed as there is a significant positive effect of the quality of the information provided in MIS on user satisfaction ($p = .000$). Hypotheses 3 and 4, MIS quality positively affects users' intention and user satisfaction to use the

system users' are accepted based on p values $< .001$. It is evident that the hypothesis that state quality of service in MIS positively affects users' Intention to use the system is found insignificant ($p = .248$), including weak and negative effects. On the other hand, the effect of the quality of service in MIS on user satisfaction is positively significant ($p = .038$). Hypothesis 7 that theorized user intention to use MIS positively affects net benefits is found significant but negative. On the basis of negative beta estimates and effects hypothesis 7 is rejected. The structural equation modelling results revealed that user satisfaction with MIS positively affects the net benefits with huge and significant effects values. The hypothetical situation regarding the effect of net benefits on the Intention to use the system is rejected based on negative and insignificant results. Further, net benefits can negatively but significantly affect user satisfaction ($p = 0.019$). Conclusively, it can be stated that user satisfaction is the strong predictor of net benefits in comparison to other variables direct effect of 1.027 and total effect of .603. Table 2 provide a summary of the hypotheses testing results.

Table 2: Summary of Hypotheses Testing

No	Hypotheses Description	p	effect	Decision
H1	Information Quality → Intention to use	.087	Positive	Rejected
H2	Information Quality → User Satisfaction	.000	Positive	Accepted
H3	System Quality → Intention to use	.000	Positive	Accepted
H4	System Quality → User Satisfaction	.000	Positive	Accepted
H5	Service Quality → Intention to use	.248	Positive	Rejected
H6	Service Quality → User Satisfaction	.038	Positive	Accepted
H7	Intention to use → Net Benefits	.058	Negative	Rejected
H8	User Satisfaction → Net Benefits	.000	Positive	Accepted
H9	Net Benefits → Intention to use	.192	Positive	Rejected
H10	Net Benefits → User Satisfaction	.019	Negative	Rejected

4.2 Analysis of the open ending questions

Analysis of the open ending question was conducted using thematic analysis using NVivo software. Thematic analysis is often used by researchers to classify and categorize common keywords in order to find relevant themes in the text (Vaismoradi et al., 2016). During this process, the researchers looked for the recurrence of themes within respondents' answers (Vaismoradi et al., 2016). The researchers followed a representational way of coding where text fragments are assigned a theme (Vaismoradi et al., 2016). Participants' answers to these questions were read line by line and coded to themes. This mode of analysis allows for the researcher's interpretations of the text and helps in capturing manifest content as well as the latent meaning of a text (Bradley et al., 2007). The following sub-section present the findings of the open-ended questions.

4.3 Findings of open-ended questions

The results of the thematic analysis of the open-ended question show that participants are generally happy with the impact MIS had on their productivity and efficiency. The analysis highlighted two main themes, system quality and the need for improvement. The following subsection discusses the findings of the thematic analysis of the open-ended question.

4.3.1 System quality

A number of respondents to the study discussed their frustration regarding the quality of the system. Common sub-themes are the issues related to the reliability and speed of the system. For

instance, one participant explained his frustration with the speed of the system "the system is too slow, sometimes I open the system, then I do something else and wait for the system to open, once the system opens, I forget why I opened it in the first place."

Themes related to system reliability also appeared in the data. Users discussed that the system could be unreliable at times; one said, "it seems like the system always fails at crucial moments." This indicates that some users perceive the system to be unreliable and the system has poor quality.

4.3.2 Continuous improvement

A common theme related to the need for system improvement occurred in this study. Generally, the participant of the study has a positive view regarding the system. However, the participants of the study believed that the system could be improved upon. For instance, participants discussed the need for a better search function in the system. one participant said, "sometimes it is difficult to find information; I think that this can be easily fixed". Another participant discussed the need for an instant chat function to discuss tasks with co-workers. She remarked, "most times I find people using WhatsApp or emails to contact me and ask for clarification. So, I have to check the system, WhatsApp and my emails to get things done. It should all be in one system". Despite such comments regarding the system, it appears that users perceive the system to be useful and generally are happy with it. Though, there are features and functions that users require to help them be more productive and efficient.

5 Discussion

The purpose of this study was to investigate the impact of MIS on the daily operations of an academic university from an employee perspective.

To this end, a mixed research study was conducted to understand the impact of MIS on the educational process from the employee perspective. The study builds on Delone and McLean IS success model to better understand how MIS impacts Universities. Furthermore, the study examined the success of MIS based on users' perceptions and examined it from a longer-term post-implementation perspective (5 years). The study confirmed some aspects of the model and explained that system quality, information quality, and service quality impact users' satisfaction. Further, the study explained that users' satisfaction impact net benefits. The findings of this study supported 5 of the 10 hypotheses it proposed. Moreover, the findings of this study suggest that The Delone and McleanIS success model can be further extended to examine the factors that impact users' continuous use of MIS thus improving and extending the impact of MIS on universities (Figure 3). The study suggests that Delone and McleanIS success model should be viewed as a cycle where organizations need to regularly improve MIS in order to continue the success of MIS and its positive impact on organizations. Further, the study indicated that continuous system improvement is an important factor for the long-term success of MIS.

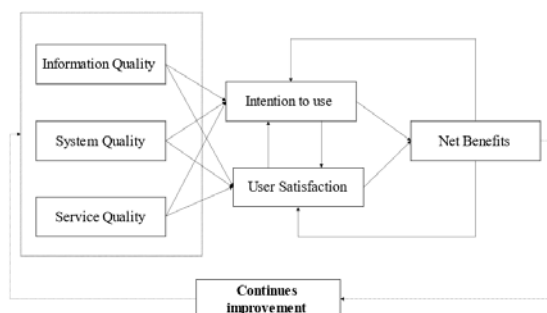


Figure 3. Extension of The Delone and Mclean IS success model: The continuous success model.

The findings of the study suggest that information, system, and service quality have positive effects on users' satisfaction which

is consistent with previous researchers (DeLone and McLean, 2003), (Shahzad et al., 2021) while it found that system quality has positive effects on users' actual use. This indicates that the higher system qualities in terms of ease of use, speed, and reliability the more likely that users' will use the system and the higher user satisfaction. For information and service quality, the results of the study do not show a significant relationship with actual use. This could be because the use of the system is mandatory in the university; hence, employees believed that they had to use the system even though they did not perceive information and service quality to be good. This is in line with some researchers who have determined that factors affecting satisfaction may not affect usage in mandatory settings (Çelik and Ayaz, 2022)

Furthermore, the study identified a significant relationship between users' satisfaction and net benefits. This suggests that the higher the users' satisfaction with the system, the higher the net benefits will be. These findings are in line with the previous researchers, which indicated that users' satisfaction has a positive impact on system net benefits to the organization, such as an increase in employee productivity and efficiency e.g. (Karoba et al., 2020), (Lee and Jeon, 2020). With regard to system actual usage, the results do not show that it significantly affects net benefits. This again may be explained by the fact that the usage of the system was mandatory. Previous researchers have suggested that mandatory use of the system may not impact net benefits as employees have little choice in using the system. Therefore, in mandatory settings, the employee may use the system but experience low morale, which in turn could impact net benefits (Hwang et al., 2016)

In addition, the findings of the open ended questions of the study propose that continued improvement could have a positive effect on the system, information, and service quality as well as a positive effect on user satisfaction and net benefits. While most users believed that the system had a positive impact on the organization by improving the productivity and efficiency of employees. Some users' believe that the system needs improvement to further increase the positive impact it is having on the university. Such as improvements in the speed, and reliability of the system as well as improvement in the functions and features of the system, is likely to increase the productivity and efficiency of employees and will improve university outcomes. Therefore, it is recommended that management should focus on regularly checking and improving the system quality to improve users' satisfaction and net benefits.

6 Contributions

The study will have both practical and theoretical contributions: first, the study contribute to theory by improving our understanding of the impact of MIS on employees on universities. Second, the study contribute to theory-building by examining and extending the Delone and McLean's IS success model and introducing the concept of continuous improvement to achieve continued success to the Delone and McLean's IS success model. In terms of practical contributions, the study offers some suggestions on how universities can further utilize MIS. As well as offer recommendations for how universities could use current programs and technologies to improve MIS and help universities achieve their objectives.

7 Implications

The study confirms Delone and McleanIS success model and further extends it by highlighting the importance of continuous updates of MIS on net benefit. The findings of the study indicated that universities employees recognized some key benefits of MIS on the organization, such as the openness, accessibility, and quick spread of information across the various department in universities. In addition, it helped improve management control of the daily operation and provided better data for decision-makers which reflected positively on university performance.

Subsequently, the proposed extinction of The Delone and McleanIS success model (figure 3), implies that universities can further benefit from exiting MIS by continuous improvement on

MIS as well as user involvement and engagement to extend the benefits of MIS. It is recommended that the university technically upgrade the system to improve its speed, usability, and reliability of the system. Moreover, other features could also be implemented, such as instant chat to improve communication between employees and to help employees understand unclear orders from management. Moreover, the system would benefit from including a better search and retrieval function. Likewise, it would help employees finish that task on time if the system could be directly linked to their personal calendars such as google calendar or outlook calendar.

8 Conclusion

This research provided an examination of the impact of MIS in universities from an employee perspective. The study explained that information, system, and service quality have positive effects on users' satisfaction and users' satisfaction has a positive effect on net benefits.

The study provided great insight on the factors that impact system net benefits on organizations. However, the findings have some limitations and should be taken with some caution. First, the sample was selected from employees of a small public university. Hence the findings of the study should not be generalized to reflect the impact of systems on all universities. Future researchers can address these limitations by widening the sample size and examining the impact of MIS on multiple universities. Furthermore, the study examined the impact of a specific type of system. Thus, the findings of the study should not be generalized to reflect the impact of all types of systems on all universities. Future research should examine the impact of different types of systems on the performance of universities such as e-learning systems. Finally, the study examined the impact of MIS on universities from employee's perspective. Future researchers can further extend our understanding of the impact of MIS on universities by examining the impact of MIS on universities from managers' perspectives as well as examining the impact of MIS on universities' performance by comparing the productivity of employees before and after MIS implementation.

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