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When users are professionals: effective user participation for information system assimilation: a multilevel model

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When users are professionals: Effective User Participation for Information Systems Assimilation

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Abstract

Prior research on the role of user participation in system development has yielded inconsistent results. One of reasons might be attributed to the various users and research in this field needs to take into consideration of the characteristics of users themselves. Users' professional background has been documented as one of major reasons for resistance. However, very little research has investigated how to resolve such resistance. Our study makes a significant step forward to understand and empirically validate the contingencies of business professional users' participation. With an exploratory case study, we identify three important contingencies that determine the effectiveness of professional users' participation in IT projects in terms of assimilation, i.e., IT competence, work-identity integrity and alignment as perceived by the professionals. The resulting model is also empirically validated involving professional users from different industries and organizations.

Keywords: User participation, Assimilation, Professional identity, IT competence, Alignment

Introduction

Information systems assimilation is defined as the extent to which the use of the technology diffuses across business/working processes and becomes routinized in the business/working activities (Fichman and Kemerer 1997; Purvis et al. 2001). At the individual level, assimilation is equivalent to post-adoption usage behavior (Jasperson et al. 2005), referring to "the myriad feature adoption decisions, feature use behaviors and feature extension behaviors made by an individual user after an IT application has been installed, made accessible to the user, and applied by the user in accomplishing IT/her work activities" (Jasperson et al. 2005), pp. 531). Usually individual assimilation is considered as a critical indicator for the success of information system (IS) development and implementation (He and King 2008).

Existing research on IS development has pointed out the importance of user participation in achieving assimilation. User participation refers to the extent to which users or their representatives carry out assignments and perform various activities and behavior s during information system development and conceptualized along four dimensions, i.e., users' hands-on performance of activities, responsibility, relations with IS, and communication with IS staff and senior management (Barki and Hartwick 1994). According to a recent synthesis of the user participation literature (Markus and Mao 2004), active participation makes users perceive the system more relevant, leading to a more positive attitude as well as having positive influences on usage of the system (Barki and Hartwick 1994). Moreover, user participation ensures that the system requirement is well informed and the resulting system is likely to have an alignment with the business demand. Finally, user participation fosters emergent interactions between business users and IS professionals (Markus and Mao 2004).

However, certain theoretical gaps and practical challenges remain (Markus and Mao 2004) with limited and inconsistent findings about the effect of user participation on IS assimilation (Harris and Weistroffer 2009; Hwang and Thorn 1999; Spears and Barki 2010). Despite the ample research on user participation in system development, user participation may not guarantee assimilation (He and King 2008; Symon and Clegg 2005), which implies that certain contingencies are important to bridge the gap between user participation in IS development and assimilation. Second, the effect of user participation in IS development may likely vary for different IS development contexts . Of particular interest in this study is the nature of the users. While most prior research focuses on operational users in IS development, advancement in IS has involved more and more professionals with high level of functional expertise as key users (Martikainen et al. 2012). However, existing research shows that, given the same participation, such professionals will be less likely to accept IT application, especially when professionals do not have sufficient knowledge in IT (Martikainen et al. 2012; Saleem 1996). According to status incongruence theory, a professional with little IT knowledge will suffer status incongruence when confronted with an IT application, and such status incongruence is claimed to create frustration, tension, and problematic attitudes and behavior in individuals (Jackson 1962; Lenski 1956; Lundberg et al. 2009). Users' professional background has been documented as one of major reasons for resistance (Lapointe and Rivard 2005; Sayer 1998). However, very little research has investigated how to resolve such resistance.

Thus, the objective of this study is to examine how professionals' participation in IS development influences their assimilation of IS. By adopting a mixed-method, we identify the contingencies that mediate the effect of user participation by professionals on IS assimilation and empirically validate the resulting research model. In doing so, the present study answers calls for more contextualized research on user participation (Markus and Mao 2004).

The remainder of the paper is organized as follows. First, we discuss the rationale for using multi-method research design used in this study. Then we report the exploratory case study and based on the case study results and extant user participation theories, we develop the research hypotheses. The next session reports the empirical study using a survey design and its findings. The paper concludes with a discussion of the implications of the study, limitations and suggestions for future research.

A Multi-Method Research Design

Given the mixed results reported by studies on the effect of user participation on IS success (Harris and Weistroffer 2009) and the lack of theories explaining the linkage between user participation and IS

assimilation, we employed a multi-method research design which consists an exploratory case study and a confirmative survey study using separate samples to examine professional user participation. In particular, a sequential design (Mingers 2001) was used in that the exploratory case study for theoretical development informed a subsequent confirmatory study for theoretical validation. Such a multi-method research design provides both a rich context and testability to the study (Kaplan and Duchon 1988; Spears and Barki 2010).

Qualitative methods (exploratory case study in this study) provide a rich information of the phenomenon under study and is appropriate under the high degree of uncertainty as in this case (Trauth 2001). Data collection for the qualitative study was not based on any a priori theories, concepts, or outcomes, and therefore was exploratory in order to reveal mechanisms that translate professional user participation to desired outcomes; while extant user participation theories were used as a framework of analysis and interpretation in order to build the connection with the existing literature. We then developed hypotheses from the qualitative study and formed a variance model that examined the effect of user participation as mediated through three contingencies. A separate sample drawn from different organizations with similar user characteristics was used for theoretical validation.

Study 1: An Exploratory Case Study

An exploratory case study was conducted with an organization that implemented an information system for financial transaction support and control. The reason to choose this organization was because this IS project was initiated by a group of financial professionals for risk analysts, auditors and controllers, consistent with the theoretical concerns. In addition, this project was user-led development and the professional users had the full ownership of the project. Yet, as the case study revealed, this did guaranty successful IS assimilation until certain contingences were satisfied due to the nature of key users. The purpose of this case study is to reveal the contingencies that bridge professional users' participation in IS development and their assimilation of the resulting system.

In-depth interviews were conducted with members of the development team (who are responsible for systems development) and the key users to elicit an understanding of the actions and processes they applied throughout the development and implementation. Key interviewees were identified based on their involvement in the design, development or implementation of the system. Table 1 shows the interviewees' information and sample interview questions. A series of semi-structured interviews were also conducted with the top management to solicit data on the strategic considerations in implementing this system. All interviews were transcribed and coded. In addition, document analysis was secondary and used primarily to establish background and to corroborate interview data.

Table 1: Interview Information

Key Interviewees	Role in the organization	Role in the project	Sample Interview questions
General Director of the organization (2 interviews)	Overall strategic decision making & particularly chairing the "Steering Committee" to prove initiatives proposed by all units.	Giving the final approval to launch the project.	Organizational context and supports for this project. In this project, what kind of roles was the top management team?

Head of Finance Controlling (1 interview)	In charge of monitoring all financial transactions within the organization. Responsible for reporting to external auditors.	Representing the key end-users. Leading the team to propose the project to the "Steering Committee". The owner of the project.	Why did you and your colleagues want to start this project? How was it developed? What happened after the project got the first approval from the Steering Committee? How did your team work with the IT department? What are the difficulties in developing and implementing this project, from your perspective?
Director of IT Department (2 interviews)	Directly reporting to the General Director. Responsible for IT maintenance and all IT-related projects.	The developer-side of the project.	In general, can you describe how your department works with the other functional department? For this specific project, how was it initiated? What were the challenges from your perspective? How did your department work with the users?
Head of System Analysis (1 interview)	Reporting to the Director of IT Department Responsible for the system analysis of IT projects.	The project leader and the interface with the users.	

In qualitative data analysis, classification and connection form the basis of theory development (Urquhart 2001). Free coding was applied in the first round to clarify the transcribed text and identify the causal connections among them (Miles and Huberman 1994), pp. 56-71). In the second round, a theory-driven coding was used to corroborate the codes developed in the first round with existing theories and constructs, e.g., alignment, assimilation, IT competence, participation and etc., and to identify new variables and/or relationships.

Results of Case Study and Theoretical Development

According to (Barki and Hartwick 1994), user participation could cover all dimensions, i.e., users' hands-on performance of activities, responsibility, relations with IS, and communication with IS staff and senior management. In this case, the key users were leading the initiative and responsible for the project. There were also some other users from the same department or the other departments which were affected by the deployment of the system. The case study identifies various user participation activities which can broadly grouped into two categories, participation in planning and development/deployment (see table 2).

Table 2: Two Categories of User Participation

User participation in system planning: User-IS Relationship (Hartwick and Barki 1994)	**User participation in system development/deployment: Hands-on activities (Hartwick and Barki 1994)**
A member of the project team responsible for the definition (feasibility, analysis of information requirements) of the system	Define screen layouts, report formats ,etc.
Develop and/or approve cost justification for	Develop & test data specifications

project	
Develop and/or approve information requirements	Review and approve results of system test done by IS staff
Participate in requirement analyses	Perform system training programs
Define and/or review system controls and security procedures	Evaluate and approve training program to be conducted by IS staff

However, such participation was not sufficient for the promised success in terms of user acceptance and assimilation. In the following sections, we would like to identify the contingencies for effective user participation and assimilation and associated organizational actions.

Despite the high responsibility and influences from the key end-users, they had a great difficulty at the beginning in communicating and collaborating with the IT team. As the Chief Controller put:

> *"We saw this project as our dream. We were thinking it's an easy project as we've been working in this area for many years and we also made the plan expecting to make IT work easy. But we didn't think about the processes. At that moment members in the team didn't have much IT background. We sat with ABC (Note: IT Corporate Systems Manager) and his team to discuss the possibility. Every time we asked 'whether we are going the same direction? It's OK for us or not?' he said no and told us the system needed this and that, 'you need to have this information which is not from my unit but the other unit'. And I had no clue about his words.*

One of major reasons was the lack of IT competence that includes the knowledge and skills in IT and its application, system development, management of IT and access to IT knowledge (Bassellier et al. 2001). According to the original conceptualization of (Bassellier et al. 2001), IT competence for managers includes both explicit and tacit knowledge of technologies, applications, system development, and management of IT. Managers with sufficient IT competence are more likely to form a partnership with IT professionals and to lead the IT projects. In this case, the managers did not have sufficient IT competence at the beginning when they initiated the project purely out of their business requirements. Their IT competence was rather developed during the project through constant interaction with IT professionals, despite that not all interactions were pleasant or constructive.

Thus, the IT competence as used in this study is a subset of the above components and is developed during the process of user participation. Such IT competence enables users to develop a common ground as well as a "good" relationship with their IT partners (Markus and Mao 2004). Different from the work by (Bassellier et al. 2001) where IT competence was considered as an antecedent for user champignon IT, our case indicates that user participation could be a valuable learning process where users can obtain IT competence relevant to the project, or so-called "learning-by-doing". Thus, we propose that:

> *H1: The effect of user participation on assimilation is contingent upon the development of IT competence in relation to the target information systems.*

The second contingency is to re-construct professional identities that incorporate IT as an integral part. In this case, the key users are professionals who possesses esoteric knowledge (Carr-Saunders and Wilson 1933) and carries out some highly critical organizational functions with certain level of autonomy (Ibarra 1999). While normal organizational members for whom organizational identity constitutes a major source to construct their own identities, professionals do not solely rely on organizational identity for self-concept construction (Van Maanen and Barley 1984). Rather, professionals are often defined by "what they did" as a profession and organizational membership is only an indicator of "where they work".

Identity plays a central role in how individuals make sense of and "enact" their environment (Weick 1995). Similarly professional identity is critical for professionals to make sense their work. As indicated in (Pratt et al. 2006), professionals' work in an organization may not be congruent with their professional identity, resulting in violation of "work-identity integrity" and affecting how professionals make sense of their work. Introducing IS to be a part of professionals' working content may profoundly challenges the "work-identity integrity" achieved in a working context without using IT (Meissonier and Houze 2010).

In the case, the financial controllers, at the beginning, considered IT as either intimidating or irrelevant. Faced with challenges, their original work-identity identity was threatened by the new IT project. The resulting discrepancy prevented professionals from developing IT competence and common ground with their IT colleagues. The situation was not improved until they were open to reconstructing their professional identities. As revealed in the case, the work-identity integrity that needs to be constructed in the process of IS development includes two important aspects, viewing IT-knowledge (technical component) and collaborating with IT colleagues (collaborative component) as parts of professional identity. Such re-construction was further reinforced by the organizational rewards for their innovative initiative and performance. The resulting work-identity integrity helped develop the synergetic collaboration between financial department and IT team. Thus, we propose that:

> *H2: The effect of user participation on assimilation is contingent upon the development of new work-identity integrity in relation to the target information systems.*

The third contingency is that by participating in system development, the users need to be informed about the alignment with business needs. It has been well recognized that, at the individual level, perceived alignment between information system and business needs is one of driving forces for end-user acceptance and usage. However, in this project, the changes induced by the IT project may not have direct benefit from using the system in terms of efficiency gains. If not addressed properly, such end-users would likely develop resistance against the proposed changes. Then how did the team handle the situation?

Realizing the need to convince end-users the value and efficacy in the new system, the team adopted several approaches to prepare and inform the end-users. Not only they focused on the alignment at the micro level, which refers to how the system fits with the end-user's working requirement, did they also address the macro alignment, i.e., how the expected changes fit with the overall organizational/departmental strategies/objectives; and the alignment with working processes, i.e., how the expected changes fit with the new working processes. Such a comprehensive approach in addressing alignment was effective and persuasive. Even for those who had lower level of participation or did not see direct gains from the system, any change would not be considered as abrupt, discontinuous but rather anticipated and continuous, reducing anxiety associated with new system. Thus, we propose that:

> *H3: The effect of user participation on assimilation is contingent upon the extent of alignment between the target information systems and the business needs as perceived by the end-users.*

Study 2: A Survey Study

To further test the research model, we conducted a survey study involving 261 employees from five different organizations who have participated in IT projects. Table 3 reports the demographic information. The surveyed organizations include one government, two semi-governments, and two private firms, which operate in different industries. All surveyed organizations have more than 500 employees and using IT to support business processes is critical. About two third of respondents were male which was consistent with the overall gender distribution of those organizations. Over 90% of respondents served management roles with different non-IT professions. Finally, the sample represents an even distribution in terms of age and tenure.

Table 3. Demographic Information

Gender	**%**	**Job Level**	**%**	**Organizational type**	**%**
Male	75.9	Senior Executives	15.7	Government	14.6
Female	24.1	Middle Management	44.8	Semi-government	59.8
Age		Entry level management	34.9	Private	25.7
21-30	23.8	Non-supervisory/Administrative	4.6	**Industry**	
31-40	29.5	**Profession**		Financial/Banking	14.6
41-50	29.1	Maintenance	4.6	Retail	17.6
>50	17.6	Finance	6.5	Manufacturing/mining	42.1

Tenure	**%**	Human resources	5.7	Other	25.7
<1 year	6.9	Supply chain	11.1		
2-5 years	22.6	Sales & Marketing	5.7		
6-10 years	27.2	Operations	26.4		
11-15 years	16.5	Quality control	19.2		
>15 years	26.8	Others	20.7		

Measures

Assimilation in this study is defined as post-adoptive behaviors at the individual level, including three different behaviors, individual features adoption, use and extension (Jasperson et al. 2005). Accordingly, three items were used to measure assimilation in this research. One sample item is like "I use the information systems to perform majority of my tasks." Although three items indicate different types of behaviors, such behaviors are likely correlated. Thus, a reflective measurement is used for assimilation.

User participation is measured with the items as identified in the case study (see table 2), which are similar to the scales developed by (Hartwick and Barki 1994). However, such items were found highly correlated which may due to the fact that people involved in planning also participated in system development. Thus, reflective measures were used in this study.

IT competence was measured with four items covering both technical as well as managerial knowledge of IT and IT projects, which were initially adapted from (Bassellier et al. 2001) and validated in the case study. The technical aspect of IT competence was measured with the sum score of 20 items indicating the explicit knowledge of specific IT and applications related to the IS used in the organization. The managerial aspect of IT competence is mainly about the knowledge of system development and project planning. Since such knowledge was developed during the projects and basic technical knowledge is necessary to develop understanding about the system development and project management, we model the measurement as reflective.

Based on the results of the exploratory case, work-identity integrity includes two dimensions, that is, using IT and working with IT department/professional as parts of their professional identity. For each dimension, we developed reflective measures for, e.g., "using information systems is an integral part of my profession' and "working with IT department in defining requirements is in line with my profession". Cronbach's alpha=0.913 for the first dimension; and 0.911 for the second. We then used the average score for each dimension and modeled them as formative measures in the structural model.

Alignment, as revealed in the exploratory case study, incorporates multiple dimensions. At the micro-level, the individual employees need to "buy in" the significance of IT and achieve the fit between the IS and their tasks, which corresponds to the two important variables (perceived usefulness and perceived ease of use) as suggested by the theory of acceptance model (Venkatesh et al. 2003). Thus, we adopted the existing measures for these two dimensions (Venkatesh et al. 2003). Moreover, alignment was also desired at the macro-level where the IS should be fit with the overall organizational objectives (Cragg et al. 2002; Spears and Barki 2010). Thus, three reflective measures were developed for macro-level alignment. A sample statement is "The IS development is based on business objectives and/or needs". All items were measured with five-Likert scale (1=strongly disagree; 5=strongly agree).

Data Analysis

Measurement validation and model testing were done in a holistic manner using Partial Least Squares (PLS). First, PLS is widely accepted as a suitable technique for testing theories in the early stage or exploratory model testing, while the other methods such as LISREL is usually used for theory confirmation (Fornell and Bookstein 1982). Second, formative measures were used in this research. Although the other covariance-based methods can accommodate formative indicators, but specific constraints on the model are necessary to ensure model identification (Bollen and Davis 2009; Diamantopoulos and Riefler 2008). These constraints often contradict theoretical considerations, leading to the problem whether model design should guide theory or vice versa. However, variance-based PLS can

handle formative indicators directly without the above issue (Fornell and Bookstein 1982).

Tests of significance were conducted for all paths using the bootstrap re-sampling procedure and the standard approach for evaluation that requires path loadings from construct to measures to exceed 0.70. Internal consistency of reflective measures was checked with composite reliability measures (ρ) and average variance extracted (AVE), as suggested by Fornell and Larcker (1981). The discriminant validity was examined by comparing the square root of the AVE for a particular construct to its correlations with the other constructs (Fornell and Larcker 1981) and by examining cross-loadings of the constructs.

This study adopted a cross-sectional design and both independent and dependent variables were measured at the same time point, implying that the common method variance could be a major threat for the validity. The control for the common method variance was done first through the instrument design. Different scales were used, and the sequence of the questions was randomized, both of which have been proved to effectively reduce the common method variance. In addition, according to Harman's single-factor test (Podsakoff and Organ 1986), common method variance is present if a single factor accounts for the majority of the covariance in the dependent and independent variables. The principle component analysis with all measures resulted in nice distinct factors (see the appendix) and the first factor only accounted for 16% of the variance, implying no substantial common method bias in our survey data.

Results

Table 4 presents the loadings of the reflective measures and weights of the formative measures to their respective constructs along with composite reliability scores. All reflective items were significant at the 99% level with loadings above 0.8, demonstrating the convergent validity. The composite reliability scores (ρ) of all latent constructs were higher than the recommended value of 0.80 (Nunnally 1978), demonstrating internal consistency. The discriminant validity is demonstrated by the cross-loadings of reflective items (see the appendix). All items loaded higher on their respective constructs than on others, providing additional support for discriminant validity. The Table 2 also includes the weights of the formative items. Weights can be interpreted in a manner similar to beta coefficients from a multiple regression (Chwelos et al. 2001), which will be discussed further in the structural model.

Table 4. Measurement Model

Variable	Loading	Variable	Weight
Assimilation (ρ=0.91; AVE=0.78)		**Work-Identity Integrity**	
Item 1	0.89***	Technical integrity	0.42**
Item 2	0.93***	Collaborative integrity	0.70***
Item 3	0.82***	**Alignment**	
IT competence (ρ=0.90; AVE=0.77)		Macro-Alignment	0.29*
Item 1	0.80***	PEU	0.34**
Item 2	0.87***	PU	0.38*
Item 3	0.84***		
Item 4	0.83***		
Participation **(ρ=0.95; AVE=0.65)**			
Item 1	0.80***		
Item 2	0.78***		
Item 3	0.85***		
Item 4	0.71***		
Item 5	0.79***		
Item 6	0.83***		

Item 7	0.79***		
Item 8	0.84***		
Item 9	0.83***		
Item 10	0.84***		
*** p<0.01; ** p<0.05; * p<0.1; ns p>0.1			

Figure 1 presents the results of the PLS analysis of the structural model, including the overall explanatory power (R2) and path coefficients (for relationships between latent variables). In testing the structural model, we also include the following control variables, i.e., gender, tenure, age and profession, to both mediators and the dependent variable. Only tenure has a significant relationship with IT competence and all the rest are removed from the figure 2.

The research model provides a good explanatory power: 43.2% of the variance of assimilation. Work-identity integrity (β=0.261; p<0.05) and alignment (β=0.459; p<0.01) have significant impact on assimilation while the effect of IT competence is not significant. Examining the weights of these formative measures reveal that both dimensions of work-identity integrity are important in achieving assimilation. Particularly, the collaborative aspect of work-identity integrity was found to be more important than technical integrity. Among three dimensions of alignment, PEU was significant at the 95% confidence level, while the other two dimensions were marginally significant at the 90% confidence level.

User participation has significant effects upon three mediators, and explains 19.6% of the variance of IT competence, 14.8% of work-identity integrity and 7.2% of alignment. Particularly, the mediating effects are examined for work-identity integrity and alignment and the result shows that both work-identity integrity and alignment completely mediate the effect of user participation on assimilation, supporting H2 and H3. IT competence does not serve as a mediator in this study, but it is one of important outcomes of user participation.

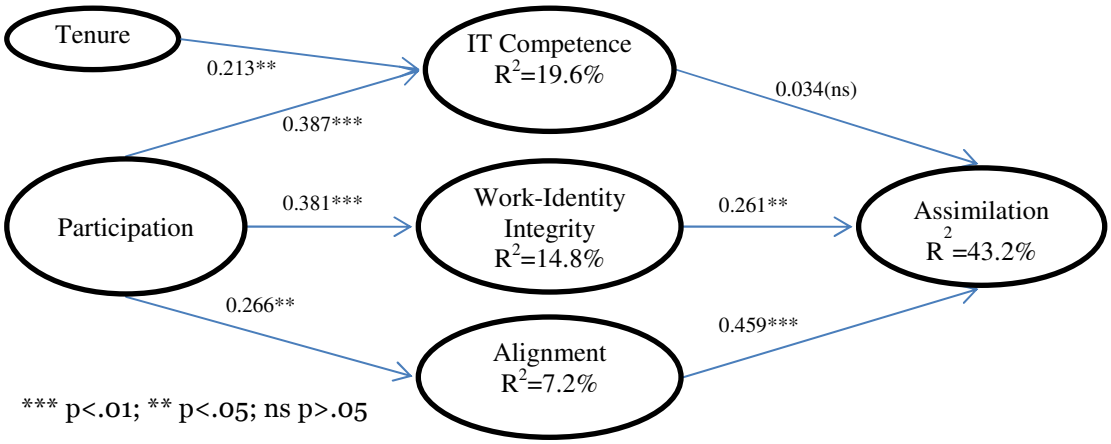

Figure 1. Structural Model Results

Discussion and Conclusion

What is effective user participation when users are professional? With an exploratory case study, we identify three important contingencies that determine the effectiveness of professional users' participation in IT projects in terms of assimilation. They are IT competence, work-identity integrity and alignment as perceived by the professionals. The resulting theory was empirically validated with a survey study involving similar professional users from multiple organizations and the results provided strong support for the theory of effective professional user participation. The significant theoretical and practical implications are discussed as follows.

Theoretical Implications

Over last two decades, it is widely acknowledged that user participation in IS development has impact on IS project outcomes, both attitudinal and behavioral (He and King 2008). However, mixed results have been reported in studies examining the effect of user participation on system success (Harris and Weistroffer 2009) and suggest a contingency approach in investigating the effect of user participation. This research makes significant contribution to this line of research by identifying such contingencies for effective user participation, i.e., IT competence, work-identity integrity, and alignment.

IT competence provides a cognitive base for professional users to be able to get involved and to collaborate with IT professionals. Different from most prior research on IT competence which assumes its pre-existence and examines IT competence as an antecedent for participation/championship, the case study indicates that IT competence has to be further developed as an immediate result of user participation.

Work-identity integrity, which has been understudied in the past, provides an identity-based common ground for professionals to incorporate IT and working with IT colleagues as a part of their professional identity. Although a few studies examine the process of identity reconstruction during IT projects (Symon and Clegg 2005), this study is one of early attempts to seek quantifying the construct and empirical validation.

Finally, alignment is identified as the third important contingencies. The case study revealed that both micro- and macro-level of alignment needs to be achieved in order to fully rationalize the value of the IS among professional users. The resulting model also receives empirical validation involving professional users from different industries and organizations, which provides external validity of the research model.

In IS development research, another reason for the inconsistent results regarding the impact of user participation might be overlooking the characteristics of users themselves (Markus and Mao 2004). Users' professional background has been documented as one of major reasons for resistance (Lapointe and Rivard 2005; Sayer 1998). However, very little research has investigated how to resolve such resistance. Our study makes a significant step forward to understand and empirically validate the contingencies of business professional users' participation. Particularly our results show that work-identity integrity and alignment are more important than acquiring IT competence in influencing final assimilation. And both work-identity integrity and alignment fully mediate the effect of user participation on assimilation. Such results not only help resolved the issue of inconsistence in explaining the effect of user participation on assimilation, but also advance our understanding about the unique requirements for professional users' participation.

Methodologically, the multi-method research of the study answers calls for multi-method studies in IS (Mingers 2001). The exploratory case study without preconceived outcomes is followed by a formative study to validate the researchers' interpretation. Such a research design provides rich contextual information and well balances both relevance and external validity.

Practical Implications

Practically, our study provides a valuable guidance for delineating the expected outcomes of user participation among professionals who are increasingly empowered to take initiatives in IS projects. Particularly, the project managers need to be aware of certain hurdles that professional users have to overcome in an IS project. High user participation does not necessarily guarantee user assimilation. The identified contingencies suggest possible organizational interventions that can help professionals to really "buy in" the new IS.

First, with more and more organizations empowering professional end users to initiate and/or even own IS projects (Hsu et al. 2012), certain IT training is still necessary to lay the cognitive common ground between professional users and IT partners for project collaboration. Such training should focus on two important aspects, IS knowledge and IT project skills. The former component helps professional users break the language barrier; while the latter one bridges the professional gaps with IT partners.

Second, effective professional users' participation also demands re-constructing professional identities

that are compatible with new work requirement implied by IS projects, which should be considered as an integral part of project management. Organizations could be more proactive in professional identity reconstruction process by triggering active dialogue between professional users and IT staffs and continuous negotiation of desired professional identities as practiced in the organizations.

Finally, both micro and macro alignment needs to be explicitly communicated to the users involved in IS projects. While informing IT-task fit or micro alignment has been a quite common practice, it is not sufficient to address resistance as not all users can obtain immediate convenience or productivity gain by using new IS. In this research, we find that comprehension of organizational gains by using IS helps professional users rationalize their participation. Thus, it is important in IS project management to inform the "big pictures" in addition to address individual benefits.

Limitations and Future Research

Besides the significant contribution to literature as well as strong implications for practices, it is necessary to outline certain limitations in the current study that may warrant the future research endeavor. Although we have addressed the typical methodological issues associated with cross-sectional design, it is preferable to employ a longitudinal design for theoretical validation in order to empirically prove the causality as derived in the theoretical development.

Furthermore, the contingencies as identified in this study are bounded by certain user groups. It is likely that contingencies for effective user participation may vary for different user groups. Our research approach could be extended further to investigate the other users groups and to identify distinctive contingences from common ones.

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Appendix: Loadings and Cross-loadings

	Component								
	1	2	3	4	5	6	7	8	9
Participation	**.725**	.168	.102	.233	-.015	.135	.029	.084	-.016
Participation	**.722**	.148	.082	.180	.043	.145	-.088	.118	-.256
Participation	**.795**	.180	.057	.126	.036	.053	-.043	.222	-.064
Participation	**.624**	.154	-.052	.263	.058	-.092	.131	.283	.002
Participation	**.783**	.075	-.079	.101	.097	.079	.058	.156	-.135
Participation	**.843**	.077	.079	.005	.098	-.141	.112	-.075	.182
Participation	**.799**	.044	.067	-.012	.231	.003	.119	-.156	.164
Participation	**.851**	.158	.056	.006	-.027	.027	.013	-.048	.105
Participation	**.834**	.103	.067	.041	.146	.006	.028	-.115	.119
Participation	**.853**	.037	-.031	.011	.164	.110	.097	-.068	-.036
IT Competence	.162	.101	.010	**.758**	-.030	.054	.135	.115	-.152
IT Competence	.143	.135	.102	**.876**	.072	.034	.061	.062	.119
IT Competence	.152	.062	.181	**.866**	.034	.047	-.037	.040	.145
IT Competence	.090	.084	.002	**.865**	.100	.107	.064	.081	.103
WI integrity: technical	.086	.284	**.749**	.174	.046	.121	.091	.109	.051
WI integrity: technical	.107	.270	**.811**	.074	.097	.177	.162	.124	.114
WI integrity: technical	.041	.177	**.848**	.029	.166	.113	.175	.061	.170
WI integrity: technical	.004	.182	**.826**	.056	.194	-.006	.154	.108	.167
WI integrity: Collaborative	.016	**.721**	.262	.014	.094	.109	.112	.248	-.062
WI integrity: Collaborative	.176	**.792**	.192	.106	.037	.111	.084	.035	.228
WI integrity: Collaborative	.268	**.766**	.220	.179	.044	.120	.140	-.091	.086
WI integrity: Collaborative	.328	**.788**	.179	.115	.120	.081	.105	.017	.136
WI integrity: Collaborative	.266	**.792**	.145	.110	.098	-.017	.091	.104	.129
Macro-Alignment	.136	.096	.253	.025	**.796**	.017	.056	.048	.052
Macro-Alignment	.174	.055	.170	.091	**.798**	.134	.065	.061	.093
Macro-Alignment	.120	-.008	.034	-.079	**.756**	.213	.102	.107	.093
Macro-Alignment	.135	.189	-.011	.177	**.686**	.274	.125	.137	-.081
Process alignment	.092	.312	.161	.004	.316	**.619**	.254	.142	.107
Process alignment	.081	.080	.124	.123	.211	**.815**	.124	.029	.185
Process alignment	.055	.044	.102	.113	.218	**.810**	.157	.146	.126
IT Significance	.040	.250	.182	.107	-.051	.282	.091	.169	**.725**
IT Significance	-.002	.159	.318	.085	.168	.113	.174	.143	**.763**
IT Significance	.013	.202	.178	.130	.228	.278	.269	.364	**.545**
IT-Task fit (micro alignment)	.054	-.033	.133	.203	.154	-.061	.062	**.841**	.041

IT-Task fit (micro alignment)	-.004	.151	.113	.049	.136	.213	.140	**.704**	.326
IT-Task fit (micro alignment)	.073	.202	.179	.039	.061	.384	.245	**.666**	.132
Assimilation	.076	.103	.260	.106	.272	.023	**.752**	.077	.185
Assimilation	.109	.243	.221	.080	.046	.310	**.763**	.135	.128
Assimilation	.161	.165	.161	.096	.100	.240	**.751**	.202	.065