A REVIEW OF INFORMATION SYSTEM SUCCESS MODELS

Anu Manchanda, Waljat College of Applied Scienes,Muscat; Dr. Saurabh Mukherjee, Banasthali Vidyapeeth University,Banasthali

Abstract

Measuring Information systems success has been the most arguable and important issue. Evaluation of success is not an easy task. Many models have been given by researchers in the past for the same purpose. The main objective of this paper is to study and review four main models of IS success –TAM, DeLone and McLean model, Updated DeLone and McLean model and Gable et. al model. Here we have compared these four models and discussed their relevance to the IS field.

Keywords: information systems, TAM**,** DeLone and McLean model, Updated DeLone and McLean model and Gable et. al model

Introduction

Information systems (IS) are systems that are used by organizations to store, filter and process data.(Wikipedia) Organizations are investing a huge amount of money on information technology(IT) to get benefits from these systems. Since large investments are made in IT, the organizations are interested in knowing the success of these systems. The organizations want to find out the impact of these systems on them as well as on individuals (Gable, Sedera, and Chan, 2003). The effectiveness of these system is depends upon many factors like organizational, environmental and people use them (Petter, DeLone, and McLean, 2008). It is not easy to evaluate the success of information systems so measuring IS success is of utmost importance. It is a multidimensional concept that can be evaluated at various levels. Therefore, many success models have been developed to assess the success of information systems. Hence it becomes important as well as necessary to review various models. The main purposes of this paper are-
a) To study the models in literature related to success measurement of IS
b) Provide overview of each success measurement model
c) Identify their relevance to IS success measurement

Information Systems Models

After an extensive review of publications four models were selected for the study here. Technology acceptance model (TAM), DeLone and McLean (D&M success model),

the updated D&M success model and The Gable et al. model. In this section a brief summary of all these models is presented-

Technology Acceptance Model

TAM model was developed by Davis to predict user acceptance of technology and was based on Theory of Reasoned Action (TRA). This model was subject of his dissertation. This model can predict the behavior. TAM indicates the relationship between external variables, perceived usefulness, perceived ease of use, attitude toward use and actual usage. TAM provides information on how the design choices influence user acceptance of technology. According to Davis, if the system appears useful to the users then they are more willing to use it.
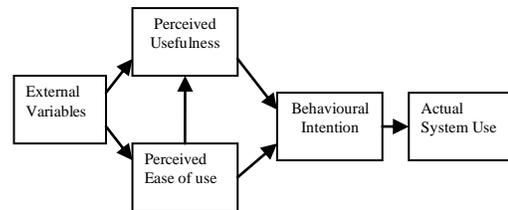

Figure 1: Technology acceptance Model

DeLone and McLean (D&M success model)

To measure the success of Information systems Delone and McLean reviewed the research published in period between 1981 to 1987. Based upon their research they identified six variables of IS success- system quality, information quality, use, user satisfaction, individual impact and organizational impact. These are interdependent variables. D&M model states that the amount of system use can affect the degree of user satisfaction (DeLone and McLean, 1992). No empirical validation of the model was proposed by them.
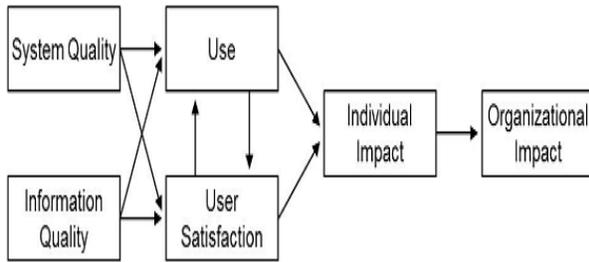
Figure 2: DeLone and McLean IS success Model (1992)

Updated DeLone and McLean (D&M success model)

After the publication of D & M model, Seddon studied this model and modified the variable use to Usefulness, Seddon also argued that this model is confusing because of the combination of process and variance in the same model. Researchers also suggested to include Service Quality construct also. Individual impact and organizational impact were replaced by Net Benefits.
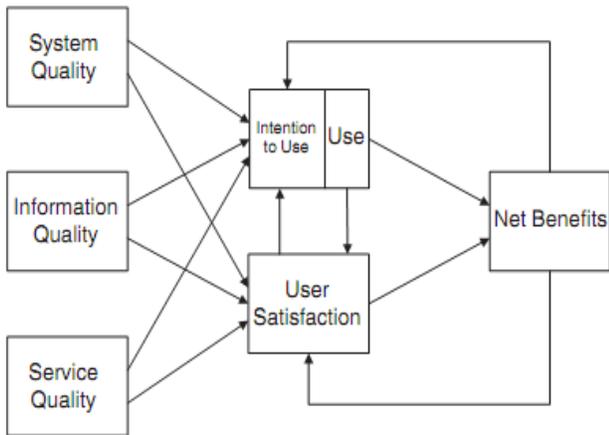

Figure 3: Updated DeLone and McLean IS success Model (2003)

Gable et al (IS impact) Model

Gable et al (2008) gave a model to measure IS success or impact. According to Gable et al. (2008) the IS-impact of an Information System (IS) is "a measure at a point in time, of the stream of net benefits from the IS, to date and anticipated, as perceived by all key-user groups". This model is based on D&M model and it overcomes many issues related to past researches.
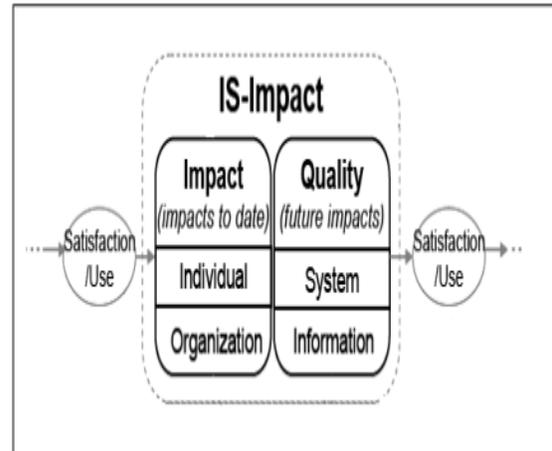

Figure 4: The IS-Impact Measurement. From Gable et al., (2008)

Overview of IS success models

Table 1: Overview of IS success models

	TAM	D&M	Updated D &M	Gable et al
Adapted from	Theory of Reasoned Action and the Theory of Planned Behavior	Communication research of Shannon and Weaver and The information influence theory of Mason	Extension of D&M model	Based on D & M model
Constructs used	(i) Perceived Usefulness	(i) System Quality	(i) System Quality	(i) Information Quality
		(ii) Information Quality	(ii) Information Quality	(ii) System quality

	(ii) Perceived ease of use (iii) Behavioral intention to use (iv)Usage	(iii) Use (iv) User Satisfaction (v) Individual Impact (vi) Organizational Impact	(iii) Service Quality (iv) Intention to Use/Use (v)User Satisfaction (vi)Net Benefits	(iii) Individual Impact (iv) Organization Impact
Applicability of the model	Information technology adoption	IS Success measurement	IS success measurement	IS impact measurement
Related Research and applications	(i) Taylor and Todd (1995) proposed the integrated model of TAM and TPB (named Combined TAM-TPB) (ii) Venkatesh and Davis (2000) proposed TAM2	Seddon model	Evaluation of e-learning courses Evaluate success of e-commerce systems	The Extended ERP Systems Success Measurement Model of (Ifinedo,2006)

Comparison of IS success models and their relevance to the field

Many models have been given by researchers in the past to measure and evaluate the success of Information systems. Each model has been studied and extended further. Each model has strengths and weakness associated with it. Here we are comparing the models and discussing their relevance to the field

The TAM model, developed by Davis (1989) is used to measure the acceptance, adoption and use of information technology. It is very popular and two constructs are used in TAM, perceived ease of use and perceived usefulness. Perceived usefulness is the degree to which an individual believes that using a particular information system or information technology would enhance his or her job. Perceived ease of use is the degree to which a person believes that using a particular information technology would be free of effort. TAM model has gained wide popularity among the researchers and is one of the most influential model. This is different from other models as it does not measure success but it is used to study and predict the user's intention to use Information technology.

DeLone and McLean model is widely accepted and most popular model of IS success measurement. It is process/casual model. It was criticized by researchers for including construct 'Use'. It was studied further and was extended ten years later. Many studies were carried out using this model. In their updated model they included 'Service Quality' and 'Use' was replaced by 'Intention to use/use'. 'Individual Impact and Organizational impact' were substituted by 'Net benefits'. Later Gable et al. introduced IS-impact model which is also based on D & M model. In this model they tried to resolve concerns of past IS success models. This model differs from other models in various ways. First, it is a measurement model and not a casual/process model like D&M model. Second, it does not have 'Use' construct. Third, overall success measure is satisfaction. Fourth, new measures were added to it reflect the IS context and organizational success. This model can be used to measure the complete view of the system and success using all the four dimensions.

Conclusion

The main objective of this paper is to review different IS success models. From the study of the literature, it is revealed that each model cannot be used in all practical situations. The scope of each model is limited so these can be used in different contexts. Here we have tried to give a

17

brief idea about the theoretical view of success models. The paper of DeLone and McLean's is a key input to the literature as it was first attempt to success measures. The Delone and McLean model is the most popular among all the models given in the past. TAM model remains the most popular to study the willingness of the user towards accepting Information technology. It's very difficult to state that which model is the best among all. Any one model can be chosen depending upon the requirement of the study to be carried.

References

[1] Chuttur M.Y. (2009). "Overview of the Technology Acceptance Model: origins, Developments and Future Directions," Indiana University, USA. Sprouts: Working Papers on Information Systems, 9(37). http://sprouts.aisnet.org/9-37.

[2] Davis, F.D.: Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly 13 (3), 319-340 (1989).

[3] DeLone, W.H., McLean, E.R.: Information Systems Success: The Quest for the Dependent Variable. Information Systems Research 3 (1), 60-95 (1992).

[4] DeLone, W.H., McLean, E.R.: The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. Journal of Management Information Systems 19 (4), 9-30 (2003).

[5] Gable, G., Sedera, D., & Chan, T. (2003). Enterprise Systems Success: A Measurement Model', Twenty Fourth International Conference on Information Systems, Seattle.

[6] Gable, G., Sedera, D., and Chan, T. (2008), 'Reconceptualizing Information System Success: the IS-Impact Measurement Model', Journal of the Association for Information Systems. (9:7), pp. 377-408.

[7] Lin, H.-F. (2007), 'Measuring online learning systems success: Applying the updated DeLone and McLean model', CyberPsychology & Behavior, vol. 10 no. 6, pp. 817-820.

[8] Petter, S., DeLone, W., and McLean, E. (2008), 'Measuring Information Systems Success: Models, Dimensions, Measures, and Interrelationships', European Journal of Information Systems, (17), pp. 236-263.

[9] Rabaa'i, Ahmad A. (2009) Assessing Information Systems Success Models: Empirical Comparison (Research in Progress). In: Proceedings of the 20th Australasian Conference on Information Systems, 2-4 December 2009, Caulfield Campus, Monash University,Melbourne.

[10] Seddon, P. (1997). A Respecification and Extension of the DeLone and McLean Model of IS Success. Information Systems Research, 8(3): 240 - 253.

[11] Shih-Chih Chen1, Shing-Han Li and Shing-Han Li, Recent related research in technology acceptance model: a literature review, Australian Journal of Business and Management Research, Vol.1 No.9 [124-127] | December-2011

[12] http://en.wikipedia.org/wiki/Information_systems

[13] http://www.scielo.br/scielo.php?pid=S1807-17752010000200003&script=sci_arttext