

Social Capital and User Acceptance of Enterprise System: Mediating Role of Local Management Commitment

Completed Research Paper

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Abstract

This study builds a multi-level research model to investigate how social capital between business units and the headquarters in large-scale organizations influences individual user acceptance of enterprise systems. Drawing on social capital theory and the human agency theory, this study argues that local management of business units plays the role of interpreting signals and messages from the headquarters, such that it can mediate the effect of social capital (which is composed of structural, relational, and cognitive dimensions) on symbolic adoption of the enterprise technology. To test the research hypotheses, a field study is conducted on 222 users of an enterprise system in 29 business units of a major financial institution in China. The results indicate that the effects of relational capital and cognitive capital on user acceptance are mediated by user perception of local management commitment; and relational capital and cognitive capital mediate the effect of structural capital on user perception of local management commitment. Limitations, theoretical implications are discussed, and practical guidance is suggested.

Keywords: Social capital, user acceptance, local management commitment, enterprise system, human agency perspective

Introduction

User acceptance of enterprise systems (ES) has been a critical issue impeding ES implementation success (e.g., Amoako-Gyampah 2007; Kumar et al. 2003; Venkatesh et al. 2000). How to enhance user acceptance of a mandated enterprise system has become an important topic for IS academic research (Amoako-Gyampah 2007; Karahanna et al. 2003; Nah et al. 2004). However, user acceptance research has been dominated by studies conducted in the voluntary usage context. Very little attention has been paid to mandatory usage (Nah et al. 2004), in spite of the fact that concepts describing user acceptance (e.g., behavioral intention) in a voluntary usage context are not appropriate in the mandatory context (Karahanna et al. 2003; Rawstorne et al. 1998).

The local management commitment is an important factor directly influencing individual acceptance behavior. Prior empirical research has found that users are more likely to hold positive beliefs toward and to be more accepting of a newly-introduced system when local management is committed to its usage (Lewis et al. 2003). Therefore, top management (i.e., the headquarters in this study) needs to obtain local management's commitment to system implementation by exercising its influence over the local management. However, the existing literature provides very limited insights to the ways by which the top management promotes local management commitment.

Our study aims to address this research gap by understanding the extent to which and how top management facilitates the development of local management commitment, which in turn leads to user acceptance of mandatory technology. To do so, we argue that, in gaining local management's commitment to system implementation, *social capital* between headquarters and local business units plays a critical role. Social capital can facilitate social actors to be committed to organizational aims (Tsai et al. 1998; Woolcock et al. 2000), and to adapt coherent organizational behaviors (Cohen et al. 2001), such that the anticipated benefits to the organization are realized (Tsai et al. 1998). In multi-unit companies, social capital has been identified as being an effective instrument for gaining the cooperation of various business units (Tsai et al. 1998). The headquarters of an organization in particular are responsible for implementing ES, and expect local business units to be committed to the implementation. The social capital between the local business units and headquarters can help facilitate the implementation of ES. Thus we believe that social capital between headquarters and the management of local business units can be an appropriate lens for this study.

Following Ghoshal and Bartlett (1994a), this study views social capital as developing between the headquarters and the employees in local units within the organizational context, which can ultimately have a beneficial influence on individual behavior. Drawing from the human agency perspective, which proposes that an external force can only affect an individual's behavior when it can first affect the behavior of the agents who can translate external influences into managerial actions within the organization (Liang et al. 2007), this study proposes that the management of a local business unit is a human agent of change. Hence, the social capital that exists between the headquarters and local business units can influence user acceptance via local management commitment. To test the research model and hypotheses, a field survey was conducted in a large commercial bank, which had implemented an enterprise system in its business units.

This study provides a better understanding of how social capital between the members in headquarters and the members in local units can enhance user acceptance of enterprise systems within a mandatory usage context, through the mediating role of local management commitment. Since this subject matter has drawn inadequate attention in prior studies, this research helps enhance our understanding of social capital in the context of user acceptance of enterprise technology.

Methodologically, this study deploys an innovative, multi-level approach to understanding the role of social capital in individual acceptance behavior. In adopting the perspective of social capital, and taking into account the hierarchical nature of a large-scale company (i.e., a company consists of multiple business unit), we empirically test the mediating effect of local management commitment on the relationship between social capital and user acceptance. This approach is methodologically different from prior research, which mainly investigates user acceptance at the individual level (e.g., Davis 1989; Venkatesh et al. 2000). As some researchers have implied that user acceptance is a multi-level issue (Lewis et al. 2003), our study adopts a multi-level approach by examining how the social capital that exists between headquarters and individual business units affects local user acceptance. With the

multilevel research design, this study provides a more comprehensive understanding of the factors that determine user acceptance (Klein et al. 2000).

Theory Development

Social capital theory and the influence of local management commitment constitute the theoretical foundation of this study. Social capital theory has emerged as a powerful theoretical lens through which to examine the cooperative behavior and coherent actions between two social actors (e.g., Bolino et al. 2002; Tsai et al. 1998). We argue in this study that the social capital built between top management and local management plays a crucial role in determining the employees' cooperative behavior, i.e., their willing acceptance of the mandated system in this study. According to human agency perspective (Liang et al. 2007), it is further argued that local management plays the agency role in mediating the impact of social capital (between the headquarters and business units) on user acceptance of a newly-introduced enterprise system.

Dependent Variable – User Acceptance

The adoption and usage of an enterprise system (ES) is mandatory (McAfee 2006), that is, management makes the decision to adopt and implemented a system, and users are required to use this new system to accomplish their tasks. In other words, users can not choose to use or not to use the introduced system; they have to use the system, this is totally different from the voluntary context in which users can decide whether to use the system. Specifically, users are mandated to actually use the new system even before they have mentally accepted the idea of its adoption. Therefore, the original concepts describing user acceptance (e.g., behavioral intention) are not appropriate in this context (Nah et al. 2004; Rawstorne et al. 1998).

In the literature, Rawstorne et al. (1998) and Karahanna and Agarwal (2003) argue that the mental acceptance of the idea of adopting a system, rather than the use intention with respect to the system, should be captured in order to reflect user acceptance in mandatory settings. Indeed, they introduce the concept of symbolic adoption to address the issue of user acceptance in the context of mandated IS usage. According to Karahanna and Agarwal (2003), symbolic adoption refers to “the peak motivational state reflective of a user’s mental evaluation of the technology and its use as a worthwhile concept” (p.8). This construct has four dimensions: (1) mental acceptance, which describes the extent to which a user favorably views the adoption of a system; (2) use commitment, which refers to the extent to which a user is committed to the use of the system regardless of whether it is mandated or not; (3) effort worthiness, which refers to a user’s positive evaluation of the return on the resources expended to enable their use of the introduced system; and (4) heightened enthusiasm, which refers to the eagerness with which a user approaches the necessary behaviors associated with the system usage (Karahanna et al. 2003). Considering the mandatory nature of ES, we intend to use symbolic adoption to measure user acceptance of an enterprise system.

Social Capital and User Acceptance

Social capital refers to a set of resources rooted in the social relationships developed among social actors, which is valuable in securing benefits for both individual and organizational participants (Adler et al. 2002). Social capital has three dimensions: structural, relational, and cognitive (Nahapiet and Ghoshal 1997). According to relevant research on the three dimensions (Chiu et al. 2006; Kale et al. 2000; Tsai et al. 1998), in this study, we specifically define structural capital as the extent to which members in a business unit interacts with members in headquarters; relational capital as the extent to which members in a business unit and members in headquarters trust, respect, and reciprocate with each other; and cognitive capital as the extent to which members in a business unit and members in headquarters share the common values and goals of the organization. The three dimensions of social capital coexist within an organization, and are interrelated (Tsai et al. 1998). Structural capital represents the social interaction ties within an organization, and it can assist in forming trust and trustworthiness (Tsai et al. 1998). Previous research has found that trusting relationships are derived from social interactions (e.g., Granovetter 1985; Gulati 1995). Frequent and close interactions between two social actors can lead to a better understanding

of one another, to a sharing of information and knowledge, and to a trusting and reciprocal relationship (Tsai et al. 1998).

Structural capital can also help in the formation of cognitive capital. It has been found that social interaction can encourage individuals to adopt organizational values (e.g., Van Maanen et al. 1979). Through social interaction, individuals come to appreciate and finally to adopt organizational languages, codes, and values (Tsai et al. 1998), such that they ultimately come to share the common values and goals of the organization. This progression is especially important where business units may have different interests and goals within a multi-unit company; however, with frequent and close interaction, they may eventually come to share a collective orientation toward the pursuit of common goals (Tsai et al. 1998).

Further, shared values and interests between social actors can help in the formation of relational capital. Prior studies have shown that trusting relationships are based on value congruence (Sitkin et al. 1993). And shared values can help erase the possibility of opportunistic behavior (Ouchi 1980), such that social actors will come to interact with and trust each other. In a multi-unit company, when the members of one business unit come to share the common values and goals of another business unit, they tend to trust one another, and to become actively engaged in establishing a reciprocal relationship.

It has been found that social capital plays a salient role in facilitating cooperative behavior among social actors (Bolino et al. 2002; Tsai et al. 1998), and it is even proposed that “without social capital, organizations simply cannot function” (Cohen et al. 2001, p10.). In contrast to contractual and legal regulations, which emphasize required responsibilities, social capital underlies the cooperative behavior through which the transaction cost incurred among social actors is greatly reduced (Cohen et al. 2001; Kumar et al. 1998), such that social capital has become the foundation of effective organizations (Kumar et al. 1998). It is argued that social capital can facilitate the gaining of social actors’ commitment to organizational activities (Tsai et al. 1998; Woolcock et al. 2000), and to clearly defined organizational behaviors (Cohen et al. 2001), such that organizational benefits are realized (Tsai et al. 1998). In the context of ES implementation in a multi-unit company, headquarters makes the decision of adopting the system and the commitment from the business unit management is expected, such that social capital comes to play the role of motivating local management to cooperate with the headquarters to facilitate system implementation.

Social capital theory has been widely used in the last two decades in explaining various economic and social phenomena (Bhandari et al. 2009), and is also frequently applied in IS research. For instance, social capital plays an important role in facilitating IT outsourcing (Chou et al. 2006) and knowledge sharing (Chiu et al. 2006; Wasko et al. 2005; Yang et al. 2009). Social capital can be of particular influence in IT diffusion and implementation within organizations, such as knowledge management system usage (He et al. 2009), the adoption of an electronic trading system (Montazemi et al. 2008), enhancing (ERP) project team effectiveness (Newell et al. 2004), achieving work coordination between IS and business departments (Hatzakis et al. 2005), and encouraging the use of online social network sites (Ellison et al. 2007). Since enterprise systems impose many changes on organizations, effective change management is a prime requisite for achieving its overall success (Orlikowski et al. 1997), and, in particular, user acceptance (Lee et al. 2004). Prior research has found that social capital can provide us with a theoretical framework for integrating different views of stakeholders in ES implementation, such that it is an appropriate approach to evaluating and explaining change management (Hatzakis et al. 2005).

To the best of our knowledge, social capital theory has not been applied in explaining user acceptance of mandated information systems. Prior research on user acceptance exclusively focused on the internal antecedents with respect to either the whole “organization”, e.g., social factors and facilitating conditions (Thompson et al. 1991); or “individuals”, e.g., perceived usefulness and ease of use (Davis 1989; Karahanna et al. 2003), and the hierarchical nature of organizations which have multiple departments or business units has been seriously neglected. However, more recent studies have indicated that such external factors (within the organization but outside the departments or business units to which the individuals belong) are also important. For example, Saraf et al. (2006) depict the important role of inter-unit social relationships in facilitating ERP assimilation; Akkermans and van Helden (2002), Somers and Nelson (2006), and Remus (2007) propose that interdepartmental communication and cooperation is critical to achieving user acceptance of ERP, and Song et al. (2007) even conclude that interdepartmental communication can indirectly influence user acceptance via mediating variables. Considering the context

of this research, we believe that the development of social capital between headquarters and outlying business units is critical to winning user acceptance. Thus, social capital theory is adopted as a theoretical lens through which to examine and ultimately to enrich our understanding of user acceptance of an enterprise system in local business units.

Local Management and User acceptance

Although social capital theory can be useful in predicting local management commitment with regard to ES implementation, user acceptance of an enterprise system tends to vary across organizational business units. To understand this variance, a human agency perspective is employed. According to human agency theory, external factors cannot directly influence an individual's behavior until they can first impact human agents (Liang et al. 2007). Since social capital between an organization's headquarters and its business units can be viewed as being external to the organizational context (Ghoshal et al. 1994a), it is believed that it cannot directly influence individual behavior. Accordingly, we propose that a business unit's local management acts as the human agency that can translate an external influence (i.e., social capital) into managerial actions (Liang et al. 2007). Actually, prior research has particularly emphasized the fact that local management is responsible for interpreting the messages and signals from top management for local personnel (Lewis et al. 2003). In reality, local management is not only influenced by the headquarters but also takes responsibility for winning user acceptance and, consequently, for realizing the benefits of system usage. With a substantial amount of social capital, business units are more likely to be committed to organizational actions and to adopt coherent organizational behavior (Cohen et al. 2001). In this study, headquarters makes the implementation decision at the organizational level, and unit-level commitment to such implementation is expected. In order to maintain a good social relationship with headquarters, local management tends to behave in accordance with the expectations of headquarters, and will be committed to system implementation. Thus, we theorize that the impact of the social capital between headquarters and dispersed business units on user acceptance is mediated by local management.

In order to better understand user acceptance, the interaction between social capital and local management must be considered. An enterprise system may be either underutilized or inappropriately utilized due to factors within a particular local context (Orlikowski et al. 1995) for which the local management takes responsibility and with which it is familiar. Prior research on user acceptance has argued that local management can translate the top management's messages into managerial actions (Lewis et al. 2003). In this study, since ground-level implementation occurs in dispersed business units, local management must take responsibility for changing norms, values, and culture within their individual unit, such that they can effectively influence the unit members' acceptance of the newly-introduced system. It is also argued that, at individual level, these norms, values, and cultural attributes take the form of procedures, rules, regulations, and routines (Purvis et al. 2001), which can greatly influence individual behavior.

Research Model and Hypotheses

Based on the theoretical arguments above, a research model is proposed (see Figure 1). Since relationships among the three dimensions of social capital have been well established in the literature, they are included in the research model, but we do not intend to specifically propose the related hypotheses. A total of 7 hypotheses are developed herein, of which 3 describe direct relationships (i.e., H1, H2a, H3a); and the other 4 are used to depict cross-level mediating effects (i.e., H2b, H3b, H4, H5).

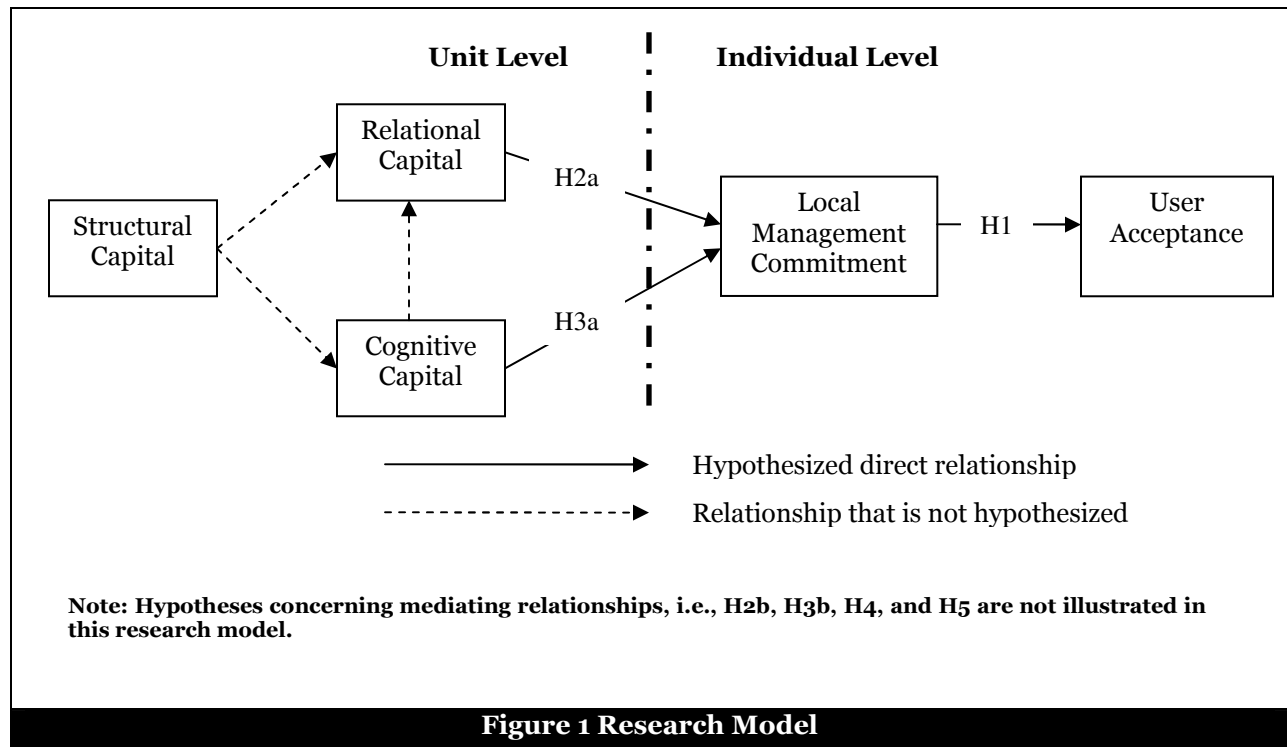


Figure 1 Research Model

Local Management Commitment and User acceptance

Following Lewis et al. (2003), we use local management commitment to depict users' perception of support (with regard to system implementation) provided by local management. Accordingly, local management commitment refers to the extent to which a business unit's management encourages, and recognizes users' effort in adapting to system usage (Lewis et al. 2003). According to Orlikowski (2000), individuals' usage behavior can be greatly influenced by the institutional context within which that behavior occurs. In large organizations, individuals' day-to-day cognition and behaviors are more influenced by their immediate supervisors who relay messages and signals from top management (Lewis et al. 2003). And prior research has identified that local management can influence individual behaviors and beliefs by reinterpreting and reinforcing the messages and signals emanating from top management within the organization (Leonard-Barton 1987). Further, to fully gain the benefits from the system implementation, local management needs to take responsibility for changing norms, values, and culture within their individual unit so as to enhance the unit members' acceptance of the newly-introduced system.

In the context of ES implementation, the actual adoption occurs within specific business units, and individuals use the system in response to direction from their direct supervisors. When local management is committed to system implementation, users tend to positively evaluate and adopt positive beliefs toward a system (Lewis et al. 2003), and hence become mentally accepting of the system usage. Further, when local management recognizes their effort and dedication to system usage, users are likely to perceive their investment in learning to use the system to be of value and worthwhile (Karahanna et al. 2003). Therefore,

H1: Local management commitment is positively related to user acceptance.

The Role of Social Capital in Promoting User acceptance

As argued above, local management largely determines the effect of social capital on user acceptance. Considering that social capital consist of three dimensions, which have different theoretical meanings, it is argued that the role of each dimension in promoting user acceptance differs from the others. Specifically, structural capital appears as the most primitive form, which subsequently can assist in the formation of

relational capital, and cognitive capital (Tsai et al. 1998). Accordingly, it is proposed that relational and cognitive capital can directly influence local management commitment which in turn can impact user acceptance. The effect of structural capital on local management commitment is mediated by relational and cognitive capital.

Relational Capital

Relational capital plays an important role in facilitating the gaining of cooperation between two social actors (Gambetta 1988; Gulati 1995; Ring et al. 1994). A social actor who is trusted by and can reciprocate with other social actors is more likely to obtain support from other social actors in achieving goals (Tsai et al. 1998). In the context of ES implementation, headquarters decides to adopt a particular system; in turn it expects the individual business units to cooperate such that it can facilitate the diffusion of the system throughout the organization. When there is a high-level of relational capital between local management and headquarters, local management will be more likely to agree with headquarters' decision to implement the system, and will be more committed to system implementation. Besides, in order to maintain a trusting and reciprocal relationship, which may ultimately benefit a particular business unit, local management is likely to cooperate with headquarters by facilitating system implementation in the workplace.

It is further argued that the relationship between relational capital and user acceptance is mediated by local management commitment. Since social capital in general can be seen as being part of the organizational context, which can influence social actors' beliefs and behaviors (Ghoshal et al. 1994a), the relational capital existing between a business unit and headquarters thus can be viewed as a higher level external influence with the potential to impact user acceptance. As discussed above, social capital theory has indicated that relational capital can directly influence local management commitment. Further, an individual's usage behavior is directly affected by local management, such that local management commitment can directly influence user acceptance (Lewis et al. 2003). In the context of ES implementation in multiple business unit, although the headquarters decides to adopt the system, local management is responsible for interpreting the messages and signals from the headquarters (Lewis et al. 2003), and takes the responsibility for the ground-level implementation. Considering that individuals' behavior is directly exposed to local management, to enhance user acceptance and thus fully benefit from implementation, headquarters needs local management to delay and interpret the messages (with regard to system implementation) to users, and take specific ground-level managerial actions to facilitate the implementation. Thus, when there is high level relational capital between the headquarters and local management, local management is likely to be stimulated to take coherent actions with the headquarters to facilitate system implementation, this in turn affects user acceptance. Therefore,

H2a: Relational capital is positively related to local management commitment.

H2b: The effect of relational capital on user acceptance is mediated by local management commitment.

Cognitive Capital

Cognitive capital represents the collective goals of the social actors within an organization (Tsai et al. 1998). When two social actors share common values and goals, they are likely to take consistent actions to benefit the whole organization (Tsai et al. 1998). Within the context of ES implementation, headquarters will introduce a system with the intent to benefit the organization, and a response that is consistent with this intent is expected from the business units. When there is a high-level of cognitive capital between a business unit and headquarters, the commonly shared goals or interests can help them avoid the possibility of misunderstandings and may in turn facilitate the exchange of information and ideas (Tsai et al. 1998), such that the members of an individual business unit can see the potential value of the newly-introduced system in which headquarters believes. Further, cognitive capital can assist in uniting dispersed groups and facilitate the integration of the whole organization (Orton et al. 1990), such that when a business unit shares the common goals and interests of headquarters it is more likely to work together with headquarters to facilitate system implementation.

We further argue that the relationship between cognitive capital and user acceptance is mediated by local management commitment. Although cognitive capital can directly influence the degree of local

management's commitment, an individual's usage behavior is directly exposed to, and tends to be directly influenced by, local management (Lewis et al. 2003). As discussed, in order to enhance user acceptance, headquarters needs local management to relay and interpret the information and messages (with regard to system implementation) to users, and facilitate the implementation with ground-level managerial actions. When there is high level cognitive capital between the headquarters and local management, local management will share the common views with regard to system implementation, such that it will take coherent actions with the headquarters, this in turn can directly influence user acceptance. Therefore,

H3a: Cognitive capital is positively related to local management commitment.

H3b: The effect of cognitive capital on user acceptance is mediated by local management commitment.

Structural Capital

Although prior researchers have proposed that structural capital plays an important role in innovation diffusion within multi-unit organizations (Ghoshal et al. 1994b; Ibarra 1993; Leonard-Barton et al. 1993; Powell et al. 1996), its impact on local management commitment is mediated by relational capital and cognitive capital. As the fundamental dimension of social capital, structural capital can help in shaping the relational and cognitive capital that is developed between business units and headquarters (Tsai et al. 1998). It is argued that the interactions between two social actors will not lead to cooperative behavior unless they can first establish a trusting and reciprocal relationship, or come to share common interests and goals. Therefore,

H4: The effect of structural capital on local management commitment is mediated by relational capital.

H5: The effect of structural capital on local management commitment is mediated by cognitive capital.

Research Method

To empirically test these hypotheses and the research model, we conducted a field study in a commercial bank (Bank G) located in South China. Prior to conducting the final survey, several users of a paperless loan approval system (PLAS), which included a loan manager at headquarters who takes charge of loan approvals, and a bank vice president who takes responsibility for the system implementation were interviewed in order to justify the appropriateness of the research context.

Organization and System

Bank G, which has 35 business units under the leadership of its headquarters, is a large, state-owned commercial bank, and is the most influential in the South China banking industry. Among its range of businesses, the loan business is the most critical for determining organizational benefits. In order to adapt to new business requirements and control the potential risks of paper-based work, the management at the headquarters of Bank G decided to adopt the paperless loan approval system (PLAS) in conducting its loan approval business. About two years ago, PLAS was introduced to all the 35 business units of Bank G.

Despite the prompt implementation, the PLAS project encountered some critical issues. First, due to the pressure from governmental institutions with respect to the need for record inspection and the potential risks of technical problems of the system, paper-based files were required to be kept. Headquarters continues to evaluate the loan applications based on paper files, and users are obliged to wait for approval feedback from headquarters via PLAS before a response is given to customers. In some business units, which have relatively strong communication links with headquarters, including business and personal interactions, users tended to turn to the system first, and they often submitted the paper-based files to headquarters a few hours or even days after the electronic files submission. On the contrary, in business units which have less business or personal contact, users conducted loan business more conservatively by turning to the paper files first, and management in some business units even did not allow employees to submit the electronic file via PLAS until they had completed the paper-based files. Since loan managers at headquarters were obliged to review loan application files via PLAS, the delayed submission of electronic files was inconvenient and inefficient.

Second, although headquarters had intended to enhance the efficiency of the loan approval process by introducing PLAS, users from some business units complained that the system was not compatible with the loan approval procedure; such that they believed that the introduction of PLAS was not a good idea.

Data Collection

To deal with the threat of method bias (Podsakoff et al. 2003), two different sources were used in this study. Specifically, executive managers in business units, who take charge of the communication with headquarters, were asked to rate social capital factors; and employees who are the end-users of PLAS rated local management commitment and user acceptance. A total of 358 individuals from all of the 35 business units participated in the survey. Due to the absence of executive managers, 6 groups were dropped. Because of incomplete data, 29 executive managers and 222 users from 29 business units were ultimately involved in the final data analysis.

Measurement Development

The constructs in this study were operationalized using extant validated scales. The four dimensions of user acceptance, i.e. heightened enthusiasm, use commitment, mental acceptance, and effort worthiness, were adopted from Karahalla and Agarwal (2003), and a total of 11 items were used to measure this formative second-order construct. Local management commitment was measured by modifying the 5-item scale described by Lewis et al. (2003). Three dimensions of social capital were measured by adapting the scales used in prior research. Specifically, structural capital was measured by examining the strength of social interactions ties, which depict the length and frequency of communication between business units and headquarters. Items were adapted from Chiu et al. (2006). Cognitive capital was measured by examining the element of shared vision, which describes the extent to which headquarters and various business units have a common understanding of the prospects and objectives of the organization. This construct derived from Tsai and Ghoshal (1998) and Chiu et al. (2006). Relational capital described mutual trust, respect, and reciprocity between headquarters and business units, the measurement was adapted from the 5-item measure used in Kale et al. (2000). The instruments are shown in Appendix A.

Data Analysis and Results

Due to the hierarchical nature of the collected data, a hierarchical linear model (HLM) was employed to test the research hypotheses and model (Zhang et al. 2009). Further, considering the involvement of the formative construct (Chin 1998), Partial Least Square (PLS) analysis of the data was also employed.

Instrument Validation

Prior to testing the research model and hypotheses, a related analysis was also conducted in order to validate the focused instruments. This study involved both formative and reflective constructs. Specifically, following Karahanna and Agarwal (2003), we conceptualized user acceptance as being a formative second-order construct. Social capital (including structural capital, relational capital, and cognitive capital) and local management commitment were conceptualized as being reflective constructs. According to prior research, formative and reflective constructs needs to be assessed based on different guidelines (e.g., Cepeda et al. 2007).

Following prior studies on evaluating formative constructs (e.g., Cenfetelli et al. 2009; Petter et al. 2007), we conducted a related analysis in order to validate user acceptance. Specifically, the validity of user acceptance was assessed by using item weights and loadings (Cenfetelli et al. 2009), and its reliability was established by examining the multicollinearity among the various indicators. The results of this analysis established the validity and reliability of the measure of user acceptance.

The convergent validity of reflective constructs was established by checking the loadings of a construct, while discriminant validity was established by checking whether the loadings of an item on its particular construct were greater than the loadings on others. Furthermore, the reliability of reflective constructs

was assessed by checking Cronbach's alpha (Nunnally et al. 1978). The results indicated that all of the reflective constructs were valid for data analysis.

Testing the Research Model

Both hierarchical linear modeling (HLM) and ordinary least squares (OLS) techniques (we specifically use SPSS in this study) were employed to test the proposed hypotheses and the research model. According to prior research (e.g., Krull et al. 2001; Pituch et al. 2006), the impacts on individual-level (Level 1) variables, i.e., the effect local management commitment on user acceptance, and the impact of social capital on local management commitment, were tested with HLM; and the effects at unit level (Level 2), i.e. the effects of structural capital and cognitive capital on relational capital, and the effect of structural capital on cognitive capital, were estimated by using OLS. Following prior multilevel studies (e.g., Krull et al. 2001; Mithas et al. 2007), we thereafter used individual-level and Level 1 interchangeably, and unit level and Level 2 interchangeably.

To justify multilevel modeling (e.g., Heck et al. 2000; Liao et al. 2005; Mithas et al. 2007), a null model (entering only the dependent variable into the function, without individual- or unit-level predictors) was run for individual-level variables (i.e., local management commitment and user acceptance). Specifically, the total variance of individual-level variables (i.e., local management commitment and user acceptance) can be partitioned into within-unit variance (i.e., individual-level variance within a unit) and between-unit variance (i.e., the variance between units). The total variability in an individual-level variable can be quantified by calculating the intra-class correlation (ICC) via between-unit component (σ^2) and within-unit component (τ), that is, $ICC = \sigma^2 / [\sigma^2 + \tau]$. A relatively high ICC value (e.g., more than 10 percent) indicates a high level of heterogeneity that may be further explained by Level 2 predictors (Mithas et al. 2007). In this study, the ICC values for local management commitment and user acceptance are 0.17 and 0.23 respectively, indicating 17 percent of variance at the unit level for local management commitment ($\chi^2[26]=71.43, p<.001$) and 23 percent variance for user acceptance ($\chi^2[28]=90.61, p<.001$). Thus, the results suggest the necessity of testing the related research hypotheses using HLM.

Testing Direct Effects

Table 1 summarizes the results of the HLM and OLS analyses. The results indicated that local management commitment was positively related to user acceptance ($\beta = 0.614, p < 0.005$), such that H1 was supported. In the research model, a total of 29 percent of variance in user acceptance was explained. Relational capital ($\gamma = 0.300, p < 0.05$) and cognitive capital ($\gamma = 0.502, p < 0.01$) were found to be significantly and positively related to local management commitment, thus H2a and H3a were supported. Nearly 71 percent of the between-unit variance in local management commitment was explained by unit-level social capital factors, and 12 percent of the total variance could be explained. According to the results of OLS analysis shown in Table 1, the interrelationships among the three dimensions of social capital, which are well established in prior studies, are confirmed.

Testing Mediating Effects

Following prior studies on multilevel mediation testing, we justified the mediating role of local management commitment following the 2-1-1 design (Kenny et al. 2003; Krull et al. 2001; MacKinnon 2008; Pituch et al. 2006; Zhang et al. 2009), in which the antecedents (i.e., relational and cognitive capital) were measured at Level 2, and the mediator (i.e., local management commitment) and outcome (i.e., user acceptance) were at Level 1; and the mediating roles of cognitive capital and relational capital were evaluated based on the 2-2-1 design (Krull et al. 2001; Pituch et al. 2006), in which both the antecedent (i.e., structural capital) and the mediators (i.e., relational and cognitive capital) were measured at Level 2, and the outcome (i.e., local management commitment) was at Level 1.

According to the procedures proposed in prior research (see Appendix B), the mediating effects test was conducted. As shown in Table 2, although the direct effects of relational capital ($\gamma = 0.614, p < .005$) and cognitive capital ($\gamma = 0.614, p < .005$) on user acceptance were significant, these direct effects become insignificant (for relational capital, $\gamma = 0.177, p > .1$; for cognitive capital, $\gamma = 0.019, p > .1$) in the presence of local management commitment; and the effects of relational capital ($\gamma_{01(2)} * \gamma_{02(3)} = 0.621, p < .05$) and

cognitive capital ($\gamma_{01(2)} * \gamma_{02(3)} = 0.738, p < 0.01$) on user acceptance were mediated by local management. H2b and H3b were thus supported. Besides, despite the significant relationship ($\gamma = 0.404, p < .005$) between structural capital and local management commitment, the impact of structural capital on local management became insignificant with the existence of relational capital ($\gamma = 0.107, p > .1$) and cognitive capital ($\gamma = 0.175, p > .1$); the results further indicated that the effect of structural capital on local management commitment would be mediated by relational capital ($\gamma_{01(2)} * \gamma_{02(3)} = 0.292, p < .05$) and cognitive capital ($\gamma_{01(2)} * \gamma_{02(3)} = 0.253, p < .05$). Therefore, H4 and H5 were supported.

Table 1 Results of HLM and OLS Analysis

Table 1 Results of HLM and OLS Analysis				
IVs	HLM Analysis		OLS Analysis	
	SA as DV	LMCM as DV	RECA as DV	COCA as DV
Individual Level				
LMCM	0.649***			
Unit Level				
STCA		0.122	0.367*	0.455*
COCA		0.502***	0.460**	
RECA		0.300*		
Explained Variance				
R ² within unit	0.313	0.003		
R ² between unit	0.226	0.706		
Total R ²	0.293	0.123	0.500	0.207
*p<.05, **p<.01, ***p<.005				
Note: 1. IV—independent variable; DV – dependent variable; LMCM—local management commitment; STCA—structural capital; COCA—cognitive capital; RECA—relational capital; SA—user acceptance				
2. R ² within unit and R ² between unit are used to estimate the cross-level effect size, specifically,				
R ² within unit = (δ^2 of null model – δ^2 of current model) / δ^2 of null model, where δ^2 is the variance within unit; and				
R ² between unit = (τ_{00} of null model – τ_{11} of current model) / τ_{00} of null model, where τ is the variance between units.				

Table 2 Summary of Mediating Effects Test

Dependent Variable	Mediating Path	Step 1	Step 2	Step 3		Mediation a $\gamma_{01(2)} * \gamma_{02(3)}$
		$\gamma_{01(1)}$	$\gamma_{01(2)}$	$\gamma_{01(3)}$	$\gamma_{02(3)}$	
SA	RECA via LMCM	0.679***	0.679***	0.177	0.914***	0.621*
SA	COCA via LMCM	0.759***	0.726***	0.019	1.016***	0.738**
LMCM	STCA via RECA	0.404***	0.595***	0.107	0.491***	0.292*
LMCM	STCA via COCA	0.404***	0.395*	0.175	0.641***	0.253*
Note: ^a . The significance of mediating effect was estimated by following MacKinnon et al.'s (1998) z-test method, that is $z = \alpha\beta / \text{square root of } (\alpha^2\sigma_\beta^2 + \beta^2\sigma_\alpha^2)$, where α is the path coefficient of independent variable on mediator, and σ_α is the standard error of α ; β is the path coefficient of mediator on dependent variable, and σ_β is the standard error of β . However, in Zhang et al.'s (2009) method for 2-1-1 design, α is the path coefficient of the relationship between mediators' group mean and dependent variable.						
SA—user acceptance; LMCM—local management commitment; STCA—structural capital;						
COCA—cognitive capital; RECA—relational capital						
*p<.05, **p<.01, ***p<.005						

Discussion

Two critical cues for enterprise system implementation stimulate an interest in investigating the impact of social capital (between the headquarters and business units) on user acceptance. The first is the phenomenon that enterprise systems are often adopted by large-scale companies, which have multiple business units within which ground-level implementation and individual usage behavior occurs. Within these individual business units, system implementation success depends on cooperation between the headquarters and the individual business units. The second is the critical reality in the workplace that users may not “accept” the newly-introduced system despite the fact that they are using it. Actually, users will not accept the mandated system until they believe that the system is beneficial, and that their efforts toward using the system are worthwhile (Karahanna et al. 2003). It is obvious that the management of local business units can enhance user acceptance via encouraging usage, establishing a beneficial vision of the system, and recognizing users’ efforts. In other words, local management commitment is vital to the process of winning user acceptance. While contractual and legal regulations force business units to do as the headquarters requires, social capital may be the key factor in gaining commitment to organizational activities and in determining coherent organizational behavior between headquarters and business units (Cohen et al. 2001). It is thus argued social capital between headquarters and business units is critical to gaining an understanding of the factors determining user acceptance. To further explain the underlying mechanism of the cross-level impact of social capital on user acceptance, we employed a human agency perspective, and subsequently argue that local management plays the agent role of translating signals and messages from its headquarters, such that local management commitment mediates the relationship between social capital and user acceptance. Taking the three dimensions of social capital into consideration, their effects are different from each other, and the results provide us with profound meanings.

As expected, local management commitment is positively related to user acceptance. This finding reflects the pervasive phenomenon of ES implementation in current large-scale companies, i.e., ground-level implementation occurs in specific business units, such that individual usage behavior tends to be directly influenced by local management, which serves as the institutional context (Orlikowski 2000) of the business unit. A high degree of local management commitment implies that local management believes the system is valuable and beneficial, and as a member of the business unit, a user is likely to hold a vision that coincides with that of the local management, and in such a way as she/he is likely to be committed to system usage. Also, local management commitment has resource allocation implications (Lewis et al. 2003). And resource allocation can help overcome obstacles in learning to use new technology and, on the signal the importance of system usage. Thus, users are more motivated to use the newly-introduced system. Furthermore, a high degree of local management commitment indicates that the users’ efforts towards mastering system usage will be recognized by local management, and serves to further motivate users.

In general, the three dimensions of social capital can influence user acceptance differently. First, relational capital can positively influence local management, and its effect on user acceptance is mediated by local management commitment. These two findings indicate the important roles of relational capital and local management commitment in gaining user acceptance. Due to trust and reciprocal relationship with the headquarters, local management tends to be committed to those organizational activities (i.e. ES implementation) that are initiated by headquarters. This finding is consistent with prior research, which has identified the fact that relational capital can result in cooperative behavior (e.g., Tsai et al. 1998). Besides, local management plays the agency role of translating the messages and signals from the headquarters into specific managerial actions (Lewis et al. 2003), and such actions eventually have an impact on individuals’ beliefs and behaviors with regard to system usage.

Second, as expected, cognitive capital can positively influence local management commitment, and its effect on user acceptance is mediated by local management commitment. On one hand, shared values and interests between the headquarters and local management can result in local management commitment. This finding is consistent with prior research on social capital, which has suggested that cognitive capital can enhance cooperative behavior between two social actors (e.g., Tsai et al. 1998). On the other hand, shared values and interests between business units and headquarters serve as the macro context, and may not directly influence individuals’ behavior until they can permeate down to the individual level in the form of procedures, rules, regulations, and routines (Purvis et al. 2001). Local management thus fills the

gap between the macro context and individual behavior. More specifically, it plays the agency role of translating the messages and signals from headquarters into specific managerial actions (Lewis et al. 2003) which in turn can influence individuals' beliefs and behaviors with regard to system usage.

Furthermore, the effect of structural capital on local management commitment is mediated by relational capital and cognitive capital. These findings confirm the fact that structural capital is the critical antecedent of relational capital and cognitive capital (Tsai et al. 1998). As the primitive dimension of social capital, structural capital between business units and headquarters may not necessarily result in local management commitment within business units. The quality of the relationship between two social actors, which is captured in relational capital and cognitive capital, may be more directly relevant to local management commitment. Such that social interactions between business units and headquarters do not directly predict local management commitment unless the interaction can first establish trust and the existence of a reciprocal relationship or a sharing of common goals and interests between individuals in headquarters and those in dispersed business units.

Limitations and Future Research

Before discussing the implications of this study, it is necessary to recognize some limitations, and provide some suggestions for future research. First, because the research context of this study was a single large-scale banking institution in China, the generalizability may be a limited. A more fertile research context would be useful in justifying the hypothesized relationships. For example, a research design which included business units in several multi-national companies would contribute much to our understanding of user acceptance with regard to ES implementation. Second, it is argued that users' evaluation of a newly-introduced system may vary at different implementation stages (Karahanna et al. 1999), such that the cross-sectional research design of this study may limit our understanding of user acceptance of an enterprise system. Thus, a longitudinal research design may complement the current snap-shot study, and provide us with a more comprehensive view of user acceptance of an enterprise system.

Theoretical Contribution

This study makes two key theoretical contributions. First, it contributes to the user acceptance literature by employing social capital theory to understand user acceptance of a mandated enterprise system. The research findings are valuable, given that ES implementation in multi-unit companies is pervasive nowadays, and user acceptance is necessary for organizations to fully benefit from a newly-introduced system. By adopting the human agency perspective, this study extends the early work by identifying how social capital between the headquarters and local business units influence user acceptance, i.e., relational and cognitive capital can predict user acceptance of mandated ES via the mediator of local management commitment. That is, although individuals' acceptance is not directly influenced by the macro-level social capital that is generated between business units and headquarters, it can be influenced by the actions of local management, which are derived from social capital between the headquarters and local business units.

Second, this study contributes to the user acceptance literature by employing an innovative, multi-level approach to exploring the impact of social capital on user acceptance of mandated information technology. Prior research mainly investigates user acceptance at the individual level (e.g., Davis 1989; Venkatesh et al. 2000), despite the fact that user acceptance could be a multi-level issue (Lewis et al. 2003). In this regard, this study takes into consideration the hierarchical nature of organizations and further integrates social capital and local management commitment into a multi-level research model for predicting user acceptance of mandated technology. In doing so, our study helps develop a more comprehensive understanding on user acceptance with the multilevel research design (Klein et al. 2000).

Practical Contribution

Our findings have significant implications for practitioners. First, the mediating role of local management commitment indicates that facilitation by local management is critical to gaining user acceptance. In the context of ES implementation, ground-level implementation occurs in specific business units where local

management directly supervises and takes responsibility for individuals' usage behavior. To enhance user acceptance, local management should be keenly aware of its role in encouraging system implementation. Specifically, users should be provided with sufficient resources, and their system usage needs to be encouraged.

Second, the direct effects of relational and cognitive capital on local management commitment provide headquarters with a significant amount of managerial guidance. As discussed, local management commitment is important for enhancing user acceptance. Thus, in order to increase user acceptance and hence more benefits from system implementation, local management should be closely involved in the whole implementation process. To do so, headquarters should establish good relationships with business units. For instance, in its daily business, headquarters can empower local management, and protect it from external risks, such that local management will come to trust and reciprocate with benefits to headquarters. Also, via the promotion of organizational tenets and strategies in daily interactions, a shared vision will be developed between headquarters and local business units.

Furthermore, the indirect effect of structural capital on local management commitment indicates the critical role played by personal interaction and communication between headquarters and local business units. The headquarters of a company must encourage the development of communication links and other types of interaction with local management so as to establish trust and reciprocal relationships. In this way headquarters will come to share common values and interests with the business units. However, the mediating roles of relational and cognitive capital imply that the quality of interaction needs to be taken into consideration. Because communication alone may not necessarily result in the development of a good relationship with local management, headquarters must give careful consideration to the effectiveness of its communications with business units.

Conclusion

While local management commitment is critical for user acceptance of mandated enterprise system which is often implemented in large-scale company with multiple business units, how it is promoted by the top management (i.e., the headquarters in this study) is still understudied. To fulfill this research gap, we propose and empirically test a research model. Specifically, drawing from social capital theory, we examine that the role of social capital between headquarters and business units in gaining local management's commitment to system implementation. Furthermore, based on human agency perspective, we examine the effect of social capital between headquarters and business units on user acceptance as mediated by local management commitment. This study contributes to the existing literature by providing a more refined understanding of how social capital between headquarters and business units can enhance user acceptance of mandated enterprise system. The multi-level research design helps obtain a more comprehensive understanding of the phenomenon of user acceptance of mandated information systems. This study also contributes to practice by providing suggestions for the top management on how to enhance user acceptance of enterprise system.

Appendix A. Survey Items

Heightened Enthusiasm (SAHE): Adapted from Karahanna and Agarwal (2003)

SAHE1: I am excited that I am able to use paperless loan approval system.

SAHE2: I am always looking forward to using paperless loan approval system.

SAHE3: I view use of paperless loan approval system with enthusiasm.

Mental Acceptance (SAMA): Adapted from Karahanna and Agarwal (2003)

SAMA1: I have mentally accepted paperless loan approval system as an important technology.

SAMA2: In my mind, I am convinced that paperless loan approval system is an important technology.

SAMA3: I personally don't view paperless loan approval system as an important concept.*

Use Commitment (SAUC): Adapted from Karahanna and Agarwal (2003)

SAUC1: The only way I will use paperless loan approval system is if it is mandated.

SAUC2: If I can choose what I use, I will not choose paperless loan approval system.

SAUC3: If I have a choice, I do not use paperless loan approval system.

Heightened Enthusiasm (SAEW): Adapted from Karahanna and Agarwal (2003)

SAEW1: Learning to use paperless loan approval system was worth the effort I put in.

SAEW2: My investment in learning paperless loan approval system was worthwhile.

Local Management Commitment (LMCM): Adapted from Lewis et al. (2003)

LMCM1: Our branch is committed to a vision of using the paperless loan approval system in work.

LMCM2: Our branch is committed to supporting our efforts in using the paperless loan approval system for work.

LMCM3: Our branch strongly encourages the use of the paperless loan approval system for work.

LMCM4: Our branch will recognize my efforts in using the paperless loan approval system for work.

LMCM5: The use of the paperless loan approval system for work is important to our branch.

Structural Capital (STCA): Adapted from Chiu et al. (2006)

STCA1: Members in our branch maintain close social relationships with employees in the headquarters.

STCA2: Members in our branch spend a lot of time interacting with members in the headquarters.

STCA3: Members in our branch know some members in the headquarters at a personal level.

STCA4: Members in our branch have frequent communication with members in the headquarters.

Relational Capital (RECA): Adapted from Kale et al. (2000)

RECA1: The relationship is characterized by personal friendship between members in our branch and those in the headquarters.

RECA2: The relationship is characterized by mutual trust between members in our branch and those in the headquarters

RECA3: The relationship is characterized by high reciprocity between members in our branch and those in the headquarters.

RECA4: The relationship is characterized by mutual respect between members in our branch and those in the headquarters.

Cognitive Capital (COCA): Adapted from Tsai and Ghoshal (1998) and Chiu et al. (2006)

COCA1: Members in our branch and members in the headquarters share the same vision for the business.

COCA2: Members in our branch and members in the headquarters are enthusiastic about pursuing the collective goals of the bank.

COCA3: Members in our branch share the same enterprise value with members in the headquarters.

Appendix B Procedures for Testing Multi-level Mediating Effects

Baron and Kenny's (1986) 3-step procedures for testing mediation have been reformulated in a multilevel settings (e.g., Krull et al. 2001; Mathieu et al. 2007). Accordingly, with regard to both 2-2-1 and 2-1-1 designs, three groups of multilevel functions were correspondingly formulated to justify the mediating effect. Specifically, the 2-2-1 design for evaluating mediation (i.e. the mediating roles of structural and cognitive capital) can be described as being comprised of three steps with the related equation [1]–[5]. Step 1 was designed to test the direct effect of Level-2 predictor X_j (i.e., structural capital) on the Level-1 outcome Y_{ij} (i.e., local management commitment). Step 2 was taken to test the main effect of the Level-2 antecedent X_j (i.e., structural capital) on the Level-2 mediator M_j (i.e., cognitive or relational capital). Step 3 was used to evaluate the effect of the Level-2 antecedent X_j (i.e., structural capital) on the Level-1 outcome Y_{ij} (i.e., local management commitment) with the existence of Level-2 mediator M_j (i.e., cognitive or relational capital). The mediating effect can be justified via the product of $\gamma_{01(2)}$ and $\gamma_{02(3)}$, i.e., $\gamma_{01(2)} * \gamma_{02(3)}$ (Zhang et al. 2009).

2-2-1 Design

$$\text{Step 1 Level 1: } Y_{ij} = \beta_{0j(1)} + r_{ij(1)} \quad [1]$$

$$\text{Level 2: } \beta_{0j(1)} = \gamma_{00(1)} + \gamma_{01(1)}X_j + \mu_{0j(1)} \quad [2]$$

Step 2

$$\text{Level 2: } M_j = \gamma_{00(2)} + \gamma_{01(2)}X_j + \mu_{0j(2)} \quad [3]$$

Step 3

$$\text{Level 1: } Y_{ij} = \beta_{0j(3)} + r_{ij(3)} \quad [4]$$

$$\text{Level 2: } \beta_{0j(3)} = \gamma_{00(3)} + \gamma_{01(3)}X_j + \gamma_{02(3)}M_j + \mu_{0j(3)} \quad [5]$$

Considering the potential threat of conflating the between-unit and within-unit effects in HLM models, we justified the moderating role of local management commitment by following Zhang et al.'s (2009) parsimonious 2-1-1 design, in which the unit-level predictor was group-mean centering and the group mean of mediator (i.e., $M_{\cdot j}$) was added at unit level. Specifically, the 2-1-1 design can be described as consisting of three steps with the related equation [6]–[12]. In Step 1, the direct effect of the Level-2 predictor X_j (i.e., cognitive or relational capital) on Level-1 outcome Y_{ij} (i.e., user acceptance) was evaluated. Step 2 was used to test the main effect of the Level-2 antecedent X_j (i.e., cognitive or relational capital) on Level-1 mediator M_j (i.e., local management commitment). Step 3 was introduced to evaluate the effect of the Level-2 antecedent X_j (i.e., cognitive or relational capital) on the Level-1 outcome Y_{ij} (i.e., user acceptance) with the existence of the Level-1 mediator M_j (i.e., local management commitment). The mediating effect can be evaluated via the product of $\gamma_{01(2)}$ and $\gamma_{02(3)}$, i.e., $\gamma_{01(2)} * \gamma_{02(3)}$ (Zhang et al. 2009).

2-1-1 Design

$$\text{Step 1 Level 1: } Y_{ij} = \beta_{0j(1)} + r_{ij(1)} \quad [6]$$

$$\text{Level 2: } \beta_{0j(1)} = \gamma_{00(1)} + \gamma_{01(1)}X_j + \mu_{0j(1)} \quad [7]$$

$$\text{Step 2 Level 1: } M_{ij} = \beta_{0j(2)} + r_{ij(2)} \quad [8]$$

$$\text{Level 2: } \beta_{0j(2)} = \gamma_{00(2)} + \gamma_{01(2)}X_j + \mu_{0j(2)} \quad [9]$$

$$\text{Step 3 Level 1: } Y_{ij} = \beta_{0j(3)} + \beta_{1j(3)}(M_{ij} - M_{\cdot j}) + r_{ij(3)} \quad [10]$$

$$\text{Level 2: } \beta_{0j(3)} = \gamma_{00(3)} + \gamma_{01(3)}X_j + \gamma_{02(3)}M_{\cdot j} + \mu_{0j(3)} \quad [11]$$

$$\beta_{1j(3)} = \gamma_{10(3)} \quad [12]$$

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