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# Testing the DeLone and McLean Model of IS Success in the User Developed Application Domain

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## Abstract

*DeLone and McLean's (1992) model of information systems success has received much attention amongst researchers. This study provides the first empirical test of the entire DeLone and McLean model in the user developed application domain. Overall, the model was not supported by the data. Of the nine hypothesised relationships tested four were found to be significant and the remainder not significant. The model provided strong support for the relationships between perceived system quality and user satisfaction, perceived information quality and user satisfaction, user satisfaction and intended use, and user satisfaction and perceived individual impact.*

## Keywords

FA05 User development, EL0301 Measuring IS success, GA03 End-user computing, EI0206 Quality, EI0207 User satisfaction, EI0208 IS utilization, EI0211 IS impacts

## INTRODUCTION

User developed applications (UDAs) are computer-based applications for which non-information systems professionals assume primary development responsibility. They support decision making and organizational processes in most organisations (McLean, Kappelman, & Thompson 1993). Perhaps the most important benefit claimed for user development of applications is improvement in employee productivity and performance, resulting from a closer match between applications and user needs since the end user is both the developer and the person who best understands the information requirements. However, the realisation of these benefits may be put at risk because of problems with information produced by UDAs that may be incorrect in design, inadequately tested, and poorly maintained.

Despite these risks organizations generally undertake little formal evaluation of the success of applications developed by end users, instead relying heavily on the individual end user's perceptions of the value of the application (Panko & Halverson 1996). This raises the important issue of the need to be able to measure the effectiveness of UDAs. In view of the scarcity of literature on UDA success (Shayo, Guthrie, & Igbaria 1999), models of organizational information systems (IS) success can provide a starting point. DeLone and McLean's (1992) model of IS success has received much attention amongst IS researchers

(Walstrom & Hardgrave 1996). If it were found to be applicable in the UDA domain it would suggest that the reliance of organizations on end user developers' satisfaction with the applications they develop is not misplaced.

### **DeLone and McLean's (1992) Model of IS success**

DeLone and McLean (1992) conducted an extensive review of the IS success literature. They found that the success of an IS had been represented by the quality characteristics of the system itself (system quality); the quality of the output of the IS (information quality); consumption of the output of the IS (use); the IS user's response to the IS (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).

DeLone and McLean proposed the model of IS success shown in Figure 1. The model makes two important contributions to the understanding of IS success. First, it provides a scheme for categorising the multitude of IS success measures that have been used in the literature. Second, it suggests a model of temporal and causal interdependencies between the categories.

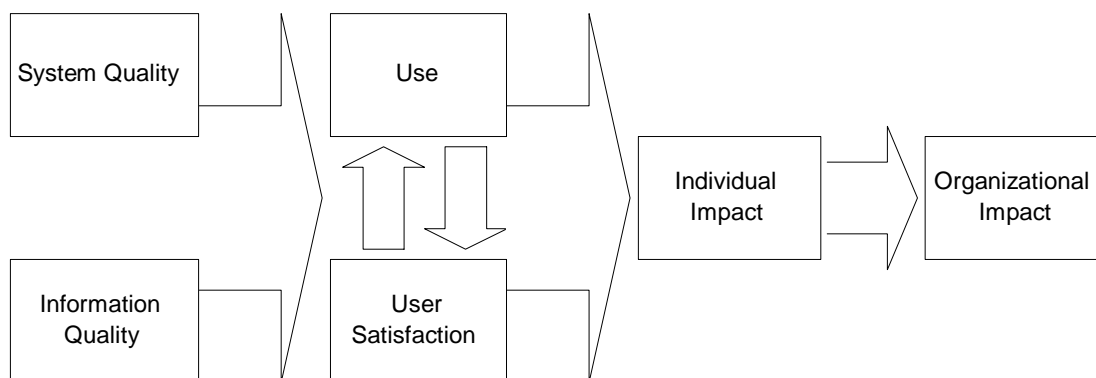


Figure 1: DeLone and McLean's (1992) model of IS success

### **Empirical Support for the Model**

There has been no complete empirical test of the relationships implied by the DeLone and McLean model, but there is empirical support for several of the relationships. Seddon and Kiew (1996) tested the 'upstream' portion of the model and their results provided substantial support for the proposed relationships among system quality, information quality and user satisfaction. Baroudi, Olson and Ives (1986) showed that, although user satisfaction influences use, use does not influence user satisfaction. The results of a study of decision support system use by Snitkin and King (1986) provided support for the proposed relationship between use and individual impact. The relationship between user satisfaction and individual impact received support in Gatian's (1994) study, in which significant positive relationships were found between user satisfaction and both objective and subjective measures of individual impact. Gelderman's (1998) survey of 1024 Dutch managers also confirmed the relationship between satisfaction and both subjective and objective individual impact measures. The Gelderman study also investigated the relationship between use and individual impact, but failed to find a relationship. Empirical support for the relationship between individual impact and organizational impact has been provided by Millman and Hartwick (1987) in their study of middle managers' perceptions of the impact of systems.

## Concerns about the Model's Applicability in the UDA Domain

Little is known about the applicability of DeLone and McLean's model in the UDA domain. Most support for elements of the model has come from research in the organizational domain. Only two of the relationships proposed in the model appear to have been specifically investigated for UDAs. The proposed relationship between quality and satisfaction is supported by Rivard et al. (1997) who found a significant positive correlation between perceived system quality and end user computing satisfaction for UDAs. Kasper and Cervený's (1985) study provided evidence for the link between individual impact and organizational impact with the improved performance of the end user developers flowing through to their firm's stock price, market share, and return on assets.

However, the results of a study by McGill et al. (1998) suggest that the process of developing an application predisposes an end user developer to be more satisfied with the application than they would be if it were developed by someone else. This may have implications for the role of user satisfaction in the model. Edberg and Bowman (1996) pointed out that users may not only lack the skills to develop quality applications but may also lack the knowledge to make realistic determinations about the quality of applications that they develop. Therefore the posited relationships between system quality and user satisfaction, and system quality and use may also be of concern. The study described in this paper was designed to investigate the applicability of DeLone and McLean's (1992) model of IS success to user developed applications. It sought to measure all the IS success factors included in the model, and to demonstrate how they might be related in the UDA domain.

## MODEL TO BE TESTED

Two modifications were made to DeLone and McLean's model to recognize earlier research results. DeLone and McLean had included both objective and subjective measures of system quality in their single system quality category. However because of concerns about the ability of end user developers to make judgments about system quality (Edberg & Bowman 1996), perceived system quality and system quality were specified as separate constructs in the model to be tested here. Also, because the literature suggests that user satisfaction causes system usage rather than vice versa (Baroudi et al. 1986) the causal path between satisfaction and use was specified in this direction. A third modification to the model reflects the difficulty in obtaining objective measures of information quality, since the quality of information in an IS is usually measured by the perceptions of those who use the information. The measures in DeLone and McLean's information quality category were mostly of this kind. In this study, the information quality category is acknowledged to be perceived information quality. The model tested in the study is therefore the model presented in Figure 2.

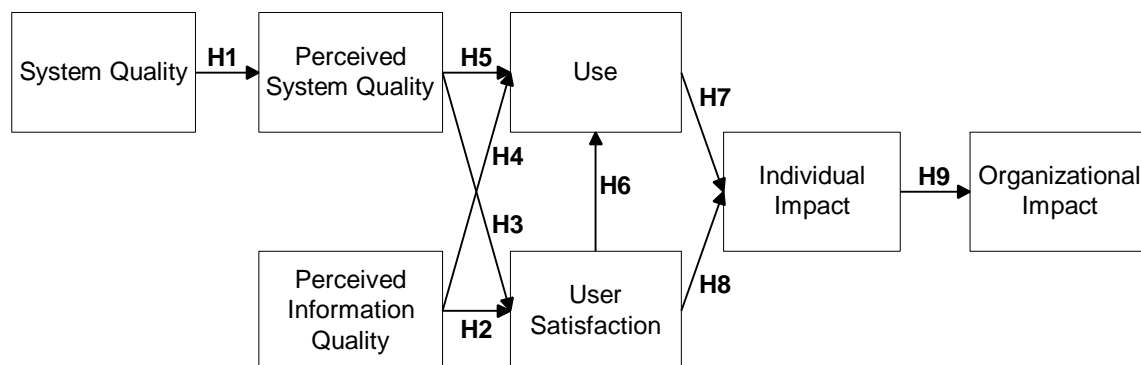


Figure 2: A modified and testable representation of the DeLone & McLean (1992) model of IS success factors showing the hypothesized relationships.

## **Hypotheses**

The hypotheses that follow directly from this model are:

- H1: User developers will perceive systems of higher system quality to be of higher system quality
- H2: User developers will be more satisfied with systems of higher perceived information quality
- H3: User developers will be more satisfied with systems they perceive to be of higher system quality
- H4: User developers will use systems of higher perceived information quality more often
- H5: User developers will use systems they perceive to be of higher system quality more often
- H6: Higher levels of satisfaction result in higher levels of use
- H7: The impact of a UDA on the individual's work performance will increase as use increases
- H8: The impact of a UDA on the individual's work performance will increase as user satisfaction increases
- H9: The organizational impact of a UDA will increase as the impact on the individual's work performance increases

## **METHOD**

Both user developers and IS experts evaluated the system quality of UDAs developed to support decision making in a business simulation. The evaluations, and the user developers' reported satisfaction with their systems and intended future use, were used to test the hypotheses drawn from the modified DeLone and McLean model shown in Figure 2. The method is described in detail in this section.

### **Participants**

The study was conducted with Masters of Business Administration (MBA) students participating in a business policy simulation over a period of 13 weeks as part of a capstone course in Strategic Management. Of the 79 participants 78.5% were male and 21.5% female. Their ages ranged from 21 to 49 with an average age of 31.8. They had an average of 9.5 years experience using computers (with a range from 2 to 24 years) and reported an average of 5.9 years experience using spreadsheets (with a range from 0 to 15 years). All participants had at least 2 years of previous professional employment experience.

The general applicability of research findings derived from student samples is an issue of concern. However, Briggs et al. (1996) found MBA students to be good surrogates for executives in studies relating to the use and evaluation of technology. The students who participated in this study are representative of professionals who would be involved in user development of applications in organizations.

### **The Game**

The Business Policy Game (BPG) (Cotter & Fritzsche 1995) simulates the operations of a number of manufacturing companies. Participants assume the roles of managers, and make decisions in the areas of marketing, production, financing and strategic planning. In this study, the decisions required for the operation of each company were made by teams with 4 or 5 members. Decisions were recorded twice a week and the simulation run immediately afterwards so that results were available for teams to begin work on during the next decision period. The simulation accounted for 50% of each participant's overall course grade.

## **The User Developed Applications**

Team members developed their own decision support systems using spreadsheets. They were not constrained with respect to the nature of the spreadsheet, how they developed it, or the hardware and software tools they used. The majority of applications were developed in Microsoft Excel<sup>®</sup> but some participants also used Lotus 1-2-3<sup>®</sup> and Claris Works<sup>®</sup>. The spreadsheets themselves were not part of the course assessment.

## **Procedure for Data Collection**

Each participant was asked to complete a written questionnaire and provide a copy of their spreadsheet on disk after eight 'quarterly' decisions had been made (4 weeks after the start of the simulation). This point was chosen to allow sufficient time for the development and testing of the applications. Ninety one questionnaires were distributed and 79 useable responses were received giving a response rate of 86.8%.

## **The Instrument**

The development of the research instrument for this study involved a review of many existing survey instruments. To ensure the reliability and validity of the measures used, previously validated measurement scales were adopted wherever possible.

### *System quality and perceived system quality*

The items used to measure system quality and perceived system quality were obtained from the instrument developed by Rivard et al. (1997) to assess the quality of user developed applications. Rivard et al.'s instrument was designed to be suitable for end user developers to complete, yet to be sufficiently deep to capture their perceptions of components of quality. For this study, items which were not appropriate for the applications under consideration (e.g. specific to database applications) or which were not amenable to independent assessment (e.g. required access to the hardware configurations on which the spreadsheets were originally used) were excluded. Minor adaptations to wording were also made to reflect the environment in which application development and use occurred. The resulting item set consisted of 40 items, each scored on a Likert scale of 1 to 7 where (1) was labeled 'strongly agree' and (7) was labeled 'strongly disagree'.

In addition to the participants' assessments of system quality, the system quality of each UDA was assessed by two independent assessors using the same set of items. Both assessors were IS academics with substantial experience teaching spreadsheet design and development. The ratings of the two independent assessors were highly correlated ( $r = 0.73$ ,  $p = 0.000$ ).

### *Perceived information quality*

The item pool used to measure perceived information quality consisted of Fraser and Salter's (1995) 14 item 7 point scale instrument where (1) is labelled 'never' and (7) is labelled 'always'. A typical item on this scale is 'Do you get the information you need in time?'

### *User satisfaction*

Given the confounding of user satisfaction with information quality and system quality in some previous studies (Seddon & Kiew 1996), items measuring only user satisfaction were sought. Seddon and Yip's (1992) 4 item 7 point semantic differential scale that attempts to measure user satisfaction directly was used in this study. A typical item on this scale is 'How effective is the system?', measured from (1) 'effective' to (7) 'ineffective'.

### *Use*

Development and use of decision support systems was optional in the BPG, so use is a pertinent measure of success in this study (DeLone & McLean 1992). Participants were asked to indicate their intended use of the system over the next 4 quarterly decisions in the BPG. This item was based on Amoroso and Cheney's (1992) item to measure use and was measured on a 5 point scale ranging from (1) 'rarely' to (5) 'often'. Intended use has been shown to be a satisfactory surrogate for actual use in studies of organizational systems (Ajzen 1988; Klobas 1995). The timing of data collection for this study means that intended use would reflect responses to the success of the IS during the preceding 4 weeks.

### *Individual impact*

Individual impact was measured by perceived individual performance impact since objective measures of individual impact were not available from the BPG. The 2 items used by Goodhue and Thompson (1995) in their study on task-technology fit and individual performance were adopted for this study. These items are measured on a 7 point Likert scale ranging from (1) 'agree' to (7) 'disagree'.

### *Organizational impact*

The BPG provides an objective measure of organizational performance. The Z-Score measure of organizational performance is a weighted sum of Z-scores on 17 performance variables. These performance variables include: net income, sales (percent of market), total equity, unit production cost, investor's ROI, stock price and earnings per share. Cotter and Fritzche (1995) consider that it closely matches both the subjective assessments of the writers of the game and those of business people who have judged intercollegiate competitions of the BPG. It was thus chosen as a single composite measure of organizational impact.

## **Data Analysis**

The relationships in the model were tested using structural equation modeling (SEM). Maximum likelihood estimates (MLE) of the measurement and structural models were made using Amos 3.6. Goodness of fit was measured by the likelihood ratio chi-square ( $\chi^2$ ), the goodness of fit index (GFI), the root mean square error of approximation (RMSEA), the Tucker-Lewis index (TLI), and the comparative fit index (CFI).

### *Measurement Model Estimation*

Although both structural and measurement models can be estimated simultaneously using SEM, the measurement model was developed first in this study. This approach was appropriate because the measures had not been tested in the UDA domain before, and because the sample size was small (Anderson & Gerbing 1988).

After indicator variables with low inter-item correlations were omitted, SEM was used to estimate a one factor congeneric measurement model for each multi-item construct. Validity and unidimensionality were demonstrated when all included indicators were statistically significant and the one factor measurement model that represented the construct had acceptable fit (Hair, Anderson, Tatham, & Black 1998). Three estimates of reliability were calculated for each construct: Cronbach's alpha coefficient, composite reliability, and average variance extracted. Although not all of the goodness of fit measures met the guidelines, overall fit for each measurement model was considered acceptable. The three measures of reliability were all acceptable for each scale (see Table 1).

Composite variables were created for perceived information quality, system quality, perceived system quality and user satisfaction using the factor score weights reported by Amos 3.6. The

loading of each composite variable on its associated latent variable and the error associated with using the composite variable to represent the latent variable were estimated as described by Hair et al. (1998). Table 1 provides a summary of the information from the measurement models used to specify parameters in the structural models.

Construct	Cronbach's Alpha <sup>A</sup>	Composite Variance <sup>A</sup>	Variance Extracted <sup>A</sup>	Mean	SD	Loading	Error
System Quality <sup>c</sup>	0.84	0.84	0.52	3.03	0.64	0.5940	0.0675
Perceived System Quality <sup>c</sup>	0.73			3.60	0.80	0.6865	0.1743
Perceived Information Quality <sup>c</sup>	0.93	0.94	0.72	5.25	1.06	1.0301	0.0703
User Satisfaction <sup>c</sup>	0.75	0.77	0.53	4.86	1.21	1.057	0.3361
Intended Use <sup>s</sup>				3.62	1.29		
Perceived Individual Impact*	0.92	0.92	0.86				
Organizational Impact <sup>s</sup>				0.046	0.61	1	0

Table 1: Summary of the information from the measurement models used to specify parameters in the structural models.

<sup>c</sup> Composite variable; \* Two items; <sup>s</sup> Single item

<sup>A</sup> Reliability measure thresholds for acceptance: Cronbach's alpha > 0.7, composite variance > 0.7, variance extracted > 0.5 (Hair et al. 1998)

### *Structural Model Evaluation*

Once measurement models were established, it was possible to estimate the hypothesised structural model of UDA success. This model was evaluated on three criteria: goodness of fit, the ability of the model to explain the variance in the dependent variables, and the statistical significance of estimated model coefficients.

The dependent variables of most interest in the DeLone and McLean model are individual impact and organizational impact. The squared multiple correlations ( $R^2$ ) of the structural equations for these variables provided an estimate of variance explained (Hair et al. 1998). If the hypothesized model is a valid representation of end user developed application success, all proposed relationships in the model (the relationships reflected in H1 to H9) should be significant. All of the hypotheses specify a direction for the proposed relationship so a one-tailed t-value of 1.645 indicates significance at the 0.05 level (Hair et al. 1998).

## **RESULTS AND DISCUSSION**

Table 2 shows the goodness of fit measures, model coefficients, standard errors and t-values for the model. Figure 3 shows the standardized coefficients for each hypothesized path in the model and the  $R^2$  for each dependent variable.

The goodness of fit measures provided conflicting information. Model  $\chi^2$  was 27.74, with 16 degrees of freedom, significant at 0.034. RMSEA was also above the recommended level at 0.097. However, the GFI (0.921), TLI (0.904) and CFI (0.945) all indicated good fit.

The model explains the variance in perceived individual impact moderately well:  $R^2$  was 0.577 (i.e. 57.7% of the variance was explained). However, the  $R^2$  for organizational impact was only 0.002, indicating that almost none of the variance in organizational impact was explained by the model.

The third criterion on which the model was evaluated was the statistical significance of the estimated model coefficients. As can be seen from the t-values in Table 2, four of the paths in the model were significant, supporting the hypothesized relationships between the constructs.



However, the remaining five paths were not significant, indicating that the model as a whole was not supported by this study.

From	To	Estimate	St. error	t value
System Quality	Perceived System Quality	-0.179	0.144	-1.240
Perceived Information Quality	User Satisfaction	0.643	0.095	6.798***
Perceived System Quality	User Satisfaction	0.310	0.105	2.955**
Perceived Information Quality	Intended Use	-0.113	0.258	-0.439
Perceived System Quality	Intended Use	-0.111	0.195	-0.568
User Satisfaction	Intended Use	0.843	0.336	2.513**
Intended Use	Perceived Individual Impact	-0.183	0.118	-1.547
User Satisfaction	Perceived Individual Impact	1.131	0.197	5.735***
Perceived Individual Impact	Organizational Impact	-0.022	0.058	-0.376
<b>Goodness of fit measures</b>				
Chi-square ( $\chi^2$ )		27.74		
Degrees of freedom (df)		16		
Probability (p)		0.034		
Goodness of fit index (GFI)		0.924		
Root mean square error of approximation (RMSEA)		0.097		
Tucker-Lewis index (TLI)		0.904		
Comparative fit index (CFI)		0.945		

Table 2: Goodness of fit, model coefficients, standard errors and t-values for the model  
 \*\* p < 0.01 (one tailed test); \*\*\* p < 0.001 (one tailed test)

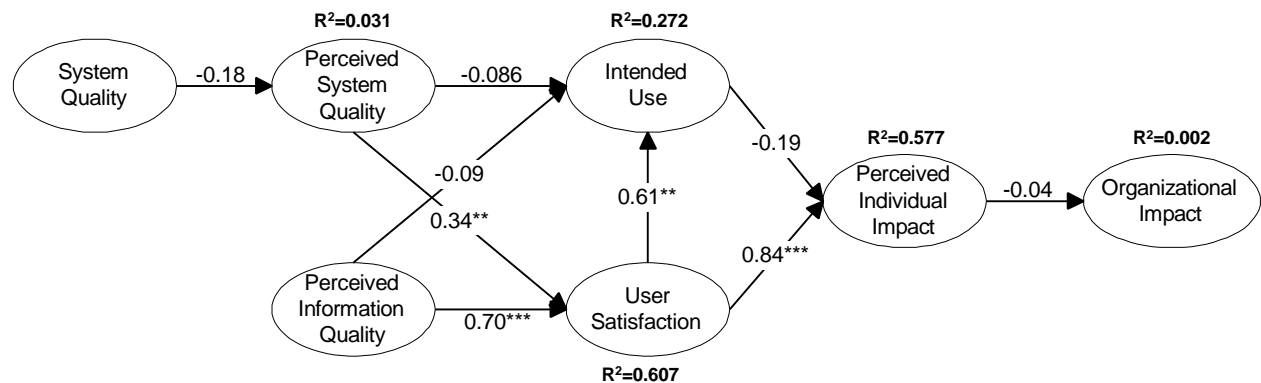


Figure 3: Structural equation model showing the standardised path coefficient for each hypothesised path and the R<sup>2</sup> for each dependent variable.

### Hypothesised relationships supported by this research

The hypothesized relationships supported by this study were: perceived system quality → user satisfaction (H3); perceived information quality → user satisfaction (H2); user satisfaction → use (H6); and user satisfaction → individual impact (H8).

The findings that perceived information quality had a large positive influence on user satisfaction, and that perceived system quality had a significant positive influence on user satisfaction, are consistent with the findings of Seddon and Kiew (1996) for organizational systems. In discussing their findings, Seddon and Kiew (1996) suggested that user satisfaction might be interpreted as a response to three types of user aspirations for a system: information quality, system quality and usefulness. Perceptions of information quality and system quality should then explain a large proportion of variance in user satisfaction.

User satisfaction had a significant positive influence on intended use. Thus the more satisfied with an application an end user was, the more they intended to use the application in future. This is consistent with Baroudi, Olson and Ives's (1986) findings in the organizational domain. The issue of a two way relationship between use and satisfaction, as in DeLone and McLean's original model, whilst not formally explored in this paper was addressed in post hoc analysis. Results indicated that the model was probably unidentified and hence could not be accepted. This analysis does not preclude a more complex relationship, which should be tested in future research: user satisfaction may explain intended use, while actual use may affect subsequent user satisfaction.

User satisfaction displayed a highly significant influence on individual impact. Again, this finding is consistent with the results of studies conducted with organizational systems (e.g. Gatian 1994; Gelderman 1998).

### **Hypothesised relationships not supported by this research**

The hypothesised paths that were not supported by this study were: system quality → perceived system quality (H1); perceived information quality → use (H4); perceived system quality → use (H5); use → individual impact (H7); and individual impact → organizational impact (H9).

The lack of relationship between system quality and perceived system quality in this study provides justification for the concerns expressed in the literature about the ability of end users to make realistic judgements of system quality (Edberg & Bowman 1996).

Neither perceived system quality nor perceived information quality directly influenced intended use. System quality and information quality need not, of course, be positively related to use. A user may need to spend a longer time using a system if the system quality or information quality is poor. The lack of association between quality and use may be particularly marked for UDAs as the high involvement end user developers have with both the development process and the completed system may result in them making more use of the system. In their 18-month study of 51 UDAs, Klepper and Sumner (1990) found that evolutionary change occurred in nearly all the UDAs. The average number of hours of use reported by the participants in this study was 4.04 hours per week with a maximum of 12 hours per week. This appears high given the relative importance of the BPG in their overall programs of study unless we consider that these figures include time spent on iterative development of the system.

No significant relationship was found between intended use and perceived individual impact. This is consistent with Gelderman's (1998) observations in the organizational domain and Seddon's (1997) contention that the relationship between use and individual impact proposed by DeLone and McLean may not exist.

Individual impact did not have a significant influence on organizational impact. This is a surprising result given the nature of the system studied. The participants in the study evidently felt their UDAs were contributing to their individual performance, yet this was not reflected in the game outcome. It is possible that perceived individual impact is not a realistic indicator of actual individual impact. In the study in which they reported a relationship between individual impact and organizational impact Kasper and Cerveny (1985) used objective measures for both constructs. Further research is required to understand these differences.

The relationship between individual impact and organizational impact is recognized to be complex. Organizational impact is a broad concept, and there has been a lack of consensus about what organizational effectiveness is and how it should be measured (Thong & Chee-

Sing 1996). Whilst changes in quantitative indicators of organizational effectiveness would provide a clear signal of organizational impact, more subtle impacts may be involved. DeLone and McLean (1992 p. 74) recognised that difficulties are involved in 'isolating the effect of the I/S effort from the other effects which influence organizational performance'. Again, this issue may be expected to be magnified in the UDA domain, where system use may be very local in scope. Any changes in organizational impact for a particular organisation would be the result of the combined individual effects of the UDAs in the organization, which may well be of varying quality. Individual UDAs could have potentially conflicting effects on each other's use as well as on organizational effectiveness, making it difficult to detect a systematic effect.

### **Demonstrating UDA impact and success**

The four model paths that were supported suggest that the impact of a UDA is mediated via user satisfaction. Perceived system quality and perceived information quality result in increased satisfaction, which leads to increased intended use and increased perceived individual impact.

A major benefit claimed for user development of applications is improved quality of information because end users should have a better understanding of the information they require. If end users are 'experts' with respect to their information, then the strong positive relationship between perceived information quality and user satisfaction is a valuable one. It should reassure organisations that rely on user satisfaction with UDAs as the sole measure of application success that the satisfaction of end users will not be disproportionate to the quality of information provided by the applications, and that end user developers can recognise when use of an application might require caution or be inadvisable. This conclusion is however based on the assumption that end user developers are 'experts' with respect to the quality of information they use. Given the lack of relationship between system quality and perceived system quality in this study, this assumption should be explored in future research.

The lack of relationship between system quality and perceived system quality might be explained by high user involvement in their own systems. Cheney, Mann and Amoroso (1986) argued that end user development can be considered as the ultimate user involvement. The literature on user involvement indicates that increased involvement is associated with increased user satisfaction (Barki & Hartwick 1994), and this might be mediated via increased perceived quality. End user developers' perceptions of system quality might be also compromised if they lack the knowledge to make realistic judgements.

The finding that perceived system quality, rather than objectively assessed system quality, influenced user satisfaction therefore suggests caution when organizations place heavy reliance on end users' perceptions of the value of applications they develop. If the satisfaction of the user developer is the sole measure of application success, and satisfaction does not reflect system quality, then the organizations may be put at risk. The benefits anticipated from end user development of applications may be compromised. It appears that Melone's (1990) caution that the evaluative function of user satisfaction can be compromised by the role of attitude in maintaining self esteem is particularly relevant in the UDA domain.

The finding that user satisfaction had a highly significant influence on individual impact is encouraging as it suggests that the reliance of organisations on end user developers' satisfaction with the applications they develop may not be misplaced. However, the major concern with this result is that individual impact was only measured using self-report items. While Gelderman's (1998) study found user satisfaction to be positively associated with both subjective and objective measures of individual impact, it would be useful to have this finding

confirmed using an independent measure of individual impact. This would ensure that differences attributable to the user also being the developer were identified.

Seddon (1997), identifying some problems with DeLone and McLean's model as a model of IS success, suggested that, rather than a single sequence of relationships, there were two linked sub-systems: one that explained use, and another that explained individual, organizational, or social impact. He argued that use is not an indicator of information system success. This study provides support for Seddon's proposal to separate impact measures from one another and from use; there was no evidence of correlation between use, individual impact, or organisational impact. It does not, however, support Seddon's proposal for two separate sub-systems; rather, it suggests that user satisfaction is a key indicator of subsequent outcomes, including use and individual impact.

## CONCLUSIONS

This study has provided the first empirical test of the entire DeLone and McLean model in the UDA domain. Overall, the model was not supported by the data. Of the nine hypothesised relationships tested by SEM, four were found to be significant and the remainder not significant. The model provided strong support for the relationships between perceived system quality and user satisfaction, perceived information quality and user satisfaction, user satisfaction and intended use, and user satisfaction and perceived individual impact.

It is notable that the model paths that were supported in this study are those that reflect user perceptions rather than objective measures. User satisfaction reflects a user's perceptions of both the quality of the system itself and the quality of the information that can be obtained from it. Intended ongoing use of the IS reflects user satisfaction, and the impact that an individual feels an IS has on their work reflects their satisfaction with the IS. However, no significant paths were found involving the objectively measured constructs system quality and organizational impact. System quality did not influence perceived system quality, and perceived individual impact did not influence organizational impact.

This study indicates that user perceptions of IS success play a significant role in the UDA domain. Further research is required to elucidate the relationship between user perceptions of IS success and objective measures of success, and to provide a model of IS success appropriate to end user development.

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