



IBRAHIM'S TRIANGLE MODEL (SATISFACTION – BENEFIT – LOYALTY) FOR SYSTEMS SUCCESS MEASUREMENT

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ABSTRACT

Currently the high rate of systems fails, and challenges face the researchers' results in relegate systems success measure to the back seat. With the big debate among the researcher about what is the best measure of system's success this study come out with a new perspective. Current study makes united between the dependent variables that measures system's success, instead of depending on one variable researchers should depend on three variables together. With 344 users from three different universities Ibrahim's triangle model approved as a valid success measure. All the hypothesis accepted and there are strong positive relationships between the triangular factors.



Keywords: Systems Success; Satisfaction; Benefit; Loyalty

1. INTRODUCTION

High rate of system fails, limited of engineered frameworks that can help organization to know about the quality and benefits of their systems towards the users' satisfactions and loyalty, lack of theoretical grounding, lack of data collection and empirical data. In the Arab world knowledge about systems quality and success are lack in line with almost nonexistence studies in Yemen with the high numbers of systems dissatisfying users and organizations (FADHEL et al., 2018a; FADHEL et al., 2018b).

There is a hardness in engineered a framework that measures quality factors in the higher education domain. In parallel, relationship of users' satisfaction towards loyalty of users to the systems is ambiguous. Researches are invited to investigate these issues. It's highly recommended to engineer a framework that make integration between the theories of software engineering and information systems such as ISO 20510 and DM 2003. It's of most important to conduct a comprehensive study that develop a novel framework can solve all or parts of the issues mentioned above (FADHEL et al., 2018a; FADHEL et al., 2018b).

Systems users are expanding than ever before, this results in measurement complexity of systems success. Researchers nowadays facing challenge of sophistication of systems and their increasing number users, these phenomena can make lose sight of the key elements such as (relevance, accuracy, timeliness etc.) of quality that are playing a role in the success of systems. The measures of systems success are growing increasingly which lead to more complexity which need future studies (DELONE; MCLEAN, 2016).

ICT plays a vital role e in most of the organization. Considerable budgets have been spent on ICT to gain a sustainable competitive advantage. However, the measurement of systems success has perplexed many scholars and experts until now (GELDERMAN; KUSTERS, 2012). The prerequisites for measurement of systems success has been a topic of argument. Because of the impact of non-controllable variables, it seems to be impossible to directly compute or determine the contribution of systems to organizational performance or on overall organizational effectiveness (GELDERMAN; KUSTERS, 2012).



2. BACKGROUND

No mutually agreed definition available and/or any reliable measurement instruments (MARDIANA; TJAKRAATMADJA; APRIANINGSIH, 2015; MCNAB; LADD, 2014; MWANGI, 2016). Therefore, basic concerns are still prevailing pertaining to the explanation of quality criterion that could be potentially deployed to examine systems quality and effectiveness (MWANGI, 2016).

Research concerning to systems definitions and its success can be traced quite a few decades ago. Yet, still lack of conceptualization exists especially with regards to its definition and what can potentially cause system success. Though, notable scholars in the area have forwarded some notable explanations. Therein, scholars have also underlined need for urgent empirical attention for theory refinement and explanation of the concept (MARDIANA et al., 2015).

Accordingly, mixed results have also been reported in terms of what can explain systems. Majority of the concerns outlined in relation to systems and software's includes ineffective measurements, limited theoretical grounding, reliance on financial performance, lack of data collection, and limited knowledge on prediction (MARDIANA et al., 2015; DELONE; MCLEAN, 2016). While many studies have investigated the relationship between information systems (IS) characteristics and IS use, the results have been inconsistent (FORSGREN et al., 2016).

This severe mixed results and lack of empirical focus on systems outlines psychological, cognitive and passionate prospects which could intervene the relationship between the instruments and predictors of success (SNEAD, MAGAL, CHRISTENSEN; NDEDE-AMADI, 2015). Research in the relationship of information systems success (use, satisfaction and benefit) has produced mixed results (GOEKE; CROWNE; LAKER, 2018).

According to Stefanovic, et al. (2016) severe paucity of research can be tracked in terms of the success of systems deployed in public systems. Very limited studies have attempted to examine and outline notable factors that could potentially enhance the quality of information in system.

3. SUCCESS MEASURES

Past studies have not considered the nature of outcomes and what features they can possibly predict for businesses such as quality of information, decision

making and/or task completion etcetera. Accordingly, these approaches did not focus on prospects that may have influenced towards the success or failure of the systems. It can be evidently understood that it is important for scholars to highlight all types of factors that enhance or deplete the quality and effectiveness of the systems and thus would also affect user evaluation of the systems (SNEAD, et al., 2015).

It was pointed out that there is need for systems evaluation because of users' satisfaction (VAEZI et al., 2016). The most meaningful measures of success for managers, designers, and end users are the measures that capture the ultimate outcomes of a systems deployment and use (DELONE; MCLEAN, 2016). The satisfaction of the students and quality of the systems should be the most important thing and WIS should make students satisfy and meet their expectations (LEE; HUH; JONES, 2016). Up to date research of satisfaction and loyalty issues have dominated the literature, but the relationships between these two concepts are ambiguous (FADHEL et al., 2018b; KHRED, 2017; MOSAHAB; MAHAMAD; RAMAYAH, 2010).

There is a cognitive gap between users' expectations and what the users perceives. Users satisfaction is one of the most acute fields of research in the area of systems and software's (VAEZI et al., 2016). Today researchers agree on that users' satisfaction is more accessible measure than the other measures. Users' satisfaction can be adaptable specific contexts. There is an important gap between what users are expect and what is delivered as impacting systems success. The benefit that comes out from the studying of user' satisfaction gives the justification of the effort done in studying it. Furthermore, studying the user satisfaction providing better understand to importance of it to the organization and users (VAEZI et al., 2016).

The benefit construct measures the systems outcomes and is therefore inevitably compared to the systems purpose. For this reason, the benefit construct will be the most contextual dependent and varied of the six DeLone & McLean (D&M) framework success dimensions (DELONE; MCLEAN, 2016). Organizations can know the success of their systems in terms of user satisfaction and benefit (VAEZI et al., 2016). Alshibly (2015) confirmed that benefit must be defined within the context of system under study and within the frame of reference of those evaluate the system benefit.

In electronic systems loyalty is the important success factor. Loyalty in the domain of business has been studied extensively. However, very lack of studies and little is known about how loyalty towards non-commerce systems. The findings of studies that has been conducted in business domain are not necessarily applicable to another domain. Examining user loyalty in non-commerce systems is worthwhile. Different culture is playing a role in make different result so, future studies is needed to generalizability the non-commerce loyalty results (BERGER et al., 2017).

Results in some studies found that satisfaction negatively associated to loyalty, other study conducted by Zeithaml (2000) in medical field and the study of Afsar, Rehman, Qureshi and Shahjehan (2010) on the bank customers in Pakistan founds significant impact cited in (OSMAN; MOHAMAD; MOHAMAD, 2015).

3.1. Problem and Objective

Universities in Mukalla Republic of South Arabia (South Yemen) has been applied without measurement of their success. Organization stack-holders under pressure to justify the cost of systems implementation and to know if these systems are success and make the users satisfied (BAHESHWAN, 2016; KHRED, 2017).

The current noticed problem is that researcher and systems mangers still confused about the valid factor of systems success measurement. Some researcher agrees on satisfaction some others agree on benefit whereas other researchers said loyalty also can be a valid measure for systems success. With the currently high rate of systems fail in the world, mix results, contrariness in the results, lack of frameworks and ambiguous of the valid factor for determine systems success (FADHEL et al., 2018a; FADHEL et al., 2018b).

This study aims to come out with a new presiptive for systems success measurement by providing a new concept (Ibrahim's triangle model for systems success measurement that made a unity between the dependent variables of success measurement).

3.2. Research Methodology

Research can be of any of the types either qualitative, quantitative or mixed methods. The best method depends on the research objective and purpose of which research is going to be conducted, as each of them has their own merits and demerits (FADHEL, 2015). 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.

The study aims to comprehensively explain the phenomenon by utilized a quantitative method to achieve the maximum benefits and to measure the success of the universities systems based on student's perception. Smart PLS used to perform the results as its categorized as one of the best tools used for predicating the results of the models in fields of software engineering and information systems.

The PLS procedure was applied to estimate the variables of the research model. Following Fadhel (2015) PLS algorithm used three times for mutual influence between the model factors. Three model estimated: Model 1 testing the whole model with relation satisfaction towards benefit and loyalty. Model 2 testing the whole model with relation benefit towards satisfaction and loyalty. Model 3 testing the whole model with relation loyalty towards satisfaction and benefit.

4. HYPOTHESIS

Based on the literature review and the related past studies in the field that are listed in chapter two, these hypotheses are suggested:

4.1. STUDENTS' SATISFACTION

Satisfaction is a strong predictor of benefit and Loyalty (BERGER et al., 2017; RAMAYAH; AHMAD; HONG, 2012). These measures have helped to combine and further our knowledge and understanding on user satisfaction and consider it as a tool to measure success. Such measures have been enabling businesses to examine technological advancements and explore how user satisfaction can be signalled through this prospect. The measures are also very flexible which is why they can also be applied to general settings (VAEZI et al., 2016).

Denotes to the measure of satisfaction of students with the major system features a student interacts with. This primarily includes online support systems, reports and access, university online systems and online course data banks. Review of the literature has suggested that satisfaction of student with system and online portals can be of significant value towards system benefit and enhancing loyalty with these web systems.

- H_{1A}, Students' satisfaction has a positive relationship with the students' loyalty and significantly affect students' loyalty towards university web-based system.
- H_{1B}, Students' satisfaction has a positive relationship with the benefit and significantly affect benefit of university web-based system.

4.2. LOYALTY

In the views of Kiran and Diljit (2011) customer loyalty is the core objectives of every service business. Therein, loyalty is referred to behavioral expressions and intentions of customers that are mainly outlined from the repeated purchase of use of service (CRONON et al., 2000). Likewise, it is also expressed from the recommendations users give to others about a service or commodity. In particular, enterprises focused on profit making require a lot of loyal customers in order to keep the revenues intact. Concerning to non-profit organization, the number of users and rate of return is decided accordingly. In terms of academic institutions, higher scale research and financial strength is considered important (KIRAN; DILJIT, 2011).

A behavioural prospect that outlines acceptance and satisfaction with a certain product or service and leads towards repeat using, encourages referrals and recommendations. Loyal students in this context would be ones engaged in repeatedly using the online system of the university and actively recommending of the same to other students.

- H_{2A}, Students' loyalty has a positive relationship with the students' satisfaction and significantly affect students' satisfaction of university web-based system.
- H_{2B}, Students' loyalty has a positive relationship with the benefit and significantly affect benefit of university web-based system.

4.3. BENEFIT

Similarly, what are and can be the likely benefits of an information system is a major question and is likely to be answered in an effective manner to better understand and assess any information system (DELONE; MCLEAN, 2003; FADHEL, 2015). Talking about benefits, IS can be termed into four categories which are productivity, innovation, user satisfaction, and management control. (DELONE; MCLEAN, 2003; FADHEL, 2015).



Measuring the key benefits of any information system can help in obtaining several benefits such as decreasing cost, time efficiency, market expansion and other intangible aspects like environment friendly services etcetera (WU; WANG, 2006). One of the highly important prospects of systems success is the benefit measure which denotes to the influence and outcomes of the systems from individuals to economies and societies at large.

Scholars in the area have outlined a significant feature when it comes to systems and their benefits. The benefits refer to the extent to which a system is healthy and worthwhile for users, organizations, groups, business sectors and economies at large such as system facilitation in decision making, productivity enhancement, welfare or job effectiveness.

- H_{3A}, Benefit has a positive relationship with the students' loyalty and significantly affect students' loyalty towards university web-based system.
- H_{3B}, Benefit has a positive relationship with the students' satisfaction and significantly affect students' satisfaction of university web-based system.

5. RESULTS

The analyzing results showed that the factor loading of all items are perfect. The Cronbach's Alpha for the factors (Benefit = .859, Satisfaction = .802 and Loyalty = .965). The Composite Reliability for the factors (Benefit = .905, Satisfaction = .863 and Loyalty = .971). The rho_A for the factors (Benefit = .882, Satisfaction = .838 and Loyalty = .988). The Average Variance Extracted for the factors (Benefit = .705, Satisfaction = .564 and Loyalty = .825). Factor loading of all items are above .6 so all items are ok and related to its construct. All the results are perfect no violation issue. For more illustration see the table below.

Table 1: Analyzing Results

Factor	Items Loading	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted
Benefit	.7713	.859	.882	.905	.705
	.7653				
	.7964				
	.7162				
	.7511				
Satisfaction	.6681	.802	.838	.863	.564
	.7202				
	.9047				
	.7517				
	.7609				

Loyalty	.6816	.965	.988	.971	.825
	.6967				
	.7908				
	.7971				
	.7648				

Source: The Researcher

Hypothesis testing showed that all the hypothesis was accepted. All the Hypothesis has a significant value and positive relationship.

- H_{1A}, Students' satisfaction has a positive relationship with the students' loyalty and significantly affect students' loyalty towards university web-based system.

($\beta = .385$ T.Value = 6.456 P.Vlaue = 0.000) the hypothesis H_{1A} was fully accepted.

- H_{1B}, Students' satisfaction has a positive relationship with the benefit and significantly affect benefit of university web-based system.

($\beta = .552$ T.Value = 1.380 P.Vlaue = 0.000) the hypothesis H_{1B} was fully accepted.

- H_{2A}, Students' loyalty has a positive relationship with the students' satisfaction and significantly affect students' satisfaction of university web-based system.

($\beta = .467$ T.Value = 9.764 P.Vlaue = 0.000) the hypothesis H_{2A} was fully accepted.

- H_{2B}, Students' loyalty has a positive relationship with the benefit and significantly affect benefit of university web-based system.

($\beta = .368$ T.Value = 7.327 P.Vlaue = 0.000) the hypothesis H_{2B} was fully accepted.

- H_{3A}, Benefit has a positive relationship with the students' loyalty and significantly affect students' loyalty towards university web-based system.

($\beta = .111$ T.Value = 2.286 P.Vlaue = 0.023) the hypothesis H_{3A} was fully accepted.

- H_{3B}, Benefit has a positive relationship with the students' satisfaction and significantly affect students' satisfaction of university web-based system.

($\beta = .552$ T.Value = 11.380 P.Vlaue = 0.000) the hypothesis H_{3B} was fully accepted.

6. THE PROPOSED MODEL

In below the proposed model of this study. This model has been fully accepted and approved since all the hypothesis is accepted.

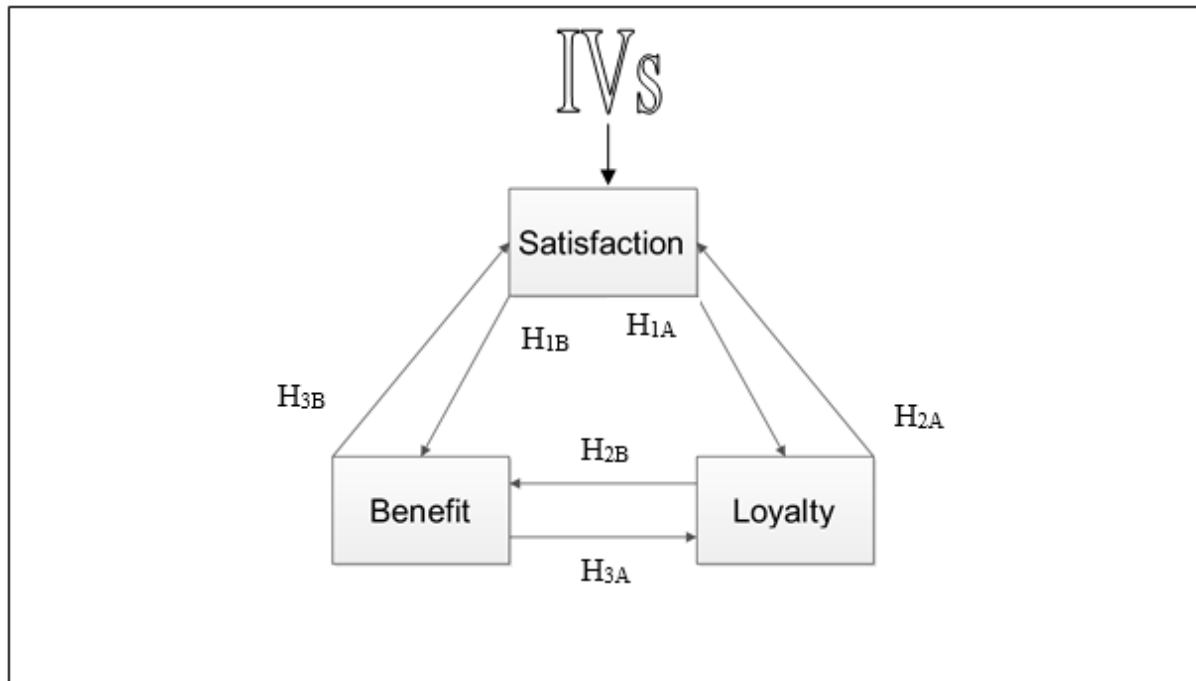


Figure 1: Ibrahim Triangle Model for Systems Success Measurement
Source: The Researcher

7. CONCLUSION

This study aims to make a new perspective by making a new way of systems success measurement and its success. To approve this model and its hypothesis researcher used adapted and validated instrument. Which gets validation from eight academic experts with least qualification a PhD. This instrument, piloted and pre-tested. all the necessary statistical analysis to make sure this instrument is valid, and it measure what it's attended to measure.

After confirmation based on all needed statistical analysis from the pilot results the main data collected from students of the universities to see their satisfaction with the universities web-based systems, are they benefited from these systems and are they loyal to these systems. Results showed that students are satisfied and gets benefit from the systems and have a degree of loyalty towards the systems so, web-based systems of universities (Al-ahgaff – Al-Anduls - Hadhramout) in Mukalla Republic of South Arabia (South Yemen) are success.

Testing the success based on three variables (independent variables: satisfaction, benefit and loyalty) approved and validated. There is a significant positive relationship between satisfaction towards benefit and loyalty. There is a significant positive relationship between benefit towards satisfaction and loyalty.

There is a significant positive relationship between loyalty towards satisfaction and benefit.

So, all these factors related to each other strongly with positive sign. This study provides a new contribution to the body of knowledge by the triangle measure of systems success. In future researchers called to apply this triangle instead of depends only on one dependent variable such as benefit of satisfaction. Researcher can use this model in their researches by linking their independent variables the variable satisfaction of Ibrahim's' triangle model.

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