

Understanding IS Adoption and Success: Integration of IS Success and Technology Adoption Research

Full Paper

Jennifer Jewer

Memorial University of Newfoundland

jenniferj@mun.ca

Deborah R. Compeau

Washington State University

deborah.compeau@wsu.edu

Maximillian D. Besworth

University of British Columbia

maximillian.besworth@alumni.ubc.ca

Abstract

Despite continued research on technology adoption and IS success; there continue to be significant organizational challenges with IT. One reason for this may be the lack of consistent understanding resulting from the fact that there are two dominant research streams in this area – technology adoption research (TAR) and IS Success research (ISSR) – which have insufficient dialogue between them. TAR and ISSR offer complementary perspectives of IS– adoption does not necessarily mean success, and measurement of system success does not necessarily explain why the system was successful. We examine the relationship between these two research streams using the theory of planned behavior (TPB) from TAR and the IS Success model from ISSR. This paper proposes an integrated model that seeks to improve understanding of IT adoption and success. Our integrated model provides the theoretical strength of the TPB as well as the actionability of IS Success.

Keywords

Information systems success, theory of planned behavior, information systems adoption.

Introduction

We live in a world of rapidly evolving technology, where organizational success is increasingly influenced by the effective integration of appropriate technologies. Despite more than 30 years of research on technology adoption and success across multiple streams, we continue to see significant organizational challenges with IT as users fail to use it or use it less effectively than intended (Sedera and Gable, 2004). Moreover, as technology moves into new sectors (e.g., healthcare) we see a repetition of the challenges that were faced in other organizations years earlier (Lau, Kuziemsky, Price, & Gardner, 2010; McGinn et al., 2012).

One reason for this state of affairs may be the lack of consistent understanding resulting from the fact that there are two dominant streams of research in this area - one related to adoption and the other related to success - which do not always talk to one another, limiting our understanding of the phenomenon (Wixom & Todd 2005). In this paper we examine the relationships between these research streams and how they might benefit from integration. These streams were developed in parallel to examine different phenomena, and each stream of research was in response to different issues going on in the field at the time. Technology Adoption Research (TAR) responded to issues of users' resistance to change, while IS Success Research (ISSR) addressed the issue of the dependent variable in MIS research (i.e. IS success). TAR includes Ajzen's Theory of Planned Behavior (1991) (TPB), Davis' (1989) Technology Acceptance Model (TAM), and Venkatesh et. al.'s (2003) Unified Theory of Acceptance and Use of Technology (UTAUT). TAR is predicated on the assumption that use leads to value, and focuses on what drives use (or intention to use). The assumption of value is not really examined, which is consistent with the underlying

theories' focus on predicting individual behavior, but limited overall. Conversely, ISSR (Bailey & Pearson, 1983; DeLone & McLean, 1992; Rai, Lang, & Welker, 2002; Seddon, 1997), has focused more on the value that is derived from technologies. It thus focuses on what TAR takes as given, and despite the abundance of ISSR, "there is a lack of comprehensive and integrative research on variables that influence success," (Petter, DeLone, & McLean, 2013). There are very few studies that bridge the gap between TAR and ISSR (Rai et al., 2002; Sabherwal, Jeyaraj, & Chowa, 2006; Seddon, 1997).

In this paper we examine IS success and the determinants of use based on the integration of theories from these complementary research streams. We examine the comparative and complementary nature of Ajzen's (1991) TPB from TAR and Delone & McLean's (2003) model of IS Success (ISS). We chose to base our proposed integrated theoretical model on TPB from TAR. TPB is the base theory for multiple theories such as TAM and UTAUT, and while UTAUT has emerged in the IS literature as the dominant theoretical model, for the purpose of theoretical integration it made sense to build from the original theory, while still accounting for the findings from its derivatives.

This paper examines how an integrated model might help theorize the adoption and success of IS and to see how TPB and ISS models might be complementary in building our understanding.

Theoretical Background

TAR began in the late 1970s with work that focused broadly on users' views of technology and their satisfaction. The theories in this stream incorporate some of the central concepts from social and behavior sciences in order to predict and understand users' adoption of technology. TPB (Ajzen, 1985, 1991) is the general theory underlying multiple IS-specific theories such as TAM (Davis, Bagozzi, & Warshaw, 1989; Davis, 1989) and UTAUT (Venkatesh et al., 2003). The cornerstone of TPB (Figure 1) is intention;

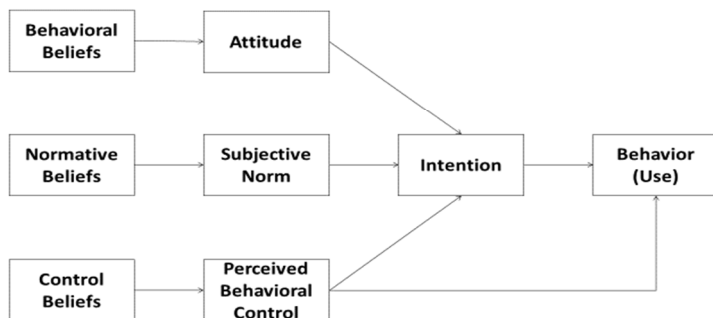


Figure 1. Theory of Planned Behavior (Ajzen, 1985)

intention is hypothesized to be the direct determinant of behavior and is, in turn, determined by the attitude toward performing the behavior, perceived social pressures to perform the behavior (subjective norm (SN)), and limitations (real or perceived) in performing a given behavior (perceived behavioral control (PBC)). These latter determinants of intention (attitude, SN and PBC) are founded on behavioral beliefs, normative beliefs, and control beliefs, respectively.

TPB has demonstrated predictive validity is explaining behavior and behavioral intention across a wide range of domains (Armitage & Conner, 2001). TPB was taken up in the IS literature by Mathieson (1991) and was subsequently extended by Taylor & Todd (1995a, 1995b) and Venkatesh and Davis (2000). TPB has demonstrated predictive validity is explaining behavior and behavioral intention across a wide range of domains (Armitage & Conner, 2001). TPB was taken up in the IS literature by Mathieson (1991) and was subsequently extended by Taylor & Todd (1995a, 1995b) and Venkatesh and Davis (2000). IS success research focuses on predicting and understanding the dependent variable, IS success. Based on the communications research of Shannon and Weaver (Shannon & Weaver, 1949), the information "influence" theory of Mason (1978) and IS research studies, DeLone and McLean (1992) proposed measures to evaluate IS success at three different levels: 1) technical (measured through system quality), 2) semantic (measured through information quality), and 3) effectiveness (measured through use, user satisfaction, individual impacts and organizational impacts). Following a period of empirical evaluation and criticism, a revised version considering both process and causal mechanisms of ISS was proposed in 2003 (Figure 2), focusing on six interrelated dimensions: system quality, information quality, service quality, use (or intention to use – DeLone and Mclean (2003) suggested intention to use may be a worthwhile alternative measure to use in some contexts), user satisfaction, and net benefits (DeLone & and Mclean, 2003). System quality, information quality and service quality affect use and user satisfaction, which in turn are antecedents of net benefits. Additionally, IS use and user satisfaction affect each other. Finally, net benefits influence and reinforce subsequent use and user satisfaction.

Over 150 empirical studies have applied the DeLone and McLean ISS Model (Petter & McLean, 2009) in different contexts and many recommended enhancements to the original ISS model (Ballantine, Bonner, & Levy, 1996; Myers, Kappelman, & Prybutok, 1997).

While there has not been a comprehensive examination of the complementarity between TAR and ISSR, linkages between ISSR and TAR have been studied previously. Rai et al. (2002) empirically examined the ISS models proposed by DeLone and McLean (1992) and by Seddon (1997) and examined their similarities and differences. Rai et al. (2002) used TAM to interpret the results and assess the theoretical validity of the relationships. They argue that the relationships in ISS “are consistent with TAM and TPB where attitudes about using the system are impacted by beliefs about the system,” (p.64).

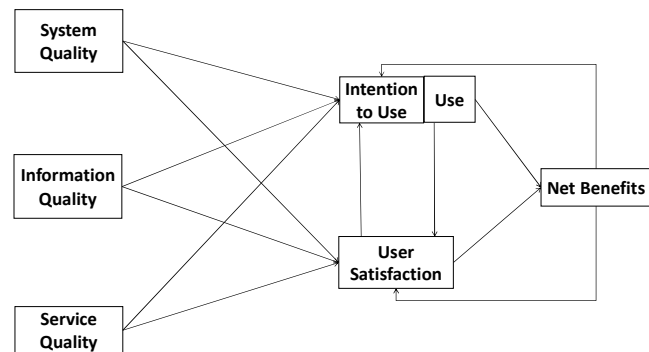


Figure 2. IS Success Model (DeLone & McLean, 2003)

Sabherwal et al. (2006) also developed and tested ISS based on the DeLone and McLean (1992), Seddon (1997), and Rai et al. (2002) models of ISS, adding context and user-related-related constructs. The user-related constructs were based on expectations-based frameworks and the diffusion of innovations, including TPB. Sabherwal et al. (2006) found that their results were “generally consistent with the research on technology adoption and use, including the theoretical and empirical work on TRA, TPB, TAM, IDT [innovation diffusion theory], SCT [social cognitive theory], and UTAUT,” (p.1861). The findings raise questions on ISS and determinants and the authors suggest that further research, specifically on these constructs and their relationships is needed. For example, “the nonsignificant effect of user satisfaction on system use (which is contrary to ISS models) is consistent with technology adoption and use models (Wixom & Todd, 2005) which have found user satisfaction to be a weak predictor of system use (Davis et al., 1989) especially when perceived usefulness and ease of use are included” (Venkatesh et al., 2003).

These papers support the need to carefully consider the impact of beliefs and attitudes on ISS, and the complementarity between TAR and ISSR. Rai et al. (2002) advocate an “integrated, multi-construct dependent measure of ISS that considers beliefs, attitudes, and behaviors” (p.66). Similarly, Sabherwal et al. (2006) suggest that future research is needed to investigate the effect of user attitudes towards IS on system quality, perceived usefulness (PU) and use. Much of TAR focuses on beliefs and attitudes, and while Rai et al.’s (2002) and Sabherwal et al.’s (2006) work included integration of constructs from TAM and TPB, it was limited. Both authors advocated for more research in this area on different contexts and with different conceptualizations.

Summary

There is substantial empirical research supporting TAR and ISSR; however, further model development is needed to more fully understand IS adoption and success. Reviews and meta-analytic studies of TPB (Albarracín, Johnson, Fishbein, & Muellerleile, 2001; Armitage & Conner, 2001; Bennett & Clatworthy, 1999; Blue, 1995; Conner & Armitage, 1998; Godin, Valois, & Lapage, 1993; Hagger, Chatzisarantis, & Biddle, 2002; Hausenblas, 1997; Hobbs & Sutton, 2005; Montoya, Atkinson, & Trevino, 2000; Sutton, 1998) have supported the theory’s predictions. For example, attitude, SN, and PBC typically explain between 39% and 42% of the variance in intentions (Armitage & Conner, 2001; Godin & Kok, 1996; Sheeran & Taylor, 1999) while intention and PBC explain between 28% and 34% of the variance in behavior (Armitage & Conner, 2001; Godin & Kok, 1996; Trafimow, Sheeran, Conner, & Finlay, 2002). As Ravis, Sheenan and Armitage (2009) noted, “although these effect sizes are impressive (cf. 61), it is also apparent that the TPB leaves a substantial proportion of the variance in intentions and behavior to be explained,” (p.2986). Similarly, while over 1000 publications have referenced the ISS model and 150 empirical studies have examined model relationships, “various relationships ... have found differing levels of support within the empirical literature” (Petter & McLean, 2009).

Furthermore, while both TPB and ISS models examine the antecedents to use, differences between the models support investigation of complementarity in order to learn more about adoption and success of an IS.

One difference is that the ISS model emphasizes net benefits (to the organization) as the ultimate dependent variable while TPB focuses only on use. Net benefits are viewed as influenced by both Use and Satisfaction in ISS. Since satisfaction in ISS includes items that measure behavioral beliefs and attitude in TPB, ISS thus theorizes a direct effect of those beliefs and attitude on net benefits.

A further difference is that TPB separates attitude (e.g. I like using) from behavioral beliefs while ISS considers them as part of a single construct.

Another difference between the models is that ISS emphasizes characteristics of the technology as antecedents to use (system and information quality) while TPB does not. Characteristics would be seen in TPB as antecedents to behavioral beliefs and their influence on use would be mediated. However, it is reasonable to think about security, for example, having a direct influence on a usage decision over and above the sense that the system helps one to do higher quality work. The same could be said of accessibility, reliability, and the components of IQ.

Finally, ISS pays attention to service quality which is absent in TPB. However, TPB pays attention to social influence and control beliefs and these are notably absent from ISS.

Theoretical Development

Figure 3 presents the proposed integrated theoretical model. The integrated model incorporates the theoretical mechanisms by which external factors influence individual behavior, based on TPB, providing a theoretical basis for the causal factors analysis in the ISS model. The integrated model allows examination of existing theories from the literature to reassess the relationship between the external factors, individual benefit, use and organizational benefit. Our aim is to improve understanding rather than (or at least more than) prediction necessitating the inclusion of more specific constructs that reflect the individual contributions of the two models.

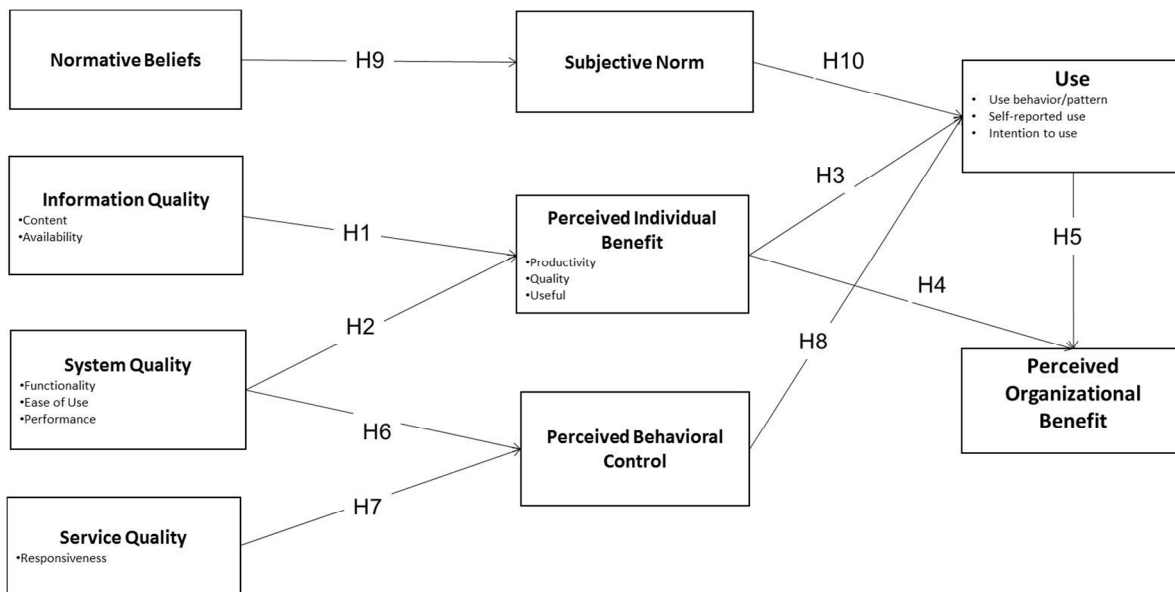


Figure 3. Integrated Model

Constructs

Table 1 identifies 9 constructs of the proposed integrated theoretical model with related TPB and ISS constructs. Consistent with the ISS, information quality includes both the content of the data and its availability (DeLone & Mclean, 2003). System quality includes three inter-related dimensions in the ISS:

functionality (the types of features), ease of use, and performance (functionality, reliability, flexibility, portability and integration) (DeLone & Mclean, 2003). We considered the performance dimension of system quality to also include accessibility, which is a control belief in TPB. We also note that ease of use is considered as a control belief in TPB. Service quality in the ISS model focuses on dimensions such as responsiveness as related to post-implementation user training, ongoing technical support and availability of such support. These items are akin to control beliefs from TPB. In TPB, Ajzen (2006) describes control beliefs as “beliefs about the presence of factors that may facilitate or impede performance of the behavior and the perceived power of these factors” (p.1).

We define perceived individual benefit as the degree to which an individual believes use of the system will enhance his or her productivity and quality of work, and the system will be useful in his/her job. Productivity and quality of work are included as items as they reflect attitudes about the likely outcomes of using the system. These would be considered behavioral beliefs in TPB and user satisfaction items in the ISS model. Usefulness is also included as an item of individual benefit, as suggested by Rai et al (2002).

Normative beliefs, subjective norm and PBC are from TPB and are defined in Table 1, and use could be measured as actual use, self-reported use or intention to use.

DeLone and McLean (2003) combined individual and organizational impacts into a single variable, net benefits. In our integrated model, we separate them, and have renamed net benefits to perceived organizational benefits as these are benefits to the organization which are distinct from the individual benefits. The specific organizational benefits measured will depend on the frame of reference (i.e. the system and the organization studied). The organizational benefits will be measured from the individual’s perspective, so that the whole model is at the individual level of analysis.

Construct	Variable	Related Constructs in Theoretical Models	
		ISS	TPB
Information Quality	Content	Information quality	
	Availability	Information quality	
System Quality	Functionality	System quality	
	Ease of use	System Quality	Control belief
	Performance	System quality	Performance includes accessibility which is a Control Belief in TPB
Service Quality	Responsiveness	Service quality	Control belief
Perceived Individual Benefit	Productivity	User satisfaction	Behavioral belief
	Quality	User satisfaction	Behavioral belief
	Useful	Perceived usefulness (TAM)	
Perceived Behavioral Control	Perceived constraints on using the system		Perceived behavioral control
Normative Beliefs	Normative expectations		Normative beliefs
Subjective Norm	Social pressure		Subjective norm
Use	Use behavior and pattern	Use	Use
	Self-reported use	Use	Use
	Intention to use	Use	Use
Perceived Organizational Benefit	Organizational Benefit	Organizational Benefit	

Table 1. Description of Model Constructs

Hypothesis Development

Ten hypotheses have been developed in our integrated model (Figure 3), which fall broadly into four categories: Perceived Individual Benefit (H1-H4), Use – Perceived Organizational Benefit (H5), Perceived Behavioral Control (H6-H8), and Subjective Norm (H9-H10). Perceived individual benefit is proposed to mediate the effect of information and system quality on use. In the ISS model, information and system quality are proposed to directly influence use and user satisfaction, which then influences use; however, we propose two important distinctions from the ISS model with respect to these relationships: (1) user satisfaction is not a separate dimension of IS impact and thus excluded from our model, and (2) the relationship between quality and use is not direct, but rather is mediated by perceived individual benefit. Each of these key assumptions is discussed in turn.

Distinction #1 – User satisfaction is not a separate dimension of IS impact. The literature supports not specifying user satisfaction as a separate dimension of IS impact. Gable, Sedera and Chan (2008) argued that user satisfaction is not a separate dimension of IS-impact and they omitted it from their IS-impact measurement model on the basis that “prior satisfaction items do not differentiate a unique dimension” (p.389). User satisfaction is a mix of measures of success constructs and measured indirectly through other constructs such as information quality and system quality (Gable, 1996; Rai et al., 2002). Gable et al (2008) also argued that in a content analysis of 192 satisfaction-related items from 16 satisfaction instruments Sedera and Tan (2005) demonstrated that only two percent of the items measures satisfaction directly. Gable et al (2008) also argued that “there is support in the literature for conceptualizing satisfaction as an immediate consequence of IS-Impact” (p.389) rather than as a separate dimension of IS impact (e.g., Anderson & Sullivan, 1993; Brady et al., 2005). Additionally, in a review of ISS model application, Delone & McLean (1992) noted several issues with the user satisfaction construct. Whose satisfaction should be measured and what measure should be used? Should they use single item or multi-attribute? In addition, the ISS model considers PU and attitude as a single user satisfaction construct. This is problematic as PU is a salient belief considered as the prevailing determinant of a person’s actions. PU is assumed to influence attitudes towards behavior (Ajzen, 1991).

Distinction #2 - Relationship between quality and use is not direct. We propose that this relationship between is mediated by perceived individual benefit, consistent with Seddon (1997). Measures of information and system quality represent beliefs about the system (Rai et al., 2002). As with the TPB, we propose that beliefs about the system influence individual attitudes, which in turn influence use. Therefore our integrated model proposes:

H1: Information quality will have a positive direct effect on perceived individual benefit.

H2: System quality will have a positive direct effect on perceived individual benefit.

H3: Perceived Individual benefit will mediate the effect of information and system quality on use.

H4: Perceived Individual benefit will mediate the effect of information and system quality on perceived organizational benefit.

The relationships between system attributes and usefulness and attitude have been found in the literature. In an investigation of resources (i.e. user attributes, support from others, system attributes, and general control-related), Mathieson Peacock and Chin (2001) found support for the relationship between resources and usefulness and attitude, even though this was not part of their original hypotheses. Therefore we propose:

H5: Use will have a positive direct effect on perceived organizational benefit.

In TPB, control beliefs affect PBC, which affect use. We have included PBC in our integrated model and propose:

H6: System quality will have a positive direct effect on perceived behavioral control.

H7: Service quality will have a positive direct effect on perceived behavioral control.

H8: Perceived behavioral control will mediate the relationship between information quality, system quality and use.

Finally, normative beliefs, defined as “beliefs about the normative expectations of others and motivation to comply with these expectations” (Ajzen, 2006, p.1), are expected to affect the SN (H9), defined as “the person’s perception that most people who are important to an individual think that they should or should not perform the behavior in question” (Fishbein & Ajzen, 1975, p.216). In addition, SN is expected to affect use of the IT (H10), defined as “an individual’s behavior of, or effort put into, using the system” (Rai et al., 2002, p.1851). These relationships are proposed in TPB; however, they are not included in the ISS model. There has been much support for the relationship between normative beliefs and SN (e.g. Armitage & Conner, 2001), thus it is proposed in this newly integrated model. There is weaker support for the link between SN and use (Armitage & Conner, 2001); however there is enough support to include this relationship in our integrated model. We propose:

H9: Normative beliefs will have a positive direct effect on subjective norm.

H10: Subjective norm will have a positive direct effect on use.

Our integrated model ultimately comprises 9 constructs and 10 hypotheses. It retains the major theoretical arguments of TPB and incorporates recent theorizing about ISS to better reflect the specific system characteristics that Cenfetelli (2004) argues have been too little considered in technology adoption research.

Discussion

The principal contribution of this work is a fully integrated model of IS adoption and success. It is hoped that the integrated model provides a clearer, more comprehensive lens through which to view IS adoption and success and that by bringing together the TPB and ISS models, researchers will be able to better understand adoption and use of an IS. Our integrated model provides the theoretical strength of TPB as well as the actionability of ISS and provides support for Sabherwal et al.’s (2006) proposal for the importance of adding user-related constructs. Our model links system characteristics to behavioral beliefs and control beliefs, and links attitude to expected net benefits for individuals. The model considers individual benefits, in addition to organizational benefits as is proposed in the ISS model, and how beliefs about information and system quality influence attitudes toward benefits.

Two aspects of our model address ongoing debates in the literature and warrant further consideration.

The first relates to the link between use and perceived organizational benefit. In the original Delone and McLean (1992) model individual and organizational impacts were considered as two distinct constructs; however, they were grouped into one construct, net benefits, in their updated model (2003). They proposed that the level of analysis would depend on context and it was the responsibility of researchers to determine the appropriate measure. However, we propose that individual and organizational impacts are distinct and have different antecedents and consequences. In a review of 180 research papers dealing with aspects of IS success Petter et al (2008) found moderate to strong support for the positive relationship between use and individual benefits, and moderate support for the positive relationship between use and organizational benefits.

The second area in which we contribute to ongoing debates is with regard to the user satisfaction construct. Our interest in examining this construct is based on the overlap between satisfaction and some of the TPB constructs, especially in how satisfaction was operationalized in the ISS framework developed by Lau et al (2007). Following the recommendations of Gable et al. (2008) and Sedera and Gable (2004), user satisfaction is removed from our integrated model, thus removing the overlaps and inconsistencies identified in the literature.

Conclusions and Future Research

TAR and ISSR streams offer complementary understanding of IS in an organization - adoption does not necessarily mean success, and measurement of the success of a system does not necessarily help to determine why the system was successful. A greater understanding of both IS adoption and success may be gained by examining the integration of TPB and ISS. This paper is an initial step towards such an understanding. This paper contributes to the field by offering an integrated perspective, and a new model, on adoption and.

Future research can empirically assess this model to further understand the linkages between the two models and their complementarity in explaining organizations' experiences with implementing IT. There is also an opportunity to extend the model with more organizational contextual factors such as organizational factors and style of implementation. We plan to conduct a case study in an organization that is implementing a new IS. We also plan to conduct focus groups and interviews of system users, developers and management to examine adoption and success of the system.

Considering the complexity of IS and the rate of technological development, future examination and evaluation of systems is beneficial and necessary. In particular, this type of research will be important to support future design, implementation, and evaluation of IS and contribute to the growing body of knowledge regarding the adoption and success of IS.

Acknowledgements

We would like to acknowledge the financial support of Mitacs, a Canadian not-for-profit research organization, and the matching support from two industry partners.

References

- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action–Control: From Cognition to Behavior* (pp. 11–39). Heidelberg: Springer.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- Ajzen, I. (2006). Constructing a TpB questionnaire: Conceptual and methodological considerations. *Time*, 2002(June 5), 1–13.
- Albarracín, D., Johnson, B. T., Fishbein, M., & Muellerleile, P. A. (2001). Theories of reasoned action and planned behavior as models of condom use: A meta-analysis. *Psychological Bulletin*, 127(1), 142–161.
- Anderson, E. W., & Sullivan, M. W. M. (1993). The antecedents and consequences of customer satisfaction for firms. *Marketing Science*, 12(2), 125–143.
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology*, 40, 471–499.
- Bailey, J. E., & Pearson, S. W. (1983). Development of a tool for measuring and analyzing computer user satisfaction. *Management Science*, 29(5), 530–545.
- Ballantine, J., Bonner, M., & Levy, M. (1996). The 3-D model of information systems success: the search for the dependent variable continues. *Information Resources Management Journal*, 9(4), 5–14.
- Bennett, P., & Clatworthy, J. (1999). Smoking cessation during pregnancy: Testing a psycho-biological model. *Psychology, Health & Medicine*, 4(3), 319–326.
- Blue, C. L. (1995). The predictive capacity of the theory of reasoned action and the theory of planned behavior in exercise research: An integrated literature review. *Research in Nursing & Health*, 18(2), 105–121.
- Brady, M. K., Knight, G. A., Cronin, J. J., Tomas, G., Hult, M., & Keillor, B. D. (2005). Removing the contextual lens: A multinational, multi-setting comparison of service evaluation models. *Journal of Retailing*, 81(3), 215–230.
- Cenfetelli, R. T. (2004). Inhibitors and enablers as dual factor concepts in technology usage. *Journal of the Association for Information Systems*, 5(11/12), 472–492.
- Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: A review and avenues for further research. *Journal of Applied Social Psychology*, 28(15), 1429–1464.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Davis, F. D., Bagozzi, R., & Warshaw, P. (1989). User acceptance of computer technology: A comparison of two theoretical models. *MIS Quarterly*, 35(8), 982–1003.
- DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(1), 60–95.
- DeLone, W. H., & Mclean, E. R. (2003). The DeLone and McLean Model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9–30.
- Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention, and behavior: An introduction to theory and

- research. Reading, MA: Addison-Wesley.
- Gable, G. G. (1996). A multidimensional model of client success when engaging external consultants. *Management Science*, 42(8), 1175–1198.
- Gable, G., Sedera, D., & Chan, T. (2008). Re-conceptualizing information system success: The IS-impact measurement model. *Journal of the Association for Information Systems*, 9(7), 1–32.
- Godin, G., & Kok, G. (1996). The theory of planned behavior: A review of its applications to health-related behaviors. *American Journal of Health Promotion*, 11(2), 87–98.
- Godin, G., Valois, P., & Lapage, L. (1993). The pattern of influence of perceived behavioral control upon exercise behavior: An application of Ajzen's theory of planned behavior. *Journal of Behavioral Medicine*, 16(1), 81–102.
- Hagger, M., Chatzisarantis, N., & Biddle, S. (2002). A meta-analytic review of the theories of reasoned action and planned behavior in physical activity: Predictive validity and the contribution of additional variables. *Journal of Sport & Exercise Psychology*, 24, 3–32.
- Hausenblas, H. (1997). Application of the theories of reasoned action and planned behavior to exercise behavior: A meta-analysis. *Journal of Sport & Exercise Psychology*, 19, 36–51.
- Hobbis, I. C. A., & Sutton, S. (2005). Are techniques used in cognitive behavior therapy applicable to behavior change interventions based on the theory of planned behavior? *Journal of Health Psychology*, 10(1), 7–18; discussion 37–43.
- Lau, F., Hagens, S., & Muttitt, S. (2007). A proposed benefits evaluation framework for health information systems in Canada. *Healthcare Quarterly*, 10(1), 112–116, 118.
- Lau, F., Kuziemy, C., Price, M., & Gardner, J. (2010). A review on systematic reviews of health information system studies. *Journal of the American Medical Informatics Association*, 17(6), 637–645.
- Mason, R. O. (1978). Measuring information output: A communication systems approach. *Information & Management*, 1(4), 219–234.
- Mathieson, K. (1991). Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior. *Information Systems Research*, 2(3), 173–191.
- Mathieson, K., Peacock, E., & Chin, W. W. (2001). Extending the technology acceptance model: The influence of perceived user resources. *Data Base for Advances in Information Systems*, 32(3), 86–112.
- McGinn, C. A., Gagnon, M.-P., Shaw, N., Sicotte, C., Mathieu, L., Leduc, Y., ... Légaré, F. (2012). Users' perspectives of key factors to implementing electronic health records in Canada: A Delphi study. *BMC Medical Informatics and Decision Making*, 12(1), 1–13.
- Montoya, I. D., Atkinson, J. S., & Trevino, R. A. (2000). Economics as a factor in models of behavioral motivation and change. *Substance Use & Misuse*, 35(3), 329–346.
- Myers, B. L., Kappelman, L. A., & Prybutok, V. R. (1997). A comprehensive model for assessing the quality and productivity of the information systems function: Toward a contingency theory for information systems assessment. *Information Resources Management Journal*.
- Petter, S., DeLone, W., & McLean, E. (2013). Information systems success: The quest for the independent variables. *Journal of Management Information Systems*, 29(4), 7–62.
- Petter, S., & McLean, E. R. (2009). A meta-analytic assessment of the DeLone and McLean IS success model: An examination of IS success at the individual level. *Information and Management*, 46(3), 159–166.
- Rai, A., Lang, S., & Welker, R. (2002). Assessing the validity of IS success models: An empirical test and theoretical analysis. *Information Systems Research*, 13(1), 50–69.
- Rivis, A., Sheeran, P., & Armitage, C. J. (2009). Expanding the affective and normative components of the theory of planned behavior: A meta-analysis of anticipated affect and moral norms. *Journal of Applied Social Psychology*, 39(12), 2985–3019.
- Sabherwal, R., Jeyaraj, A., & Chowa, C. (2006). Information system success: individual and organizational determinants. *Management Science*, 52(12), 1849–1864.
- Seddon, P. B. (1997). A respecification and extension of the DeLone and McLean Model of IS Success, 8(3), 240–253.
- Sedera, D., & Gable, G. (2004). A factor and structural equation analysis of the enterprise systems success measurement model. In *Twenty-Fifth International Conference on Information Systems* (pp. 449–464). Washington, D.C.
- Sedera, D., & Tan, F. T. C. (2005). User satisfaction: An overarching measure of enterprise system success. *PACIS 2005 Proceedings*, 2, 963–976.

- Shannon, C. E., & Weaver, W. (1949). *The mathematical theory of communication*. Urbana, IL: University of Illinois Press.
- Sheeran, P., & Taylor, S. (1999). Predicting intentions to use condoms: A meta-analysis and comparison of the theories of reasoned action and planned behavior. *Journal of Applied Social Psychology, 29*(8), 1624–1675.
- Sutton, S. (1998). Predicting and explaining intentions and behavior: How well are we doing? *Journal of Applied Social Psychology, 28*(15), 1317–1338.
- Taylor, S., & Todd, P. A. (1995a). Assessing IT usage: The role of prior experience. *Management Information Systems Quarterly, 19*(4), 561–570.
- Taylor, S., & Todd, P. A. (1995b). Understanding information technology usage: A test of competing models. *Information Systems Research, 6*(2), 144–176.
- Trafimow, D., Sheeran, P., Conner, M., & Finlay, K. A. (2002). Evidence that perceived behavioral control is a multidimensional construct: perceived control and perceived difficulty. *Br J Soc Psychol, 41*(1), 101–121.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186–204.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.
- Wixom, B. H., & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research, 16*(1), 85–102.