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# User Satisfaction with Information Technology Service Delivery: A Social Capital Perspective

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Existing research has long considered service quality as a primary determinant of user satisfaction with information technology (IT) service delivery. In response to the knowledge-intensive and collaborative nature of IT service delivery in the contemporary business context, we advance the theoretical understanding of user satisfaction by re-conceptualizing IT service delivery as a bilateral, relational process between the IT staff and users. Based on this reconceptualization, we draw on social capital theory to examine the antecedents of user satisfaction with IT service delivery. Specifically, we posit that two major dimensions of social capital, i.e., cognitive capital and relational capital, not only positively affect user satisfaction but also strengthen the established relationship between service quality and user satisfaction. Furthermore, we propose that the effect of the other dimension of social capital—structural capital—on user satisfaction is fully mediated through cognitive capital and relational capital. A field study of 159 users in four financial companies provides general empirical support for our hypotheses. Theoretical and practical implications of these findings are discussed.

*Key words*: IT service; social capital; service quality; user satisfaction; survey
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## 1. Introduction

Explaining user satisfaction via information technology (IT) services delivery has been an important area of information systems (IS) research for nearly two decades. Existing research has long considered service quality, a construct adapted from the service marketing research (Parasuraman et al. 1985), to be a primary determinant of user satisfaction with IT service delivery (Jiang et al. 2002, Kettinger and Lee 1994, Pitt et al. 1995). However, this stream of research assumes that customers are *exogenous* to service delivery (Oliver 1993, Parasuraman et al. 1985). Specifically, in prior research, service is seen as an intangible product delivered from providers to customers while users are only the recipients of IT services evaluating and "consuming" the value embedded in the service (Kettinger and Lee 1994, Pitt et al. 1995). Although this view may have been an accurate description of the interaction of users and the IT unit at one time, today it underplays the role of customers in IT service delivery. Therefore, the broad objective of this study is to advance our theoretical understanding of the antecedents to user satisfaction with IT service delivery.

To achieve this, we base our conceptual view of the antecedents to user satisfaction on an alternative definition of IT service. In the modern business environment with its fast-changing customer needs and knowledge-intensive technology requirements, IT as a form of products (or solutions) is increasingly turning into a service and is becoming more inseparable from the ways in which it is delivered (Cusumano and Hopkins 2011). This understanding of "IT as a service" highlights the need for generating and delivering unique competences that account for customers' inputs that are specifically related to their business needs (Cusumano 2010). In this context, we define IT service delivery as the joint application of specialized competences (knowledge and skills in the business and the IT domains) by users and their IT unit. Instead of seeing users as mere consumers of value delivered through an IT service, this conceptualization envisions users as *endogenous* to how IT service is delivered, and, as those who coproduce (rather than

just receive) an IT service; they do so by exchanging and combining their business competences with the IT competences of the IT unit. This definition of IT service delivery is also underpinned by the service-dominant logic advanced in the recent marketing literature (Lusch et al. 2007, Vargo and Lusch 2004).

Augmented by the endogenous role of users, this updated definition reflects the collaborative, relational nature of IT service delivery required by contemporary firms. The modern business environment is characterized by intense rivalry, globalization, and time-to-market pressures, and thus firms are driven to pursue business value by continuously investing heavily in sophisticated IT solutions such as Web services, data warehousing, enterprise application interfaces, and extended enterprise networks (Sambamurthy et al. 2003). Users in functional units must collaborate closely with their IT counterparts to continuously integrate their emerging business needs into these IT solutions in order to create and sustain competitive advantages (Sambamurthy et al. 2003). In this context, the social relationship between users in the functional unit and those in the IT unit becomes critical to achieving joint collaboration success.

In light of this updated definition of IT service, we propose to model user satisfaction from the perspective of ongoing social interactions between customers and service providers (Lusch et al. 2007, Tuli et al. 2007). Using this perspective, social capital—the set of resources embedded within the social relationships among actors within a network—will impact the value perception of customers (Nahapiet and Ghoshal 1998). Thus, our study focuses on addressing the research question: how does social capital between users and IT service delivery units impact user satisfaction with IT service delivery?

To answer this question, we draw upon the intellectual elements of social capital theory that specifically address value cocreation embedded in social relationships through its relational underpinnings (Nahapiet and Ghoshal 1998). Based on this theory, we argue that IT units satisfy their users by delivering IT services with the assistance of users, a process of exchanging and integrating domain-specific knowledge via relational connections. Specifically, it is proposed that three primary dimensions of social capital (structural, cognitive, and relational) form a bond between users and their IT unit, and directly or indirectly impact user satisfaction with IT service delivery. Also, social capital is predicted to moderate the relationship between service quality and user satisfaction such that this relationship would be stronger when social capital is high.

This study makes several key research contributions. First, it adds to the existing literature on user satisfaction by reconceptualizing IT service delivery as a social relational process, and as such, offers an alternative, relationship-centric explanation, i.e., social capital, with respect to why users feel satisfied with IT service delivery. Second, this study adds to the literature by showing that social capital enhances the well-known effect of service quality on user satisfaction by improving the shared understanding between IT users and IT units. Finally, it extends the applicability of social capital theory to the IT service domain.

## 2. Theoretical Background

The relational process view of service delivery has its conceptual origin in the service-centered perspective of marketing (Vargo and Lusch 2004), a view which envisions service as a continuous series of social and economic processes in which one party's specialized competencies are exchanged and applied so as to create value for itself or another party. It is through the application of specialized competencies needed by the customers that value for customers is created and customer satisfaction is subsequently achieved (Lusch et al. 2007).

The relational process view of service delivery treats customers as being *endogenous* to the value creation process (Vargo and Lusch 2004). Customers can contribute value by collaborating with service providers in such activities as requirements definition, customization, and integration of goods/services, participation in deployment, and provision of post-deployment feedback (Tuli et al. 2007). Indeed, much marketing research has shifted toward the recognition of customers as service coproducers. For instance, Normann and Remirez (1993) state that "the key to creating value is to coproduce offerings that mobilize customers" (p. 69). Similarly, Prahalad and Ramawamy (2000) note that customer involvement is important to the value-creation process; and Schneider and Bowen (2010) argue for the importance of drawing on customer competence in order to create value both for and with them.

Guided by this customer-centric perspective, we more extensively define IT service delivery as the joint application of specialized competences in the IT and business domains between the service provider and the user for the benefit of the user through such deeds, processes, and performance as IT planning, development, implementation, operation, and maintenance. This definition of IT service is a timely update in the contemporary, digitally enabled business environment, where rapidly changing business needs demand IT solutions from their service providers to stay responsive to change. In this context, IT solutions become increasingly "servitized" (Cusumano and Hopkins 2011), i.e., they are turned from products

in their traditional sense toward services as they must be constantly adjusted to deliver business value to users on demand and in a time-sensitive fashion. To this end, the material manifestation of IT service (i.e., an IT solution) and its delivery efforts (e.g., planning, development, operation, and maintenance) become increasingly inseparable, with the common underlying mechanism of integrating knowledge in the business domain with that in the IT domain (Cusumano 2010). In this sense, this augmented definition offers a first step to introducing the "IT as a service" aspect into IT service delivery.

IT service delivery, as is defined in our study, highlights the collaborative, relational nature of service and the crucial role of users in creating value during service delivery. Under this definition, value from an IT service can no longer be simply delivered through service "encounters" by the provider (Jia et al. 2008); instead, it requires contributions from both users and IT service providers through ongoing interactions and tight collaboration between them (Carr 2006, Jia et al. 2008, Montoya et al. 2010). Such tight collaboration could take place at all stages of IT service delivery in contemporary businesses, yet should be particularly applicable to those that require the substantial involvement of users from the concerned business domains.

In fact, the extant literature on various stages of IT services delivery implies the collaborative role of users (see §1 in the online supplement, available at http://dx.doi.org/10.1287/isre.1120.0421, for a review). For example, research reports that the social alignment (e.g., shared understanding) between IT and business executives is important for effective IT planning because business executives' input is an essential component of a strategic IT plan (Reich and Benbasat 2000). In the IT development literature, it is evident that user participation enhances user satisfaction and system quality (Hartwick and Barki 1994, He and King 2008). More specifically, development methods such as joint application design (Carmel et al. 1993), participative design (King and Rodriguez 1981), user-centered design (Norman and Draper 1986), and collective reflection-in-action (Levina 2005) all highlight the key role of users in IT development. Likewise, the IT implementation literature consistently reports the value creation potential of developing a partnership between IT and business departments (Feeny and Willcocks 1998, Ross et al. 1996) and highlights the importance of developing trust (Gefen 2004) and a shared understanding between them (Reich and Benbasat 2000). Similarly, others indicate that user involvement and feedback affect complex IT task performance (Jia et al. 2008, Montoya et al. 2010).

The need for reconceptualizing IT service delivery by highlighting the collaborative role of users is not only implied in the IS literature, but it is also manifested in the modern fast-changing and knowledge-insensitive business environment for two reasons. First, in the fast-changing environment (e.g., financial services sectors), gaining a competitive advantage requires users and IT units to collaborate more closely to effectively sense and respond to the emerging demands (Sambamurthy et al. 2003). Second, the scope and depth of IT services have dramatically expanded to encompass a large body of specialized knowledge drawn from multiple domains (Van de Ven 2005). Thus, satisfactory IT service delivery entails sharing both the technical knowledge of IT units and the business knowledge of the users (Ko et al. 2005), and more importantly, effectively integrating them (Mitchell 2006). This process inevitably demands close collaboration between, and significant contributions from, both parties.

By way of contrast, however, the existing IT service quality literature builds on a traditional view of service as being merely deeds, performances, and processes through which a tangible or intangible product is delivered (Lovelock and Wirtz 1991) and hence presents a view that is limited in explaining user satisfaction only from a *relational* perspective with its focus on the joint application of specialized competences (Oliver 1995). Beginning with Pitt et al. (1995) and Kettinger et al. (1994), service quality—a five-dimensional construct consisting of *tangibles, reliability, responsiveness, assurance*, and *empathy*—was advanced to be a primary antecedent to user satisfaction with IT service delivery (Jiang et al. 2002, Van Dyke et al. 1997). Based on Bagozzi's (1992) cognitive appraisal → emotional response → coping behavior framework (i.e., initial service evaluation leads to an emotional reaction that in turn drives behavior), this body of research generally pictures service quality as a perceived superiority of the way in which service is delivered by the service provider per se (Cronin et al. 2000, Parasuraman et al. 1985).

However, this view of service quality positions customers outside of the service delivery cycle; it in no way captures the substance of value creation by both users and providers. This view notwithstanding, the conceptualization of service delivery as a one-way (rather than a bilateral) process, and service quality as a customer's appraisal of delivery captures only an incomplete set of the IT service delivery process (Bendapudi and Leone 2003). It underplays the aforementioned need for building ongoing relationships with customers (Lusch et al. 2007), particularly for the services demanding the continuous application of specialized domain knowledge through social interactions (Tuli et al. 2007).

To understand user satisfaction with IT service delivery in the contemporary business context, we must expand on what is known in the service quality literature, and develop a theory with an explicit focus on social relationships. Hence, we draw on social capital theory to examine user satisfaction with IT services.

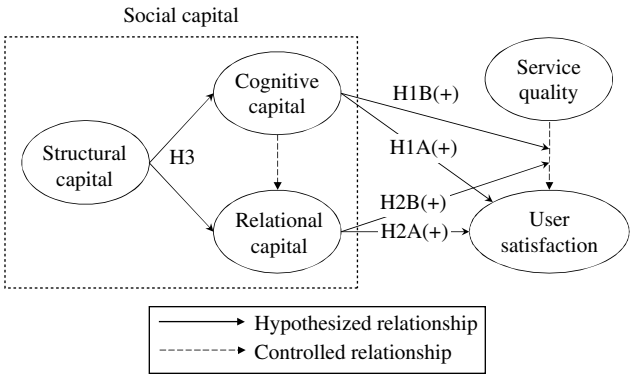
## 3. Research Model and Hypotheses—Social Capital and User Satisfaction

Satisfaction in the marketing literature refers to a positive emotional state resulting from the value appraisal of a customer's consumption experience (Oliver 1980). Customers are satisfied with a service when their needs are fulfilled by the value created for them in the service process (Oliver 1995). In accordance with this view of satisfaction, we define *user satisfaction* as the level of emotional response to needs fulfillment through IT services. In other words, users would become satisfied when their needs are fulfilled by using IT services.

In this study, we propose that only two of the three dimensions of social capital (relational and cognitive capital) directly influence user satisfaction with IT service. We further posit that these two dimensions of social capital positively moderate the controlled relationship between service quality and user satisfaction, such that the effect of service quality on user satisfaction is stronger when both relational capital and cognitive capital are rated as being higher. Moreover, the effect of structural capital, the third dimension of social capital, on user satisfaction is indirect and is mediated through cognitive and relational capital. Figure 1 is a snapshot of our research model.

Social capital theory is primarily concerned with the significance of social relationships as a source of social action (Coleman 1988) and value creation (Nahapiet and Ghoshal 1998). Social capital is defined as "the sum of the actual and potential resources embedded within, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet and Ghoshal 1998, p. 243). Unlike the physical capital embodied in physical artifacts and the human capital vested in humans, social capital is used to describe the relational resources that are deeply rooted in the ongoing relationships between actors within a social network that facilitates the various social interactions between actors (Coleman 1988). Given the context of our study, we focus on the individual user's perception of the social capital that exists in the relationship between the respective user department and the organizational IT unit. We believe that it is the individual user's subjective perception of the unit-level social capital that stimulates the individual users to appraise satisfaction.

**Figure 1 Research Model**




Social capital generally involves three dimensions: structural, cognitive, and relational (Nahapiet and Ghoshal 1998). *Structural capital* is "the overall pattern of connections between actors—that is, who you reach and how you reach them" (Nahapiet and Ghoshal 1998, p. 244). Structural capital is generated by the structure of the social network and the interactions among actors, including the location of actors and the frequency of communication. It describes the "impersonal configuration of linkages between people or units" (Nahapiet and Ghoshal 1998, p. 244). *Cognitive capital*, on the other hand, is defined as those resources that enable shared representations and interpretations among parties (Cicourel 1973). It emphasizes the common understanding that facilitates interactions among the actors in the social network. Finally, *relational capital* involves assets that are created and leveraged through social relationships, including trust and trustworthiness, norms, obligations, and identification (Nahapiet and Ghoshal 1998). This form of capital represents resources rooted in the interpersonal relationships that are created through a history of interaction among actors.

This multidimensional view of social capital provides a pliable theoretical lens for explicating the IT service process because each of the three dimensions directly or indirectly, facilitates, through other dimensions, the exchange and combination of knowledge resources (Nahapiet and Ghoshal 1998, Tsai and Ghoshal 1998). Although these three dimensions each represent a distinct facet of social capital, existing research has suggested that they are interrelated (Nahapiet and Ghoshal 1998). Specifically, structural capital influences cognitive capital and relational capital, and cognitive capital influences relational capital (Tsai and Ghoshal 1998). Furthermore, the effect of structural capital on the exchange and combination of knowledge is thought to be derived directly and indirectly through the development of the relational and cognitive dimensions of social capital (Nahapiet and

Ghoshal 1998, Tsai and Ghoshal 1998). In later sections of this paper, we focus on examining how and why these dimensions impact user satisfaction with IT service provision.

### 3.1. Cognitive Capital and User Satisfaction

Shared language, an important instantiation of cognitive capital, represents the common codes, terms, and narratives used in the communication process (Chiu et al. 2006, Nahapiet and Ghoshal 1998). Shared language facilitates the exchange and combination of knowledge between two parties in three important ways. First, as the means by which people discuss and exchange information, language plays an important role in social relations (Nahapiet and Ghoshal 1998). People who share a common language are better able to understand one another. Second, a shared language is associated with shared perceptions regarding an activity (Pondy and Mitroff 1979); thus, people can more readily anticipate similar values or visions that might arise from the knowledge sharing (Chiu et al. 2006, Nahapiet and Ghoshal 1998). Third, a shared language enables actors to more effectively combine shared information because it can help avoid possible misunderstandings in their communication and will provide more opportunities to share their resources freely. All of these factors collectively contribute to the formation of user satisfaction, because effective knowledge sharing can facilitate the fulfillment of users' business needs (Au et al. 2008).

Shared language between users and IT units is critical to efficient IT service provision in that it facilitates the effective exchange and integration of specialized IT and business knowledge. For instance, successful IT planning and management is found to be related to the level of an IT units' business understanding (Ross et al. 1996). IT professionals who are multilingual—conversant in the languages of multiple user organizations—can better facilitate the knowledge exchange between various internal organizations; accordingly, they are able to translate and frame meanings in a language and in terms that others can understand (Bassellier and Benbasat 2004, Pawlowski and Robey 2004). With respect to users, recent research finds that business professionals with an understanding of IT are more satisfied with enterprise systems implementation because they are able to anticipate the value of system implementation in a similar way to the IT staff (Davis et al. 2009). In short, a shared language facilitates the meaningful communication needed for the exchange and combination of knowledge (Nahapiet and Ghoshal 1998), which helps satisfy users' business needs, thereby contributing to user satisfaction. Thus, we hypothesize the following.

Hypothesis 1A (H1A). *Cognitive social capital positively influences user satisfaction with IT service.*

### 3.2. Relational Capital and User Satisfaction

Relational capital describes the interpersonal relationships that develop between IT units and users, including mutual trust and a norm of respect and reciprocity (Nahapiet and Ghoshal 1998). Trust reflects the extent to which one believes in and is willing to depend on another party (McKnight et al. 1998) and is an instrumental factor in alleviating perceptions of risk and uncertainty reflected in the research on business relationships, knowledge sharing, and e-commerce. The norm of reciprocity is a mutual indebtedness where individuals reciprocate the benefits they receive from others (Wasko and Faraj 2005). It can contribute to value creation because the payout may bring returns to others (Kankanhalli et al. 2005). In short, relational capital can facilitate the exchange and combination of knowledge by enabling access to other parties for the exchange, anticipating value through such an exchange and developing the motivation to engage in value creation (Nahapiet and Ghoshal 1998). This knowledge exchange and integration process would help users to fulfill their business needs, thus contributing to user satisfaction (Au et al. 2008).

The effect of relational capital on IT user satisfaction can be viewed from the perspective of both IT units and users. If there is a high level of reciprocity and respect between users and IT units, both users and IT professionals would have a strong motivation to exchange information with each other, knowing that they could earn considerable respect and could expect equivalent returns in the future (Kankanhalli et al. 2005, Nahapiet and Ghoshal 1998, Wasko and Faraj 2005). Moreover, recent IT service research demonstrates the importance of building trust between IT units and business professionals (Montoya et al. 2010). Mutual trust can in turn facilitate a knowledge exchange by reducing the perceived risks in sharing, as evidenced in the relationship marketing research (Carr 2006, Grover et al. 1996). A sufficient exchange of knowledge between users and IT units improves the IT units' understanding and appreciation of users' business needs and hence is more likely to deliver IT services that satisfy users' needs. Thus, we propose

Hypothesis 2A (H2A). *Relational social capital positively influences user satisfaction with IT service.*

### 3.3. Cognitive Capital, Relational Capital, and Service Quality

We argue that cognitive and relational capital not only have a direct impact on IT user satisfaction, but also have an indirect effect by positively moderating (strengthening) the relationship between service quality and user satisfaction. As discussed earlier, service quality can positively impact user satisfaction as users appraise the performance of the IT service delivery process. Users experience emotional

responses to their perceived quality of the process that ultimately enhances satisfaction.

Research on human cognition suggests that the partners' appraisal of each other can be positively strengthened when they share cognitions, given that such cognitions reduce the amount of effort required to perform the appraisal (Hardin and Conley 2001). Cognitive capital, which in our case is shared language, strengthens shared cognitions between organizational members, and hence reduces the amount of cognitive effort of organizational members required to achieve a reasonable understanding and anticipation of what one (e.g., the IT unit) could possibly do for another (e.g., users) (Tsai and Ghoshal 1998). Similarly, a high level of shared language helps develop similar perceptual categories and common frames of reference between individuals, leading them to better appreciate and value each other's contribution (Berger and Luckman 1966). A better mutual understanding and appreciation would in turn help the two parties be more cooperative with each other (Putnam 1993). With a stronger cooperative tendency, users would be more willing to have a positive appraisal of a given level of service quality that IT staff provides in the service process, and hence would indicate a higher level of satisfaction with the IT service (Davis et al. 2009). In contrast, when the level of shared language is low, and the users are not as cooperative, they would be less willing to have a positive appraisal of a given level of service quality delivered. Thus, we hypothesize the following.

Hypothesis 1B (H1B). *Cognitive social capital strengthens the relationship between service quality and user satisfaction*.

We further argue that the impact of service quality on user satisfaction should vary across different levels of relational capital. Relational capital consisting of trust, reciprocity, and respect reinforces the collective identification of individuals (Nahapiet and Ghoshal 1998), which in turn contributes to their "in-group" perception of each other even if they may come from different predefined departments in the organization. The existing research has suggested that people generally attribute more positive characteristics to in-group members than to out-group members (Hardin and Conley 2001), and that in-group members' work is perceived more favorably and hence more satisfactorily even if the quality is the same (Howard and Rothbart 1980). Furthermore, relational capital that is characterized by trust, reciprocity, and respect plays an important role in the development of cooperative behavior among members (Fukuyama 1995). People with stronger trust and cooperative tendencies are more benevolent to and positive about other's behavior (Fukuyama 1995).

In the context of IT service provision, high relational capital between users and IT staff leads users to regard IT staff as in-group members even if they are officially situated in different organizational groups (Levina and Vaast 2005, Pawlowski and Robey 2004); users would also be more cooperative with and benevolent to IT staff when they appraise IT services. Thus, in the situation of high relational capital, users should be more ready to positively appraise a given level of perceived service quality delivered by IT staff, resulting in higher user satisfaction. By contrast, when relational capital between users and IT staff is low, users might perceive IT staff as out-group members and might be less cooperative. Hence, they might give a less positive appraisal of a given level of service quality delivered by IT staff, leading to lower user satisfaction. Thus, we hypothesize the following.

Hypothesis 2B (H2B). *Relational capital strengthens the relationship between service quality and user satisfaction with IT services*.

### 3.4. The Role of Structural Capital

We propose that structural capital, in the form of social interaction, affects user satisfaction through the full mediation effect of cognitive capital and relational capital. On the one hand, social interaction develops cognitive capital by building a common set of language, perception, and understanding between two actors (Tsai and Ghoshal 1998). On the other hand, social interaction contributes to the development of relational capital by building trust (Tsai and Ghoshal 1998) norms of reciprocity, and mutual respect (Wasko and Faraj 2005). In the IT service delivery context, interacting with and collecting feedback from users have indeed been consistently emphasized as an important process to develop a shared understanding between users (Pawlowski and Robey 2004) and the building of trust relationships with them (Montoya et al. 2010). Because cognitive and relational capital in turn impact user satisfaction as we discussed earlier, we suggest that structural capital affects user satisfaction through the effects of cognitive and relational capital.

Although the prior research has also suggested a direct effect of structural capital on value creation resulting from the access to resources, e.g., information (Nahapiet and Ghoshal 1998, Tsai and Ghoshal 1998), we argue that, in the IT service context, mere access to information through social interaction is not sufficient to satisfy users' business needs. Instead, the fulfillment of user needs for IT service hinges on the joint combination and application of the exchanged business and IT knowledge (Ko et al. 2005, Mitchell 2006). This outcome would require that both IT staff and users have both a strong motivation and the ability to understand and appreciate the shared knowledge, which are enabled primarily by cognitive and

relational capital (Nahapiet and Ghoshal 1998). Users would not be satisfied until their business needs are understood, honored, and addressed by the resulting IT services. Thus, we expect that cognitive and relational capital fully mediates the relationship of structural capital and user satisfaction.

Hypothesis 3 (H3). *The effect of structural capital on user satisfaction with IT services is fully mediated through cognitive and relational capital.*

Moreover, it is known that cognitive capital positively influences relational capital (Nahapiet and Ghoshal 1998, Tsai and Ghoshal 1998). Thus, although we do not hypothesize about this known relationship, we still include it in our research model for theoretical completeness (see Figure 1).

## 4. Methods

### 4.1. Research Setting

To test the research model, a field study of IT users in four financial services firms in mainland China was conducted. Data was collected using a field survey instrument and a sampling frame centered in the financial services industry. This is an appropriate research context for two major reasons. First, financial services firms rely heavily on sophisticated IT solutions to enable both their internal business operations and their external customer services (Montoya et al. 2010). This dependence is evidenced by a reported average IT expenditure of over 10% of total revenue, the highest percentage across all of the major corporate sectors (Nash 2007). As a result, most employees in financial institutions are heavy IT users (Krishnan et al. 1999). Also, the financial services industry possesses the lowest user-IT staff ratio, with an average of 16 users per IT staff member (Nash 2007), thus ensuring a relatively high level of social interaction between users and IT staff. Furthermore, given the knowledge-intensive nature of this industry, changes in IT solutions to accommodate business requirements demand close cooperation between IT staff and users in order that they share and integrate specialized domain knowledge (Sambamurthy et al. 2003).

Second, the financial services industry in China has experienced rapid growth—a rate of growth that gives rise to the constant need for either new or improved IT solutions that are so critical to an expanding business (Meng and Lee 2007). The high level of ongoing investment in developing, deploying and updating these IT solutions required to meet the fast-changing business needs has made the phenomenon of tight collaboration in delivering IT services more salient in Chinese financial services firms, making these firms an appropriate context within which to conduct our empirical tests.

Our data collection instrument was administered in four large financial services firms located in a major financial city center in China. We obtained sponsorship for our study from one of the firms and gleaned the others through referrals from the CIO of the first firm. These four chosen financial services firms proved to be appropriate contexts for our study as revealed in the initial interviews with the relevant top executives and functional/IT managers, which indicated that most of the departments relied heavily on advanced IT solutions to carry out their daily routines. A variety of IT solutions supporting internal businesses and external customer services (e.g., transaction systems, financial analysis systems, and security systems) had either been, or were being deployed at the time of our survey. As such, the relevant IT and business units had been actively collaborating on servicing (e.g., planning, developing, deploying, or maintaining/updating) IT solutions to address various emergent business needs.

Consistent with our earlier discussion concerning the fact that tight collaboration and knowledge exchange prevails throughout the IT service delivery process in contemporary organizations, our initial interviews revealed that whereas the IT expenditure decision was normally made in an authoritative fashion by top management in these firms, IT service delivery was typically characterized as being bilateral and collaborative with respect to knowledge-intensive work. For instance, a marketing manager stressed the importance of relying on the IT unit for knowledge inputs during the requirement definition stage of an IT project:

> *Collaboration between the IT department and our department is very important. Sometimes we are not thorough enough in terms of detailing business requirements or system test requirements . . . . Luckily, our IT employees remind us that some business requirements are not very clear and help us to improve it. We also gradually understand the IT department and collaborate with them better over time.*

In addition, one IT manager pointed out the need to count on user departments for necessary business knowledge during IT project planning:

> *IT services are not only about technology. There are many other aspects we should take into consideration. For instance, we need to learn the general strategy of the firm as well as the budget limits. We also need to know what business departments exactly require.*

He proceeded to highlight the equal importance of engaging user units to learn about IT:

> *To complete an IT project needs collaboration between our department and business departments. Business departments will firstly tell us what they need, but sometimes these requirements may not be technically desirable due to resources constraints, such as human resource, time, and*

*money. We will communicate with business departments about these issues to achieve an agreement* [*on alternative solutions*]*. . . . Through such communication, business departments will not blame us but understand us.*[1]

Hence, we believe that a collaborative relationship between business units and IT groups was both extant and emergent in this setting.

### 4.2. Measurement

All measurement items were adapted from prior studies although some terms were changed to fit the specific research context (see the appendix). As the respondents were native speakers of Mandarin Chinese, a committee approach was utilized to translate the questionnaire (Van de Vijver and Leung 1997), followed by a three-step revision procedure to ensure the face validity of the measurement items.[2]

Service quality was measured using the SERVPERF instrument because of its appropriateness for empirical studies (Cronin et al. 2000, Zeithaml et al. 1996). This instrument includes five dimensions of service quality, namely: tangibles, reliability, responsiveness, assurance, and empathy. They are measured via 22 items, with each dimension being composed of four to five reflective items.

User satisfaction was assessed through a short-form measure of user information satisfaction verified by Baroudi et al. (1988). This instrument consists of 13 scales classified into three dimensions: staff and services, information product, and knowledge and involvement, with two items per scale. Each scale was scored by taking the average of its two items. This instrument has been widely used in assessing user satisfaction with IT units and the IT services function (Jiang et al. 2002, Kettinger and Lee 1994). Therefore, we adopted this instrument to measure user satisfaction with IT services provided by IT units. Both service quality and user satisfaction were specified as *formative* constructs.[3]

The three dimensions of social capital were measured reflectively, by the level of social interaction ties, shared language, and relational capital, respectively. The scales measuring social interaction ties and shared language were adapted from Chiu et al. (2006), and the scale measuring relational capital was adapted from Kale et al. (2000).[4] These items were adapted to measure individual user perceptions of the social capital between their unit and the IT unit, in order to capture the perceived level of social capital that varies across individuals because of both between-unit and within-unit differences.

Finally, several demographical variables including gender, age, tenure, education, and computer experience, were included as control variables. Organization dummies were also created as controls.

### 4.3. Data Collection Procedure

The questionnaire was distributed to the four financial services firms previously indicated as our sampling frame. The executives in these firms were advised to distribute the survey only to business employees whose work required interaction with and support from their respective IT units. As a result, a total of 200 business employees across the four firms were identified as the respondents to the survey. A total of 174 responses were received, representing a respectable response rate of 87% (Sivo et al. 2006). After removing those responses with excessive missing information, 159 valid survey responses were obtained (88 responses from company A, 27 from company B, 21 from company C, and 23 from company D), of which 44% were male, 57% were between 20 and 29 years old, over 85% had a university degree or a higher education level, and over 50% had used computers for over four years (see §2 in the online supplement).

### 4.4. Data Analysis Technique

Partial least squares (PLS) was used to test the research model because of the several advantages of this technique. First, as a second-generation structural equation modeling (SEM) technique, it can estimate the loadings (and weights) of indicators on constructs (hence, assessing construct validity) and

[1] The interviews were conducted in Chinese. The transcripts were then translated into English.

[2] Three native Chinese speakers fluent in English independently translated the English survey, and then discussed their translation results item-by-item to achieve a consensus. Next, the questionnaire was further verified through a three-step process. First, it was checked by two academic domain experts in IS user satisfaction and social capital. Second, the two experts interviewed several professionals in one of the surveyed companies to validate the questionnaire. Finally, the questionnaire was distributed to five professionals in the other financial services companies for further comments and suggestions.

[3] Service quality and user satisfaction were modeled as reflective constructs in some prior studies. However, modeling them as formative constructs may be more appropriate (Petter et al. 2007), because they meet Jarvis et al. (2003) four criteria for specifying formative constructs: (1) direction of causality from indicators to construct; (2) noninterchangeability of indicators; (3) low covariation among indicators; and (4) different nomological net of indicators. An increasing number of studies have raised the concern that reflective modeling of these two constructs may be inappropriate (Cenfetelli and Bassellier 2009, Petter et al. 2007). We thus specify them as formative.

[4] There were five items in the original scale for measuring relational capital. Four were finally adopted in our study. The other item, which describes "close, personal interaction" between two parties, overlaps with structural capital. The subsequent interviews with professionals for questionnaire validation confirmed this concern, verifying our belief that removing this item does not affect the validity of the construct.

the causal relationships among constructs in multistage models (Fornell and Bookstein 1982). Second, in comparison with covariance-based (CB) SEM, PLS is robust with fewer statistical identification issues; moreover it is most suitable for models with formative constructs and relatively small samples (Hair et al. 2011), which is the case in our study. Additionally, whereas CB-SEM is regarded as being more appropriate for theory confirmation, PLS does provide a good approximation of CB-SEM in terms of final estimates (Gefen et al. 2011, Hair et al. 2011). Based on the above considerations, PLS was chosen for the current study.

## 5. Results

### 5.1. Measurement Model

To achieve a more parsimonious model for testing, we condensed the two high-order constructs (e.g., service quality and user satisfaction) by using factor scores of the subconstructs as items of the higher order construct. For example, there are five subconstructs of service quality (e.g., tangibles, reliability, responsiveness, assurance, and empathy), and there are several reflective items for each subconstruct. We first calculated the factor scores of each subconstruct using PLS (e.g., five factor scores were generated) and then we took these five factor scores as the formative items for service quality. Factor scores have been widely used in prior studies to simplify a research model (Williams and Hazer 1986).

Assessments of the measurement model of formative constructs and reflective constructs follow different guidelines. First, an established procedure used to assess the construct validity and reliability of the formative constructs (e.g., service quality and user satisfaction) was followed (Petter et al. 2007). The construct validity of formative constructs was assessed by examining both the item weights and the loadings; the weights indicate the relative importance of the items and the loadings represent the absolute importance of the items (Cenfetelli and Bassellier 2009). Reliability of the formative constructs was assessed by examining the possible multicollinearity among indicators. The analysis results confirm that all our formative constructs passed the thresholds (see §3 in the online supplement).

Second, we assessed the reliability and validity of the reflective constructs (e.g., three dimensions of social capital). Their reliability was assessed using composite reliability and average variance extracted. Convergent and discriminant validity were assessed by a confirmatory factor analysis. Convergent validity was assessed by checking the loadings to see if items within the same construct correlated highly among themselves, and discriminant validity was assessed by examining the factor loadings to see if the item loadings on the intended constructs were higher than on the other constructs (Kankanhalli et al. 2005). The results show that, except for the first item for structural capital (discussed earlier), the other items passed these reliability and validity tests (see §4 in the online supplement).

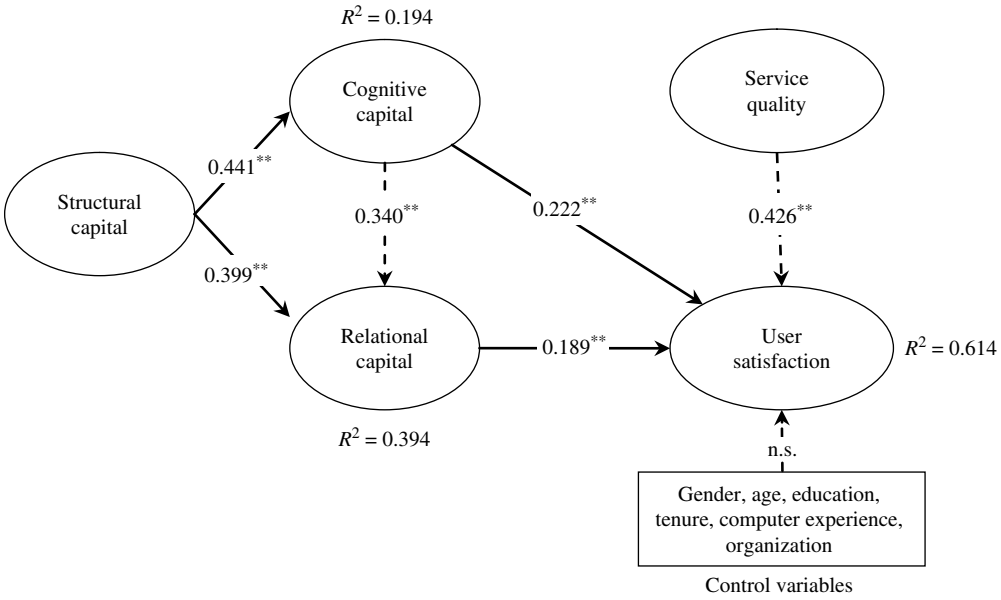
The descriptive statistics including the mean value, standardized deviation, and correlations of all the variables are shown in Table 1. As the correlations between constructs are relatively high, a multicollinearity problem could exist. However, the regression analysis results showed that the variance inflation factor values for all of the constructs were acceptable (i.e., between 1.594 and 2.182) (Petter et al. 2007). These results suggest that multicollinearity is not a concern, leading to the conclusion that the psychometric properties of the instrument as a whole were acceptable.

**Table 1 Descriptive Statistics**

| | Mean | Std. dev | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. User satisfaction | 5.07 | 0.89 | | | | | | | | | | | | |
| 2. Service quality | 5.40 | 0.94 | 0.63 | | | | | | | | | | | |
| 3. Structural capital | 4.91 | 0.97 | 0.38 | 0.57 | | | | | | | | | | |
| 4. Cognitive capital | 5.04 | 0.93 | 0.51 | 0.56 | 0.46 | | | | | | | | | |
| 5. Relational capital | 5.43 | 0.95 | 0.56 | 0.62 | 0.55 | 0.49 | | | | | | | | |
| 6. Gender | 1.55 | 0.51 | −0.23 | −0.10 | −0.03 | −0.11 | −0.07 | | | | | | | |
| 7. Age | 2.47 | 0.63 | 0.18 | 0.14 | 0.20 | 0.06 | 0.32 | −0.21 | | | | | | |
| 8. Education | 4.11 | 0.69 | 0.16 | 0.24 | 0.15 | 0.07 | 0.20 | −0.03 | 0.26 | | | | | |
| 9. Tenure | 2.29 | 0.75 | 0.04 | 0.05 | 0.09 | 0.10 | 0.07 | 0.01 | 0.31 | −0.04 | | | | |
| 10. Computer experience | 3.47 | 0.76 | 0.01 | −0.02 | 0.10 | 0.12 | 0.05 | −0.01 | 0.26 | 0.23 | 0.17 | | | |
| 11. Organization (D1) | 0.55 | 0.50 | 0.33 | 0.11 | 0.14 | 0.03 | 0.21 | −0.18 | 0.18 | 0.18 | −0.02 | −0.07 | | |
| 12. Organization (D2) | 0.17 | 0.38 | −0.23 | −0.21 | −0.25 | −0.20 | −0.19 | 0.07 | −0.07 | −0.11 | −0.11 | −0.01 | −0.50 | |
| 13. Organization (D3) | 0.13 | 0.34 | −0.28 | −0.15 | −0.13 | −0.03 | −0.27 | 0.09 | −0.17 | −0.04 | 0.09 | 0.18 | −0.43 | −0.18 |

*Notes.* Gender (1 indicates "male" and 2 indicates "female"); Age (1–5, respectively, indicates "≤19"; "20–29"; "30–39"; "40–49" and "≥50"); Education (1–4, respectively, indicates "middle school or lower"; "two-year college"; "graduate" and "postgraduate or higher"); Tenure (1–4, respectively, indicates "<1 year"; "1–3 year"; "4–6 year" and ">6 year"); Computer experience (1–4, respectively, indicates "<2 year"; "2–4 year"; "4–8 year" and ">8 year").

**Figure 2 PLS Results for the Main Effects**




$^{*}p \leq 0.05$; $^{**}p < 0.01$; n.s = $p > 0.05$.

### 5.2. Structural Model

The PLS results for the main effects are shown in Figure 2. First, the significant impacts of social capital on user satisfaction were observed. Specifically, relational capital ($\beta = 0.189$, $p < 0.01$) and cognitive capital ($\beta = 0.222$, $p < 0.01$) had significant influences on user satisfaction. Therefore, H1A and H2A were supported. Second, the results also confirmed that service quality was an important predictor of user satisfaction ($\beta = 0.426$, $p < 0.01$). However, all control variables were found to be insignificant, such as gender ($\beta = -0.086$, $p > 0.1$), age ($\beta = -0.028$, $p > 0.1$), education ($\beta = -0.046$, $p > 0.1$), tenure ($\beta = 0.017$, $p > 0.1$), and computer experience ($\beta = 0.027$, $p > 0.1$). The three dummy variables for organization were also found to be insignificant ($\beta = 0.086$, $-0.056$, and $-0.090$, respectively, $p > 0.1$). All of these factors together explained 61.4% of the variance in user satisfaction.

To test the interaction effects between social capital and service quality, the interaction variable as the cross product of the two interacting variables can be first calculated following the procedure of Chin et al. (2003)[5] and then tested using hierarchical analysis. As shown in Table 2, a hierarchical analysis of the five models was conducted. In model 1, the control variables were included. In model 2, the two social capital factors (cognitive capital and relational capital) were added. The results show that the two social capital factors elevate the $R$-square from 21.7% to 53.0% (with an increase of 31.3%, and $f^2 = 0.666$), indicating a large effect size. In model 3, service quality was added. It yielded an $R$-square variation of 0.084 ($f^2 = 0.218$), indicating a medium effect size. Models 4 and 5 included the moderating effect of cognitive and relational capital. The results showed that the path coefficients for the moderating effects of cognitive capital and relational capital were positive and significant with betas of 0.146 ($t = 2.785$, $p < 0.01$) and 0.150 ($t = 2.603$, $p < 0.01$), respectively, thus providing support for H1B and H2B. The $R$-square changes both were 0.017 ($f^2 = 0.046$) representing a small effect, which is nonetheless similar to those achieved in prior studies on moderators (Chin et al. 2003).[6]

Figures 3 and 4 delineate the interaction effect between service quality, cognitive capital, and relational capital. Service quality is shown to have a significant effect on user satisfaction under both the low and high conditions of cognitive/relational capital. However, the effect of service quality on user satisfaction is stronger with higher social capital, confirming a positive moderating effect of social capital.

To examine Hypothesis 3, we also tested the mediation effect of cognitive and relational capital between

[5] They suggested a two-step construct score procedure to deal with the interaction effects between the formative constructs. The first step is using the formative indicators in conjunction with PLS to create underlying construct scores for the predictor and moderator variables, and the second step uses the single composite scores to create a single interaction term.

[6] We also tested the model by modeling service quality and user satisfaction as reflective constructs and found no appreciable difference from the results shown in Table 3. Furthermore, when modeling them as reflective, we also checked for common method variance (CMV), and found that CMV was not a critical issue for our study (see §5 in the online supplement for details).

**Table 2 Summary of PLS Results**

| | DV—User satisfaction | | | | |
|---|---|---|---|---|---|
| IVs | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| Gender (1 = M; 2 = F) | −0.176* | −0.119* | −0.086 | −0.080 | −0.075 |
| Age | 0.001 | −0.045 | −0.028 | −0.029 | −0.025 |
| Education | 0.073 | 0.004 | −0.046 | −0.058 | −0.093 |
| Tenure | 0.072 | 0.033 | 0.017 | 0.024 | 0.035 |
| Computer experience | 0.032 | −0.015 | 0.027 | 0.014 | 0.031 |
| Company (dummy variable 1) | −0.017 | 0.036 | 0.086 | 0.103 | 0.110 |
| Company (dummy variable 2) | −0.293 | −0.125 | −0.056 | −0.044 | −0.031 |
| Company (dummy variable 3) | −0.320* | −0.134 | −0.090 | −0.091 | −0.092 |
| Cognitive capital | | 0.369** | 0.220** | 0.255** | 0.217** |
| Relational capital | | 0.355** | 0.190* | 0.161* | 0.192** |
| Service quality | | | 0.426** | 0.464** | 0.479** |
| Service quality × cognitive capital | | | | 0.146** | |
| Service quality × relational capital | | | | | 0.150** |
| $R^2$ | 0.217 | 0.530 | 0.614 | 0.631 | 0.631 |
| Adj. $R^2$ | 0.170 | 0.495 | 0.582 | 0.598 | 0.598 |
| $\Delta R^2$ | | 0.313 | 0.084 | 0.017 | 0.017 |
| $f^2$-statistic | | 0.666 | 0.218 | 0.046 | 0.046 |

*Notes.* Cohen's $f^2$-statistic $= [R^2_{AB} - R^2_A)/[1 - R^2_{AB}]$ (1988), where $R^2_A$ is the variance accounted for by a set of one or more independent variables *A*, and $R^2_{AB}$ is the combined variance accounted for by *A* and another set of one or more independent variables *B*. $f^2$ of 0.02, 0.15, and 0.35 are termed small, medium, and large effect sizes, respectively.

*$p < 0.05$, **$p < 0.01$.

structural capital and user satisfaction. According to Baron and Kenny's method (1986), when only structural capital was considered, its effect on user satisfaction was significant ($\beta = 0.468$, $p < 0.01$). In contrast, when the influence of cognitive and/or relational capital on user satisfaction was considered, its effect became nonsignificant ($\beta = 0.097$, $p > 0.1$) (see Table 3). Thus, Hypothesis 3 was supported: the effect of structural capital on user satisfaction was fully mediated by cognitive capital and relational capital.

Our research model implies that there could be a mediated moderation effect of structural capital on the relationship between service quality and user satisfaction through relational capital and cognitive capital. To ensure the robustness of the results derived from our earlier data analyses that test mediating and moderating effects separately, we conducted a further analysis by following Edwards and Lambert (2007), who described an improved regression technique for testing mediated moderation effects. The results confirmed all the hypotheses tested earlier and reported above using PLS. More importantly, the results showed that structural capital and service quality had a marginally significant indirect interaction effect on user satisfaction through cognitive capital ($\Delta\beta = 0.106$, $p < 0.1$) and a significant indirect interaction effect through relational capital ($\Delta\beta = 0.143$, $p < 0.05$). Moreover, the results showed that the direct moderating effect of structural capital between service quality and user satisfaction was not significant ($\Delta\beta = 0.020$, $p > 0.1$, and $\Delta\beta = -0.020$, $p > 0.1$), when the mediated moderation effects of

**Figure 3 Interaction Effect Between Service Quality and Cognitive Capital**

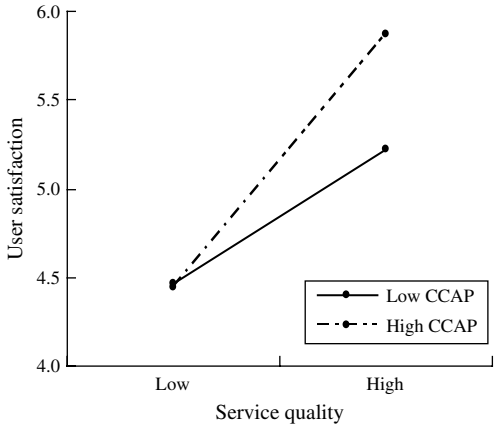



**Figure 4 Interaction Effect Between Service Quality and Relational Capital**

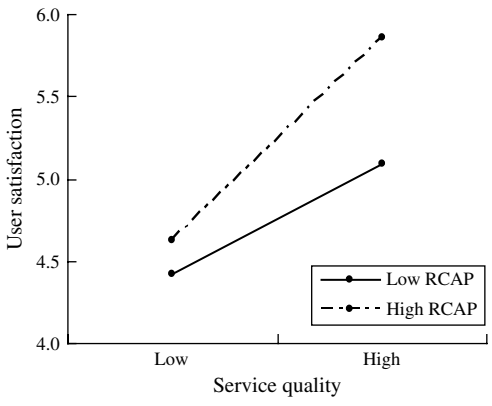


**Table 3 Mediating Effects of Cognitive and Relational Capital**

| IV | M | DV | IV → DV | IV → M | IV → DV | M → DV | Results |
|---|---|---|---|---|---|---|---|
| SCAP | CCAP | SAT | 0.468** | 0.452** | 0.240** | 0.499** | Partial |
| SCAP | RCAP | SAT | 0.468** | 0.556** | 0.162 | 0.541** | Full |
| SCAP | CCAP | SAT | 0.468** | 0.452** | 0.097 | 0.354** | Full |
| | RCAP | | | 0.554** | | 0.384** | |

*Notes.* SCAP = structural capital, CCAP = cognitive capital, RCAP = relational capital, SAT = user satisfaction,
*$p < 0.05$, **$p < 0.01$.

cognitive and relational capital were accounted for. These results lend general support to the full mediated moderation effect of structural capital through cognitive and relational capital. Overall, this further analysis enhanced our empirical confidence in the research model (see §6 in the online supplement for details).

### 5.3. Limitations

An interpretation of our research findings should take into consideration several limitations. First, as the empirical context of our study, China's industrial features and cultural factors may limit the general applicability of our conclusions. Future research could extend this study across different industrial and cultural settings to enhance its generalizability. Second, although the sample size of 159 respondents in our study does not appear to limit the power of the model (observed power was over 0.99), especially after we transformed the higher-order constructs (service quality and user satisfaction), future research could run the full second-order model with a larger sample. Third, the moderating effects of social capital in this study yield a significant, albeit limited, increase in explained variance in user satisfaction. Although even small effects using the product-indicator approach can hint at important model relationships (Chin et al. 2003), our interpretation of these results should be made with caution. Future researchers are urged to test these effects under other conditions, perhaps using other measurement approaches. Fourth, the structural capital measure used in this study could be enhanced by adopting an alternative social network approach (Hahn et al. 2008, Robert et al. 2008), which would assess the structural relationship between the two actors in both directions, thus making the measure immune to common method bias. Fifth, given the limited number of departments in our data set, our analytical approach appropriates social capital at the level of individual user perception. Although this approach is consistent with similar studies in the literature (Kankanhalli et al. 2005, Lewis et al. 2003), future research should consider applying a multilevel analytical approach. Furthermore, our research model has resulted in a respectable level of explanatory power on user satisfaction with IT service provision, but future research could and should control for more alternative explanations by including additional control variables (e.g., information quality, system quality) (DeLone and McLean 2003). Finally, due to the relatively small sample size and lack of two emitting paths from the formative constructs (e.g., service quality) (Diamantopoulos 2011), it is not possible for us to use the covariance-based SEM to analyze the model with formative constructs. This step may be achieved through enlarging the sample size, creating multiple indicators multiple causes models, and/or adding reflective measures or dependent variables in future studies (Diamantopoulos 2011).

## 6. Discussion and Implications

### 6.1. Discussion

This study examines the antecedents of user satisfaction with IT services by drawing on social capital theory. Our results first suggest that social capital between users and IT units, particularly the cognitive and relational dimensions, are strong predictors of user satisfaction with IT services. Second, our results indicated two positive moderating effects of social capital (cognitive and relational) on the well-known relationship between service quality and user satisfaction. Finally, our results indicated that the effect of structural capital on user satisfaction was fully mediated through cognitive capital and relational capital, suggesting that frequent communication between IT units and users may not necessarily lead to user satisfaction unless cognitive capital and relational capital are well developed.

Apart from the research model tested in our study, it is worth noting an alternative model that positions social capital as an antecedent to, rather than as a moderator of, service quality. Although it is plausible that social capital enhances several aspects of service quality (e.g., assurance and empathy), theorizing about the impact of social capital on user satisfaction through the mediation of service quality may undermine the ability of social capital theory to address IT service delivery as a bilateral process. This issue arises because service quality, as defined in the prior literature and discussed earlier, mostly concerns the superiority of the manner in which a service is *delivered by the IT service provider* (Pitt et al. 1995), rather than the degree to which the service is cocreated between the provider and the user. In this context, arguing that there is a relationship between social capital (a set of constructs that highlight the endogenous role of users in IT service delivery) and user satisfaction through service quality (a construct that instead assumes an exogenous role of users) might weaken the central premise of IT service as

a bilateral collaborative process between IT units and users. Moreover, our results, which were derived from an empirical comparison between our model (social capital as a moderator) and the alternative model (social capital as an antecedent), show that the alterative model generates an $R$-square of 59.6% (see §7 in the online supplement), which is lower than the primary model with an $R$-square of 63%, indicating that the alternative model does not provide improved explanatory power.

### 6.2. Theoretical Implications

This study offers several important theoretical implications. First, it offers a new theoretical understanding by reconceptualizing IT service delivery in the contemporary context. Prior research on IT service quality has only considered the role of IT units in the delivery process (Pitt et al. 1995) and has focused on service quality as the dominant antecedent to user satisfaction (Jiang et al. 2002, Pitt et al. 1995, Van Dyke et al. 1997). There are, no doubt, important insights that emerge from an arms-length relationship between users and IT service providers where users are essentially exogenous to service delivery. However, today's knowledge-intensive IT services often demand much closer working relationships between users and IT units, thus calling for a fundamental rethinking of the nature of IT service delivery. By drawing on recent work in IT service (Cusumano 2010) and marketing (Lusch et al. 2007, Vargo and Lusch 2004), we advance the current understanding of IT services delivery as a relational process through which specialized domain knowledge in IT and business units is exchanged and integrated. This conceptualization shifts the focus of IT service from the original service provider-driven process, a perspective long taken in the service quality literature (Kettinger and Lee 1994, Pitt et al. 1995), to a more relational, collaborative process taking place between users and IT units, thereby building a conceptual foundation upon which alternative theories can be introduced to explain user satisfaction with IT services.

Second and more specifically, our study contributes to the IT services literature by introducing social capital theory as an important alternative theoretical lens through which to gain an understanding of user satisfaction with IT services. In doing so, our study theorizes and empirically validates the crucial role of social capital (particularly cognitive and relational capital) in formulating user satisfaction, over and beyond the already better understood relationship between service quality and user satisfaction (Kettinger and Lee 1994, Pitt et al. 1995). Specifically, the results advance the scholarly understanding of cognitive capital and relational capital as key antecedents to user satisfaction in the context of IT services that necessitate distinctive interactions and collaboration, thus highlighting the crucial role of social capital. This study also finds cognitive and relational capital to be notable moderators of the effect of service quality on user satisfaction. This finding adds to the service quality literature, which has overlooked the boundary condition of interunit social relationships around the service quality → satisfaction relationship, thereby taking an important step toward theoretical advancement in the service quality area.

Third, our study contributes to social capital theory by extending its applicability to the domain of IT services. Although social capital has been used to explain a variety of interpersonal behaviors such as individual knowledge sharing, interunit resource exchange, the creation of intellectual capital, and virtual teamwork (Kankanhalli et al. 2005, Nahapiet and Ghoshal 1998, Robert et al. 2008, Tsai and Ghoshal 1998), its ability to shed light on the collaborative processes between IT units and users for IT services delivery had yet to be formally tested before the present study, despite recent practitioner reports suggesting the importance of social relationships between IT units and business units to the success of IT initiatives (Carr 2006). Our research findings extend social capital theory to the contemporary IT service context by showing that social capital between IT units and business units plays a crucial role in shaping user satisfaction with IT service.

Furthermore, our study provides nuanced insights into the hierarchy-of-effect of the three dimensions of social capital in terms of their specific impacts on user satisfaction. Somewhat different from prior social capital research showing both a direct and indirect effect of structural capital on value creation (Nahapiet and Ghoshal 1998, Tsai and Ghoshal 1998), the current study finds that the effect of structural capital on user satisfaction is not partially, but is instead fully mediated through cognitive and relational capital. This finding adds to the social capital literature by suggesting that, in the contemporary IT service context, the structural dimension of social capital would not create value for users (thus not satisfying users) by simply accessing knowledge resources, as it would otherwise do in other contexts; instead, it satisfies users only by facilitating the joint application of knowledge exchanged between IT and business units through the effects of cognitive and relational capital. This distinctive finding, in our opinion, contributes to the social capital literature by developing theoretical distinctions for the theory in the contemporary IT service context.

### 6.3. Practical Implications

In terms of practical implications, our findings suggest that although IT units should remain committed to improving service quality, they should also

focus on developing strong social capital with business units. Specifically, IT units can enhance their cognitive capital with users by developing a shared language through such means as enhancing communication with users (Jia et al. 2008), conducting proper training in related business domains (Bassellier and Benbasat 2004), and helping their business counterparts learn more about IT (Montoya et al. 2010). IT units should also build and maintain good interpersonal relationships with users; for example, by developing various formal as well as informal contacts and by establishing a cooperative culture within the organization (Carr 2006). Third, given the indirect, yet still important role of structural capital in affecting user satisfaction, IT units should consider enhancing structural capital with users by increasing the frequency of and occasions for interpersonal communication.

To conclude, IT services are evolving rapidly toward a new model where users and IT units will increasingly interact in cocreating services. In this collaborative, relational process, social capital plays a key role in shaping user satisfaction. Future research and practice should focus more intently on how to develop social capital between IT units and business units in order to better understand and manage IT service delivery.

### Electronic Companion

An electronic companion to this paper is available as part of the online version at http://dx.doi.org/10.1287/isre.1120.0421.

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### Appendix. Survey Instrument

| Constructs | Items |
|---|---|
| | Service quality (Pitt et al. 1995) (1 = strongly disagree; 7 = strongly agree) |
| Tangible | 1. IS has up-to-date hardware and software available to me. |
| | 2. IS's physical facilities are visually appealing to me. |
| | 3. To me, IS's employees are well dressed and neat in appearance. |
| | 4. To me, the appearance of the physical facilities of there IS units is in keeping with the kind of services provided. |
| Reliability | 5. When IS promises to do something for me by a certain time, it does so. |
| | 6. When I have a problem, IS shows a sincere interest in solving it. |
| | 7. To me, IS is dependable. |
| | 8. IS provides its services to me at the times it promises to do so. |
| | 9. To me, IS insists on error-free records. |
| Responsiveness | 10. IS tells me exactly when services will be performed. |
| | 11. IS employees give prompt service to me. |
| | 12. IS employees are always willing to help me. |
| | 13. IS employees are never too busy to respond to my requests. |
| Assurance | 14. The behavior of employees instills confidence in me. |
| | 15. Users will feel safe in my transactions with IS units' employees. |
| | 16. IS employees are consistently courteous with me. |
| | 17. IS employees have the knowledge to do their job well for me. |
| Empathy | 18. IS gives me individual attention. |
| | 19. IS has operating hours convenient to me. |
| | 20. IS has employees who give me personal attention. |
| | 21. IS has my best interests at heart. |
| | 22. Employees of IS understand the specific needs of mine. |
| | Social capital (1 = strongly disagree; 7 = strongly agree) |
| Structural capital (Chiu et al. 2006) | 1. Employees in my department maintain close social relationships with employees in the IS department. |
| | 2. Employees in my department spend a lot of time interacting with employees in the IS department. |
| | 3. Employees in my department know some employees in the IS department at a personal level. |
| | 4. Employees in my department have frequent communication with employees in the IS department. |

## Appendix. Continued

| Constructs | Items |
|---|---|
| | Social capital (1 = strongly disagree; 7 = strongly agree) |
| Relational capital (Kale et al. 2000) | 1. The relationship is characterized by mutual respect between employees in my department and those in the IS department.<br>2. The relationship is characterized by personal friendship between employees in my department and those in the IS department.<br>3. The relationship is characterized by mutual trust between employees in my department and those in the IS department.<br>4. The relationship is characterized by high reciprocity between employees in my department and those in the IS department. |
| Cognitive capital (Chiu et al. 2006) | 1. When interacting with employees in the IS department, we use common terms or jargon.<br>2. During the discussion with employees in the IS department, we use understandable communication pattern.<br>3. When communicating with employees in the IS department, we use understandable narrative forms. |
| | User satisfaction (Baroudi and Orlikowski 1988) * (with the A–B structure, A = 1, B = 7) |
| Staff and services | 1. My relationship with IS staff: dissonant-harmonious; bad-good.<br>2. IS employees' processing of requests for changes to existing systems: fast-slow; untimely-timely.<br>5. Attitude of the IS staff to me: cooperative-belligerent; negative-positive.<br>11. My communication with IS staff: dissonant-harmonious; destructive-productive<br>12. Time required for new systems development: unreasonable-reasonable; acceptable-unacceptable. |
| Information product | 7. Reliability of output information: high-low; superior-inferior.<br>8. Relevance of output information (to intended function): useful-useless; relevant-irrelevant.<br>9. Accuracy of output information: inaccurate-accurate; low-high<br>10. Precision of output information: low-high; definite-uncertain.<br>13. Completeness of the output information: sufficient-insufficient; adequate-inadequate. |
| Knowledge and involvement | 3. Degree of IS training provided to me: complete-incomplete; low-high.<br>4. My understanding of systems: insufficient-sufficient; complete-incomplete.<br>5. My feelings of participation: positive-negative; insufficient-sufficient. |

*The item number is consistent with the original instrument.

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