Delone and mclean is success models

DeLone & McLean IS success models

According to Grover(1996), there is no definition of IS success. Each group of stakeholders who assess IS success in an organization has a different definition. From a software developer's perspective, a successful information system is completed on time and under budget, has a set of features consistent with specifications, and functions correctly. Users may find an information system successful if it improves their work satisfaction or work performance. From an organizational perspective, a successful information system contributes to the company's profits or creates a competitive advantage. Furthermore, IS success also depends on the type of system that is evaluated (Seddon et al. 1999, p. 21).

IS success had seen different definitions given by many authors. According to Bailey and Pearson (1983) IS success is defined as " Measuring and analyzing computer user satisfaction is motivated by management's desire to improve the productivity of information systems." Authors Goodhue and Thompson (1995, p. 213) had given definition to IS success as "…MIS success ultimately corresponds to what DeLone and McLean (1992) label individual impact or organizational impact. D&M reviewed the literature published in 1981-1987 in seven publications to develop a taxonomy of IS success. This taxonomy was based upon Mason's modification of the Shannon and Weaver model (C. E. Shannon Weaver 1949)ofcommunications which had identified three levels of information: the technical level (accuracy and efficiency of the system that produces it), the semantic level (its ability to transfer the intended message), and the effectiveness level (its impact on the receiver). Mason adapted this theory for IS and expanded the

effectiveness level into three categories: receipt of information, influence on the recipient, and influence on the system (R. O. Mason 1978). D&M identified categories for system success by mapping an aspect of IS success to each of Mason's effectiveness levels. This analysis yielded six variables of IS success: System Quality, Information Quality, Use, User Satisfaction, Individual Impact, and Organizational Impact. System Quality was equivalent to the technical level of communication, while Information Quality was equivalent to the semantic level of communication. The other four variables mapped to Mason's subcategories of the effectiveness level. Use related to Mason's '' receipt of information.'' User Satisfaction and Individual Impact were associated with the '' information's influence on the recipient.'' Organizational Impact was the '' influence of the information on the system.'' D&M developed their initial taxonomy using established theories of communication adapted to IS. These theories suggested that the flow of information was linear; however, they suggested that for IS, these different measures of success were independent, but that there was interdependency among them. Fig. 1 shows the original model. D&M suggested that researchers should use this model in a predictive manner, yet they cautioned that one must measure and/ or control each of the variables in the model to ensure a complete understanding of IS success. D&M called upon others to validate their model ."

In order to provide a more general and comprehensive definition of IS success that covers these different points of view, DeLone and McLean (1992) reviewed the existing definitions of IS success and their corresponding measures, classifying them into six major categories. They

created a multidimensional measuring model with interdependencies between the different success categories.

The original D&M IS success model

According to DeLone and McLean (1992), measurement of IS success is critical for understanding the value and efficacy of IS management actions and IS investments. One of the most important and popular works on IS success model is the DeLone and McLean model (D&M IS success model). DeLone and McLean proposed in 1992 a taxonomy and an interactive model as the frameworks for conceptualizing IS success.

Driven by the need of a process to understand IS and its impacts, they developed a multi-dimension integrated view of IS success model. DeLone and McLean (1992) comprehensively reviewed IS success measures and concluded with a model of interrelationships between six IS success variable categories: (1) system quality, (2) information quality, (3) IS use, (4) user satisfaction, (5) individual impact, and (6) organization impact (see Fig. 1). This model makes two important contributions to the understanding of IS success. First, it provides a scheme for categorizing the multitude of IS success measures which have been used in the research literature. Second, it suggests a model of temporal and causainterdependencies between the categories (McGill, Hobbs, & Klobas, 2003; Seddon, 1997). Since 1992, a number of studies have undertaken empirical investigations of the multidimensional relationships among the measures of IS success.

Seddon and Kiew (1994) tested part of the DeLone and McLean (1992) model using a structural equation model. They replaced " use" with " usefulness"

and added a new variable called " user involvement," and their results partially supported the DeLone and McLean (1992) model. The description and examples of measures for these six dimensions are: First, system quality denotes system performance like data accuracy, system efficiency, response time, etc. Second, information quality refers to the quality of the IS product, such as currency, relevance, reliability, and completeness. Third, use refers to the frequency an information system is used, examining items like the number of functions used, frequency of access, and amount of connect time. Fourth, user satisfaction records the satisfaction level as reported by system users, including overall satisfaction and satisfaction of interface, etc. Fifth, individual impact refers to measuring the impacts brought about by the information system on individual users, such as changes in productivity, decision model, and decision making. Sixth, organizational impact requires the evaluation of the changes caused by the information system to the organization, such as decrease in operating cost, savings in labor costs, and growth in profits.

This original model identified six interrelated dimensions of IS success. It suggested that the success can be represented by the system quality, the output information quality, consumption (use) of the output, the user's response (user satisfaction), the effect of the IS on the behavior of the user (individual impact), and the effect of the IS on organizational performance organizational impact). This model provided a scheme for classifying the multitude of IS success measures and suggested the temporal and causal interdependencies between the six dimensions. Motivated by DeLone and McLean's call for further development and validation of their model, many

researchers have attempted to extend or respecify the original model. A number of researchers claim that the D&M IS success model is incomplete. They suggest that more dimensions should be included in the model, or present alternative success. Other researchers focus on the application and validation of the model (Rai et al. 2002). Following the Seddon's extension of Delone & McLean IS success model in 1997 into partial behavioural model of IS use and IS process model for IS success, Garrity and Sanders (1998) further adapted the model taking into account the organisational and sociotechnical systems. The model was further extended by Molla and Licker (2001) to measure e-Commerce success.

The New D&M IS model
Information systems (IS) success is one of the most researched topics in IS literature. De Loneand McLean (1992) become aware of the complex reality that surrounds the identification and definition of the IS success concept. They organize the large number of studies on IS success and present a comprehensive and integrative model. DeLone and McLean, in their study, identify six main dimensions for categorizing the different measures of IS success: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. They develop an IS success model in which these categories are interrelated, shaping a process construct. Their model proposes that " system quality and information quality singularly and jointly affect both use and user satisfaction.

Additionally, the amount of use can affect the degreeof user satisfaction as well as the reverse being true. Use and user satisfaction are direct antecedents of individual impact; and, lastly, this impact on individual

performance should eventually have some organizational impact" (DeLone & McLean, 1992) (Figure 2). DeLone and McLean (1992) state that their model is " an attempt to reflect the interdependent, process nature of IS success", undertaking to describe the IS success concept and the causes for the success.

According to Ballantin & other researchers (1996) and Seddon (1997), DeLone and McLean's work makes several important contributions to the understanding of IS success. First, it consolidates previous research. Second, it provides a scheme for classifying the different measures of IS success that have been proposed in the literature into six dimensions. Third, it suggests a model of temporal and causal interdependencies between the identified categories. Fourth, it makes the first moves to identify different stakeholder groups in the process. Fifth, it has been considered an appropriate base for further empirical and theoretical research. Sixth, it has met general acceptance in the IS community.

In the years that followed, several researchers altered or extended the model, while others adapted it for specific applications, such as knowledge management or e-commerce (W. H. DeLone, E. R. McLean 2004) systems. Recognizing these potential improvements over their original model, D&M acknowledged these modifications and revised their model accordingly (W. H. DeLone, E. R. McLean 2003). The updated model is shown in Fig. 2. D&M also modified their model to address some limitations of the original model. A key addition in the updated model was the inclusion of Service Quality as an additional aspect of IS success (L. F. Pitt, R. T. Watson, C. B. Kavan 1995); it was added because the changing nature of IS required the need to assess

service quality when evaluating IS success. D&M also recommended assigning different weights to System Quality, Information Quality, and Service Quality depending on the context and application of the model.

There has been an intense debate about whether system use is a good measure of IS success. Although some authors (P. B. Seddon 1997) have suggested that it is better to remove system use as an IS success variable, DeLone andMcLean argued that systemusewas an appropriate measure. They asserted that the source of the problem was a too simplistic definition of system use, and that researchers must consider the extent, nature, quality, and appropriateness of it. Simply measuring the amount of time a system is in use is not enough: informed and effective use is an important indication of IS success.

The DeLone and McLean Information System Success model, published in 1992, supplies a general framework to measure information systems success through the analysis of six different but interdependent factors: " system quality" on a technical level, " information quality" on a semantic level and " use", " user satisfaction", " individual impacts" and " organization impacts" on an effectiveness level. All these factors relate each other both on a temporal and a causal model; in the temporal model we first find system quality and information quality, which characterize an information system when it is just created; in a second stage of this process come use and user satisfaction, which feed or restrain each other and that are strongly influenced by the first two factors; finally, both in a temporal and in a causal way, comes first the individual impact and then the organizational impact,

which is not seen as a simple sum of individual impacts but as a complex network of consequences.

The generic nature of each of these entities makes the framework suitable for a variety of different information systems and contexts. During the last decade hundreds of articles have been written to confirm or challenge the validity of DeLone and McLean conclusions; in 2003 a new article was written by the same two authors to refine the whole model by taking into account all the suggestions/critiques made to the original article. The primary purpose of the original 1992 D&M IS success model was to synthesize previous researches on IS success into a more coherent body of knowledge and to provide guidance to future researchers (DeLone and McLean, 2003). The role of IS has changed and progressed during the last decade. Similarly, academic inquiry into the measurement of IS Although it may be more desirable to measure system benefits in terms of numeric costs (e. g cost savings, expanded markets, incremental additional sales, and time savings), such measures are often not possible because of intangible system impacts and intervening environmental variables that may influence the numbers (T. McGill, V. Hobbs 2003). Therefore, there has been little consensus on how net benefits should be measured objectively and thus they are usually measured by the perceptions of those who use the IS. Therefore, '' perceived system benefits'' or '' perceived usefulness'' has been adopted as an important surrogate of IS success (B. H. Wixom, H. J. Watson 2001) The right-hand side of the DeLone and McLean's model, which assumed linear causality between system use, user satisfaction, individual impact, and organizational impact, has not been authenticated. Seddon contended that

the model was too encompassing and introduced some confusion because it mixed process and causal explanation of IS success. He further argued that system use must precede impacts and benefits, but that it did not cause them. Accordingly, system use would be a behavior that reflects an expectation of system benefits from using an IS and thus would be a consequence of IS success, rather than a determinant of system net benefits. Some empirical surveys (M. Gelderman 1998) also found that the association between system use and system benefit was not statistically significant. System use is necessary but not sufficient to create system benefits. User satisfaction results from the feelings and attitudes from aggregating all the benefits that a person hopes to receive from interaction with the IS (B. Ives, M. H. Olson, J. J. Baroudi 1983). In fact, attitude cannot influence system benefits—on the contrary, perceived system benefits can influence user satisfaction. Therefore, individual impact and net benefits can cause user satisfaction (rather than vice versa).

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benefits—on the contrary, perceived system benefits can influence user satisfaction. Therefore, individual impact and net benefits can cause user satisfaction (rather than vice versa).

The measurement of IS success or effectiveness is critical to our understanding of the value and efficacy of IS management and investments (DeLone and McLean, 2003). They have striven to bring both awareness and structure to the " dependent variable"- IS success – in IS research, and the result is the so-called updated D&M IS success model (Figure 2). Their major contribution is proposing a taxonomy and an interactive model as frameworks for conceptualizing and operationalizing IS success for future researchers.

In response to the progresses in IS applications, DeLone and McLean refined their original model and proposed an updated version in 2003. Service quality was added into the success model, and the individual impact and organizational impact were combined into a single variable named " net benefits" as shown in Figure 4. To catch up with the advancements of its applications, IS needs not only to provide users information products but also to meet users'.

In addition, some researchers (J. J. Baroudi, M. H. Olson, B. Ives 1986) have suggested that user satisfaction causes system use rather than vice versa. Thus, the Delone and McLean's assertion that system use causes user satisfaction seems to be merely a temporal rather than causal relationship. Many models based on that of DeLone and McLean have been presented. However, they often confuse the independent variable and dependent

variables of IS success. '' Technological support'', '' knowledge strategy or process'', and '' support and service'' are three examples of suggested additions but these clearly cause success (rather than being part of it). The variables should be dependent; i. e. surrogate measures for success. DeLone and McLean suggested that the IS success model should include service quality for electronic commerce systems.

DeLone & McLean (2003) argue that Seddon's (1997) reformulation of the DeLone & McLean (1992) model into two partial variance models (i. e. IS success model and partial behavioural model of IS Use) unduly complicates the success model, and thus assert that System Use or Intention to Use is still an important measure of IS success. Given that Systems Use/Intention to Use is included in their updated IS success model, DeLone & McLean (2003; 2004), however, did not attempt to reconcile their model with Seddon's (1997) Perceived Usefulness measure and Davis's (1989) Technology Acceptance Model (TAM) that explains system use behaviour. Thus, there is a need for research to combine the updated D&M model with Seddon's (1997) Perceived Usefulness construct and the IS acceptance/adoption literature to give it the richness in theoretical perspective that it presently lacks. While the updated D&M model is a generic, comprehensive e-commerce systems success model, it suffers from certain difficulties. First, the Net Benefit measure in the model is conceptually too broad to define. As DeLone & McLean (2004) suggest, ' The new net benefits construct immediately raises three issues that must be addressed: what qualifies as a benefit? for whom? and at what level of analysis' Thus, when using the updated D&M model, researchers need to clearly and carefully define the

stakeholders and the context in which Net Benefits are to be measured (DeLone & McLean, 2004).

DeLone and McLean (2003) propose an updated IS success model (Fig. 2) and evaluate its usefulness in light of the dramatic changes in IS practice, especially the advent and explosive growth of ecommerce. They agree with Seddon's premise that the combination of variance and process explanations of IS success in one model can be confusing, but argue that Seddon's reformulation of the DeLone and McLean (1992) model into two partial variance models unduly complicates the success model, and defeats the intent of the original model. Based on prior studies, DeLone and McLean (2003) propose an updated model of IS success by adding a " service quality" measure as a new dimension of the IS success model, and by grouping all the " impact" measures into a single impact or benefit category called " net benefit." DeLone & McLean (2004) propose several e-commerce systems success measures identified in the management information systems (MIS) and marketing literature, the nomological structure of the updated D&M model is not fully consistent with the quality- value-satisfaction-loyalty chain in the marketing and consumer behavior. Thus, continued research is also required to reconcile the updated D&M model with the marketing research literature.

Although some researchers claim that service quality is merely a subset of the model's systems quality, the changes in the role of IS over the last decade argue for a separate variable called the " service quality" dimension (DeLone & McLean, 2003). On the other hand, while researchers have suggested several IS impact measures, such as individual, work group

impacts, organizational impacts (DeLone & McLean, 1992),
interorganizational impacts, consumerimpacts, and societal impacts
(Seddon, 1997), DeLone and McLean (2003) move in the opposite direction
and group all of the impact measures into a single net benefits variable, to
avoid complicating the model with more success measures. Given that
system usage continues to be used as a dependent variable in a number of
empirical studies, and takes on a new importance in Internet-based system
success measurements, where system use is Voluntary, " system usage" and
the alternative " intention to use" are still considered as Important measures
of IS success in the updated DeLone and McLean model.

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