

User advocacy and information system project performance

Eric T.G. Wang^a, Jamie Y.T. Chang^{a,*}, Jiunn-Yih J. Jiang^b, Gary Klein^c

^a *Department of Information Management, National Central University, Chung-Li 32054, Taiwan*

^b *College of Business and Economics, The Australian National University, Canberra, Australia*

^c *College of Administration and Business, University of Colorado, Colorado Springs, United States*

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Abstract

User participation in information system projects is an established practice well backed by research. However, participation is usually considered limited to helping shape the requirements of the system being developed in order to be certain that a functional system is developed. This narrow perspective overlooks the potential of having the user be an advocate for the system to grow support among all stakeholders of the project. We build and empirically test a model that links user advocacy to project performance. The model also establishes links between two potential antecedents of user advocacy, socialization that includes training and relationship development, and extrinsic motivation. All links are positively supported by data collected from 128 matched-pairs of information system users and developers. Information system project managers are encouraged to establish reward structures and training to promote a role of advocacy for the users represented in the project team.

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1. Introduction

A unique feature of knowledge-intensive service development is user involvement during the course of a project (Bettencourt et al., 2002). This holds in information system (IS) projects that prescribe effective user participation in order to achieve success (Markus and Mao, 2004). In the IS case, user participation is the behaviors and activities that users perform contributing to system design during the system development process (Barki et al., 2001). These activities include user hands-on activity, user review, and user responsibility and are associated with a decrease in production costs and, at the same time, an increased sense of obligation and responsibility on the part of the user (He and King, 2008). These benefits have stimulated the devel-

opment of modern popular systems development methods such as prototyping, rapid application development, joint application design, participative design, and user-centered system design for IS projects (Butler and Fitzgerald, 2001). These methods have a primary focus on user activities in completing the project tasks.

One unique aspect of user responsibility is advocacy, promoting an alternate stakeholder perspective of the system requirements (Seiling, 2008). Stakeholder buy-in to a project has always been one of the most critical factors for successful project implementation and management (Conner, 1992; Young and Jordan, 2008). As a result, user advocacy could play an important role in IS project development beyond the traditional user participation activities during system design. However, the user participation literature has overlooked these contributions of the user in the achievement of project goals both in terms of verifying the expected benefits and determining how advocacy can be advanced. Should advocacy be crucial, then project performance in terms of cost, schedule and scope goals should be enhanced.

* Corresponding author.

E-mail addresses: ewang@mgt.ncu.edu.tw (E.T.G. Wang), jamie.chang0310@gmail.com (J.Y.T. Chang), jjiangmis@gmail.com (Jiunn-Yih J. Jiang), gklein@uccs.edu (G. Klein).

User advocacy does not appear to be automatic in an IS development project and must be fostered along with other user behaviors (He and King, 2008). To promote such behavior likely requires both skills to conduct and motivation to pursue the activities (Tesch et al., 2009). Skills are often acquired through the development of socialization capabilities that consider formal training, informal development, and opportunities to develop relationships among project team members (Bettencourt et al., 2002). Motivation is often developed by making evident how active participation can lead to the achievement of personal goals, a form of extrinsic motivation (Steers and Porter, 1991). However, whether these forms of skill development and motivation promote desired advocacy among the users is not established in the literature.

The primary focus of this study is, therefore, to examine the impact of user advocacy on final project outcomes. Specifically, does user advocacy advance an IS development in terms of project goals that include efficiency and effectiveness considerations? Furthermore, we propose user socialization and extrinsic motivation as two antecedents of user advocacy. The question we address is whether or not user advocacy is advanced with multiple forms of training and common extrinsic motivators. Given IS development methods that incorporate even greater user participation, it becomes important to understand how participation can become more effective and influential during the course of an IS project. A model is developed to represent relationships among project performance, user advocacy, and the two antecedents, user socialization and extrinsic motivation. The model is tested and confirmed with a survey of matched users and developers from recent IS projects.

2. Background and research model

Three of the key stakeholders who are most directly linked to IS projects are the project owners, the eventual users, and the project managers, yet the goals of each may differ according to the unique perspectives of each (Klein et al., 2002). The project owners are usually interested in building IS capabilities that promote organizational agility and effectiveness. Users are looking for the ability to enhance their operations. Project managers must focus on completing projects that meet the goals of the stakeholders in a timely and cost effective manner. These goals can occasionally contradict each other, especially in complex and rapidly evolving technology based projects such as IS development (Schwalbe, 2007). Research into satisfying the desires of the stakeholders follows two primary streams. The first examines how project management interventions promotes stakeholder activities during the project life cycle and has found traits such as skills, motivation, leadership, and integrated knowledge to be among the important factors (Liu et al., 2010; Turner and Muller, 2005; Ratcheva, 2009). A second stream of work is directed at identifying roles and activities critical to project success and has studied factors such as common knowledge, learn-

ing, participation, and support (Sense, 2008; Tesch et al., 2009; Bryde, 2008; Young and Jordan, 2008). This latter is where user participation work generally falls, but should be expanded to consider those factors that also promote desired user behavior.

User participation in IS projects has received great amount of attention by researchers for decades (Barki and Hartwick, 1994; Tesch et al., 2009). At first, user participation was viewed simply as a “*user and developer who are cooperatively involved to the extent that the activities of each facilitate the attainment of the ends of the others*” (Swanson, 1974). Later works separated user participation into two distinct components: user participation and user involvement (Barki and Hartwick, 1994). User involvement refers to a subjective psychological state reflecting the *importance* and *personal relevance* that a user attaches to a given system. On the other hand, user participation now refers simply to the assignments, activities, and behaviors that users or their representatives perform during the system development project. Later, Barki and Hartwick (1994) further divided user participation into (1) user responsibility, referring to the user being accountable for elements of project success; (2) user relationships, referring to the extent of communication and influence between users and IS personnel; and (3) user hands-on activities, referring to the extent of user activities. Prior empirical user participation studies mainly concentrated on user participative activities during system design and implementation (He and King, 2008). These categories still hold descriptive power for studies, but the relationship between the user and software developer continues to evolve to more complex relations as systems and application areas became more complex (Hsu et al., 2008).

One additional feature that seems to be gaining importance is user advocacy (Young and Jordan, 2008; Bryde, 2008). User advocacy refers to users representing the needs or perspectives of their functional group by promoting the merits of the project to key stakeholders from a contextual orientation to secure buy-in to their project (Bettencourt et al., 2002). During system development processes, users often sell merits of their projects to key stakeholders and try to gain internal commitment among key stakeholders to secure buy-in to the projects (Markus and Mao, 2004). Here, users articulate their own needs to other stakeholders regarding the benefits of the system for the organization (Mambrey et al., 1998). Bettencourt et al. (2002) also point out that user advocacy can facilitate a sense of ownership among key client constituencies for project outcomes that will lead to enhanced individual efforts. As such, users play a “boundary spanner” role to communicate with other stakeholders during the project and transform the practices of involved parties in order to accommodate disparate goals (Carlile, 2004). Thus, user advocacy could influence stakeholder support and, subsequently, the final project outcomes. Unfortunately, little attention has been paid to user advocacy in the literature in building project success, in motivating the advocacy role, or in preparing the user

to assume the advocacy role through socialization functions such as training.

Motivation theory takes a rationally calculative perspective that an individual's involvement in an activity arises from desire to obtain rewards that are apart from the work itself, and the degree of effort invested in the activity will depend on the receipt of rewards (Amabile, 1993; Handy, 1993). Extrinsic motivation refers to individuals engaging in the work in order to attain a personal goal apart from the work itself. In the case of an IS project, users will have higher extrinsic motivation when they experience greater control over the system and can expect advancement or improvements to their functional tasks. However, motivation should go along with the proper skills needed to perform any task (Bettencourt et al., 2002; Deci and Ryan, 1985). If insufficient skills are available, then it would be best to conduct appropriate training and relationship building activities before initiating an IS project (Dvir et al., 1998).

In IS projects, performance typically refers to the extent to which the project team accomplishes the system development tasks efficiently and effectively. Project performance is a comprehensive view that includes meeting project goals, staying within a budget, hitting schedule targets, attaining required quality, developing the full scope, and performing tasks efficiently (Jones and Harrison, 1996). It is important to consider multiple aspects because a delivered project may meet business goals but exceed allowable costs or go past essential due dates (Schmidt et al., 2001). Taking these all into account as desired outcomes of a project, we propose the research model shown in Fig. 1. User socialization and extrinsic motivation will positively associate with the levels of user advocacy which, in turn, contribute to final project performance.

3. Research hypotheses

The aim of this study is to build and empirically test a research model that links user advocacy to project performance. The research model also establishes links between two potential antecedents of user advocacy: socialization and extrinsic motivation. The relationships among these variables are provided in the following sections.

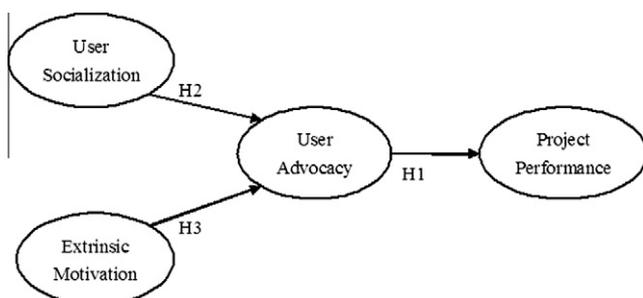


Fig. 1. Research Model of User Advocacy.

3.1. User advocacy and project performance

During an IS project, the decision making process is made difficult because the external conditions are dynamic and diverse stakeholders are involved. System design is viewed as a democratic design of work systems which, of course, include stakeholder participation. Getting support from management and users has been the most often cited factor for IS project success (Markus and Mao, 2004). Jiang et al. (2002, 2006) pointed out that user-related risks (e.g. a low extent of user participation, a low degree of user involvement, and a negative user attitude) led to failed IS development projects. User advocacy refers to users' actions of selling the project's merits to key stakeholders. Users selling the merits of the project to key stakeholders and gaining internal commitment should have a positive impact on final project outcomes (e.g. project performance). Project performance refers to the extent to which the project team accomplishes their tasks both efficiently and effectively. Markus and Mao (2004) claimed the buy-in among stakeholders could explain the effectiveness of participation by stakeholders during IS projects. Therefore, we propose that users who not only participate in design activities, but also negotiate and communicate with other stakeholders engaged in the project, are more likely to enhance project performance. Formally:

H1: user advocacy is positively associated with project performance.

3.2. Extrinsic motivation and user advocacy

Extrinsic motivation refers to the desire or intention to exert effort toward some goal that is apart from the work itself (Steers and Porter, 1991). Motivation theory takes the rationally calculative perspective that an individual's involvement in an activity arises from their desire to obtain rewards and the extent of effort invested in the activity depends on the receipt of rewards commensurate with their efforts (Handy, 1993). In other words, users are motivated when they perceive their behavior will lead to certain extrinsic tangible outcomes (Dessler, 1999). The literature on user participation has indicated that IS users are more willing to work with IS developers when they perceive the proposed systems will benefit their own performance (He and King, 2008). Therefore, based upon motivation theory and the IS literature, we propose:

H2: user extrinsic motivation is positively associated with user advocacy.

3.3. User socialization and user advocacy

User socialization refers to the development of skills with formal training, informal development, and capitalizing on opportunities to develop relationships among project team members (Bettencourt et al., 2002; Tesch et al., 2009). Ability is as an important factor for performing a task and is also a critical factor in motivation theory (Deci

and Ryan, 1985; Jiang et al., 2007; Bettencourt et al., 2002). Past research focused on how to enhance the users' ability to perform the desired task by providing them with necessary behavioral tools and training (Bettencourt et al., 2002). IS studies also demonstrated that holding user training sessions on relationship building and the transfer of user knowledge are critical for complex IS development projects (Jiang et al., 2007; Lyytinen et al., 1998). These user training activities can also serve to reinforce client role clarity, flexibility, and solidarity. As a result, prior to starting a project, IS management often provides training for users to learn their roles and responsibilities as well as provide opportunities for informal building of relationships, norms and trust among the team members. Furthermore, a great amount of empirical research has indicated that building relationships among team members is important to the socialization processes and has significant impact on members' behaviors and commitment (Griffin et al., 2000; Korte, 2009). Two recent meta-analyses of the socialization research indicated that socialization has significant effects on an employee's commitment, satisfaction, and organizational citizen behaviors (Bauer et al., 2007; Saks et al., 2007). Skill development and relationship building are two of the more critical socialization processes. Therefore, user training and relationship establishment can enhance the levels of user participation effectiveness. Based upon the above discussion, we hypothesize:

H3: user socialization is positively associated with user advocacy.

4. Research methodology

To test the research model and hypotheses shown in Fig. 1, matched-pair survey instruments were developed. IS users provided information about extrinsic motivation and user advocacy. IS developers were asked to respond to items about user socialization. Since project performance is viewed differently by the various stakeholders in a system (Klein et al., 2002), both IS users and developers were asked to answer the items about project performance to reduce information bias. The study adopted the matched-pair questionnaires for two reasons: the first reason is to reduce potential problems arising from common method variance (CMV) when both the independent and dependent variables were answered by the same informant (Podsakoff et al., 2003). The second reason is multiple informants reduce bias by obtaining information from the most informed subject possible (Kumar et al., 1993). Research with multiple informants can increase the reliability and validity of informant reports (Kumar et al., 1993).

4.1. Sampling procedures and characteristics

To achieve the requirement of multiple informants, the target sample for this study includes both IS users and IS developers who actively participated in a recent information systems development project together. A cross-sectional

mail survey was administrated to collect data. First, potential companies were identified as the sampling ground. The companies were randomly selected from a list of development contacts for a major Taiwanese university. To identify appropriate projects with IS users and IS developers, the department of human resource management in each company was asked to select a contact person in several IS projects within their organization. The project contacts were introduced to the purpose of the study and requested to participate by identifying a user and a developer on their project to complete the surveys.

For those willing to participate in this study, an appointment was made for a second visit when survey packages were delivered by the researcher. The package contained a cover letter with instructions and survey instruments for both an IS staff member of the project team and an IS user working on the same IS project. Each identified participant received one survey instrument and one envelop in which to seal the completed instrument. All participants were assured of full confidentiality. The organizational contact person collected the completed surveys, by pairs, and returned them, in the individual envelops, to the researcher. Four to six weeks later, contacts not returning the paired instruments were reminded to collect the surveys. Contacts had identified a total of 194 projects for participation. A total of 134 matched samples were returned. Out of those responses, questionnaires from 6 projects were incomplete and thus discarded from the sample. This results in a final data set of 128 observations. Demographic information of the final sample is provided in Table 1.

4.2. Constructs

All the examined research variables were measured using multi-item scales from prior studies reported in the literature. The items were translated into Chinese and verified for accuracy by two faculty members and two practitioners fluent in both Chinese and English. All items were measured on a 5 point Likert scale according to the original sources for the measures, with anchors ranging from 1 (strongly disagree) to 5 (strongly agree). According to Dawes (2007), 5 and 7 point scores produce the same means scores once rescaled, but a scale with more response options produces lower mean scores and appears biased even after scaling. Less than 5 points results in lower reliability, while 5 and higher point scales are highly correlated indicating little difference between scales of 5, 7, or more in linear analysis (Preston and Colman, 2000). The items for measuring user socialization were developed for this study. Items for extrinsic motivation were adopted from Chang et al. (2010). Project performance was measured using six items of efficiency and effectiveness adopted from existing scales that tapped into subjects' perceptions of project efficiency and effectiveness (Tesch et al., 2009). User advocacy was measured using three items adapted from Bettencourt et al. (2002). The list of the items for each variable is in Table 2.

Table 1
Demographic analysis ($N = 128$).

Variables	Categories	<i>n</i>	%	Variables	Categories	<i>n</i>	%
Gender	Male	65	50.8	Number of users	≤3	16	12.5
	Female	63	49.2		4–7	41	32.0
		8–15	29		22.7		
		16–25	10		7.8		
		26–50	8		6.3		
		51–100	8		6.3		
>100	15	11.7					
	Missing value	1	0.7				
Job position	Senior manager	38	29.7	Project completed	No	58	45.3
	Manager	47	36.7		Yes	70	54.7
	Professional	41	32.0				
	Other	1	0.8				
	Missing value	1	0.8				
Industry	Service	5	3.9	Project duration	<1 year	47	36.7
	Manufacturing	25	19.5		1–2 years	51	39.8
	Education	27	21.1		2–3 years	16	12.5
	Others	34	26.6		3–5 years	5	3.9
	Missing value	37	28.9		>5 years	9	7.1
Number of years in company	<1 year	11	8.6				
	1–5 years	37	28.9				
	6–10 years	28	21.9				
	11–15 years	15	11.7				
	16–20 years	10	7.8				
	>21 years	27	21.1				

5. Data analysis and results

PLS Graph 3.0 was used to evaluate the measurement and structural models. Using ordinary least squares as its estimation technique PLS performs an iterative set of factor analyses and applies a bootstrap approach to estimate the significance (*t*-values) of the paths. A recommended two-step procedure including measurement validation followed by structural path analysis was used for data analysis (Chin, 1998b). In addition to using PLS to test the hypothesized model, researchers should pay attention to two major measurement concerns: (1) the reliability and validity of measures; and (2) the appropriate nature of the relationship between measures and constructs (Goodhue et al., 2006; Hulland, 1999).

5.1. Assessing the measurement model

Item reliability, convergent validity, and discriminant validity tests are often used to validate the measurement model in PLS. Individual item reliability can be examined by the factor loading of each item. A high loading implies that the shared variance between constructs and its measurement is higher than error variance (Hulland, 1999; Goodhue et al., 2006). Factor loadings higher than 0.7 are viewed as high reliability and factor loadings <0.5 should be dropped.

Convergent validity should be assured when multiple indicators measure one construct. It can be examined by item reliability, composite reliability, and the variance

extracted by constructs (AVE) (Fornell and Larcker, 1981; Kerlinger and Lee, 2000). To have required convergent validity, composite reliability of each construct should be higher than 0.7 (Chin et al., 2003). Moreover, if the square root of the AVE is <0.707, it means that the variance captured by the construct is less than the measurement effect and the validity of the associated indicators is questionable (Fornell and Larcker, 1981). Discriminant validity focuses on testing whether the measures of constructs are different from each other (Messick, 1980). There are two procedures for assessing discriminant validity. First, the square root of AVE should be higher than inter-construct correlation coefficients (Fornell and Larcker, 1981; Chin, 1998b). Second, the correlation between pairs of constructs should be lower than 0.80 (Bagozzi et al., 1991).

As shown in Table 2, all but one indicators in this study have loading higher than 0.7, while the remaining item is still higher than what is recommended to be dropped. Furthermore, the minimum composite reliability is 0.86 and the item-total correlations are all higher than 0.3. The square roots of the AVEs shown on the diagonal of the correlation matrix in Table 3, ranged from 0.78 to 0.90, exceeding the threshold of 0.707. As indicated in Table 3, the AVEs are greater than the inter-construct correlations. The results exhibit strong construct reliability and validity. Table 3 also shows the descriptive statistics and the correlation matrix of aggregated data. For each variable, the minimum and maximum values, skewness (M3), and kurtosis (M4) are provided. For each variable the skewness

Table 2
Construct items and validation.

Constructs	Loadings	ITC
<i>User socialization (CR = 0.86)</i>		
1. Our organization encourages users attend IT seminars, symposia, and other learning opportunity	0.78	0.54
2. Our organization provides opportunities for informal individual user development (other than formal training)	0.86	0.69
3. Our organization provides various programs such as clubs and community gatherings between users and IS developers	0.63	0.55
4. Users are satisfied by the content of job training or self-development programs	0.83	0.64
<i>User advocacy (CR = .93)</i>		
1. Users sell key stakeholders on the merits of the project	0.90	0.74
2. Users gain internal commitment among key stakeholders (secure buy-into the project)	0.87	0.74
3. Overall, users advocate the project and sell its merits to other stakeholders	0.94	0.85
<i>Extrinsic motivation (CR = .89)</i>		
1. Involvement with the team will provide me with job convenience	0.82	0.69
2. Involvement with the team will allow me to advance more quickly	0.74	0.61
3. Involvement with the team will get me what I want	0.88	0.77
4. Involvement with the team will provide me more control/influence over the final system	0.81	0.59
<i>Project performance (CR = .94)</i>		
1. Projected goals were met	0.86	0.80
2. The expected amount (scope) of work was completed	0.89	0.85
3. Completed work was of a high quality	0.78	0.66
4. The schedule was adhered to	0.84	0.76
5. The budget was adhered to	0.75	0.64
6. Task operations were carried out efficiently	0.91	0.87

Table 3
Descriptive statistics.

Variables	Min.	Max.	Mean	SD	M3 ^a	M4 ^b	Correlation matrix				
							S	A	E	P	
User socialization (S)	1.00	5.00	3.30	0.77	-0.34	.47	0.78				
External motivation (E)	2.00	5.00	3.85	0.72	-0.16	-0.51	-0.08	0.81			
User advocacy (A)	2.67	5.00	3.96	0.66	0.04	-0.80	0.24	0.37	0.90		
Project performance (P)	2.08	5.00	3.90	0.59	-0.52	0.54	0.36	0.23	0.35	0.84	

Bold diagonal in the correlation matrix represents the square root of AVE.

^a M3: skewness.

^b M4: kurtosis.

was <2 and the kurtosis <5, indicating no significant violation of normal distribution assumptions (Ghiselli et al., 1981).

5.2. Assessing the structural model

The test of the structural model includes estimating the path coefficients, which indicate the strengths of the relationships between the independent and dependent variables, and the R^2 value, a measure of the predictive power of the model for the dependent variables. A bootstrap resampling procedure was used to generate t -statistics and standard errors (Chin, 1998b). The bootstrap procedure utilizes a confidence estimation procedure other than the normal approximation. In this study, PLS Graph 3.0 was set to apply a bootstrap resampling method (200 resamples) to determine the significance of the paths within the structural model (Barclay et al., 1995).

The overall results of the analysis are shown in Fig. 2. As hypothesized, user advocacy is significantly associated

with project performance (path coefficient = 0.213, $p < 0.01$). User socialization (path coefficient = 0.266, $p < 0.01$) and extrinsic motivation (path coefficient = 0.386, $p < 0.001$) are significantly associated with user advocacy, accounting for 20.4% of the variance. User

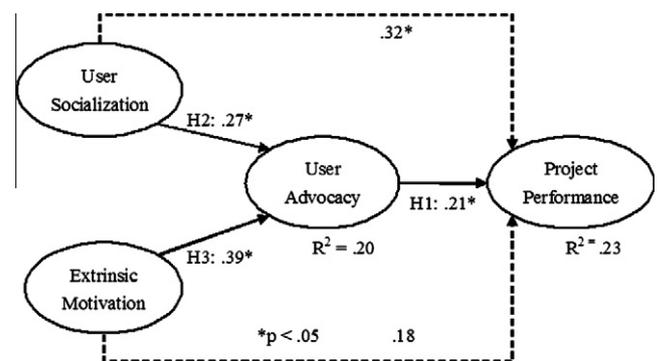


Fig. 2. PLS path analysis results.

socialization (path coefficient = 0.323, $p < 0.001$), user advocacy (path coefficient = 0.213, $p < 0.01$), and extrinsic motivation (path coefficient = 0.177, $p > 0.05$) together explain about 23.1% of the dependent variable's variance, but the effect of extrinsic motivation is non-significant. The standardized path coefficients ranged from 0.213 to 0.386, with all of the paths exceeding the suggested minimum value of significance at 0.2 (Chin, 1998a). Thus the fit of the overall model is good. All hypotheses are supported based on these results.

To determine if user advocacy is at least a partial mediator for both antecedent variables and not simply an artifact of the structural relationships, both antecedent variables were also included in the model linking to the final dependent variable of project performance. User socialization was significant to project performance (path coefficient = 0.323, $p < 0.01$), but extrinsic motivation (path coefficient = 0.177, $p > 0.05$) was not. These latter two links indicate that user advocacy is a full mediator between extrinsic motivation and project performance and a partial mediator between user socialization and project performance indicating the importance of including user advocacy in the model. Table 4 provides a detailed summary of all the test results.

6. Conclusions

A large number of studies have shown the importance of user participation to IS project outcomes. Nevertheless, the user participation literature has mainly focused on the three major user behaviors of user review, user-influence, and user-hands-on activities for system design and implementation. The behind-the-scenes user behaviors that contribute to functional working relationships are often overlooked. In fact, studies have found numerous potential negative effects in projects involving multiple stakeholders including lack of support, interpersonal conflicts, and communication gaps. One potential behavior for securing buy-in among stakeholders to a project, unfortunately, is overlooked in the IS literature – user advocacy. In this study, user advocacy is positively related to project performance and to the proposed antecedents: extrinsic motivation and user socialization.

The results of this study open new avenues for IS researchers. First, unlike the current IS participation literature that has focused on user activities during system design; our results indicated that users could play impor-

tant roles for other needs (e.g., generating stakeholder support and consonance of requirements) during the system development project. Future studies are encouraged to examine the detailed nature and scope of user advocacy regarding aspects of when, where, and how to serve as a voice for the project. Secondly, although it is not the purpose of this study to explore the full list of potential antecedents of user advocacy, the results of this study suggested that user socialization and extrinsic motivation were important factors leading to user advocacy. Future studies are encouraged to examine other project management interventions (e.g. co-location, partnering) that may lead to greater user advocacy.

For IS project managers, the results of this study indicated that, first, it is not only user participation activities such as user review and hands-on activities during system design that are critical to IS project success, but also user advocacy. The roles of users in system development should not be limited to the design and implementation of the system but also as a selling agent to other stakeholders. Social roles are an organized set of prescriptions and/or expected activities that can be associated with a given position. A role includes categories of activities that are recognized and expected by others. IS project managers should help users recognize that their user participation role is not limited to system design activities but includes contextual performance of their proposed projects.

Secondly, the results also indicated that user socialization in the form of training and relationship building played significant roles in fostering user advocacy and had a direct, positive impact on project performance. This suggests that IS management must not underestimate the importance of user competence on participation and understanding of the proposed system. What employees experienced in their working world is correlated with the experiences they provided for their customers; unless IS project managers provide sufficient preparation for users, IS project managers should not expect supportive users or effective user participation. Finally, the results also showed that extrinsic motivation is fully mediated by user advocacy. Many studies have been devoted to how to enhance customer commitment; however, it may not be under the control of IS project managers to determine the benefits of the proposed projects. Nevertheless, IS project management must strive to meet user needs and help all stakeholders to realize the potentials of the proposed systems.

Table 4
Tests of Hypotheses.

	Hypothesis	Standardized path coefficient	t-value	Result
H1	User advocacy → project performance	0.213	2.749*	Support
H2	User socialization → user advocacy	0.266	2.914*	Support
H3	Extrinsic motivation → user advocacy	0.386	4.507*	Support
	User socialization → project performance	0.323	3.584*	
	Extrinsic motivation → project performance	0.177	1.847	

* $p < 0.05$.

This study has a number of limitations, which can be overcome in future studies. First, since the data were collected from information system development project teams in Taiwan, this limits the generalizability of the findings due to cultural influences and localized business practices. Future studies can investigate the potential differences for other kinds of projects (e.g. implementation projects, R&D projects, or new product development projects) and other cultures. Second, the aim of this study is to examine the impact of user advocacy on project performance. We identify just two antecedents of user advocacy, user socialization and extrinsic motivation. Providing organizational mechanisms to encourage user socialization and extrinsic motivation are critical for facilitating user advocacy. Future studies should consider what further mechanisms can facilitate these two behaviors. Third, the results of our study indicate that user advocacy plays a significant role for project performance. User advocacy is but one feature of a co-production environment. Other features might interact with advocacy to alter the relationships. Future studies can investigate the impact of other co-production components on final project outcomes. Fourth, the project outcomes measured in this study focused on project performance as perceived by IS users and developers. Other dimensions of success that impact the organization, individuals, operations, and system usage are not considered. Lastly, cross-sectional surveys have limitations in attributing and substantiating affirmative causality. Future studies should collect longitudinal data to assess causal relationships.

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