LINKING THEORY AND PRACTICE:
PERFORMING A REALITY CHECK ON A MODEL OF IS SUCCESS

Michael Rosemann, Queensland University of Technology, Centre for IT Innovation
Brisbane Qld 4000, Australia, m.rosemann@qut.edu.au

Iris Vessey, Indiana University, Kelley School of Business
Bloomington, IN 47405, USA, ivessey@indiana.edu

Abstract

The issue of 'rigour vs. relevance' in IS research has generated an intense, heated debate for over a decade. It is possible to identify, however, only a limited number of contributions on how to increase the relevance of IS research without compromising its rigour. Based on a lifecycle view of IS research, we propose the notion of 'reality checks' in order to review IS research outcomes in the light of actual industry demands. We assume that five barriers impact the efficient transfer of IS research outcomes; they are lack of awareness, lack of understandability, lack of relevance, lack of timeliness, and lack of applicability. In seeking to understand the effect of these barriers on the transfer of mature IS research into practice, we used focus groups. We chose DeLone and McLean's IS success model as our stimulus because it is one of the more widely researched areas of IS.

Keywords: Relevance, IS Research, Focus Group, IS Success, D&M's IS Success Model

1 INTRODUCTION

The IS research community in the U.S. has long debated the relative importance of rigour and relevance in its research. *Rigour* is required to satisfy the quality standards demanded of academic disciplines housed within business schools and is largely manifested in publications in academic journals acknowledged as well-respected and therefore of high quality. Establishment of rigour in IS research is necessary, for example, for IS academics to establish credibility within the school/department and the university, thereby attaining tenure and promotion, and to compete for research funding, etc. *Relevance* is required to satisfy IS's practitioner constituents that academia will educate the next wave of IS professionals, as well as providing fertile ground for the development and organization of applicable knowledge, and leadership to organizations on the effective management and utilization of information technologies (Kavan 1998).

Since its inception in the 1960s, the North American IS research community has focused on satisfying the demands of its immediate home – the business school, and therefore, the university – thereby valuing rigour. A major focus, for example, has been on using rigourous methodology in its investigations (Benbasat and Weber 1996). Notwithstanding Benbasat and Weber's statements to the contrary (1996), is clear that little progress has been made in recent years in valuing relevance over rigour. This view is supported by a research review process that often appears to seek the "fatal flaw," at whatever cost, rather than seeking to determine whether a paper could make a significant contribution to the field. More recently, two journals have called for, and published, a number of articles on the relevance/rigour issue. (See *Information Resources Management Journal*, 11 (1) (Winter 1998) and *MIS Quarterly*, 23 (1) (March 1999).) It is unclear, however, that this focus has had an impact on the IS community. Nonetheless, the IS research community keeps returning to the issue. For a recent example, see Baskerville and Myers (2004).

At this point in time, the relevance issue in IS research is most often addressed by choosing research issues that are perceived as important to practice (as in the annual key issues surveys conducted by Computer Sciences Corporation and the Society for Information Management; see Senn 1998), collecting and analyzing data from practice, and publishing the findings in academic journals. Some researchers also seek to publish their findings in practitioner journals, although rarely. The major point of contact with practitioners following the conduct of the research is that IS researchers who seek data from practitioners may present them with a short summary of their findings, if promised or requested. The latter usually occurs without any kind of debriefing to explain the findings and their relevance to the practitioner community. In other words, knowledge transfer is not currently a focus of the majority of IS researchers. One reason for this approach could be the lack of incentives for researchers to conduct more relevant research because it is often not valued by the top IS research journals. Under these circumstances, it would be easy for practice to develop the impression that the IS community does not seek to be relevant.

As a consequence of decades of primarily seeking to conduct rigorous research, the IS community has not developed sound ways of including practitioners' viewpoints. We really have no way, therefore, of assessing whether our research is relevant to practice. In this research, we introduce a new perspective on the issue of research relevance. Based on an examination of the research lifecycle, we propose that the IS research community conduct what we call "reality checks" on established IS research outputs. In doing so, we address directly the statement by Benbasat and Zmud (1999) that:

> "*The IS field does not possess the evidence with which to illustrate the impact of its research.*"

We illustrate our approach to conducting an exploratory reality check with DeLone and McLean's (D&M's) IS success model (1992, 2003). We believe that mature research should be exposed to such reality checks. Alternative candidates would therefore be Rogers' Diffusion of Innovations Model (1983) and the Technology Acceptance Model (Davis 1989), for example. We asked ourselves what we know about the extent to which the DeLone and McLean model is known to practitioners, understood by practitioners, useful to practitioners, used by practitioners, too difficult for practitioners to apply in their given contexts, and so on. To provide a broader perspective on this issue, we examined the reactions of both corporate IS personnel and IS consultants. As far as we are aware, research of this nature has not been conducted for this model or for any other model produced by IS research. Tan and Pan (2002) used a similar methodology, but were focussing on developing a ERP-specific success model and involved post-grad. students, and not experienced practitioners.

The following section analyzes why IS research is little used by practitioners and then presents the approach that we take to address these issues in our research. It also introduces D&M's IS success models (1992, 2003), the latter of which is hereafter referred to as D&M's IS success model, as the authors suggest. Section 3 presents the research methodology used in the exploratory reality check we conducted on D&M's model, while Section 4 presents the results of our data analysis. Section 5 discusses the findings and presents the implications of our research for both research and practice. Finally, Section 6 presents possible future research.

2 BACKGROUND

In this section, we first discuss the reasons why there is so little communication between the academic and practitioner communities on significant issues in the discipline. We then present the approach that we use in this research to examine the appropriateness of D&M's model of IS success to the IS practitioner community.

2.1 The Relevance of IS Research to Practice

The focus on rigour has led to the disenchantment of the practitioner community. We can identify at least five major problems.

a) First, the most prestigious IS journals and conference proceedings focus almost exclusively on rigorous research (e.g., MISQ or ICIS). As such, these articles are written by academics for academics. Hence, the IS practitioner community typically neither attends such conferences nor reads such articles and therefore potentially *lacks awareness* of IS research (Senn 1998).

b) Second, even if practitioners were exposed to the outcomes of rigorous IS research, it is likely that they would often perceive them as difficult to understand (see, for example, Benbasat and Zmud 1999; Kavan 1998; Robey and Markus 1998; Senn 1998). The world of IS research has its own terminology and expends considerable effort reporting on such methodological aspects as significance tests, tests of instrument validity and reliability, etc., which are often impossible for outsiders to understand. Hence, there is an issue with the *understandability* of IS research as published in typical IS journals and conference proceedings.

c) Third, the outcomes of academic research are not necessarily in an appropriate form to have an impact on practitioners. There are two reasons. First, a model or theory might be over-engineered or might not capture the practical realities. Sophisticated conceptual modelling techniques beloved of certain academics, for example, are rarely used extensively in practice (Davies, Green, Rosemann, and Gallo 2004). Many examples of this phenomenon may also be found in the Operations Management literature. Second, although many proposed "critical success factor" models provide a useful list of important issues, they often lack detailed insights into how those factors can actually be achieved in practice (e.g., appropriate top management support). Hence, there is an issue of increasing the relevance of IS research to IS practitioners by *presenting IS research findings in an appropriate form*.

d) Fourth, a model or theory might be of sufficient quality, but its timing may not be appropriate; for example, it might be ahead of its time. More commonly, however, a model or theory may be outdated, a fact that may often be explained by the demand for rigorous research. The focus on rigorous research often demands more empirical work than the creative work that leads to new approaches or new solutions. Further, as Glass (1994) states: "practice often leads theory," a fact that can be substantiated by reviewing many of our current technologies (see, also, Senn 1998.) As just one example, the entire research area of Enterprise Systems contributed little to the direction that Enterprise Systems vendors took in developing their products (Gable 1998).[1] Instead, IS researchers commonly study ex-post issues, such as success factors in the implementation of such systems, and have been criticized for conducting "post-mortems" (see, also, Mandviwalla and Gray 1998). Hence there is an issue of *timing* of the IS research contribution to the practitioner community.

e) Fifth, even if practitioners are aware of research outcomes, understand them, and perceive them to be appropriate, relevant, and timely, it does not mean that they are able to apply them. For example, although explanatory models might be useful in better understanding a certain phenomenon, the *lack of applicability* limits the potential impact of such models or theories.

2.2 The Current Study

In this research, we address IS research relevance from a research lifecycle perspective. We present the view of the IS research lifecycle that we use in this research. We then introduce the target of our reality check: D&M's IS success model (1992, 2003).

2.2.1 Our Approach to Addressing the Issue

The relevance vs. rigour debate most often presents IS research as having conflicting objectives: if one pursues rigour then relevance will suffer; if one pursues relevance then rigour will suffer. In other words, rigour and relevance are often seen as the two extreme points of a continuum so that achieving one is viewed as necessarily compromising the other. Robey and Markus (1998), on the other hand, argue that both relevance and rigour can be pursued simultaneously by making considered choices in research approach, research design, and research presentation. Like Robey and Markus, we believe that it is possible to engage in research that is at the same time both rigorous and relevant.

Our view is that rigour and relevance as two important criteria for "good IS research" should be emphasized in different stages of the lifecycle of a research project. Figure 1a presents the various stages on a continuum from relevance to rigour; stages where relevance is more important than rigour appear above the mid-line and stages where rigour is more important appear below the mid-line. Initially, it is important that the majority of IS research identify relevant research problems, problems that are grounded in current practice. This initial stage would then be followed by several stages that are largely invisible to practitioners, in which rigour should be pursued. Although industry representatives are often involved as sources of evidence in empirical studies (e.g., case studies, action research), overall they play a rather passive role in the mid-stages of a research project. Finally, the results of the research are communicated. As we have seen, however, in most cases communication occurs within the IS academic community and findings are only rarely exposed to the wider community of IS practitioners who were responsible for identifying the problem and may also have contributed to the data collection phase of the research lifecycle.

In this research, we introduce a new perspective on the issue of relevance that focuses on the final stage of the research lifecycle as presented in Figure 1b, that of communicating the results and having practitioners evaluate them. We suggest that the IS research community conduct reality checks on IS research outputs. At this point in our research evolution, this approach could be used to examine whether IS research theories, models, and/or frameworks are appreciated by practice and therefore

---

[1] Note, however, that Lyttinen (1999), on the other hand, states that several innovations, including "megapackages (SAP)" can be traced to IS academics.

appropriate for use. That is, we could conduct investigations into whether IS outputs in some sense ring true to practitioners or "match" practitioners' views of their world.

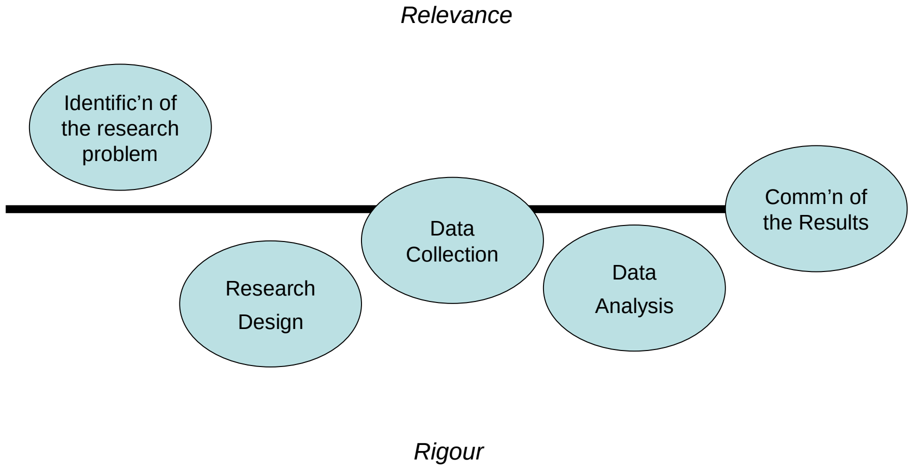

Figure 1a: Rigour and Relevance in the IS Research Lifecycle

Note that, in taking this approach, we extend our model of rigour and relevance in the IS research lifecycle to include a further stage beyond the normally recognized research process, one that is focused on the evaluation of knowledge. The outcomes of this evaluation could then also result in feedback to earlier phases of the knowledge lifecycle.

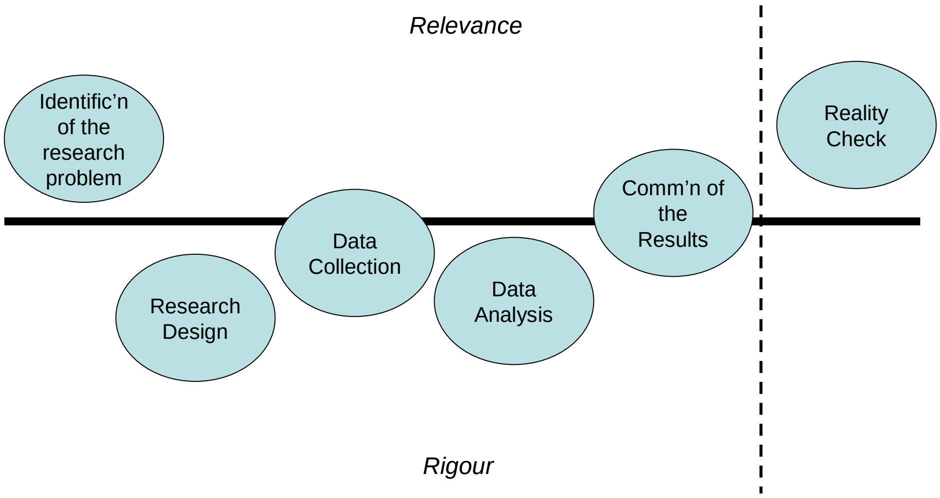

Figure 1b: Rigour and Relevance in the Extended IS Research Lifecycle

Applicable theories and models should be transferred into practice so that the impact they make will ultimately lead to an ROI for the entire research stream. However, there is another, more subtle reason, for conducting reality checks: evaluating mature models and theories in this way leads to greater involvement of a community outside the academic world, which provides new input for the further development of those theories and models.

2.2.2 Introduction to DeLone and McLean's IS Success Model

DeLone and McLean's IS success model (1992, 2003) is a good example of the type of IS research that we believe should be subjected to the type of evaluation we propose here. It addresses an issue crucial to business, is backed by significant research effort, and has now been "validated" by further research (DeLone and McLean 2003). D&M's IS success model (1992) summarized and structured the extant literature on IS success into an overall model designed to capture the relevant aspects of the success of information systems (IS) in practice as well as the inter-relationships among them. The authors then published a revised model in 2003 (DeLone and McLean 2003). Both of these models are based almost exclusively on significant volumes of research by IS academics. The first study, for example, reviewed 100 articles on "IS success," which afforded 180 measures. The second article, which examined just those studies in the area that appeared following the publication of the first paper, reported that there are "almost 300 articles in refereed journals that have referred to, and made use of, this IS success model" (DeLone and McLean 2003). Hence, a substantial amount of the blood, sweat, and tears of IS research has been expended in trying to determine what constitutes IS success. We therefore asked the question: Do IS practitioners even know about the model? If so, how well do they know it? For example, do they understand it, agree with it, use it in their own organizations?

Figure 2a presents the original model (1992), while Figure 2b presents the revised model (2003). The theoretical basis for the model in Figure 2a is Shannon and Weaver's model of communication (1949) augmented by Mason (1978). Shannon and Weaver viewed the output of a communication as occurring at the technical level (that is, the accuracy and efficiency of the system that produced the information), the semantic level (that is, the success of the information in conveying the intended meaning), and the effectiveness level (that is, the effect of the information on the receiver). Mason (1978) then augmented this model by viewing effectiveness as influence, which could be described in terms of a series of events that involved receipt of the information, evaluation of the information, and application of the information, leading to both a change in recipient behaviour and a change in system performance. DeLone and McLean (1992) then perceived of information receipt as use, influence on the recipient as user satisfaction and individual impact, and influence on the system as organizational impact.

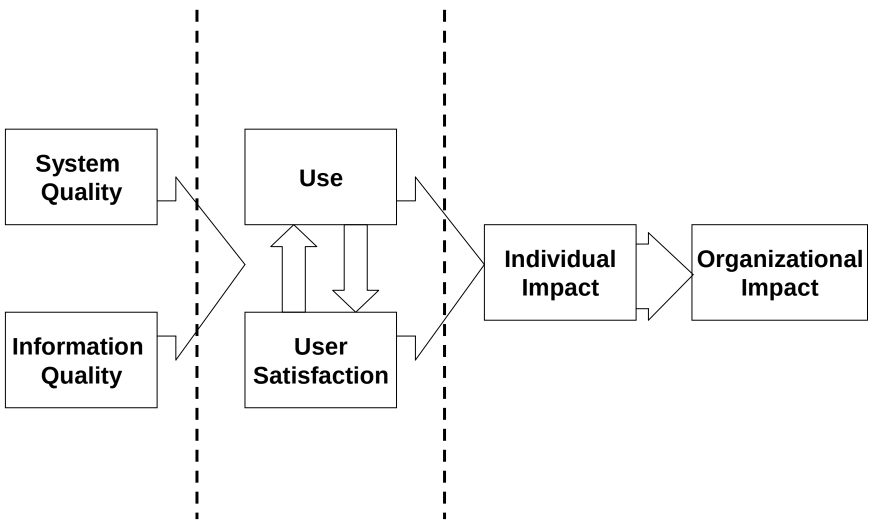

Figure 2a: DeLone and McLean's Original Model of IS Success (1992)

D&M's original model views IS success as occurring in the following way. System and information quality are seen as influencing both user satisfaction and use of a system. There is a mutual interaction between use and user satisfaction in which satisfaction with the system influences use and use influences user satisfaction. Use and user satisfaction then have a joint impact on the individual. Finally, the impact of the system on individuals within the company results in impacts at the organizational level. DeLone and McLean state that their model is a combined variance (causal) and process (temporal) model, as can be seen in the mutual interaction of user satisfaction and use; use, for example, cannot influence user satisfaction until after the system has actually been used. The combined variance/process model structure has been strongly criticized by Seddon (1995). Combined perspectives in the model means that many of the boxes and arrows may have different interpretations in different contexts, resulting in the reader interpreting the same part of the model in different ways under different circumstances.

D&M’s revised model (2003) differs in three ways from their initial formulation, two of which the authors describe as extensions. First, they introduce service quality as an initial variable, in addition to system quality and information quality. Service quality is designed to capture the fact that the IS Department also plays a role in facilitating end-user computing via the services it offers to business personnel wishing to develop their own systems. Hence the IS Department functions as both information provider and service provider. Second, impacts on the individual and the organization have been replaced by net benefits. The change from “impact” to “benefit” was made to simplify the recording of the various kinds of impacts that could potentially be investigated; for example, work group impacts, inter-organizational impacts, and societal impacts. The third change is that rather than the effects of quality impacting use and user satisfaction, quality is now viewed as influencing intention to use or use, as well as user satisfaction. This change is shown in D&M’s revised model, although no reference is made to it in the text. Note that intention to use forms part of the Technology Acceptance Model and that Seddon (1995) proposed the use of certain variables from that model in his suggested revision of D&M’s first model.

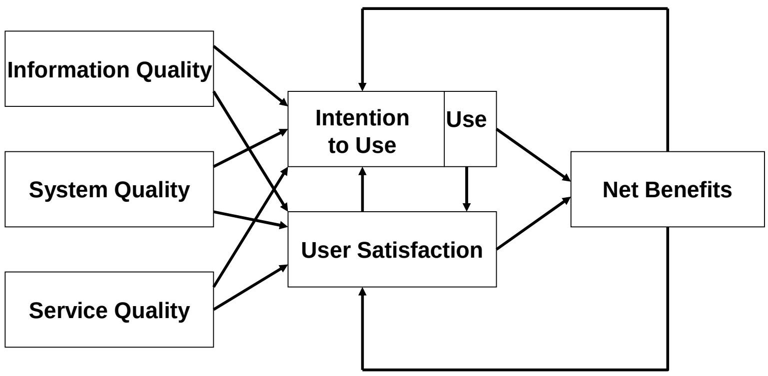

Figure 2b: DeLone and McLean’s Revised Model of IS Success (2003)

3 RESEARCH METHODOLOGY

We used D&M’s revised model of IS success (2003) as the stimulus for our reality check (see Figure 2b). The innovative nature of our research required an exploratory approach to examine its applicability in practice. We chose focus groups as a way of gaining insights into the perceptions of practitioners in evaluating established academic IS models. Focus groups are an established way for a moderated multi-directional discussion of a specific research topic (Powell and Single, 1996). The intention is to explore a new domain and derive insights, which result out of group discussions and go beyond the outcomes of 1-1 interviews (Morgan, 1988). In these focus groups we wanted to understand how practitioners currently evaluate the success of IS, how the main criteria for IS evaluation can be grouped, and, in particular, the group members’ impressions of the merits of D&M’s model. Because consultants have considerable influence on corporate IS activities, we performed our reality check on D&M’s IS success model using IS consultants as well as corporate IS personnel. To increase the homogeneity of the focus groups, we conducted two separate sessions. Each focus group lasted approximately 2.5 hours. The focus groups were conducted in Australia in July 2004.

We opened each focus group with the question "How do you measure the success of your most complex information systems?" In our first focus group, that with corporate IS personnel, we invited participants to share their approaches in sequence, which resulted in some discussion of the criteria prior to eliciting those of all participants. As a result, in the second focus group, that with IS consultants, we invited the participants to write down the main criteria prior to opening up a discussion of the criteria. In both instances, the criteria were then discussed and clustered by types of measures. We then introduced D&M's model to the groups and answered any related questions. Finally, we compared the criteria identified in the focus groups with D&M's established academic model. The final question we addressed was: "Would you consider using this model to measure IS success in your organisation? If not, why not?"

4 DATA ANALYSIS

All focus group members had prior relationships with universities and therefore had a general appreciation for academic research. As expected, we found that the directions taken by our two focus groups were quite sensitive to the difference in the responsibilities of the representatives, both between and within groups. Hence, we describe the findings of each of the groups separately and then compare them to the D&M model.

4.1 Focus Group 1: User Representatives

The three corporate IS personnel who formed the first focus group had quite diverse backgrounds, coming from the utility and finance industries, and from the public sector. We found that the focus of the members reflected the role they played in the IS area of their enterprise. Hence, we report the results on that basis, and in the sequence in which the participants shared their views.

- The focus group member from the public sector was the manager of IT operations. Not surprisingly, therefore, his focus was on issues such as continuity measures and service desk response. He also believed that end-to-end project tracking from initiation through operation is an important success criterion.
- The focus group member from the finance industry was the organization's process manager. From a technical perspective, this participant viewed infrastructure up-time (availability), and service requests (help desk) as important criteria. From a business perspective, he believed that net business value both from a technical perspective (cost to keep a system running, including licensing) and a business perspective (developers meeting users' expectations), as well as business' view of the performance of a system, should be assessed. Although not in place at his company, this group member was a strong believer in also measuring the quality of a delivered system, stating that:

  > "You pay for lack of quality if it slips in development. It is much easier to recognize value if you have a quality system to start with. Poor quality shows in poor uptime, number of programmers, etc; it turns up in lots of metrics over time."

- The third focus group member was a Group Process Manager at a utility company. His first focus was on project success (on budget, on time), and on the benefits derived from projects 3-6 months following implementation. Important criteria for the latter were reduction in head count, throughput, time of process execution, as well as net benefits. He also stressed the fact that levels of system availability beyond the essential are a cost to the company. Other measures on which he focused included business operational support and service for operations, as well as service for all of the IT components of the technical infrastructure. Finally, he indicated that end-user satisfaction is a measure that his company monitors.

Following sharing and discussing of the success criteria used in their three organizations, the three participants grouped their criteria and prepared a model that reflected their view of the success criteria.

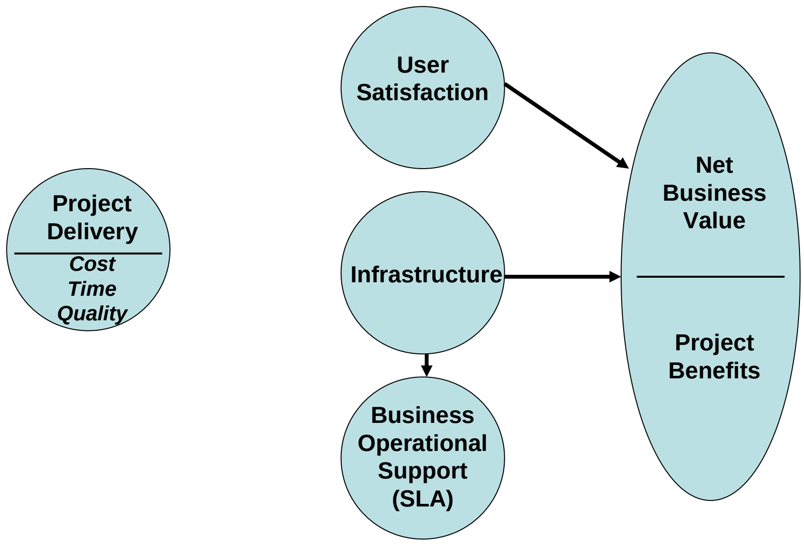

Figure 3: Outcome of Focus Group 1 Deliberations

4.2 Focus Group 2: Consultants

Two of the three consultants involved in the second focus group worked for large, global consulting companies. The third consultant, who was focused on web-based solutions, formed part of a much smaller, global consulting firm.

The group of consultants was surprisingly homogeneous in their comments on how they currently measure the success of information systems. Hence we present the findings for this group in terms of their major success criteria, which clustered as follows.

- Financial measures such as return on investment, net present value, shareholder value, costs, savings.
- Productivity measures, such as reduction in headcount, etc.
- Comparisons of individually defined key performance indicators before and after the project.
- Client satisfaction with the system; a related issue is the customer/partner/supplier "happiness factor," as one participant phrased it.
- User-related measures of personal satisfaction such as user acceptance, user empowerment, and improved task skills.
- System-related measures such as accessible information and system responsiveness.

During the focus group, it became clear that the participants had difficulty differentiating between the success of an IT application as opposed to the success of the related project. It appears likely that this focus, which is evidenced in the statement below, is shaped by the consultants' role in conducting implementation projects.

> "We only engage in such implementation projects if they also provide our own organization with benefits. This includes not only financial benefits, but also a "referencible" client;[2] and the consultants also have to improve their knowledge. It has to be a true win-win situation."

---

[2] A referencible client is one that the company can use for promotion purposes.

A further measure of project success is "delivery upon project milestones."

4.3 Comparison of D&M's Model with Models from Practice

We now compare D&M's model with those of our practitioners. We address both factors that practice contributes to D&M's model and those factors that are missing from the models derived from practice.

What can practice learn from D&M's model?

1. Probably the factor that was addressed least (and/or least well) by practice was intention to use/use, a factor that was all but absent among those of our six participants. One consultant referred to a related factor as "workers' support of the systems implemented; not trying to find a way around it." Nonetheless, the participants appeared intrigued with the notion and showed interest in potentially applying it in their corporations.
2. Our participants did not refer to information quality in their initial assessment of success factors. When it was brought to their attention in D&M's model, they commented that the effect of information quality can be compounded across a number of systems. Hence, the lack of attention to information quality appeared to be an oversight.
3. Service quality was not used by our respondents in the way in which it was intended by DeLone and McLean, that is, as a measure of the service provided to those employees engaging in end-user computing. It does seem to us that the IS Department would need to assess the success of those types of systems specifically and separately from the ones that the department itself develops, or otherwise implements and maintains. Hence, we believe that the inclusion of service quality in D&M's model is problematic.

Next we present some of the factors elicited by our focus group participants that are missing from D&M's model.

1. Both groups focused to a considerable extent on the project that delivered the systems under discussion, in terms of cost, time, and quality. While this is not surprising in the case of the consultants, the emphasis given to the project by corporate IS personnel was also substantial. These observations suggest that D&M's model should be extended to include the influence of project quality on the ultimate success of the system, thus making the distinction between implementation success and system success more explicit (Tan, Pan, 2002).
2. Both focus groups placed considerable emphasis on service delivery based on both systems and technology (the infrastructure), issues that are largely absent from D&M's model. Again, this observation suggests that D&M's model needs to be extended to include operational issues such as these.

5 DISCUSSION

Here we present an analysis of the utility of D&M's IS success model to practice based on the key criteria of awareness, understandability, timing, relevance, and applicability used earlier to characterize current problems in seeking to produce IS research that is relevant to practice.

It was satisfying to observe that all participants could see the merit in D&M's model; for example, they all requested the original papers. None of the participants had heard about the model before or read any of the academic journals in which the model and its revisions had been published. Thus, we feel that our focus groups increased their *awareness* of this model.

We also helped the practitioners involved to *understand* the model, which they perceived as largely intuitive. There was a certain challenge in both groups in understanding the semantics of the arrows linking the factors. Note, however, that we did not test how well the participants would have understood the model based solely on the publications and without our explanations.

All the focus group participants perceived the model as *timely*. Clearly, measuring the success of information systems is a timeless challenge. This observation encouraged us to engage in further work on the transfer of this model into practice.

Most focus group participants confirmed the *relevance* of information quality, system quality, service quality (viewed largely as the quality of the help desk), user satisfaction, and net benefits (sometimes using different terminology) before we exposed them to D&M's IS success model. The notion of "intention to use" was new for all the practitioners and was viewed with interest. It was not obvious, however, how intention to use could be measured in practice. In this context, it also became obvious that there are two layers in this model that need to be differentiated. First, there is the model itself as represented in Figure 2b. Second, and for many of the involved participants even more important, there are the underlying measures for each factor. It was a common viewpoint that the model is only as good as its underlying measures. This might be a potential difference in the interests between practitioners and academics because academics tend to focus on evaluations and extensions of models more than on actual measures. Furthermore, participants from both focus groups wanted a stronger recognition of the characteristics and success of the project leading to the system implementation.

Consequently, another issue that participants perceived with this model was its immediate *applicability*. Some of the consultants were interested in using the model, "but it is just an academic paper," as one participant phrased it. "When the model is so successful in academia, why did nobody develop a tool based on this model that facilitates its application in practice?" The consultants perceived as a major downside the fact that a potentially interesting and mature model could not be easily applied to their current challenges.

Our study has several limitations. First, it should be kept in mind that our study represents just the first step in exploring the possibility of doing reality checks on well-established IS research models or frameworks. The focus groups we conducted were exploratory in nature and should not be viewed as attempting to present a rigourous approach to performing such a check. Second, the study was conducted in Australia. We see no reason, however, to suspect national or regional differences in the utility of this, or, indeed, any other system-level IS model. Third, we relied on the feedback of only two focus groups consisting of 6 people in total. Thus, this work could be strengthened using more focus groups and greater numbers of respondents.

6 FUTURE RESEARCH

Based on our findings, we see potential for future research in the following areas. First, further research needs to be conducted on the link between system and project success, a link identified by all participants and one that is not addressed in D&M's model. There was consensus that a system can be perceived as successful, but not the related project, and vice versa. This issue is, of course, more relevant in the early phases of the system lifecycle. Nevertheless, we believe that the interrelationships between system and project success deserve further attention.

Second, the feedback from the two types of focus group members (users and consultants) highlighted the different perceptions of these stakeholders. We see potential for more research into the development of a better understanding of the role of the stakeholder in evaluating IS success (see, for example, the work by Sedera, Gable, and Chan 2004).

Third, there is clearly a great opportunity to derive automated solutions based on accepted, mature IS theories and models. As a consequence of this research, for example, we have started to convert D&M's model into a web-based solution. This portable solution will be accessible via a simple web-browser and will guide the user through an assessment of the success of their systems based on that model. Hence, it will facilitate the immediate application of the model in practice.

Fourth and finally, we want to provide more detailed requirements and guidelines for how to perform adequate and sound reality checks of IS models, theories, and frameworks.

7 REFERENCES

Baskerville, R. and Myers, M. D., "Special Issue on Action Research in Information Systems: Making IS Research Relevant to Practice." Foreword, *MIS Quarterly*, 28 (3), 2004, 329-335.

Benbasat, I. and Zmud, R.W., "Empirical research in information systems: The practice of relevance," *MIS Quarterly*, 23, 1 (1999), 3-16.

Benbasat, I. and Weber, R., "Rethinking 'Diversity' in Information Systems Research," *Information Systems Research* 7 (4), 1996, 389-399.

Davies, I., Green, P., Rosemann, M., and Gallo, S. "Conceptual Modelling - Why do we do it?" *Proceedings of the 23rd Conference on Conceptual Modelling*. Shanghai, 8-11 November 2004.

Davis, F. D. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13 (3), 1989, 319-340.

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

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

Gable, G. G., "Large Packaged Software: a Neglected Technology?" *Journal of Global Information Management*, (6) 3, 1998, 3-4.

Glass, R.L., "Theory versus Practice." In R. L. Glass, *Software Creativity*, Englewood Cliffs, N.J: Prentice-Hall PTR, 1994.

Kavan, C.B. "Profit through Knowledge: The Application of Academic Research to Information Technology Organizations." *Information Resources Management Journal*, 11 (1), 1998, 17-22.

Lyttinen, K., "Empirical Research in IS: On the Relevance of Practice in Thinking of IS Research." *MIS Quarterly*, 23, 1 (1999), 25-28.

Mandviwalla, M. and Gray, P. "Is IS Research on GSS Relevant." *Information Resources Management Journal*, 11 (1), Winter 1998, 29-37.

Mason, R.O., "Measuring Information Output: A Communication Systems Approach," *Information and Management*, 1 (5), October 1978, 219-234.

Morgan, D. I. "Focus Groups as Qualitative Research." Sage Publications. California. 1988.

Powell, R.A. and Single, H.M. "Focus Groups." *International Journal of Health Care*, 8 (5), 1996, 289-303.

Robey, D. and Markus, L.M. "Beyond Rigor and Relevance: Producing Consumable Research about Information Systems." *Information Resources Management Journal*, 11 (1), Winter 1998, 7-15.

Rogers, E. M. *Diffusion of Innovations*. 3rd Ed. New York: Free Press, 1983.

Sedera, D., Gable, G., Chan, T. "Measuring Enterprise Systems Success: The Importance of a Multiple Stakeholder Perspective". *Proceedings of the 12th European Conference on Information Systems (ECIS 2004)*. Turku, Finland, June 2004.

Senn, J. "The Challenge of Relating IS Research to Practice." *Information Resources Management Journal*, 11 (1), Winter 1998, 23-28.

Seddon, P. B., "A Respecification of the Delone and McLean Model of IS Success," *Information Systems Research*, 8 (3), 1997, 240-253.

Shannon, C.E. and Weaver, W. *The Mathematical Theory of Communication*. Urbana, IL: The University of Illinois Press, 1949.

Tan, C.W., Pan, S.L. "ERP Success: The Search for a Comprehensive Framework." *Proceedings of the 8th Americas Conference on Information Systems (AMCIS 2002)*, Dallas, 9-11 August, 925-933.