Success model for measuring information system implementation: Literature review

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Abstract. Many researchers have done research on information systems before; this is because of the breadth of studies or topics about IS. There is some example of a study on how to measure Information System Success by testing instrument factors. Some researchers can produce different judgments regarding the success of implementation of IS; this is because the first definition of success of each researcher is changed, the two perspectives on success assessment, the three variables used, the four implementations in different environments. Several models can be used as references to assess the success of IS, Delone and McLean are examples that are widely used as references, which use six variables in measuring IS implementation. From the model used, later there will be a gap in determining the model, and this becomes an opportunity for the development of the model as follows. The development of models to measure information system success can be done by adoption, adaptation, and combination. This is legitimately valid as long as the development of the model is accompanied by supporting theories. The purpose of this review literature is especially researchers can provide an overview of related to the method of previous researchers. Then it can be used as a framework for solving problems.

1. Introduction
Information communication technology is a need that cannot be bargained, especially for organizations that are indeed used to support their business processes [1,2]. This can be seen from the complexity of the process of the organization. So, it is not surprising that large investments are made by the organization in supporting its business processes, because of the hope that the profits will be greater than the investments incurred. It becomes a problem if investments in the IT field fail and this will certainly have a major impact on the organization's business processes. Please note that project failures in the IS field have high numbers compared to other projects [3]. Why is that? This is because the IS project has dynamic, complex and unstructured elements. To assess whether the IS project has failed or not, some researchers define it by several criteria. It can be said that an IS project has failed if the project is over budgeting, over timing, and far from the intended purpose [4]. IS project failures in several countries have different percentage figures. For example, Indonesia, where the percentage of IS project
failures was 55% problematic, and 18% were cancelled [5]. This percentage is obtained from 110 IS projects.

One form of measurement for the success of the IS project is the success model. This model can be used as a reference in the measurement. There are several measurement models that can be used, for example [6–8]. Of all the models certainly, have different definitions in measuring IS success. This is understandable because until now there is no definite statistical calculation of IS failure measurement.

The purpose of this research is to present competently about the success of IS. Then this study is also intended to answer the question (1) the extent to which IS success is reviewed from literature review, (2) the extent to which IS success can be used in measurement (3) what IS relationship is successful with research that has been studied.

Research conducted based on an existing literature review that relates to IS success. This means that research is carried out by analysing from papers or journals or international comparisons with the aim to provide a general description of the success of IS. The benefits of this research not only provide IS's success science knowledge but also provide the latest references from publications about IS success.

2. Methodology
In conducting a literature review the researcher uses a traditional review method, namely by selecting paper chosen by the researcher. This is done because the topic chosen is in accordance with the knowledge of the researcher.

3. Literature review
To measure the success of IS some researchers have defined IS success. Researchers' perspective is certainly different in defining IS success, so there is no absolute measurement in measuring IS success. Measurement of IS success depends on which perspective will be assessed, for example, seen from the user's perspective. So that is assessed for example related to satisfaction. Developer perspective can be said to be successful if the IS product is on time and does not exceed the budget. Besides that, in measuring the success of IS, it can be seen from which dimension to be assessed [9]. In table 1 we can see some definitions of IS success based on experts.

| Author | Definitions |
|--------|-------------|
| Edward J. Garrity [1] | "Information systems (IS) success is a measure of the degree to which the person evaluating the system believes that the stakeholder is better off" |
| Doll, William J and Gholamreza Torkzadeh [2] | "Measuring user satisfaction is used as a benchmark IS Success" |
| Seddon, Peter, and Min-Yen Kiew [6] | "Usefulness is a measurement IS Success..." |
| Delone and McLean [3] | "Measurement of IS is a representation of the qualitative characteristics of the IS itself by making 6 variables ..." |

Based on the theory review above, it is generally explained that IS success can be measured based on several perspectives. Examples of the Delone and McLean model [6] describes the measurement of success in IS with three dimensions, the system, use of the system and finally the impact of the use itself. From the above definitions, some researchers categorize IS success based on level. Where these levels can be used as standards and considered as the success of IS.
Figure 1. Classification of measuring IS success.

Based on fig 1. Then there are several categories in measuring IS Success. Among them are the Delone and McLean model wherein measuring success IS is divided into six dimensions [10]. However, researchers claim that the Delone and McLean method is not so complete, and this needs to be updated, this is because the measurement dimensions are considered lacking. This was once expressed by Seddon and Kiew where he criticized Delone and McLean model was difficult to combine between causal concepts and process concepts [11]. Based on these criticisms, Delone and McLean updated the model [6] by adding several changes, including adding a system quality dimension, intention to use, net benefit dimensions. and in 2003 Delone and McLean issued a model change like Figure 2 below:

Figure 2. Delone and McLean IS success model [3].

Then the Seddon and Kiew model [6] was made based on the development of the D and M Model [11]. The Seddon and Kiew models [12] have differences with the D & M model [6]. The difference lies in the variables studied, where Seddon and Kiew research by replacing use variables with usefulness. Then Seddon and Kiew add user satisfaction variables. This is intended to facilitate the user's perception of usability and satisfaction. As in figure 3.
Figure 3. Seddon and Kiew [6].

The research that was revealed by Mason is well known for the information influence theory where the theory focuses on the influence of information [8]. Mason changes the term effectiveness to influence, meaning that influence is defined based on the level of acceptance, evaluation of information. The point is that the influence of information can provide behavioural changes to the recipient and system performance.

Researcher Shannon and Weaver explain the theory of communication by grouping process information in terms of levels [13]. There are three levels expressed by Shannon and Weaver, namely technical, semantic, and finally effectiveness. At the technical level, Shannon and Weaver explained that the accuracy obtained from the measurement of the system where the system produces information. Both semantic levels are levels where information can be said to be successful if it is appropriate or has the same meaning as what is desired. Finally, is the level of effectiveness which explains how far the influence of information received by the recipient.

4. Result and discussion
As a first step, researchers collect several papers in the form of journals or conferences. There are 12 papers that have been read and then analysed in detail. And the results of the analysis can be seen in table 2.

Table 2. Emp and non-emp of information system success.

| Author                | Type       | IS Success Element |
|-----------------------|------------|--------------------|
|                       |            | Sys-Q Inf-Q Serv-Q Use-In USE Use-S Ind-I Org-I Net-B |
| Delone and McLean 1992 (4) | Conceptual | √                   | √                   | √                   | √                   | √                   | √                   |
| Seddon 1997 (5)       | Conceptual | √                   | √                   | √                   | √                   | √                   | √                   |
| Seddon and Kiew 1994 (6) | Conceptual | √                   | √                   | √                   | √                   | √                   | √                   |
| Delone and McLean 2002 (7) | Conceptual | √                   | √                   | √                   | √                   | √                   | √                   |
| Delone and McLean 2003 (3) | Conceptual | √                   | √                   | √                   | √                   | √                   | √                   |
| Delone and McLean 2004 (8) | Empirical  | √                   | √                   | √                   | √                   | √                   | √                   |
| Bradley 2006 (9)      | Empirical  | √                   | √                   | √                   | √                   | √                   | √                   |
Table 2. Cont.

| Author | Type      | IS Success Element |
|--------|-----------|--------------------|
| Yusof et al. 2006 (14) | Conceptual |                   |
| Petter & McLean 2009 (15) | Empirical | ✓ ✓ ✓ ✓ ✓ ✓ ✓ |
| Urbach et al. 2010 (12) | Review    | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ |
| Petter et al. 2012 (10) | Review    | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ |
| Gao & Bai 2014 (11)       | Review    | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ |

| Sys-Q: system quality; Inf-Q: information quality; Serv-Q: service quality; Use-In: use intention; USE: use; Use-S: user satisfaction; Ind-I: individual impact; Org-I: organizational impact; Net-B: net benefit. |

Based on table 2, it can be seen that there are three types, namely C meaning Conceptual, E means empirical, R means the review. From the above papers, it can be seen that there are six papers categorized as conceptual. There are four papers with the empirical type, and finally, there are two papers with the type of review.

From the results of the research, there are a number of evaluations, namely:

- From several studies conducted using Delone and McLean Model to measure IS success [3]. Some models are integrated with other models with the aim of proposing a new model update.
- The use of mixed motives namely qualitative and quantitative is used to measure IS success.
- Some research in measuring success is seen from the user's perspective, but there are also some used in organizational perspective.

5. Conclusion

The results of the study are presented from several papers that discuss IS success that are classified based on 1992 to 2014. The search for sources is obtained from several sources that have been published either in the form of journals or conferences internationally.

Based on the results of the study it can be suggested to look for some material so that the focus of the research on the literature review IS Success.

References

[1] Garrity E J and Sanders G L 1998 Information systems success measurement (Igi Global)
[2] Doll W J and Torkzadeh G 1988 The measurement of end-user computing satisfaction (MIS Q) p 259–274
[3] DeLone W H and McLean E R 2003 The DeLone and McLean Model of Information Systems Success: A Ten-Year Update J Manag Inf Syst 19 4 9–30
[4] DeLone W H and McLean E R 1992 Information systems success: The quest for the dependent variable Inf Syst Res. 3 1 60–95
[5] Seddon P B 1997 A respecification and extension of the DeLone and McLean model of IS success Inf Syst Res. 8 3 240–253
[6] Seddon P and Kiew M-Y 1996 A partial test and development of DeLone and McLean’s model of IS success Australas J Inf Syst. 4 1
[7] DeLone W H and McLean E R 2002 Information systems success revisited. In: System Sciences 2002 HICSS Proceedings of the 35th Annual Hawaii International Conference on. IEEE 2966–2976
[8] Delone W H and Mclean E R 2004 Measuring e-commerce success: Applying the DeLone &
McLean information systems success model *Int J Electron Commer.* 9 1 31–47

[9] Bradley R V, Pridmore J L and Byrd T A 2006 Information systems success in the context of different corporate cultural types: an empirical investigation *J Manag Inf Syst.* 23 2 267–294

[10] Petter S, DeLone W and McLean E R 2012 The past, present, and future of "IS Success" *J Assoc Inf Syst.* 13 5 341

[11] Gao L and Bai X 2014 An empirical study on continuance intention of mobile social networking services: Integrating the IS success model, network externalities and flow theory *Asia Pacific J Mark Logist.* 26 2 168–189

[12] Urbach N, Smolnik S and Riempp G 2010 An empirical investigation of employee portal success *J Strateg Inf Syst.* 19 3 184–206

[13] Shannon C E, Weaver W and Burks A W 1951 *The mathematical theory of communication*