User Satisfaction with Information Technology Services:
A Social Capital Perspective

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Abstract

In view of today’s collaborative and knowledge-intensive nature of IT services, this study reexamines the antecedents of user satisfaction with IT services. We conceive IT service provision as an interactive, relational process by which users and IT units engage in service coproduction. Drawing on social capital theory, we develop a research model to examine relational factors influencing user satisfaction with IT service. We propose that the three dimensions of social capital – structural, cognitive and relational capital – positively affect user satisfaction. Furthermore, we argue that these dimensions of social capital strengthen the well-known relationship between service quality (SERVQUAL) and user satisfaction. A field study of 159 users in four financial companies provides general empirical support to our hypotheses. The implications of the findings to theory, practice, and future research directions are also discussed.

Key words: IT services, knowledge-intensive services, social capital, service quality, user satisfaction, service coproduction
1. Introduction

The broad objective of this study is to advance our theoretical understanding of the antecedents to user satisfaction on IT service by drawing upon a renewed conceptualization of IT service provision. The existing research has long taken Service Quality (SERVQUAL), a construct adapted from the service marketing research (Parasuraman, Zeithaml, & Berry, 1985), as a primary determinant of user satisfaction with IT service provision (Jiang, Klein, & Carr, 2002; Jiang, Klein, & Crampton, 2000; Kettinger & Lee, 1994, 2005; Pitt, Watson, & Kavan, 1995). However, this stream of research assumes that customers are exogenous to the service provision process (Oliver, 1993; Parasuraman et al., 1985). Service is seen as an intangible product delivered from providers to customers, while users are seen as only the recipients of IT service, evaluating and “consuming” value embedded in IT artifacts and solutions delivered by the IT unit (Kettinger & Lee, 1994; Pitt et al., 1995). This view underplays the role of customers as a service coproducer in the service provision process.

In this paper, we examine the antecedents to IT user satisfaction by founding our conceptual base on an alternative definition of IT service provision. Drawing on the Service-Dominant logic advanced in the recent marketing literature (Lusch, Vargo, & O’Brien, 2007; Vargo & Lusch, 2004), we define IT service provision as the joint application of specialized competences (knowledge and skills in the business and the IT domains) by users and their organizational IT unit through deeds, processes, and performances for the benefits of the users. Instead of seeing users as consumers of value delivered through IT service, this new conceptualization sees users as endogenous to the service provision process, who coproduce IT services with their organizational IT unit by exchanging and combining their
business competences with technical competences of the IT unit. As will be discussed later, we believe that this new conceptualization of service provision more precisely captures the collaborative, relational nature of IT services necessitated in contemporary firms. In light of the renewed definition of IT services, we revisit the research question: what factors influence user satisfaction on IT service provision?

The shift of focus from service as a transactional process to a relational process between the customer and the service provider urges researchers to understand customer value perception from the perspective of ongoing social interactions between customers and service providers (Lusch et al., 2007; Tuli, Kohli, & Bharadwaj, 2007). As a result, we believe that social capital – the set of resources embedded within the relationships among actors within a network – will influence value perception of customers (Nahapiet & Ghoshal, 1998). We posit that three primary dimensions of social capital (structural, cognitive, relational) impact user satisfaction with IT service provision. In addition, we propose that all three dimensions will be more important for user satisfaction when users’ perception of IT SERVQUAL is higher. A survey of 195 IT users in four financial institutions in China provides general support to our research model.

This study makes several key contributions to the literature. First, it draws upon the service-domain logic in the marketing discipline (Lusch et al., 2007; Vargo & Lusch, 2004) to explicitly re-conceptualize IT service provision towards a service coproduction (and hence value co-creation) process that involves both users and IT units. Second, it adds to the existing literature on IT user satisfaction by offering an alternative, relationship-centric explanation, social capital, as to why users become satisfied with IT service provision. Third,
it also adds to the literature by showing that social capital enhances the well-known effect of SERVQUAL on user satisfaction by improving knowledge exchange and combination between users and IT units.

The remainder of this paper is organized as follows. We first provide the theoretical background of this study. We then develop our research model linking user satisfaction, social capital, and service quality, followed by reporting empirical results from the field survey conducted to validate the hypotheses. Finally, implications regarding theory and practice, limitations, and future research directions are discussed.

2. Theoretical Background

IT user satisfaction is defined as the “extent to which users believe the information system available to them meets their information requirements” [Ives et al. (1983); p. 785]. Similarly, Swanson (1974) defines IT user satisfaction as the “manifold of beliefs about the relative value of the MIS”. In accordance, in our study we define IT user satisfaction as users’ global emotional response to the cognitive appraisal of the value of IT service.

2.1 User Satisfaction and Service Quality

Pioneered by Pitt et al. (1995) and Kettinger et al. (1994), the existing IS research has adopted Service Quality (SERVQUAL), a five-dimensional construct consisting of tangibles, reliability, responsiveness, assurance, and empathy, as a primary antecedent to user satisfaction on IT service provision (Jiang et al., 2002; Kettinger & Lee, 1997, 2005; Van Dyke, Kappelman, & Prybutok, 1997). The significance of SERVQUAL in the research on IT user satisfaction was later highlighted by DeLone and McLean (2003), who updated Service Quality into their influential IS Success Model.
While SERVQUAL has been proven as a key factor, the literature on Service Quality conceptualizes services as *intangible products* transacted between providers and customers. Based on Bagozzi’s (1992) cognitive appraisal→emotional response→coping behavior framework, this body of research generally sees Service Quality as the cognitive appraisal of value embedded in the intangible product or the transaction process; customers are positioned outside of the service provision cycle, appraising various aspects of the delivery quality in terms of the service provider *per se* and the transaction process (e.g., SERVQUAL) (Parasuraman, Berry, & Zeithaml, 1991; Parasuraman et al., 1985; Parasuraman, Zeithaml, & Berry, 1988, 1994a, 1994b; Zeithaml, 1988; Zeithaml, Parasuraman, & Berry, 1985).

However, the conceptualization of service as an intangible product and service quality as customers’ appraisal of transacted services only captures a subset of the service provision process (Bendapudi & Leone, 2003). It underplays the emerging need for building ongoing relationships with customers in the process of service provision (Lusch et al., 2007), particularly services that require continuous social interactions (Tuli et al., 2007). Recently, an increasing number of research has pointed out that IT service is complex and knowledge-intensive work, the success of which requires ongoing interactions and tight collaboration between users and IT service providers (Carr, 2006; Jia, Reich, & Pearson, 2008; Montoya, Massey, & Khatri, 2010). Thus, it is important for scholars to shift the focus of IT services from delivering intangible products to managing ongoing relationships. We elaborate this in the next section.

### 2.2 IT Service Provision as Value Co-creation between User and IT Unit

The relational process view of service provision can find its conceptual origin in the
service-centered perspective of marketing (Vargo & Lusch, 2004), which conceptualizes service as a continuous series of social and economic processes in which one party’s specialized competences are exchanged and applied so as to create value for itself or another party. It is through the application of specialized competences 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 provision treats customers as endogenous to the value creation process, and entitles customers as value co-creators (Vargo & Lusch, 2004). Customers can create value to services by joining such activities as requirement 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 Ramirez state that “the key to creating value is to coproduce offerings that mobilize customers” [(Normann & Ramirez, 1993), 69]. Similarly, Prahalad and Ramaswamy note that customer involvement is important to the value-creation process (Prahalad & Ramaswamy, 2000). As we will explain below, this relational view of service provision better reflects the nature of IT service provision in contemporary businesses.

Inspired by the service-centric perspective, we define IT service as the joint application of specialized competences in the IT and the business domains through deeds, processes and performance for the benefits of IT users. This definition highlights the collaborative, relational nature of IT service production and acknowledges the joint role of users and IT units as value co-creators. Indeed, the extant literature on various streams of IT services such
as IT planning, development, implementation and operations has long implied that users should engage in IT service coproduction (Table 1). For example, it is widely accepted in the IS development literature that user participation enhances user satisfaction and system quality (J. He & W. R. King, 2008). The IT management literature consistently reports the value creation potential of developing partnership relationships with business functional departments (D. F. Feeny & L. P. Willcocks, 1998; Ross, Beath, & Goodhue, 1996). Similarly, the IT service literature shows that user involvement and feedback play a crucial role in affecting performance in many complex and unstructured IT tasks (Abdel-Hamid, Sengupta, & Swett, 1999; Jia et al., 2008; Montoya et al., 2010).

Table 1 – Literature Implying the Relational Nature of IT Services

<table>
<thead>
<tr>
<th>IT Service Stages</th>
<th>Concepts Related to Relationships</th>
<th>Literature Sources</th>
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</thead>
<tbody>
<tr>
<td>Planning</td>
<td>Social alignment between IT and business</td>
<td>(Luftman &amp; Brier, 1999; Reich &amp; Benbasat, 2000)</td>
</tr>
<tr>
<td></td>
<td>Multiple contingencies</td>
<td>(V Sambamurthy &amp; Zmud, 1999)</td>
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<td></td>
<td>Strategic alignment</td>
<td>(Henderson &amp; Venkatraman, 1993; Hevner, March, Park, &amp; Ram, 2004)</td>
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<td></td>
<td>Business planning—IS planning integration</td>
<td>(Teo &amp; King, 1997)</td>
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<td>Development</td>
<td>Business understanding of IT professionals</td>
<td>(D. Feeny &amp; L. Willcocks, 1998)</td>
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<td></td>
<td>User-developer conflict</td>
<td>(Gallivan &amp; Keil, 2003; Robey, Smith, &amp; Vijayasarathy, 1993)</td>
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<td></td>
<td>IS development workload</td>
<td>(Hawk &amp; Dos Santos, 2002)</td>
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<tr>
<td></td>
<td>Mutual agreement</td>
<td>(Brabander &amp; Thiers, 1984)</td>
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<tr>
<td></td>
<td>User participation</td>
<td>(Hartwick &amp; Barki, 1994; J. He &amp; W. King, 2008)</td>
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<td></td>
<td>Collective reflection in action</td>
<td>(Levina, 2005)</td>
</tr>
<tr>
<td></td>
<td>User-centered system design</td>
<td>(Norman &amp; Draper, 1986)</td>
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<td></td>
<td>Joint application design</td>
<td>(Carmel, Whitaker, &amp; George, 1993)</td>
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<td></td>
<td>Participative design</td>
<td>(King &amp; Rodriguez, 1981)</td>
</tr>
<tr>
<td>Implementation</td>
<td>Shared domain knowledge</td>
<td>(Reich &amp; Benbasat, 2000)</td>
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<td></td>
<td>Knowledge brokering</td>
<td>(S. Pawlowski &amp; D. Robey, 2004)</td>
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<td></td>
<td>Boundary spanning</td>
<td>(Levina &amp; Vaast, 2005)</td>
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</table>
The need for conceptualizing IT service as service coproduction between users and IT units is not only derived from the recent service literature, but also manifested in today’s practice. IT service coproduction becomes particularly prominent in today’s fast-changing, knowledge-intensive nature of businesses. First, under fast-changing business environments (e.g., financial services sectors), competitive advantage is short-lived, calling for firms to undertake a series of actions to continuously recreate advantage (D'Aveni, 1994; V. Sambamurthy, Bharadwaj, & Grover, 2003). This requires users and IT units to collaborate more closely in order to effectively sense and respond to the turbulent business environment (V. Sambamurthy et al., 2003). Second, the scope and depth of IT services have dramatically expanded to embody a large body of specialized knowledge drawn from multiple domains (Van de Ven, 2005). Thus, satisfactory IT services entail the sharing of both technical knowledge owned by IT units and business knowledge held by users (Ko, Kirsch, & King, 2005; Rus & Lindvall, 2002), and more importantly, the effective integration of these highly specialized knowledge (Bettencourt, Ostrom, Brown, & Roundtree, 2002; Mitchell, 2006). This knowledge exchange and combination process inevitably demands close collaboration among, and significant contributions from, all involved parties.

For example, IT outsourcing, a common practice for contemporary organizations to manage their IS projects, requires knowledge contributions from multiple parties, including users, IT units and external IT vendors (Ko et al., 2005; Lee & Lee, 2000; Xu & Ma, 2008).
Business value for users can only be created when multiple parties, including users themselves, integrate their specialized knowledge and develop the system collaboratively (Kellogg, Orlikowski, & Yates, 2006; Levina, 2005). Likewise, large-scale system integration projects that join disparate IT applications and business processes across multiple facilities, such as the Enterprise Application Interface (EAI) and e-banking systems, need users and IT units to tightly collaborate with each other (Mitchell, 2006; Montoya et al., 2010).

To understand user satisfaction with IT services that characterize ongoing service coproduction between users and IT units, we need to build on a theory with an explicit focus on social relationships. We draw on social capital theory to approach our research question.


Figure 1 provides a summary of our research model. As shown in the figure, in this paper, we propose that three dimensions of social capital (structural, relational, and cognitive) between users and IT units directly influence user satisfaction with IT service. We further posit that the three dimensions of social capture positively moderate the relationship between SERVQUAL and user satisfaction, such that the effect of SERVQUAL on user satisfaction is stronger when social capital is higher.
Social capital theory is primarily concerned with the significance of relationships as a source for social action (Burt, 1992; J.S. Coleman, 1988) and how social relationships contribute to value creation (Nahapiet & 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 & Ghoshal, 1998), p.243]. Unlike the physical capital embodied in physical artifacts and the human capital vested in humans, social capital is deeply rooted in the ongoing relationships between actors within a social network that are able to facilitate various social activities across actors (Adler & Kwon, 2002; J. S. Coleman, 1988).

Social capital includes three dimensions: structural, cognitive, and relational capital (Nahapiet & Ghoshal, 1998). *Structural capital* is “the overall pattern of connections between actors—that is, who you reach and how you reach them” [(Nahapiet & 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.

*Cognitive capital* is “resources providing shared representations, interpretations, and systems
of meaning among parties” (Cicourel, 1973). Cognitive capital emphasizes the common
understanding that facilitates interactions among the actors in the social network. *Relational*
capital is assets that are created and leveraged through social relationships, including trust
and trustworthiness, norms, obligations, and identification (Nahapiet & Ghoshal, 1998). It
represents resources rooted in the interpersonal relationships through a history of interaction
among actors. This multi-dimensional view of social capital provides a valuable theoretical
lens to examine the IT service coproduction process, because each of the three dimensions
facilitate exchange and combination of knowledge resources (Nahapiet & Ghoshal, 1998;
Tsai & Ghoshal, 1998). In later sections of this paper, we examine how and why social capital
impacts user satisfaction with IT service provision.

### 3.1. Structural Capital and User Satisfaction

Structural capital describes the overall pattern of social ties and frequency of
communication (Nahapiet & Ghoshal, 1998). Social interaction ties constitute information
channels through which useful information can be gathered for exchange and combination (J.
S. Coleman, 1988). Structural capital contributes to value creation, and hence user
satisfaction, by increasing access to related parties for exchanging knowledge in a timely
manner (Burt, 1992). In terms of opportunities to access, customers’ easier access to
necessary knowledge resources from the service provider through social ties can increase
value perception of the service, and hence leading to higher customer satisfaction. In terms of
timing, social interaction ties can help actors to access other actors’ knowledge sooner, thus potentially increasing the efficiency for value creation.

In the IT service context, frequent communication between users and their IT unit helps the IT unit to understand the business needs of users and to become familiar with the channel through which the knowledge is exchanged. Communication also increases users’ familiarity with the knowledge exchange process (e.g., information regarding when, who, and how), making learning more efficient and effective. This is especially important for complex, ongoing IT project work, for which knowledge exchange cannot be done over service “encounters” but requires intensive and frequent interactions with users over extended periods of time (Jia et al., 2008). For instance, research has shown that communication between users and IT professionals is critical to tailoring IT service to user needs (Hartwick & Barki, 1994). Therefore, structural capital is helpful in clarifying user needs of IT service by enhancing timely access to specialized knowledge, leading to high user satisfaction. Therefore,

**H1a:** Structural social capital positively influences user satisfaction with IT services.

### 3.2. Cognitive Capital and User Satisfaction

Shared language, an important instance of cognitive capital, represents the common codes, terms, and narratives used in the communication process (Chiu, Hsu, & Wang, 2006; Nahapiet & Ghoshal, 1998). Shared language facilitates knowledge exchange and combination in three important ways. First, as the means by which people discuss and exchange information, language plays an important role in social relations (Nahapiet & Ghoshal, 1998). People who share a common language are more able to understand one
another. Second, a shared language is associated with shared perceptions regarding the activity (Pondy & Mitroff, 1979); thus, people can more readily anticipate similar value or vision out of the knowledge exchange (Chiu et al., 2006; Nahapiet & Ghoshal, 1998). Third, a shared language enables actors to more effectively combine shared information (Boland & Tenkasi, 1995). All these collectively contribute to formation of user satisfaction.

Shared language between users and IT units is important for IT service provision because it facilitates value co-creation through effective exchange and integration of specialized IT and business knowledge. For instance, successful IT planning and management is found to related to the level of IT units’ business understanding (Ross et al., 1996). IT professionals who are multilingual – conversant in the languages of multiple user organizations – can better facilitate knowledge exchange across various internal organizations, because they are able to translate and frame meanings in language and terms that others can understand (Bassellier & Benbasat, 2004; S. D. Pawlowski & D. Robey, 2004). On the side of users, recent research finds that business professionals with 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 IT staff (Davis, Kettinger, & Kunev, 2009). In short, a shared language facilitates the exchange of meaningful communication needed for exchange and combination of knowledge (Nahapiet & Ghoshal, 1998).

**H2a:** Cognitive social capital (expressed through shared language) positively influences user satisfaction on IT service.

### 3.3. Relational Capital and User Satisfaction

Relational capital describes interpersonal relationships between IT units and users,
including mutual trust and norm of respect and reciprocity (Nahapiet & Ghoshal, 1998). Trust reflects the extent to which one believes in and is willing to depend on another party (McKnight, Cummings, & Chervany, 1998), an instrumental factor in alleviating perceptions of risk and uncertainty in the research on business relationships, knowledge sharing, and e-commerce (D. Gefen, Benbasat, & Pavlou, 2008). The norm of reciprocity represents a sense of mutual indebtedness where individuals reciprocate the benefits they receive from others (Wasko & Faraj, 2005). It can contribute to value creation, because the payout may bring returns to others (Chiles & McMackin, 1996; Kankanhalli, Tan, & Wei, 2005). In short, relational capital can facilitate exchange and combination of knowledge by enabling access to other parties for exchange, anticipation of value through exchange, and the motivation to engage in value creation through exchange and combination (Nahapiet & Ghoshal, 1998).

The effect of relational capital on IT user satisfaction can be viewed from the perspectives 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 strong motivation to exchange information with each other, because they could expect equivalent returns in the future and could earn great respect (Bock, Zmud, Kim, & Lee, 2005; Kankanhalli et al., 2005; Nahapiet & Ghoshal, 1998; Wasko & Faraj, 2005). Moreover, the existence of mutual trust can facilitate knowledge exchange by reducing the perceived risks in sharing. Prior studies on relationship marketing have shown similar findings (Berry, 1995; Carr, 2006; Crosby & Stephens, 1987; Grover, Cheon, & Teng, 1996). Similarly, recent IT service research demonstrates the importance of building trust between IT units and business professionals (Montoya et al., 2010). Furthermore, relational capital is helpful in uplifting the arduous
relationship between the source and the recipient (Szulanski, 1996). Taken together, we propose that relational capital between users and IT units contributes to high user satisfaction because it enables exchange and combination of specialized domain knowledge.

**H3a:** Relational social capital positively influences user satisfaction on IT service.

### 3.4. Social Capital and Service Quality

We argue that social capital not only has a direct impact on IT user satisfaction, but also has an indirect effect by positively moderating (strengthening) the relationship between service quality and user satisfaction. As discussed earlier, service quality positively influences user satisfaction because users conduct cognitive appraisal on the quality of the IT service outcomes. Based on the evaluation of the total value received through the delivered service, users generate their emotional responses in the form of satisfaction.

This cognitive appraisal process can be facilitated, to some extent, by social capital. That is, the presence of social capital helps strengthen the favorable responses to the appraisal of service quality. Later in this paper, we argue that the impact of service quality on user satisfaction is stronger when structural, cognitive, and relational capital is higher. Users with higher social capital will more readily generate favorable responses to the cognitive appraisal process, whereas those with lower social capital will tend to generate less favorable responses to the same level of service quality.

Structural capital gives users more opportunities to access specialized IT knowledge resources and engage in open communication. When users evaluate the quality of delivered IT services, their appraisal is based on the information cues received from the delivered IT product/solutions and from the IT service providers (Kettinger & Lee, 1994). Structural
capital provides another venue through which users easily collect more information cues, i.e., from the past social interactions between users and providers that accounts for the entire history of interactions (Nahapiet & Ghoshal, 1998). These information cues result from more general, yet open and participative discussion between users and the IT staff. Users tend to leverage the information cues collected through social interactions when processing all the information cues to generate an overall emotional response. When structural capital is higher, the information cues from the history of social interactions are more favorable, thus cognitive appraisal on service quality would lead to more favorable overall emotional responses, i.e., a higher-level of user satisfaction. Thus, we hypothesize:

**H1b**: Structural social capital strengthens the relationship between service quality and user satisfaction with IT services.

Cognitive capital, in our case shared language, enhances users’ access to others’ knowledge and their ability to exchange and use the knowledge (Tsai & Ghoshal, 1998). When shared language is stronger, users would take less effort to understand and appreciate the IT service process (Davis et al., 2009). Thus, the cognitive appraisal on service quality processed by the users would take much less effort to result in emotional responses, due to users’ shared knowledge on the service by the IT staff. This is concurred by the cognition research stating that one’s cognitive appraisal on another one can be strengthened when they have shared cognitions (Hardin & Conley, 2001). Even when service quality is not high, it can still bring high user satisfaction because users spend less effort in understanding the value of the IT services (Au, Ngai, & Cheng, 2008). Furthermore, shared language would lead users and IT professionals originally categorized as out-group to develop a tendency to regard
each other as “in-group” (Levina & Vaast, 2005; S. D. Pawlowski & D. Robey, 2004), and people attribute more positive characteristics to ingroup members (Hardin & Conley, 2001). Thus, the same level of perception of service quality may lead to higher satisfaction for “ingroup” members with a higher level of shared language. Therefore, we hypothesize:

**H2b:** Cognitive social capital (expressed through shared language) strengthens the relationship between service quality and user satisfaction.

We further argue that the impact of service quality on user satisfaction would vary across different levels of relational capital. Relational capital, consisting of trust, reciprocity and respect, increases the motivation to exchange and combine knowledge between different entities and enhance anticipation of value through exchange, because users tend to perceive lower risks associated with the exchange, anticipate reciprocal values from the exchange, and tend to respect the other party’s contribution (Nahapiet & Ghoshal, 1998). When relational capital is strong, users are more likely to feel assured that cooperation with the IT unit would be risk free and could anticipate good return of value (Montoya et al., 2010). With this perception of the IT unit in mind, users would more likely to evaluate the same level of service quality more favorably (lower risk and higher value), thus leading to higher user satisfaction. Similarly, when users respect IT professionals (thus higher relational capital), they would be more receptive to IT professionals’ suggestions and advice; under such a situation, users perceiving the same level of service quality by the IT unit would be more satisfied with the IT solutions received. Furthermore, like cognitive capital, relational capital reinforces collective identification and therefore also contributes to individual’s “in-group” perception of those out-group members in the organization. In-group members’ work is perceived more favorably and hence more satisfactory, even if the quality is the same.
(Howard & Rothbart, 1980). Therefore, we hypothesize:

**H3b:** Relational social capital strengthens the relationship between service quality and user satisfaction.

### 3. Methodology

#### 3.1. Research Setting

To test the research model, a field study of users from financial institutions receiving IT services in Mainland China was conducted. The questionnaire for data gathering focused on financial institutions in China as the research sites for several reasons. First, IT plays a strategic role in the financial industry, enabling both the development and renewal of business capabilities, and the delivery of financial products (V. Sambamurthy et al., 2003). This requires close collaboration between IS departments and business functions.

Second, the financial industry in China has experienced tremendous changes in its industry structure since China’s entry to the World Trade Organization (WTO) in early 2000. The increasing rivalry from international companies, globalization, and the fast-growing domestic financial market require players to actively transform their businesses in order to gain a competitive edge in this highly volatile environment. In this context, the role of IT in enabling such transformation has become more critical.

Third, financial institutions are often at the frontline in adopting advanced IT solutions in order to facilitate critical daily business functions such as market analysis and communication, development of financial derivatives, and management of financial transactions (Montoya et al., 2010). The wide adoption of these IT-based services makes business staff heavily reliant on digitized service in their business processes. In conjunction with the knowledge-intensive nature of financial services, the sharing and integration of a large body of specialized
knowledge is a prerequisite captures the core of IT services. Taking these reasons together, we consider the financial institutions in China a suitable setting for empirical investigation.

3.2. Measurement

All measurement items were adapted from prior studies, although some terms were changed to fit the specific research context (Appendix A). Service Quality was measured using SERVQUAL developed by Parasuraman et al. (1994a). In SERVQUAL, the five dimensions of service quality, namely, tangible, reliability, responsibility, assurance, and empathy, are measured using 22 items, with each dimension composed of 4 to 5 items. In this study, we adapted the IS-specific SERVQUAL measure developed by Pitt et al. (1995). There is an ongoing debate regarding how to measure SERVQUAL; either by using a gap score in terms of the difference of perception and expectation of service quality (Jiang et al., 2002; Kettinger & Lee, 1994; Klein, Jiang, & Cheney, 2009; Pitt et al., 1995) or by using the performance-only approach (i.e., SERVPERF) (Cronin & Taylor, 1994; Van Dyke et al., 1997). Although the original SERVQUAL was measured using the gap approach, most recent studies have pointed out that perception-only measures are more appropriate for empirical studies (Cronin, Brady, & Hult, 2000; Cronin & Taylor, 1994; Kettinger, Lee, & Lee, 1995; Kettinger, Park, & Smith, 2009; Parasuraman et al., 1994a; Zeithaml, Berry, & Parasuraman, 1996). Thus, in this study, Service Quality was measured through the performance-only approach.

User satisfaction was assessed through a short-form measure of user information satisfaction (UIS) verified by Baroudi et al. (1988). This instrument consists of 13 scales with 2 items per scale. These 13 scales can be further classified into three dimensions: staff and
services, information product, and knowledge and involvement. Each item was measured using a seven-point Likert scale, and each scale was scored by taking the average of the two items. A number of items were reverse-scored to prevent the respondents from half-heartedly answering the questions. This instrument has been widely used in assessing user satisfaction with IT units and with the IT services function (Jiang et al., 2002; Kettinger & Lee, 1994). Therefore, we also adopted this instrument to measure user satisfaction with IT service provided by IT units.

The three dimensions of social capital were respectively measured by Social Interaction Ties, Shared Language, and Relational Capital. Social Interaction Ties represent the strength of the relationships, the amount of time on and the frequency of communication between IT units and users (Chiu et al., 2006). Shared Language reflects the similarity of IT units and users in terms of communication with and understanding of each other. These two scales capture the structural and cognitive dimensions of social capital. Both scales were adapted from Chiu et al. (2006). Relational capital describes mutual trust, respect, and reciprocity between IT units and users. This scale was adapted from Kale et al. (2000), which fully capture these aspects. It is worth noting that there were five items in the original scale for relational capital, but only the latter four were finally adopted in our study because the first item describes “close, personal interaction” between two parties, which overlaps with structural capital. Results from our pilot study also raised this concern, enhancing our confidence that removing this item will not affect the validity of the construct.

The original measurement items were in English, which were translated to Chinese. To ensure that the results would not be subject to linguistic misinterpretations, we translated the
items from English to Chinese utilizing a translation committee approach, that is, a committee of bilinguals (Van de Vijver & Leung, 1997). Three native Chinese speakers fluent in English were involved in the committee. All were IS Ph.D. students familiar with the research area. The three members were first requested to translate the English measurements individually, and the initial individual translation results were discussed together item-by-item until agreement was achieved. After the Chinese instrument was finalized, a four-step revision of the questionnaire was further conducted to ensure the face validity of the measurement items (Appendix B).

Aside from the independent and dependent variables in the proposed research model, several demographical variables, including gender, age, position, tenure, and computer experience, were included as control variables in the data analysis. Organization dummies were also created.

3.3. Data Collection Procedure

The instrument was administered in four financial service firms in China. We contacted a Chief Information Officer (CIO) in one of the firms who agreed to sponsor the administration of the instrument in his firm. He also gave recommendations and helped us contact the three other firms through his ties with the top management in those firms. The employee size of the four companies ranges from 25 to 109. Three of the firms are subsidiaries of a much larger financial company. All four sample firms have independent IT units closely connected with business departments. For instance, during our initial interview, a business department manager reported that his department kept frequent communication with the IT unit to ensure that the IT unit can help them to quickly respond to the rapidly changing environment.
Two hundred questionnaires were distributed to IT services users in the selected firms, as identified by the respective CIOs. One hundred and seventy-four responses were received; an excellent response rate of 87%. Among these responses, 15 were incomplete or of questionable validity, resulting in 159 valid questionnaires for data analysis. Male participants comprise 44% of the respondents, and 57% are in the age range of 20-29. Over 85% of the participants have university or higher education level, and over 50% have used computers for more than 4 years.

3.4. Data Analysis Technique

Partial Least Squares (PLS) was used to test the research model and hypotheses. There are several advantages of using PLS. First, compared with a first-generation, traditional statistical method such as regression, a second-generation causal modeling technique such as PLS can estimate the loadings of indicators on constructs and the causal relationships among constructs in multi-stage models (Fornell & Larcker, 1981). Second, compared with covariance-based structural equation modeling (SEM) applications such as Linear Structural Relations (LISREL), PLS is more suitable for exploratory research and may require fewer data points (Fornell & Bookstein, 1982). Chin (1998) and Gefen et al. (2000) have suggested ten times the largest number of independent constructs affecting a dependent construct or the largest number of formative indicators as the N threshold, which was not a limitation in our sampling. Third, PLS is able to readily model formative, as well as reflective constructs, which can be more complicated in covariance-based SEM. In consideration of the sample size, formatively conceptualized constructs (e.g., service quality and user satisfaction), and the exploratory nature of this study, we chose PLS as the analysis tool.
4. Results

4.1. Measurement Model

In the research model, Service Quality and User Satisfaction were conceptualized as two formative second-order constructs, while the three dimensions of Social Capital were conceptualized as three reflective constructs, similar to prior research (Chiu et al., 2006).

Service Quality (with five sub-constructs: Tangibles, Reliability, Responsiveness, Assurance, and Empathy) (Pitt et al., 1995) and User Satisfaction (with three sub-constructs: Staff and Services, Information Product, and Knowledge and Involvement) (Baroudi & Orlikowski, 1988) were specified as formative constructs. Jarvis et al. (2003) proposed four criteria for making a decision whether to model a construct as formative or reflective: (1) direction of causality from construct to indicators; (2) interchangeability of indicators; (3) covariation among indicators; and (4) nomological net of construct indicators (Cenfetelli & Basseller, 2009; Petter, Straub, & Rai, 2007; Rai, Patnayakuni, & Seth, 2006). These two constructs meet the criteria that: (1) the direction of causality is from the sub-constructs to the respective second-order construct; (2) the sub-constructs are not interchangeable, (3) the sub-constructs do not necessarily covary with each other, and (4) they do not share the same nomological net (i.e., they have the same antecedents and consequences).

Each second-order construct is modeled as a formative construct consisting of multiple sub-constructs with reflective items. We constructed a factor score to consolidate the reflective items of each sub-construct of Service Quality and User Satisfaction. Using factor

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1 It is worth noting that service quality has often been modeled as a reflective construct in prior studies (Jiang et al. 2002; Kettinger and Lee 1994; Kettinger and Lee 2005; Pitt et al. 1995). However, a critical idea regarding the relationship between construct and indicators shows that modeling it as a formative construct may be more appropriate (Petter et al. 2007). A recent paper has also suggested that modeling service quality as a formative construct can better capture the relationship between construct and indicators (Cenfetelli et al. 2009).
scores to simplify a research model has been widely used in prior studies (Bagozzi & Heatherton, 1994; Chin & Gopal, 1995; Williams & Hazer, 1986). Since there are five sub-constructs for Service Quality (Pitt et al., 1995) and three sub-constructs of User Satisfaction (Baroudi & Orlikowski, 1988), the number of items for Service Quality and User Satisfaction were reduced from twenty-two and thirteen to five and three, respectively. A similar example can be found in Mithas et al (2008).

Assessments of the measurement model of formative constructs and reflective constructs follow different guidelines. First, the established procedure to assess the construct validity and reliability of the formative constructs was followed (Petter et al., 2007). The construct validity of formative constructs is assessed by examining both the item weights and loadings: the weights indicate the relative importance of items while the loadings represent the absolute importance of items (Cenfetelli & Bassellier, 2009). The construct reliability of formative constructs is assessed by examining the possible multicollinearity among indicators. The analysis results show that all the formative constructs pass the thresholds (Appendix C).

Second, we assessed the reliability and validity of reflective constructs (e.g., three dimensions of social capital). The reliability was assessed using composite reliability and average variance extracted (AVE). Convergent and discriminant validity was assessed by a confirmatory factor analysis (CFA) to determine whether the loadings on the corresponding construct were significantly high or higher than loadings on other constructs. Discriminant validity can also be assessed by comparing the correlations and the square root of AVEs. The results show that, except for the removal of the first item of structural capital (discussed earlier), other items pass the tests (Appendix D).
As the correlations between constructs are relatively high, a multicollinearity problem may exist. However, the regression results show that the variance inflation factor (VIF) values for all of the constructs are acceptable (i.e., between 1.594 and 2.182). These suggest that multicollinearity is not a concern. This leads to the conclusion that the psychometric properties of the instrument as a whole are acceptable.

4.2. Structural Model

The PLS results for the main effects are shown in Figure 2. Significant impacts of Social Capital on User Satisfaction were supported. Specifically, Relational Capital and Shared Language (Cognitive Capital) had significant influences on User Satisfaction ($\beta = 0.187$, $p<.05$; $\beta = 0.239$, $p<.01$, respectively). Structural Capital was found to have no significant effect when Relational and Cognitive Capital were controlled ($\beta = -0.017$, $p>.1$). Therefore, H2a and H3a were supported, but H1a was not. The social capital factors explained 49.3% of the overall variance (see Table 1, Model 1). The results also confirmed that Service Quality as
an important predictor of User Satisfaction ($\beta = 0.415, p<.01$). Two control variables Gender ($\beta = -.083, p>.05$) and Company dummy ($\beta = 0.081, -0.056, and -0.083$ for three dummy variables, $p>.1$) were not found significantly related to User Satisfaction. All of these factors totally explained $61.4\%$ of the variance in User Satisfaction.

As all the predictors were continuous variables, the interaction effects of Social Capital and Service Quality were calculated as the cross product of two interacting variables, following Chin et al. (2003). We tested the interaction effect by checking whether the path from the interaction variable to the dependent variable was significant. Chin suggested a two-step construct score procedure to deal with the interaction effects between 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, while the second step takes the single composite scores to create a single interaction term (Chin, Marcolin, & Newsted, 1996). As shown in Table 1 (Model 4-6), the moderating effects of Social Capital were significant for two out of the three dimensions: the path coefficients for the moderating effects of Cognitive Capital and Relational Capital were positive and significant at $0.146$ ($t=2.942, p<.01$) and $0.119$ ($t=2.383, p<.05$) respectively, supporting H1b and H2b. But the moderating effect of Structural Capital was marginal at $0.095$ ($t=1.787, p<.1$). Thus, H3b was not supported.

Table 2 summarizes the PLS results for the hierarchical analysis of six models. In Model 1, three social capital factors were considered, and in Model 2 Service Quality was added. The results show that three social capital factors explained $49.3\%$ of the variance in user satisfaction, and the inclusion of Service Quality increased the R-square from $49.3\%$ to
In model 3, the other two control variables gender and company were entered but bring no significant increase in R-square. Models 4 to 6 included the moderating effect of Structural, Cognitive, and Relational Capital, and the R² square changes were .007, 017, and 012 respectively. Cohen (1988) and Chin et al. (2003) recommended the use of $f^2$ statistics. This is calculated by the R²s of the baseline model and the model with interaction effect in order to assess the strength of effect size, where 0.02, 0.15, and 0.35 had been suggested to be small, moderate, and large effects, respectively. As shown in Table 3, the interaction effects for the three dimensions of social capital (i.e., structural, cognitive, and relational) were found to have effect sizes $f^2$ of 0.018, 0.046, and 0.032, respectively, representing a small effect, similar to prior studies on moderators (Chin et al., 2003).

Table 2. Summary of PLS Results

<table>
<thead>
<tr>
<th>IVs</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
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</thead>
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<td>-.017</td>
<td>-.015</td>
<td>-.023</td>
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<td></td>
<td>(t=1.069)</td>
<td>(t=.169)</td>
<td>(t=.231)</td>
<td>(t=.215)</td>
<td>(t=.345)</td>
<td>(t=.330)</td>
</tr>
<tr>
<td>Shared Language</td>
<td>.353**</td>
<td>.220**</td>
<td>.239**</td>
<td>.240**</td>
<td>.277**</td>
<td>.240**</td>
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<tr>
<td></td>
<td>(t=4.733)</td>
<td>(t=2.722)</td>
<td>(t=3.226)</td>
<td>(t=3.280)</td>
<td>(t=3.756)</td>
<td>(t=3.287)</td>
</tr>
<tr>
<td>Relational Capital</td>
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<td>.237**</td>
<td>.187**</td>
<td>.176*</td>
<td>.157*</td>
<td>.191*</td>
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<tr>
<td></td>
<td>(t=4.758)</td>
<td>(t=3.346)</td>
<td>(t=2.458)</td>
<td>(t=2.360)</td>
<td>(t=2.052)</td>
<td>(t=2.507)</td>
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<tr>
<td>Service Quality</td>
<td>.441**</td>
<td>.415**</td>
<td>.448**</td>
<td>.451**</td>
<td>.449**</td>
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</tr>
<tr>
<td></td>
<td>(t=5.750)</td>
<td>(t=5.529)</td>
<td>(t=6.365)</td>
<td>(t=6.840)</td>
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<tr>
<td>Gender</td>
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<td>-0.078</td>
<td>-0.076*</td>
<td>-0.075</td>
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<tr>
<td>(1=M; 2=F)</td>
<td>(t=1.736)</td>
<td>(t=1.603)</td>
<td>(t=1.703)</td>
<td>(t=1.557)</td>
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<tr>
<td>Company (Dummy variable 1)</td>
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<td>.096</td>
<td>.095</td>
<td>.094</td>
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</tr>
<tr>
<td></td>
<td>(t=.909)</td>
<td>(t=1.092)</td>
<td>(t=1.045)</td>
<td>(t=1.075)</td>
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</tr>
<tr>
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<td></td>
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<tr>
<td>Company (Dummy variable 3)</td>
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</tr>
<tr>
<td></td>
<td>(t=1.081)</td>
<td>(t=1.603)</td>
<td>(t=1.225)</td>
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<td>Service Quality x</td>
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<td>Shared Language</td>
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<tr>
<td>Service Quality x</td>
<td>.119*</td>
<td></td>
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</tbody>
</table>

2 It is worth noting that in our analysis, service quality and user satisfaction are specified as formative constructs. However, these two constructs have been modeled as reflective in prior studies. To compare our results against these studies, we also conducted a data analysis by expressing them as reflective constructs. The results show no appreciable difference from the results in Table 3. The significant levels of the main effects and interaction effects remain consistent with those reported in Table 3 (results available upon request). Furthermore, when modeling them as reflective, we also checked common method variance (CMV), and found, by using well established tests, that CMV was not a critical issue for our study [see Podsakoff et al. (2003) tests in Appendix E]. Since an increasing number of studies have raised the concern that the reflective modeling of these two constructs may be miss-specified (Petter et al. 2007; Centefelli and Bassellier 2009), we preferred to treat them as formative constructs.
5. Discussions, Implications, and Limitations

5.1. Discussions

This study examines the antecedents of user satisfaction with IT services by reconceptualizing IT services provision as a service coproduction process between users and IT units. This perspective allows us to shift the focus of IT services as transacted intangible products to relationship-centric processes. Drawing on social capital theory, we identify structural, cognitive and relational capital as relational factors affecting user satisfaction.

Our results yield several interesting findings. First, the results show that, as hypothesized, cognitive capital (shared language) has a significant direct effect on user satisfaction. This result suggests that when IT units and users have a high level of shared language, users are more satisfied with IT services offered by the IT unit. Similarly, relational capital is found to be significantly related to user satisfaction, confirming our hypothesis that relational capital is high, users tend to have high satisfaction with IT services. Path coefficient comparisons indicate that these two dimensions of social capital may have similar influences on user satisfaction. These two findings suggest that social capital, particularly capital relating to cognitive and relational dimensions are strong predictors to user satisfaction with IT services.

Second, our results found two important moderating effects of social capital (cognitive and relational) on the well-known relationship between service quality and user satisfaction, suggesting that service quality poses a stronger effect on user satisfaction when relational and
cognitive capital is higher. Although these significant moderating effects are small in size, research has suggested that small effect size is non-trivial (Cohen, 1988, 1992) and could indicate important model relationships (Chin et al., 2003; Lowry, JR., Jenkins, & Guthrie, 2009).

However, against our hypotheses, structural capital has neither a direct effect on user satisfaction, nor a moderating indirect effect. To understand this unsupported hypothesis, we speculated that the effect of structural capital on user satisfaction might not be direct but mediated by cognitive capital and relational capital. Prior studies on social capital have suggested that the three dimensions of social capital may be correlated (Nahapiet & Ghoshal, 1998): structural capital leads to cognitive and relational capital, and cognitive capital also leads to relational capital (Tsai & Ghoshal, 1998). A post-hoc analysis was therefore conducted to examine this potential mediation relationship (see Appendix F). According to Baron and Kenny’s causal step method (1986), when only structural capital is considered, its effect on user satisfaction is significant ($\beta = .468, p < .01$). In contrast, when the influences of cognitive and/or relational capital on user satisfaction are considered, its effect becomes insignificant ($\beta = .097, p > .1$). This supports our explanation of the insignificant direct effect of structural capital on user satisfaction.

5.2. Theoretical Implications and Contribution

This study makes several important theoretical contributions. First, our study offers a renewed conceptualization of IT service provision in the context of contemporary businesses. Prior research on IT services has primarily considered the role of IT units as service providers (Pitt et al., 1995) and has focused on service quality as the dominant indicator for
determining user satisfaction (Jiang et al., 2002; Kettinger & Lee, 1997, 2005; Pitt et al., 1995; Pitt, Watson, & Kavan, 1997; Van Dyke et al., 1997). However, today’s rapidly changing business needs, and the knowledge-intensive IT services require users to engage in service coproduction with IT staff. Drawing on service-domain logic in the marketing area, we reconceptualize IT service as a relational process through which specialized domain knowledge in IT and businesses is exchanged and integrated. This conceptualization shifts the focus of IT service from the original service provider-driven process to a relational, collaborative process between users and IT units.

Second, the study also contributes to the IT services literature by introducing the notion of social capital as an important theoretical lens to understand user satisfaction with IT service provision. Social capital has been employed to understand a variety of interpersonal behavior such as knowledge sharing, cooperation, inter-unit resource exchange, the creation of intellectual capital, supplier relations (Baker, 1990; Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). Its efficacy in explaining the collaborative processes between IT units and users in the context of IT services provision has never been formally understood, despite research in related areas suggesting that relationships between IT units and business units are important for the success of IS initiatives (Carr, 2006), such as ERP implementation (Pan et al., 2007). Our study contributes by theorizing and empirically validating the direct effects of social capital (cognitive and relational) on user satisfaction with IT service, over and beyond the already known construct of service quality. The results advance our scholarly understanding that social capital is important antecedents to user satisfaction in the context of IT services that feature interaction and collaboration.
Third, our study advances the theory on IT service quality by finding social capital as a significant contingent factor between service quality and user satisfaction. This finding adds to the SERVQUAL literature that rarely explores contextual factors between cognitive appraisal and emotional responses. It generalizes the important role of social capital such that social capital is still useful even if certain IT services are transactional rather than relational.

Finally, our study provides insights into the hierarchy-of-effect of the three dimensions of social capital when considering their impact on user satisfaction. The results show that the effect of structural capital is fully mediated by cognitive and relational capital. This means that frequent communication between IT units and users may not necessarily lead to user satisfaction unless shared language and relational capital are developed at a reasonable level. In other words, only when structural capital is transformed into cognitive and relational capital will its effect on user satisfaction be realized. However, the insignificant direct effect of structural capital does not mean that improving communication between IS departments and users is unimportant. It can still indirectly influence user satisfaction through the mediation of cognitive and relational capital.

5.3. Practical Implications

Our study has important practical implications to IT service provision. This study suggests that while IT units should remain committed to improving service quality by delivering reliable and assured services, they should also focus on managing relationships with users by cultivating social capital. Specifically, IT units should enhance cognitive capital with users in terms of developing shared language. They may do so by enhancing communication with users (Jia et al., 2008), conducting proper training on related business
domains (Bassellier & Benbasat, 2004), and helping business counterparts learn more about IT (Montoya et al., 2010). Second, IT units should pay attention to building 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; Xin & Pearce, 1996). Third, given that structural capital can affect user satisfaction through the mediation of cognitive and relational capitals, IS departments should consider enhancing structural capital with users by increasing the frequency of and occasions for communication.

5.4. Limitations and Future Research

Interpretation of our research findings should take into consideration several limitations. First, this study was conducted in the financial sectors of Mainland China. China’s industrial features and cultural factors may limit the general applicability of our conclusions. As discussed in the methodology, financial firms were selected as the research setting because they represent the rapidly changing business environment and the features of current IS services. However, in organizations where IS departments do not play a strategic role (e.g., traditional manufacturing industries), there may be some variations in the conclusion. We suggest that scholars conduct similar studies on different industrial and cultural settings. Approximating the same conclusions can validate the generalizability of the theory, while different conclusions are also helpful in exploring potential moderators that may influence our research model.

Second, several significant results have been obtained based on a sample of 159 respondents. The relative small sample may limit the power of our proposed model. By
conducting a post-hoc statistic power analysis, we obtained an observed power over .99, indicating a strong support for our research model.\(^3\) However, with such samples, we can parcel some items of complex constructs, including service quality and user satisfaction, to reduce the number of items. This item reduction is helpful in conducting a structural equation modeling analysis in PLS. In future studies, larger samples may enable the testing of a second-order model.

Third, despite the presence of significant moderating effects of social capital, only small effects of these moderating effects have been attained in this study. Incorporating these moderating effects can bring in a significant, albeit relatively small, increase of explained variance (e.g., about 1%). While even small effects using the product-indicator approach could indicate important model relationships (Chin et al., 2003; Lowry et al., 2009), our interpretation of these significant results should be taken with caution. Future research is urged to re-examine and verify the size of these moderating effects.

**6. Conclusion**

Recognizing the change in the nature of IT services in the contemporary economy, we proposed that IT services are collaborative and relational processes rather than transactional. Based on the premise of the relational nature of IT services, we redefine IT service provision as a service coproduction process between users and IT units, and use social capital theory to identify relational antecedents to user satisfaction with IT services. Results confirm the significant role social capital plays in the service coproduction process. Our study opens a new research avenue for research in examining user satisfaction with IT services.

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