An Integration between Information Systems Engineering and Software Engineering Theories towards Engineering a Novel Instrument and Framework of Web-Based Systems Success: Hypothesis Testing

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Abstract. Systems and its success evaluation are an important prospect whereby, several studies can be traced, outlining its importance and vitality. However, there is a need to identify responsive specific factors to help better understand the systems determinants and its success evaluation. In the academia, systems are used to facilitate students, human resource, e-commerce activities any much more. Hence, examining the systems and evaluating as to what length it is successful is essential. This study aims to provide the results of the hypothesis testing. There have been 7 accepted hypothesis and 3 rejected hypotheses. Hypothesis results showed that ISO 25010 works better than TAM and DM Models in systems success measurement.

1. Introduction

Systems and software's are implemented by organizations to help facilitate employees in their work tasks, enhance usability, satisfy target audience and deliver superior quality products and services to the market. Hence, through evaluating the success of the systems, it helps to ensure that the tangible and intangible prospects of are all responsively achieved (Moh'd Al-adaileh, 2009; Mwangi, 2016; Petter et al., 2008).

Rate of failure of software's and information systems is 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 is measured of systems and developing a framework helps in solving the problem of higher rate of systems failure. Success is measured is also, an important part of systems development to improve system performance. However, studies showed a lack of research done on systems success in world universities Arab region's universities and Yemeni universities and limited adequate frameworks. Systems especially the web-based faces high rate of failure in the world and the 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 measuring success (Fadhel, Idrus, Ibrahim, Omar, Bahashwan, et al., 2018).

2. Literature Review

The higher numbers of dissatisfying systems users and fail of software's, information systems, mobile application and web-based systems in the World, Arab countries and in Yemen as large clear the way and make it necessary to conduct a comprehensive research and developing a framework that can help the organization and the world. Measure the success of web applications based on the satisfaction of the users is rather a recent and frequently neglected issue (Fadhel, Idrus, Ibrahim, Omar, Baheshwan, et al., 2018).

This study, which is the first study on the evaluation of information system website success conducted in Yemen universities has opened the path for other Yemeni researchers to conduct future researches on evaluation of information success system generally. Researchers call for further investigation for the framework in different context (Fadhel et al., 2018).

The studies in Arab in general are lacking and in the Yemeni context is almost non-existent. The researchers open the way for the Yemeni researchers to conduct studies in the information system websites success evaluation in Yemeni context. Researchers recommended investigating the effect of management support and computer anxiety towards satisfaction in other frameworks. It's highly recommended to engineer a framework that makes integration between the theories of software engineering and information systems such as ISO 20510 and DM 2003 (Fadhel et al., 2018).

Moh'd Al-Adaileh (2009) cited based on CHAOS report which suggests that there are eight thousand three hundred eighty information system applications are under development present. A successful information system for any projects is the one that supports in completing the project with the allotted time and allocated budget. Sadly, according to the report, more than 60 percent of the projects fail in this aspect whereby they require to handle projects in a responsive manner and nearly 52 percent fail to complete within the allotted time and funds. Additionally, 32 percent of the projects lacking responsive information systems have failed and hence ended up in cancellation.

According to Dominguez (2009) project success compared to 1994 success of projects is better however, when compared to 2006 they are a little worse. The author further confirmed that CHAOS report is an important measure for IT industry as a whole and for information systems in particular. According to Shane Hastie (2015) studies have outlined that small-scale projects have much higher probability for success compare to the larger ones as shown the table 2.1 (Shane Hastie, 2015). The findings have outlined that there are still gaps pertaining to the achievement of successful outcomes when it comes to software development. As summarized in table 2.2, highlighting the five-year project results with the revived definition of success factors i-e financials and timeliness (Shane Hastie, 2015).

As per Stockdale and Standing (2006) and Fadhel (2015) the need for engineering interpretive approaches for systems (information system and software's) assessment have increased since the late 1980s dealing with systems assessment as a technical issue would lead to meaningless results as it requires the consideration of numerous social and organizational domains. Henceforth, strengthening of the systems requires to have an engineering interpretive approach. In this regard, there are numerous engineering approaches available that could possibly help us understand the assessment of the systems.

Gordon (2012) and Kanaracus (2008) reported that enterprises have boosted their investments and budget allocations on systems whereby, one of the major issues that they are facing is concerned with systems assessment cited in (Fadhel, 2015). Businesses are struggling to develop such systems that could effectively handle large scale applications and provide guidelines pertaining to its assessment and maintenance (Stockdale & Standing, 2006) cited in (Fadhel, 2015).

3. Problem & Objective

It has been asserted that information systems and software's are not capable of delivering what they are principally promised for. This is due to the lack of business value determination by the individual systems (DeLone & McLean, 2016; Irani & Love, 2001; Irani Zahir, 2000). In reality, thus lacking is due because of systems evaluation negligence, causing major issues when it comes to assessing the effectiveness and responsiveness of the systems. In the similar vein, management authorities are also responsible for this issue since they are the ones who should be focusing on conducting system evaluation for their respective organizations (DeLone & McLean, 2016; Irani & Love, 2001; Irani Zahir, 2000). This research aims to conduct an evaluation test for systems implemented in Mukalla universities.

4. Methodology

With an adapted and validated instrument this study will be conducted under quantitative research method approach best suited under the current circumstances. Hence the data from the students were collected by the questionnaire survey. Research which is categorized as a quantitative can be described as is a way of accurately assessing factors through operational explanations (Wahab, 2016) allude to (Cooper, Schindler & Sun 2006).

5. Hypothesis

H1, Perceived quality of information significantly affect students' satisfaction of university web-based system.

H2, Perceived quality of system significantly affect students' satisfaction of university web-based system.

H3, Perceived ease of use significantly affect students' satisfaction of university web-based system.

H4, Perceived reliability significantly affect students' satisfaction of university web-based system.

H5, Perceived usability significantly affect students' satisfaction of university web-based system.

H6, Perceived functionality significantly affect students' satisfaction of university web-based system.

H7, Perceived efficiency significantly affect students' satisfaction of university web-based system.

H8, Perceived security significantly affect students' satisfaction of university web-based system.

H9, Students' satisfaction significantly affect loyalty towards university web-based system.

H10, Students' satisfaction significantly affect benefit of university web-based system.

6. Results

Table 1. Hypothesis Testing Result

Hypothesis	β	P Values	Support or Not Support
H_3, Perceived Ease of Use significantly affect students' satisfaction of university web site system.	0.0369	0.5283	Not Supported
H_7, Perceived Efficiency significantly affect students' satisfaction of university web site system.	0.1989	0.0003	Supported
H_6, Perceived Functionality significantly affect students' satisfaction of university web site system.	0.1299	0.0053	Supported
H_1, Perceived Quality of Information significantly affect students' satisfaction of university web site system.	-0.0292	0.5502	Not Supported
H_4, Perceived Reliability significantly affect students' satisfaction of university web site system.	0.1097	0.0372	Supported

H_8, Perceived Security significantly affect students' satisfaction of university web site system.	0.3558	0	Supported
H_2, Perceived Quality of System significantly affect students' satisfaction of university web site system.	-0.0277	0.5879	Not Supported
H_5, Perceived Usability significantly affect students' satisfaction of university web site system.	0.1704	0.0087	Supported
H_{10}, Students' Satisfaction significantly affect benefit of university web site system.	0.6254	0	Supported
H_9, Students' Satisfaction significantly affect loyalty towards university web site system.	0.4706	0	Supported

From the table above hypothesis testing showed that DM factors (information quality and systems quality) had not had a significant effect so H_1 and H_2 are Rejected. Hypothesis number 3 related to TAM was also rejected because it does not have a statistically significant effect. The factors (functionality, reliability, efficiency, usability and security) related to ISO 25010 of Hypostasis H_4, H_5, H_6, H_7, H_8 were accepted. Also, H_9 and H_{10} were accepted because all these hypotheses (H_4, H_5, H_6, H_7, H_8, H_9 and H_{10}) have a statistically significant effect.

7. Conclusion

Hypothesis results approved that ISO 250101 is valid model that can be used for systems success measurement. Results showed a strong significant value for all factors for the ISO 25010 whereas DM and TAM factors showed non- significant values. Researchers are in an open call for using the ISO 25010 in the future studies.

8. References

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