



**NIAS-MUKALLA WEB BASED SYSTEMS SUCCESS
MEASUREMENT AND STUDENTS SATISFACTION EVALUATION
BASED ON SECURITY FACTOR OF SYSTEMS QUALITY
ENGINEERING THEORY (ISO 25010) AND OTHER FACTORS**

Ibrahim Eskandar Ibrahim Fadhel

*School of Human Development and Techno-communication,
University Malaysia Perlis, Malaysia
Department of Computer and Information Systems, National
Institute of Administrative Science (NIAS), Yemen
E-mail: ibrahimeskandarfadhel@gmail.com*

Syed Zulkarnain Bin Syed Idrus

*School of Human Development and Techno-communication,
University Malaysia Perlis, Malaysia
E-mail: syzul@yahoo.com*

Mohd Syukri Yeoh Abdullah

*Institute of Malay World & Civilization (ATMA), The National
University of Malaysia, Malaysia
E-mail: syukri@ukm.edu.my*

Amani Ali Elmetwaly Ali Ibrahim

*School of Human Development and Techno-communication,
University Malaysia Perlis, Malaysia
E-mail: amani.ali@unimap.edu.my*

Mazni Omar

*College of Science and Arts, School of Computing University
Utara Malaysia, Malaysia
E-mail: omar.mazni@gmail.com*

Shatina Saad

*Faculty of Business and Management, University Teknologi Mara.
Selangor, Malaysia & Center of Technology and Supply Chain
Management, University Teknologi Mara, Malaysia.
E-mail: shatsaad@gmail.com*

Submission: 1/17/2019

Revision: 2/27/2019

Accept: 3/13/2019

ABSTRACT

Latest studies reported that systems success measure suffers from mix of results and limited models that help in success measurement and evaluation.



Because of systems models are domain specific and context related, there is a dire need for taking the measure to other perspectives like using related external factors such as management support or using software engineering theories such as ISO 25010. This study aimed to move the measure from a business perspective to other perspectives. This study investigated NIAS-Mukalla student satisfaction based on security, management support, computer anxiety and usefulness. All these independent variables found to be positively and significantly affected the satisfaction of the users. NIAS-Mukalla students were satisfied with the web-based systems.

Keywords: Satisfaction; Security; Management Support; Computer Anxiety; Usefulness; Web-Based Systems; NIAS; Information systems and Success

1. INTRODUCTION

Rate of failure of software's and information system (IS) are high among the world and there is a dire need for engineering a systems quality framework works as a success measure tool in the context and domain of the study. Success measure of systems and developing a framework helps in solving the problem of higher rate of systems failure. Success measure is also, an important part of systems development to improve systems performance.

However, studies showed a lack of research done on systems success in world universities Arab region universities and Yemeni universities and limited adequate frameworks. Systems especially the web-based faces high rate of failure in world and Arab region, it was observed that many funded system projects failed, it was also, noted that in Yemen systems were completed and implemented without evaluation and success measuring (FADHEL et al., 2018).

Large numbers of dissatisfying systems users, organizations and higher rate of systems failure is still a problem. In targeting this failure, measure of systems success categorized as a solution to increase the rate of success in future systems initiatives. Success measure of systems is an important part of software's engineering and information systems engineering to improve systems performance.

However, it was observed that many funded system projects failed, it was also, noted that in Yemen systems were completed and implemented without success measuring. Data analysis and interpretation for the web-based information systems

(WIS) success framework related to higher education can be taken as a latest phenomenon.

Moreover, this is also, responsive and effective for assessing security, usefulness, computer anxiety and management support aspects to explain satisfaction. The present study is enthusiastic to outline the need for highlighting student perspective where exists dearth of research in this regard and dire need for engineering framework that works as a tool for organizations to success measure of their systems.

Though, prior scholarly work has outlined significant role and importance of designing quality university WIS framework from the aspect of WIS developers not from the side of users. Henceforth, the present study aims to strive for highlighting the perception of users (students) (FADHEL et al., 2018).

1.1. Background

The success measure and evolution of software's (SWs) and information systems (ISs) is rooted in many interdisciplinary researches such as information technology, computer science, systems engineering, accounting, business administration, organization behavior and operational research (FADHEL, 2015). This is the reason why systems are considered as an applied research domain because it is a domain that is made up of other research domains (FADHEL, 2015).

Filed of software's and ISs in general facing a challenge in defining and measuring success. Right now, this filed becomes more complex so, it must have performed the success assessment of those systems. Defining the success of systems based on the context is a prime importance. Software's and ISs demands and challenges that accrues every day, continue to relegate success measurement to a back seat (DELONE; MCLEAN, 2016).

The researchers facing a challenge when they assessment systems success. Focusing on the customers as the users to evaluate the systems success is the key of today's customer-focused era (DELONE; MCLEAN, 2016).

Success of web-based systems of the universities is completely dependent on the users' satisfaction (ALMAHAMID; TWEIQAT; ALMANASEER, 2016; BAIRAMZADEH; BOLHARI, 2010; HASAN; ABUELRUB, 2008). Systems nowadays



turned to be web-based information system (WIS) this is because the development in the information and communication technology.

The gateway for information, products, and services in organizations is websites. As a result, it is important for organizations to have WIS that live up to the expectations of the target users so as to achieve the intended goals (TOKDEMIR, 2009).

However, the evaluation and success measure of systems particularly the ones who are web compatible is necessary to help ensure that it fulfil user requirements and the core purpose that it was developed to serve. This also helps critically to resolve any problems and suggests advancements that are necessary to enhance system website effectiveness, quality and weaknesses (FADHEL et al., 2018; MEHRATE, 2010; SUWAWI; DARWIYANTO; ROCHMANI, 2015).

Systems are a domain based on empirical research with analytical tools and conceptual frameworks to establish vital concepts in the domain (FADHEL, 2015; IRANI; GUNASEKARAN; LOVE, 2006). This interdisciplinary dimension of systems has been it to impact many aspects of the society such as healthcare, businesses, education and others.

Its development defined by various stages which is known as system cycle and it involves the creation and application of system development (ISD) (FADHEL, 2015). Yemen is regarded as one of the poorest countries in the Arab world and it is ranked 160 on the human development index (HDI), which places among low human development countries (NATIONS, 2015).

Therefore, to the best knowledge of the researcher, there are lack of studies of systems success evaluation in general and in website success measure conducted in the Arab context. No research took a place in Yemen (BAHESHWAN, 2016). Software quality factors that have a potential impact on the system's success and that should be considered in very large ISs (KHADDAJ; HORGAN, 2004).

Success assessment, making the decision by stakeholders and the intelligence of business are depending on many factors, the information quality IQ and other quality factors such as system quality (SQ) are the core of systems. Future researcher is highly needed to make better understanding of how quality significance to systems (DELONE; MCLEAN, 2016).

1.2. Glance about culture of arab region

Rouibah (2009) cited that researchers claimed that Arab or Western cultural and managerial differences determine the systems success factors, as every culture has its own mindset of dealing with these success factors (MCCOY; GALLETTA; KING, 2007). Technologically developed countries are focused by researchers due to the extensive utilization of systems and availability of satisfied users (DELONE; MCLEAN, 1992; LEE; KIM GUPTA, 2009) but technologically less equipped countries are not attractive for this purpose (ROUIBAH, 2009).

Rouibah (2009) said based on (MCCOY et al., 2007) the divergence in culture, system and various types of users are reason of variation in expected consequences of success factors of systems.

Users of systems in Arab region such as Kuwait, Jordan and Yemen are having significant managerial support in order to gain success of systems (FADHEL, 2015; AL-ADAILEH, 2009; ROUIBAH; HAMDY; AL-ENEZI, 2009). Leading and important values & ideologies of a culture define social behavior of a region and academic psychology has widely accepted it. The study of human societies, cultures and their development has been examined by various researchers to discover cultural differences in different countries (FRIGUI; ROUIBAH; MARZOCCHI, 2013).

In spite of this, (STRAUB et al., 2002) found that there is difficulty in defining and measuring the concept of culture in different regions so that researchers did not pay any specific attention towards studying cross-cultural concept as they are necessary in systems areas.

Further, Rouibah (2009) argued that technologically developed nations such as North America and Europe, has been selected for the research focused on information technology as compare to Arab world; which is lagging in technological advancements; though Arab culture and its significance has been focused by different researcher overtime cited in (FRIGUI; ROUIBAH; MARZOCCHI, 2013).

Many researchers have investigated Arab culture and its significance. As mentioned in the article of (FRIGUI et al., 2013; DIK, 2011; OBEIDAT et al., 2012) that (HOFSTEDE, 1991) found different characteristics of Arab culture such as large power distance, relatively strong uncertainty avoidance; high collectivism and moderate

Masculinity/Femininity after examining several Arab countries referred as “Arab Group”.

Cited in Obeidat et al., (2012) that is (WEIR, 1993) found in his studies that religious difference, social and political life of Arab region derive its culture and keeps it unique in practicing management style as compare to American, European and Japanese culture. Arabs belongs to high-context culture and have substantial close personal relationships and information networks among friends, colleagues and clients cited in (DIK, 2011).

Arabs, as polychronic people, are committed to people and relationships rather than to the job and can be more concerned with closely related persons like family, friends and close business associates. Arabs also tend to build lifespan relationships with their teachers, colleagues, clients and etc. and like to be in close proximity of one another (DIK, 2011).

Considering Arab region as one unit or need to study their culture separately still remains difficult to decide (OBEIDAT et al., 2012). A study has found different cultural difference within the same country and defiantly significant difference within Arab countries so that they need to be studied separately because with these differences it is not appropriate to generalize cultural values across the Arab world. However, there is different opinion found which as well emphasize that Arab culture can be treated as one unit (OBEIDAT et al., 2012).

Beliefs and attitudes are generally shared among Arabs which shows similarities in cross national and social class of this region. Geographical boundaries of Arab region start from Atlantic Edge of Africa to the north part of continent including Arabian Gulf, Sudan and Middle East. Due to these geographical boundaries, he claims that similarities in Arab Culture are found. So that, researcher considered Arab countries as one entity and identified as “Arab Culture” (OBEIDAT et al., 2012).

Researchers found it difficult to claim that Arab countries have similarities in culture because of its huge geographical area. Which primarily consist of 22 Arab countries including Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen. North Africa and Middle East are also considered as the part of Arab world due to its occupied area of 14 million

square kilometers which is quite larger than Europe 10.4 million square kilometers (DIK, 2011).

Arab world is considered and known as two geographical regions such as Eastern Arab and Western Arab, Eastern Arab countries include Yemen, Kuwait, Oman & etc. Western consist of African countries like Egypt, Sudan & etc. All Arab countries have same language, culture and religion as well as there are similarities in economic associations with few differences in wealth standards and history (DIK, 2011).

In comparison of Europe they have different languages, cultures, and historical background. Social relationships in Arab culture has its importance and it has priority of face to face conversation when it comes to the communication. Technological advancements have created new opportunities communicate which is different to their real identity. Adoption of new technology and changes in their priorities shows the involvement of Arabs in Social networking sites instead face to face communications (FRIGUI et al., 2013).

Furthermore, North America and Europe has taken more attention of researcher as compare to Arab region for the purpose of studying on systems (FRIGUI ET AL., 2013). Freedom of speech and democratic rights are given by Western culture so that individuals enjoy independence and take their own decisions without involvement of others. Western culture emphasizes to be analytical, level of thinking and being ethical in their life (FRIGUI et al., 2013).

1.3. Computer anxiety

The earlier frameworks failed to identify clearly the factors and sub-factors that lead to satisfaction upon using a new system such as computer anxiety (CHEOK & WONG, 2015). A very balanced aspect of satisfaction formulation by investigating computer anxiety (MALIK et al. 2016).

According to (ELIE-DIT-COSAQUE; PALLUD; KALIKA, 2011), cited that IT anxiety denotes to state of anxiousness towards IT usage. This in some literatures is also called as computer anxiety. however, to some scholars it is a little different whereby it denotes to apprehension feelings by an individual whilst using IT (THATCHER; PERREWE, 2002).



According to Elie-Dit-Cosaque et al., (2011) have outlined the factors that can be affected from IT anxiety which includes IT adoption, use related attitudes and actual use. Notably, studies and research aspirations can be tracked, deploying several theoretical 143 approaches from both, psychological related as well as information system concerned prospects on the topic.

For example, (PRAMATARI; THEOTOKIS, 2009), outlined anxiety as a negative antecedent of supermarket consumers' intentions to adopt product-related radio frequency identification (RFID) services.

Elie-Dit-Cosaque et al. (2011), asserted that more insight is needed as some scholars have distinguished computer anxiety from other contextual based anxieties such as communication-based anxieties. Hence, there are several people who do not feel anxiety about IT in general but experience such feelings when it comes to some specific applications (ELIE-DIT-COSAQUE et al., 2011).

On the grounds of Malik et al. (2016), IT anxiety is one of the important determinants of user satisfaction. This is since different customers come with different experiences and computer anxiety levels based on their anxiety in computer usage.

Lee, Choi and Kang, (2009) has outlined that online systems mainly describe these factors that can possibly rely on elements like literacy level of the user, past information technology (IT) experiences and age. The study found people from different age groups showing different levels of anxiety. In the views of (KANG; LEE, 2010), these factors also concluded similar results in their study.

Their study also, outlined that user adoption and online system use intentions can be influenced by such factors. to establish this discussion in the study, Canadian common measurement tool (CMT), Swedish customer satisfaction barometer model (SCSB), European customer satisfaction index (ECSI) indexes were used in the past studies cited in (MALIK et al., 2016).

In the views of Cheek and Wang (2015), computer related anxiety is a crucial, yet topic given limited empirical attention. When an individual experience fear or worries about using a system or technology, the satisfaction level is likely to go down. Barbeite and Weiss (2004), have asserted that anxiety is principally the form of emotional fear from possible negative outcomes. They are inversely related to each

other which means that, higher the anxiety, lower the user satisfaction (CHEOK; WONG, 2015; MALIK et al., 2016).

Computer Anxiety: It denotes to the feelings and expression of unpleasant effects. Situations whereby, technology use conclude in unpleasant experiences, charging individual emotional elements can be referred as technology or computer anxiety.

Such anxiety is common and often results from poor or below average experiences when interacting with internet or technology. Review of the literature has outlined computer anxiety to be significantly related with the level of satisfaction of an individual with online information systems.

1.4. Management support

Management support play a vital role in systems success and affecting the satisfaction and should be targeted in comprehensive studies (AL-MAMARY; SHAMSUDDIN; HAMID, 2014; FADHEL, 2015; WANG; SONG, 2017). Concerning the success and performance of information systems, organizational scholars have been highlighting the crucial role of management support. Studies have underlined that management support is one of the highly important components for ensuring IS success.

Accordingly, studies have pin pointed that for obtaining success of information systems, management support is essential. Keeping this in view, scholars in this domain have suggested different elaborations to the idea of management support. Some have defined it as time bound support from management related to some project or activity. On the contrary, some studies have explained and related it with top management (FADHEL, 2015).

Likewise, another definition forwarded in this regard related with the senior management and administrators contributing their time and effort to help facilitate audit arrangements and facilitate management issues. Studies suggest that support from management authorities can be viewed in several different prospects such as subordinate facilitation, employee help and support, taking managerial responsibility effectively etcetera (FADHEL, 2015).

Thus, management support can be in several forms and prospects. Not only that it involves delegation and exercise of authority for effective business functioning

but also caters to subordinate facilitation for effective accomplishment of assigned job tasks (FADHEL, 2015).

Management support in the prospect of information systems denotes to extent of support received during the IS implementation and its operational usage. some of the prominent management support features includes resource allocation, trouble shooting, knowledge management, system handling, support, and process management (AL-ADAILEH, 2009; ZAIED, 2012).

Management Support: The term denotes to the support, facilitation and recognition of the governing authorities in a certain system or organizational set up whereby, a system is being deployed. Support of management in this regard can be of notable help when it comes to student`s satisfaction with university e-platforms.

1.5. Perceived usefulness

Refers to (LIAW, 2008), the degree to which an individual believes that using a particular system would enhance his or her performance. Perceived usefulness (PU) can be notable when it comes to technology acceptance. The element defines individual attitudes and how people perceive them and to what measure they view them to be fruitful towards their work and performance prospects cited in (AL-AZAWEI; LUNDQVIST, 2015).

According to (MOHAMMADI, 2015) as he based on (HANAFIZADEH, et al., 2014) usefulness perceptions are the major factors that define as to what extent the users of an information system viewed as convenient in usage, innovative and effective. Especially in the current global technological advancements, individual acceptance and willingness towards using a system solely relies upon their perceptions of it being useful.

According to (LIÉBANA-CABANILLAS; MUNOZ-LEIVA; REJÓN-GUARDIA, 2013) usefulness perceptions are crucial for harnessing satisfaction when it comes to technology. The concept refers to subjective likelihood of a user towards using a specific system towards fostering performance in the job.

The explanation is more inclined towards organizational context highlighting the implementation of system that could facilitate customers` in a much more convenient manner at work. Systems and processes that can help facilitate the access of

customers in a much easier manner can be robust in enhancing perceptions regarding usefulness and satisfaction of the technology (LIÉBANA-CABANILLAS et al., 2013).

Liébana-Cabanillas et al. (2013) on the explanation of (HUANG et al., 2013) and (ZHOU; LU, 2011) highlighted that several researches have outlined that perceived usefulness can mark a considerable impact on user satisfaction. Based on the work of (DAVIS, 1989; OFORI et al., 2016) have asserted that perceived usefulness is the idea of the extent of the practicality of a system for an individual towards bring effectiveness and efficiency in his/her performance.

The element of perceived usefulness is one of the most promising elements that can influence technology acceptance and relies solely on consumers' expectations from the technology to improve their work and life (OFORI et al., 2016).

Ofori, Larbi-Siaw, Fianu, Gladjah and Boateng (2016), said the expectation model that outlines and determines information system's consistency also defines the system performance and the possible expectations of end users. This also highlights as to when they are likely to gain satisfaction which in turn often explains the use of IS (OFORI et al., 2016).

1.6. Security

When it comes to websites, their technical features may include security, content reliability, and accuracy. As per definition, (ASTANI; ELHINDI, 2008) suggests that website security relates with authentication for user and its potential in this regard. In detail, security refers to the capability of a portal to provide secure access virtual environment to users whereby, they can use data related to a given product or service without any scam (MBIWA, 2014).

According to (LUDIN; CHENG, 2014; SHIRATUDDIN, 2015) also, denotes to degree to which system protects the information and data in such a manner that users can access it as per the level of authorization. Security effect satisfaction of users significantly (CHIANG; HUANG; YANG, 2011).

Security refers to the degree to which a product or system protects information and data so that persons or other products or systems have the degree of data access appropriate to their types and levels of authorization (SHIRATUDDIN, 2015).

1.7. Hypothesis

- H₁- Computer Anxiety significantly and positively effect satisfaction.
- H₂- Management support significantly and positively effect satisfaction.
- H₃- Usefulness significantly and positively effect satisfaction.
- H₄- Security significantly and positively effect satisfaction.

For the instrument questions, researchers can refer to the appendix

2. METHOD

In this study quantitative approach has been used (FADHEL, 2015). Survey questioner from one part has been distrusted using census method to the student of the universities in Mukalla. The translation of the survey to Arabic was reviewed by authorized translation company. Data analysis done by using Smart PLS 3. PLS is the most appropriate tool to be used as result analyses and predicating results in the researches fields of software engineering and information systems.

Unit of analysis for this research is the individual end users, students of level one who used the system. The undergraduate diploma in Yemen consist of 2 Levels. End users of level 1 who used the NIAS-Mukalla web-based system will be selected to answer the questioner.

The unit of analysis in this research involves the main users of national institute of administrative science Mukalla NIAS-Mukalla that are the students who are in level one. Researcher used census method to get answers for the questionnaire to meet the research aims. Determining the sample size is important to estimate the characteristics of the population (FADHEL, 2015).

The sample size is larger than thirty and less than five hundred is proper and adequate for analysis, preferably ten times or greater than the number of the indicators in the study as cited in (FADHEL, 2015).

3. ANALYSIS AND FINDINGS

Out of 310 students, 230 were responded to the online survey and filled the questionnaire. A response rate of 74 percent. Moreover, appropriate sample size was obtained for the study as the rules of thumb that a sample size between 30 and 500 is appropriate for data analysis (preferably 10 times or more than that of number of variables involved in the study).



3.1. Hypothesis testing

Test results of construct reliability, factor loading and validity of the variables are excellent as shown in table 1.

To test the hypotheses suggested for this research as presented in table 2, a Pearson correlation analysis was performed to see the connection between the indicators. If the value of correlation is equal to 1.0, it indicates that there is perfect positive or negative relationship. If it is equal to zero it means that there is no relationship (AUGUSTIE, 2014).

The coefficient of correlation shows the direction and strength of linear association of variables in the study and the significance level of all coefficients is also given (SEKARAN; BOUGIE, 2016). As shown in table 2, positive sign with coefficient of correlation indicated that both variables move in same direction while negative sign designates the opposite direction of two variables (SEKARAN, 2003).

Table 1: Construct Reliability Factor Loading and Validity of the Variables.

Variables	No. items	Loadings	Cronbach's Alpha	Rho_A	CR	AVE
Computer Anxiety	4	0.78	0.780	0.785	0.858	0.603
		0.83				
		0.74				
		0.75				
Management Support	4	0.79	0.878	0.744	0.858	0.581
		0.75				
		0.62				
		0.58				
Usefulness	4	0.87	0.809	0.823	0.877	0.643
		0.82				
		0.85				
		0.64				
Security	5	0.70	0.819	0.827	0.874	0.583
		0.83				
		0.82				
		0.72				
		0.74				
Satisfaction	5	0.70	0.819	0.834	0.875	0.586
		0.69				
		0.92				
		0.73				
		0.80				

Source: The Researcher

Table 2: Hypothesis Testing Summary

H	B	T	P	Status
---	---	---	---	--------

H1	0.181	2.250	0.024	Support
H2	0.140	2.507	0.012	Support
H3	0.152	2.610	0.009	Support
H4	0.567	6.404	0.000	Support
Note: * $p < 0.05$, *** $p < 0.001$				

Source: The Researcher

The correlation of the variables of NIAS-Mukalla web-based system. It can be noted that there is correlation with positive sign between the NIAS-Mukalla web-based system indicators and all are accepted. For this study, multiple regressions were carried out to predict satisfaction based on computer anxiety, management support, usefulness and security. PLS procedure was performed to estimate the dependent indicator of the study framework. In addition, bootstrapping method used and generated five hundred bootstrap samples to apply path estimates significance test (FADHEL, 2015).

4. DISCUSSION AND IMPLICATIONS

The idea of this research is to determine what factors influence students' satisfaction of NIAS-Mukalla web-based system and to know whether students are satisfied or not. After measuring the four dimensions and satisfaction allowed researcher to understand the relationship between the 4 dimensions and satisfaction. The results of this study are positively related to students' satisfaction.

Computer anxiety is significantly and positively effect NIAS-Mukalla students' satisfaction. Management support found to be significantly impacted the satisfaction with a positive sign and this result is in line with the result of (FADHEL, 2015). On the other hand, usefulness and security found to be as a strong effector on the satisfaction with a positive sign.

4.1. The framework

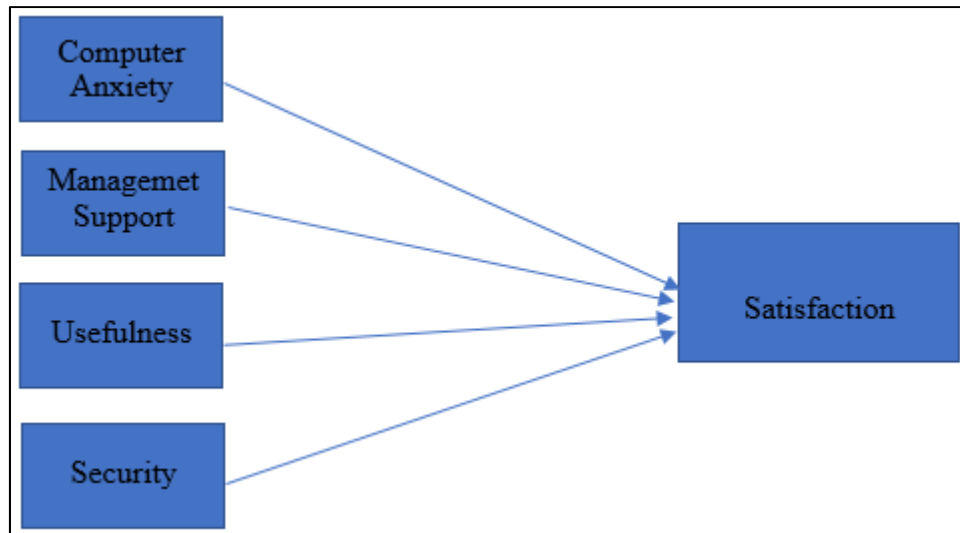


Figure 1: Framework of the Study
Source: The Researcher

5. CONCLUSION & FUTURE WORK

NIAS-Mukalla students are satisfied with the web-based system. NIAS-Mukalla student satisfaction effected positively and significantly by management support, computer anxiety, usefulness and security. The software engineering ISO 25010 factor (security) is a strong predictor of satisfaction. Also, the other external factors (management support and computer anxiety).

This study clear that systems success measure needs to be taken out of business studies frame. Using smart PLS for testing and analyzing the results of such studies in the domains of software engineering and information systems is highly recommended.

Information systems evolution and systems success measure need to be investigated from perspectives of software engineering & computer science and any other valid perspective that can add something new. There is fact tell us the results of a study can be applied in other (organization, domain, community, context and country) but not sure and necessary it is applicable.

Developers and system admins perspectives are not targeted yet in this field of research, researchers are calling to investigate these perspectives either quantitatively or qualitatively. Investigate the ISO 25010 features such as security, compatibility, portability and maintainability will lead to add new value and contribution to the field.

Systems success measurements are not well-known in the Arab and least developed countries. Regarding to the developed world the literature is full of studies

of commercially-systems and replication of well-known frameworks. It's clear that there is mix of results, limited of qualified frameworks since that most of the frameworks are in business systems, poor measurements, lack of theoretical frames, poor instruments, lack of agreement on the dependent variables and independent variables.

There is a dire need for some studies that goes beyond business perspective and business systems. Since that systems quality framework are domain context and with the paucity of frameworks, especially for some domains such as higher education, researchers are wanted to investigate these gaps.

Finally, for precise results, researchers are required to consult and get validation from experts regarding to their instruments that are going to be used. In the domains of information systems and software engineering (quality & testing) number of experts required to validate the instrument or the framework are 3 to 6 experts.

REFERENCES

- AL-AZAWEI, A.; LUNDQVIST, K. (2015) Learner Differences in Perceived Satisfaction of an Online Learning: An Extension to the Technology Acceptance Model in an Arabic Sample. **Electronic Journal of E-Learning**, v. 13, n. 5, p. 408–426.
- AL-MAMARY, Y. H.; SHAMSUDDIN, A.; HAMID, N. A. (2014) Key factors enhancing acceptance of management information systems in Yemeni companies. **Journal of Business and Management Research**, v. 5, p. 108–111.
- ALMAHAMID, S. M.; TWEIQAT, A. F.; ALMANASEER, M. S. (2016) University website quality characteristics and success: lecturers' perspective. **International Journal of Business Information Systems**, v. 22, n. 1, p. 41–61.
- ALVES, J. M.; WANGENHEIM, C.; LACERDA, T.; SAVARIS, A.; WANGENHEIM, A. (2015) Adequate software quality evaluation model v1. 0. **Instituto Nacional Para Convergência Digital-INCOD**, Tech. Rep.
- ASTANI, M.; ELHINDI, M. (2008) An empirical study of university websites. **Issues in Information Systems**, v. 9, n. 2, p. 460–465.
- AUGUSTIE, C. (2014) An analysis on factors influencing international online shopping: Indonesian perspective. **Universiti Utara Malaysia**.
- BAHESHWAN, F. (2016) Evaluation OF Information Systems in Yemen Based On User's' Perspective? Mukalla: **Hadhramout University**.
- BAIRAMZADEH, S.; BOLHARI, A. (2010) Investigating factors affecting students' satisfaction of university websites. In **Computer Science and Information Technology (ICCSIT), 2010 3rd IEEE International Conference on**, v. 1, p. 469–473, IEEE.

- BYRD, T. A.; THRASHER, E. H.; LANG, T.; DAVIDSON, N. W. (2006) A process-oriented perspective of IS success: Examining the impact of IS on operational cost. **Omega**, v. 34, n. 5, p. 448–460.
- CHEOK, M. L.; WONG, S. L. (2015) Predictors of e-learning satisfaction in teaching and learning for school teachers: A literature review. **International Journal of Instruction**, v. 8, n. 1, p. 75–90.
- CHIANG, L.; HUANG, C.-Y.; YANG, W.-C. (2011) The Effect of User's Satisfaction of web Security on Trust in eGovernment. **In the Proceedings of the 11th European Conference on EGovernment**: Faculty of Administration, University of Ljubljana, Ljubljana, Slovenia, p. 140.
- CHIN, J.; LIN, S.-C. (2016) A Behavioral Model of Managerial Perspectives Regarding Technology Acceptance in **Building Energy Management Systems. Sustainability**, v. 8, n. 7, p. 641.
- CHIU, P.-S.; CHAO, I.-C.; KAO, C.-C.; PU, Y.-H.; HUANG, Y.-M. (2016) Implementation and evaluation of mobile e-books in a cloud bookcase using the information system success model. **Library Hi Tech**, v. 34, n. 2, p. 207–223.
- CONSTANTIN, A. M. (2013) The antecedents of e-satisfaction and e-loyalty. **Timisoara Journal of Economics**, v. 5, n. 2, n. 18, p. 236–252.
- DAVIS, F. D. (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. **MIS Quarterly**, p. 319–340.
- DELONE, W. H.; MCLEAN, E. R. (1992) Information systems success: the quest for the dependent variable. **Information Systems Research**, v. 3, n. 1, p. 60–95.
- DELONE, W. H.; MCLEAN, E. R. (2016) Information Systems Success Measurement. *Foundations and Trends® in Information Systems*, v. 2, n. 1, p. 1–116.
- DIK, R. (2011) Arab management accounting systems under the influence of their culture. **Dortmund University**.
- ELIE-DIT-COSAQUE, C.; PALLUD, J.; KALIKA, M. (2011) The influence of individual, contextual, and social factors on perceived behavioral control of information technology: A field theory approach. **Journal of Management Information Systems**, v. 28, n. 3, p. 201–234.
- EPPLER, M. J.; ALGESHEIMER, R.; DIMPFEL, M. (2003) Quality Criteria of Content-Driven Websites and their Influence on Customer Satisfaction and Loyalty: an Empirical Test of an Information Quality Framework. In **IQ** (p. 108–120)
- FADHEL, I. E. I. (2015) An evaluation of information system success based on students' perspective: The case of Hadramout University. **Universiti Utara Malaysia**.
- FADHEL, I. E. I.; IDRUS, S. Z. S.; IBRAHIM, A. A. E. A.; OMAR, M. (2018) An integration between information systems engineering and software engineering theories towards engineering a novel framework of web-based systems success for institutions based on students' perceptions. In **Journal of Physics: Conference Series**, v. 1019, p. 12081) IOP Publishing.
- FADHEL, I. E. I.; IDRUS, S. Z. S.; IBRAHIM, A. A. E. A.; OMAR, M. B.; ALBZEIRAT, S. K.; BAHESHWAN, F. (2018) Measuring System Success in New Context By

Adapting DM 2003 Framework With The External Factor Management Support. In **Journal of Physics: Conference Series**, v. 1019, p. 12003) IOP Publishing.

FRIGUI, S.; ROUIBAH, K.; MARZOCCHI, G. L. (2013) Cross Cultural Comparison Between Arabic and Western Countries in Location-Based Social Networking Usage on Mobile Phones: The Case of Facebook. **Issues in Information Systems**, v. 14, n. 2, p. 109–118.

HANAFIZADEH, P.; BEHBOUDI, M.; KOSHK SARAY, A. A.; TABAR, M. J. S. (2014) Mobile-banking adoption by Iranian bank clients. **Telematics and Informatics**, v. 31, n. 1, p. 62–78.

HASAN, L.; ABUEL RUB, E. (2008) Assessing the Quality of Web Sites. **INFOCOMP Journal of Computer Science**, v. 7, n. 4, p. 11–20.

HOFSTEDE, G. (1991) **Cultures and organizations: software of the mind** London. UK: McGraw-Hill.

HUANG, C.-C.; WANG, Y.-M.; WU, T.-W.; WANG, P.-A. (2013) An empirical analysis of the antecedents and performance consequences of using the moodle platform. **International Journal of Information and Education Technology**, v. 3, n. 2, p. 217.

IRANI, Z.; GUNASEKARAN, A.; LOVE, P. E. D. (2006) Quantitative and qualitative approaches to information systems evaluation. **European Journal of Operational Research**, v. 173, n. 3, p. 951-956.

<https://doi.org/http://dx.doi.org/10.1016/j.ejor.2005.06.001>

JEON, M. M. (2009) Impact of perceived website service quality on customer e-loyalty on a lodging website. **Iowa State University**.

KANG, Y. S.; LEE, H. (2010) Understanding the role of an IT artifact in online service continuance: An extended perspective of user satisfaction. **Computers in Human Behavior**, v. 26, n. 3, p. 353–364.

KHADDAJ, S.; HORGAN, G. (2004) The evaluation of software quality factors in very large information systems. **Electronic Journal of Information Systems Evaluation**, v. 7, n. 1, p. 43–48.

KIRAN, K.; DILJIT, S. (2011) Antecedents of customer loyalty: Does service quality suffice? **Malaysian Journal of Library & Information Science**, v. 16, n. 2, p. 95–113.

LEE, H.; CHOI, S. Y.; KANG, Y. S. (2009) Formation of e-satisfaction and repurchase intention: Moderating roles of computer self-efficacy and computer anxiety. **Expert Systems with Applications**, v. 36, n. 4, p. 7848–7859.

LEE, S.-Y. T.; KIM, H.-W.; GUPTA, S. (2009) Measuring open source software success. **Omega**, v. 37, n. 2, p. 426–438.

LIAW, S.-S. (2008) Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system. **Computers & Education**, v. 51, n. 2, p. 864–873.

LIAW, S.-S.; HUANG, H.-M. (2013) Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments. **Computers & Education**, v. 60, n. 1, p. 14–24.

- LIÉBANA-CABANILLAS, F.; MUNOZ-LEIVA, F.; REJÓN-GUARDIA, F. (2013) The determinants of satisfaction with e-banking. **Industrial Management & Data Systems**, v. 113, n. 5, p. 750–767.
- LIU, I.-F.; CHEN, M. C.; SUN, Y. S.; WIBLE, D.; KUO, C.-H. (2010) Extending the TAM model to explore the factors that affect Intention to Use an Online Learning Community. **Computers & Education**, v. 54, n. 2, p. 600–610.
- LUDIN, I. H. B. H.; CHENG, B. L. (2014) Factors influencing customer satisfaction and e-loyalty: online shopping environment among the young adults. **Management Dynamics in the Knowledge Economy**, v. 2, n. 3, p. 462.
- LWOGA, E. T. (2014) Critical success factors for adoption of web-based learning management systems in Tanzania. **International Journal of Education and Development Using Information and Communication Technology**, v. 10, n. 1, p. 4.
- MALIK, B. H.; SHUQIN, C.; MASTOI, A. G.; GUL, N.; GUL, H. (2016) Evaluating Citizen e-Satisfaction from e-Government Services: A Case of Pakistan. **European Scientific Journal, ESJ**, v. 12, n. 5.
- MBIWA, P. N. (2014) Evaluating the Quality of Management Information Systems: A case of SACCOs in Nairobi, Kenya. **University of Nairobi**.
- MCCOY, S.; GALLETTA, D. F.; KING, W. R. (2007) Applying TAM across cultures: the need for caution. **European Journal of Information Systems**, v. 16, n. 1, p. 81–90. <https://doi.org/10.1057/palgrave.ejis.3000659>
- MEBRATE, T. (2010) A framework for evaluating academic website's quality from students' perspective. **TU Delft, Delft University of Technology**.
- AL-ADAILEH, R. M. (2009) An evaluation of information systems success: A user perspective-The case of Jordan telecom group. **European Journal of Scientific Research**, v. 37, n. 2, p. 226–239.
- MOHAMMADI, H. (2015) Investigating users' perspectives on e-learning: an integration of TAM and IS success model. **Computers in Human Behavior**, n. 45, p. 359–374.
- NATIONS, U. (2015) Briefing note for countries on the 2015 Human Development Report **Yemen**.
- OBEIDAT, B.; SHANNAK, R.; MASA'DEH, R.; AL-JARRAH, I. (2012) Toward better understanding for Arabian culture: Implications based on Hofstede's cultural model. **European Journal of Social Sciences**, v. 28, n. 4, p. 512–522.
- OFORI, K. S.; LARBI-SIAW, O.; FIANU, E.; GLADJAH, R. E.; BOATENG, E. O. Y. (2016) Factors influencing the continuance use of mobile social media: The effect of privacy concerns. **Journal of Cyber Security and Mobility**, v. 4, n. 3, p. 105–124.
- PRAMATARI, K.; THEOTOKIS, A. (2009) Consumer acceptance of RFID-enabled services: a model of multiple attitudes, perceived system characteristics and individual traits. **European Journal of Information Systems**, v. 18, n. 6, p. 541–552.
- ROUIBAH, K.; HAMDY, H. I.; AL-ENEZI, M. Z. (2009) Effect of management support, training, and user involvement on system usage and satisfaction in Kuwait. **Industrial Management & Data Systems**, v. 109, n. 3, p. 338–356.

- SAADÉ, R. G.; KIRA, D. (2009) Computer anxiety in e-learning: The effect of computer self-efficacy. **Journal of Information Technology Education**, v. 8.
- SEKARAN, U. (2003) **Research methods for business: A skill building approach**. John Wiley & Sons.
- SEKARAN, U.; BOUGIE, R. J. (2016) **Research methods for business: A skill building approach**. John Wiley & Sons.
- SHIRATUDDIN, N. (2015) Evaluation of e-Book applications using ISO 25010. In **Technology Management and Emerging Technologies (ISTMET), 2015 International Symposium** on (p. 114–118) IEEE.
- STRAUB, D.; LOCH, K.; EVARISTO, R.; KARAHANNA, E.; SRITE, M. (2002) Toward a theory-based measurement of culture. **Human Factors in Information Systems**, v. 10, n. 1, p. 61–65.
- SUWAWI, D. D. J.; DARWIYANTO, E.; ROCHMANI, M. (2015) Evaluation of academic website using ISO/IEC 9126. In **Information and Communication Technology (ICoICT), 2015 3rd International Conference on** (p. 222–227) IEEE.
- THATCHER, J. B.; PERREWE, P. L. (2002) An empirical examination of individual traits as antecedents to computer anxiety and computer self-efficacy. **MIS Quarterly**, p. 381–396.
- TOKDEMIR, G. (2009) An Assessment Model for Web-Based Information System Effectiveness. **MIDDLE EAST TECHNICAL UNIVERSITY**.
- VALVI, A. C.; WEST, D. C. (2013) E-loyalty is not all about trust, price also matters: extending expectation-confirmation theory in bookselling websites. **Journal of Electronic Commerce Research**, v. 14, n. 1, p. 99.
- WANG; SONG, J. (2017) The relation of perceived benefits and organizational supports to user satisfaction with building information model (BIM) **Computers in Human Behavior**, n. 68, p. 493–500.
- WEBB, H. W.; WEBB, L. A. (2004) SiteQual: an integrated measure of Web site quality. **Journal of Enterprise Information Management**, v. 17, n. 6, p. 430–440.
- WEIR, D. T. H. (1993) Management in the Arab world. In **the First Arab Management Conference**. University of Bradford Management Centre (p. 604–623.) UK.
- WOLFINBARGER, M.; GILLY, M. C. (2003) eTailQ: dimensionalizing, measuring and predictingetail quality. **Journal of Retailing**, v. 79, n. 3, p. 183–198.
- ZAIED, A. N. H. (2012) An integrated success model for evaluating information system in public sectors. **Journal of Emerging Trends in Computing and Information Sciences**, v. 3, n. 6, p. 814–825.
- ZHOU, T.; LU, Y. (2011) Examining mobile instant messaging user loyalty from the perspectives of network externalities and flow experience. **Computers in Human Behavior**, v. 27, n. 2, p. 883–889.

Appendix

The factor Anxiety adapted from (LIAW; HUANG, 2013; MALIK et al., 2016; SAADÉ; KIRA, 2009)



I'm not feeling bad when using my university web system.

لا يجعلنا استخدام موقع نظام معلومات معهدي اشعر بسوء

I'm not feeling anxiety when using my university web system.

لا اشعر بالرغبة عند استخدام موقع نظام معلومات معهدي

I'm not feeling uncomfortable when using my university web system.

لا اشعر بعدم الارتياح عند استخدام موقع نظام معلومات معهدي

I'm not feeling nervous when using my university web system.

لا اشعر بالترفة عند استخدام موقع نظام معلومات جامعتي يجعلنا اشعر

The factor Perceived Management Support adapted from (FADHEL, 2015; ROUBAH et al., 2009; ZAIED, 2012)

Management support discusses problems regarding the university web system and provides all necessary resources to improve it.

الدعم الفني يناقشون المشاكل المتعلقة بموقع نظام معلومات الجامعة ويقدمون النصائح والحلول لتفادي المشاكل والتحسين الى الأفضل

Management support encourages using the university web system.

الدعم الفني لموقع نظام معلومات الجامعة يشجعون استخدام النظام

Management support frequently mentions the various problems, matters related to university web system.

الدعم الفني يقدم الدعم لي في كثير من الأحيان ولكن من المشكلات المتعلقة بموقع نظام معلومات الجامعة

Management support much interested in university web system usage rate.

الدعم الفني يهتم كثيرا لمعدل استخدام موقع نظام معلومات الجامعة من قبل الطلاب

The factor usefulness adapted from (BYRD; THRASHER; LANG; DAVIDSON, 2006; CHIN; LIN, 2016; LIU; CHEN; SUN; WIBLE; KUO, 2010; LWOGA, 2014; MOHAMMADI, 2015)

Using my university web system improves my performance.

استخدامي لموقع نظام معلومات جامعتي حسن من ادائي

Using my university web system is useful.

استخدامي لموقع نظام معلومات جامعتي مفيد بالنسبة لي

Using my university web system would enhance my effectiveness.

استخدامي لموقع نظام معلومات جامعتي حسن من فعاليتي

My university web system is efficient.

موقع نظام معلومات جامعتي فعال

The factor Perceived Security adapted from (ALVES et al., 2015; JEON, 2009; MALIK; SHUQIN,; MASTOI; GUL; GUL, 2016; WEBB; WEBB, 2004; WOLFINBARGER; GILLY, 2003; ZAID, 2012; ZEHIR, 2014)

I believe my university web system is secure.

انا اعتقد ان موقع نظام معلومات جامعتي آمن

Overall, I trust my university web system.

بشكل عام انا اثق في موقع نظام معلومات جامعتي

My university web system has adequate security features that make you feel secure while using.

موقع نظام معلومات جامعتي يحتوي مميزات امنية نشعرنا بالأمان اثناء الاستخدام

I believe that the information offered by my university on the university web system is sincere and honest.

اعتقد ان المعلومات التي تقدمها جامعتي عبر موقع نظام المعلومات صادقة ونزيهة

The output information of my university web system is secure.

مخرجات موقع نظام معلومات جامعتي امنة

The factor Satisfaction adapted from These questions adapted from (AL-AZAWEI; LUNDQVIST, 2015; CHIU; CHAO; KAO; PU; HUANG, 2016; CONSTANTIN, 2013; EPPLER; ALGESHEIMER; DIMPFEL, 2003; FADHEL, 2015; JEON, 2009; KIRAN; DILJIT, 2011; LIAW; HUANG, 2013; MOHAMMADI, 2015)

My university web system is of high quality

موقع نظام معلومات جامعتي يتمتع بجودة عالية

My university web system has met my expectations

موقع نظام معلومات جامعتي وافق توقعاتي

My interaction with my university web system is very satisfying

تفاعلي مع موقع نظام معلومات جامعتي مرضي جدا

Overall, I am satisfied by using my university web system

بشكل عام راضي عن استخدامي لموقع نظام معلومات جامعتي

Overall, I'm happy with my university web system

بشكل عام انا سعيد بموقع نظام معلومات جامعتي