The 3-D Model of Information Systems Success: the Search for the Dependent Variable Continues

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Research into the issue of information systems (IS) success is vital if IS is to demonstrate its worth. Predicated upon success not being a random variable, a number of models which attempt to delineate success and its causes have been proposed. One of the more complete and better known is that of DeLone and McLean (1992). This model has been used as a basis for empirical research in information systems success. Since its development other researchers have refined and extended the model. This paper attempts to take the analysis further. It evaluates the DeLone and McLean model on a number of dimensions, and a new model is proposed which fundamentally extends DeLone and McLean’s work. The new 3-D model is described and its contribution to further research assessed.

The many well-publicised information systems (IS) failures and the paradox of high investment and low productivity returns has brought issues of success causes and success measurement to the fore. Predicated upon success not being a random variable, a number of models which attempt to delineate success and success causes have been proposed. One of the more complete and better known is that of DeLone and McLean (1992). This model has been used as a basis for empirical research, and has been refined and extended by a number of researchers.

DeLone and McLean’s model of information systems success is based on the work of Shannon and Weaver (1949) and Mason (1978), together with a study of 180 published papers which address the issue of IS success. Their analysis leads them to propose an interrelated set of six success constructs which, taken together, dominate previous IS research. This paper briefly introduces the DeLone and McLean model and its contribution, then presents a critique on a number of issues. A new model, the 3-D model, that extends the original is presented which, it is suggested, both overcomes some of the limitations identified, and can be used as a basis for further research.

The DeLone and McLean Model

The DeLone and McLean model (Figure 1) proposes six major dimensions of information systems success: system quality; information quality; use; user satisfaction; individual impact; and organizational impact. Using the six dimensions, they review the conceptual and empirical literature and present a descriptive model of IS success, in addition to discussing the implications of searching for the dependent variable of success. The DeLone and McLean model is a positive development in furthering research in IS success in several respects. First, it consolidates previous research. Second, it classifies the measures of information systems...
success into plausible groupings and so has intuitive appeal. Third, it begins to identify different stakeholder groups in the process (Lyttinen and Hirschheim, 1987). Fourth, it has been considered a suitable foundation for further empirical and theoretical research, and has met with general acceptance as such. The issue now is to evaluate this model and build upon the foundations offered.

A number of the researchers who have employed the DeLone and McLean model suggest that it is incomplete in certain areas. For example, Seddon and Kiew (1994) suggest that user involvement is a fundamental factor which should be present. Their empirical findings confirm some of the causalities identified in the model but do not confirm others. Seddon (1995) reaffirms his dissatisfaction with the original DeLone and McLean model, which, he argues, focuses on “muddled thinking” with respect to the term IS use, and proposes another variant which separates IS success from IS use, and further cautions that use is not synonymous with success. He separates benefits from individual and organisational impact. He questions the notion of causality, preferring to use the term influence, and suggests that DeLone and McLean have confused issues by attempting to deal with both causality and temporal effects in a single model. The effects of IS are not inevitable and to assume so is to betray a technical positivistic perspective; the preference of influence shows a perspective which recognises that the key players in information systems are people rather than systems. Seddon thus implicitly admits that the model may not be complete by suggesting that “all other things being equal, higher levels of expectations will lead to higher levels of IT use” (p.16). He also introduces the influencing factor of expectations and perceptions, adopting again a much more subjective philosophical stance than DeLone and McLean’s model admits. In line with this, he also introduces a factor which is the user’s personal experience of using a system.

Bonner (1995) also revises the DeLone and McLean model and tentatively introduces the concept of information awareness. He also mentions user quality in terms of knowledge skills and abilities. His recognition of the people element is a welcome addition to the model. Bonner also suggests that the case study described in his paper supports the DeLone and McLean model. However, although the chosen case does not disprove the model, it supports it only weakly. Information and system quality in the case are shown to be inadequate, but so, independently, are all the other factors. A more powerful example might be a case where despite good quality information and system, it failed because of, say, failure to ensure user satisfaction. Indeed a whole range of cases would be needed to adequately support the model.

Critical Analysis of the DeLone and McLean Model

This section critically assesses the DeLone and McLean model from a number of different viewpoints, exposing the need for a broader model.

Delone and McLean’s Own Reservations

DeLone and McLean do not claim that their model is definitive, and indeed invite further validation: “The success model clearly needs further development and validation before it could serve as a basis for the selection of appropriate IS measures” (p.88). Their own reservations point the way for a critical examination of their assumptions and boundaries. For example; “To be useful, a model must be both complete and parsimonious” (p.87); this paper argues that the model is insufficiently complete. “The selection of success measures should also consider the contingency variables such as the independent variables being researched; the organisational strategy, structure, size, and environment of the organisation being studied; the technology being employed; and the task and individual characteristics of the system under investigation” (p.88). Thus DeLone and McLean recognise the limited perspective of their model which the proposed model attempts to redress: “Researchers who neglect to take these factors into account do so at their peril” (p.87). This paper argues that
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