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LEVERAGING DIGITAL TECHNOLOGIES: HOW INFORMATION QUALITY LEADS TO LOCALIZED CAPABILITIES AND CUSTOMER SERVICE PERFORMANCE[1]

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With the growing recognition of the customer's role in service creation and delivery, there is an increased impetus on building customer-centric organizations. Digital technologies play a key role in such organizations. Prior research studying digital business strategies has largely focused on building production-side competencies and there has been little focus on customer-side digital business strategies to leverage these technologies. We propose a theory to understand the effectiveness of a customer-side digital business strategy focused on localized dynamics—here, a firm's customer service units (CSUs). Specifically, we use a capabilities perspective to propose digital design as an antecedent to two customer service capabilities—namely, customer orientation capability and customer response capability—across a firm's CSUs. These two capabilities will help a firm to locally sense and respond to customer needs, respectively. Information quality from the digital design of the CSU is proposed as the antecedent to the two capabilities. Proposed capability-building dynamics are tested using data collected from multiple respondents across 170 branches of a large bank. Findings suggest that the impacts of information quality in capability-building are contingent on the local process characteristics. We offer implications for a firm's customer-side digital business strategy and present new areas for future examination of such strategies.

Keywords: Customer service, capabilities, information quality, process, customer response, customer orientation, business value of IT

Introduction

Digital technologies are transforming firms' customer-side operations and firms are increasingly looking for effective digital business strategies to harness these technologies. Recurrent discontinuities, due to the rapid pace of innovations, shorter product life cycles, ever-changing customer needs, and growing internationalization of businesses, have made customer service performance critical for firm survival. There is substantial evidence that 40 percent of customers who experience poor customer service stop doing business with the target company (e.g., Dougherty and Murthy 2009; Malhotra et al. 2007; Pavlou and El Sawy 2010). Hence, customer-side operations are gaining center-stage in many firms. For instance, Wachovia bank, now part of the Wells Fargo group, popularized a "sun down" rule ensuring that the employees of the bank establish contact with an unhappy customer on the same day a customer complaint is received (Berry et al. 1994). With a focus to serve customers with

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what they want, the way they want it, and when they want it, firms are increasingly adopting varied digital technologies in their customer-side operations (Walsh 2007).

Often, firms adopt these digital technologies to better sense and respond to customer needs. For instance, Continental Airlines has adopted a data warehousing platform to gain access to real-time customer and flight information that helps them better understand and meet their passengers' needs and wants (Watson et al. 2006). To better sense and respond to customer needs, customer-side digital initiatives of firms are often focused on their local operations. For example, Barclays Bank, a major financial player with 118,000 employees and operations in over 60 countries, is focusing on various Internet technologies, such as Web 2.0, blogs, wikis, podcasts, folksonomies, and RSS feeds, to enhance customer service performance across its local branches (Cisco 2007). Similarly, Best Buy focuses on the use of digital technologies, such as those used for data synchronization, to enhance customer service across its stores, and implemented an internal product management system for improvements in the quality of information provided to in-store customers (Kovac et al. 2009). However, despite widespread digitization, leveraging digital technologies in customer-side operations continues to be a challenge for many service organizations. To cope with such challenges, many third parties, such as Cisco's Internet Business Solutions Group, have started to offer consulting services to help firms leverage their customer-side digital technologies for enhanced performance (Cisco 2007). Yet, little is known regarding effective digital business strategies and many large organizations still fail to harness these technologies to enhance their customer service performance (Tallon 2010). Increasingly, there are greater concerns about the very small improvements (approximately 3 to 5 percent) in customer satisfaction across industries (Maoz 2010). In this work, we examine ways to leverage digital technologies for enhanced service performance by proposing and testing a theory of customer-side digital business strategy.

The traditional view of digital business strategy posits development of large-scale systems, such as ASAP and SABRE, that run on centralized infrastructure technologies, such as mainframes (Cash and Konsynski 1985; Hopper 1990; Vitale 1990), to gain a competitive position in the industry due to the size and related network effects of such systems (Porter 1980). However, a contemporary view of digital business strategy emphasizes that, to realize their impacts on performance, digital technologies may be better harnessed by building organizational capabilities (Eisenhardt and Martin 2000; Pavlou and El Sawy 2006; Teece et al. 1997). Such capabilities may help a firm to sense and respond to business opportunities and threats quickly (Gosain et al. 2004). Indeed, prior research has focused on digital business strategies to develop production-side capabilities in various upstream domains, such as new product development (Pavlou and El Sawy 2006, 2010), supply chain (Gosain et al. 2004; Rai et al. 2006), and manufacturing operations (Banker et al. 2006). However, customer-side digital business strategies are less studied.

Following the research studying production-side digital business strategy, most prior research on customer-side digital business strategy has studied links between an organization's centralized information systems resource possessions, such as investments, technical skills, and generic technologies, and customer service performance (Ray et al. 2005). However, customer-side operations are markedly different from production-side operations. Because service creation and delivery is inherently a local activity, a theory of customer-side digital business strategy needs to focus on local dynamics. Unlike goods, production and consumption of services are often concurrent, and services may not be inventoried because the exact configuration of a service interaction may not be known *a priori* (Chase 1978, 1981; Lusch et al. 2007). Finally, customers, who can often be cocreators of services, are becoming more demanding and localized personalization is the key to effective customer service performance (Cenfetelli et al. 2008; Harvey et al. 1997; Vargo and Lusch 2004; Zeithaml et al. 1985). Despite the importance of localized dynamics in service organizations, little research on customer-side digital business strategy focuses on local dynamics. To address the gap, we propose a middle-range theory[2] of customer-side digital business strategy that suggests development of *localized* customer service capabilities to harness digital technologies for enhanced service performance.

In developing our theory, we examine the relationship between the information quality of a customer service unit (CSU) and its customer service capabilities to locally sense and respond to customers' needs. We focus on capability-building dynamics that help develop two customer-side capabilities—namely, customer orientation capability and customer response capability—across CSUs of a service organization. Using a coordination perspective, we propose that information quality enables strategic and operational

[2]Compared to a general theory that is often very broad, middle-range theories are less abstract and more specific to an empirical context (Merton 1968). Often, such middle range theories form the basis for more abstract general theories that are more diversified, inclusive, loose knit, and generalized across various domains (Van de Ven 2007).

coordination required to build customer orientation capability and customer response capability, respectively. In addition, because we examine capability-building dynamics in the context of a CSU, our study examines the role of the CSU's process characteristics in capability-building dynamics. To empirically test the proposed relationships, we collected data from customer service processes across 170 branches of a large bank in India (hereinafter called BANK). In addition to finding positive impacts of a CSU's information quality on its customer service capabilities, our results suggest that the effectiveness of information quality in building customer service capabilities is contingent on the sophistication of the CSU's customer service process.

By presenting a theory of customer-side digital business strategy, our work contributes to research on digital business strategies in multiple ways. First, our theory contributes to the literature studying the impacts of digital technologies in the context of services (Bardhan et al. 2010; Lusch and Vargo 2008; Lusch et al. 2010; Ray et al. 2004; Vargo and Lusch 2004). Prior research has largely focused on the direct impacts of digital technologies on service performance. We extend this literature by studying new relationships between digital technologies and the mediating localized customer service capabilities (Ray et al. 2005; Tallon 2010). Further, prior research in the customer service domain has assessed how acquisition of digital technologies influences customer service performance (Ray et al. 2005). Our work seeks to extend such research by assessing how digital business strategy related to building information quality (an aspect of digital design) enhances customer service performance. We demonstrate that the focus on information quality needs to incorporate the nuances of the local context. Specifically, by studying the moderating impacts of process characteristics on the relationship between digital technologies and customer-side organizational capabilities, we extend prior research that calls for a process-level examination of digital technologies and their consequences (Banker et al. 2006; Barua et al. 2004). Second, by examining the customer-side capability-building dynamics, we extend the stream of research on digital business strategies related to building production-side capabilities (e.g., Banker et al. 2006; Pavlou and El Sawy 2006). Finally, this work extends the literature on *glocalization*—an emerging theme amongst contemporary researchers studying global strategy (Cavusgil and Cavusgil 2012; Ghemawat 2007; Sheth 2011). Although prior research on global strategy focused on the strategic choice between aggregation (global economies of scale) and adaptation (local responsiveness), recent literature suggests a move toward glocalization—that is, customization of a firm's offerings according to local customers' needs while retaining the benefits of globalization, such as economies of scale (Cavusgil and Cavusgil 2012; Ghemawat 2007; Sheth 2011; Steenkamp and de Jong 2010). Digital technologies are a key to coordination across global operations. Our study adds to the literature on glocalization by focusing on ways to leverage digital technologies to enhance localized adaptations in globalizing operations.

Model Development

In proposing our theory of the customer-side digital business strategy, we highlight customer orientation capability and customer response capability as two localized customer service capabilities that enhance customer service performance within CSUs of an organization. Further, we use a coordination perspective to examine the capability-building impacts of the interplay between information quality (an aspect of a CSU's digital design) and customer service process sophistication of the CSU. Our examination of the customer-side digital business strategy is set in the customer service processes of units of a large organization. Figure 1 presents our research model. The constructs in the model are defined in Table 1.

Customer Service Process

A process is often defined as "structured sets of work activity that lead to specified business outcomes for customers" (Davenport and Beers 1995, p. 57) or as activities underlying value generating processes (transforming inputs to outputs), such as inbound logistics, manufacturing, sales, distribution, and customer service (Melville et al. 2004). For example, a customer service process in the insurance industry has been defined as the set of activities that involve episodes of interaction between customers (and agents acting on the behalf of customers) and employees of a firm when customers make inquiries, request changes to a policy, or conduct financial transactions (LOMA 1993; Ray et al. 2005). In general, customer support and service comprises the way that a product is delivered, bundled, explained, billed, installed, repaired, renewed, and redesigned (El Sawy and Bowles 1997). We define customer service process as comprising the set of activities that are associated with the creation and delivery of products and services to customers. Based on this definition, localized customer service capabilities represent a CSU's ability to build specific routines for such activities within the customer service process.

Localized Customer Service Capabilities

Contemporary digital business strategies often focus on capability-building dynamics. In general, capabilities define

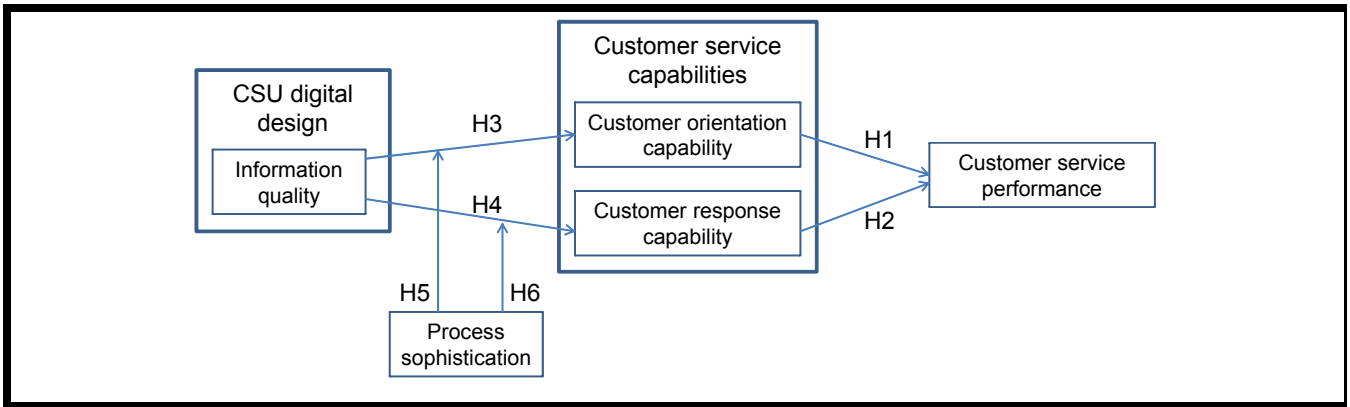

Figure 1. Research Model

Table 1. Construct Definitions

Construct and Definition	Source
Customer service performance of a CSU represents its customers' overall evaluation of its service offering.	Fornell et al. (1996)
Customer orientation capability is defined as the ability of a CSU to monitor the needs of its customers and enable its business strategies with a focus on customer needs.	Narver and Slater (1990)
Customer response capability of a CSU is defined as its ability to quickly and effectively respond to customer needs and wants.	Jayachandran et al. (2004)
Information quality is defined as the completeness, accuracy, format and currency of information produced by a CSU's digital technologies. Completeness refers to the degree to which the system provides all the necessary information; accuracy refers to the user's perception that the information is correct; format is the user's perception of how well the information is presented; and currency represents the user's perception of the degree to which the information is up to date.	Wixom and Todd (2005)
Process sophistication is defined as the complexity and information intensity of a process. Process complexity refers to the nonroutineness, difficulty, uncertainty, and interdependence within a process; and process information intensity refers to the amount of information processing required to effectively manage the activities of the business process.	Karimi et al. (2007) Porter and Millar (1985)

"ways of organizing and getting things done, which cannot be accomplished by using the price system to coordinate activity" (Teece and Pisano 1994, p. 540). Because these may not be bought in open markets, capabilities need to be developed in-house. Capability-building often entails routinization of key tasks and activities within a firm's processes (Eisenhardt and Martin 2000; Teece et al. 1997). Such capabilities are an important aspect of contemporary business strategy as these may enhance the ability of an organization to sense and respond to a changing business environment (Haeckel 1999; Roberts and Grover 2012). Digital technologies are known to be a key enabler of organizational capabilities (e.g., Banker et al. 2006; Mithas et al. 2011; Pavlou and El Sawy 2011; Tanriverdi 2005). However, because of the localized nature of service creation and delivery, capability-building dynamics within service operations are likely to be different from such dynamics in production-side operations (Froehle 2006; Vargo and Lusch 2004). Unlike goods, services may not be inventoried and, hence, are often produced and consumed simultaneously (Bardhan et al. 2010; Vargo and Akaka 2009; Vargo and Lusch 2004). Further, given that customers are often cocreators of services, firms may have to develop capabilities to locally sense and respond to customer needs. Hence, we propose that customer-centric firms may enhance their service performance by building localized customer service capabilities.

Customer Orientation and Customer Response Capabilities

We identify customer orientation capability and customer response capability as two localized capabilities within customer-centric firms that reflect preparedness (or propen-

sity) to act and action, respectively (Deshpande et al. 1993; Jayachandran et al. 2004). Specifically, customer orientation capability may map to the idea of preparedness, reflecting intent, awareness, orientation, theoria, or listening; and customer response capability represents action, reflecting response, move, enactment, conduct, or praxis. At the individual level, marketing studies have often identified twin stages of individual actions, such as (1) interest, orientation, or awareness; and (2) decision, action, or adoption (Bonus 1973; Kalish 1985; Rogers 1995; Van den Bulte and Lilien 1999). Although an analogous formal theoretical model is not prevalent at the aggregate level, prior literature has often built on the *marketing concept* to conceptualize capabilities. The marketing concept suggests that firms should be customer focused. Day (1994) argues for the need to develop market-sensing and customer-linking capabilities to implement the marketing concept in an organization. In prior research, the idea of the marketing concept has been evoked to conceptualize key ideas, such as marketing orientation and customer orientation (Day 1994; Drucker 1954). A marketing orientation emphasizes a broad focus on activities related to three behavioral components—namely, customer orientation, competitor orientation, and interfunctional coordination (Narver and Slater 1990). A more exclusive focus on the customer is proposed through the concept of customer orientation that represents a CSU's understanding of its target buyers for creating superior value for them continuously (Slater and Narver 1994). Based on these arguments, we examine customer orientation capability as a customer service capability of a CSU that helps create localized customer-focused strategies.

Besides customer orientation capability, CSUs in customer-centric firms may need to develop a capability for quick and effective response to customer needs. Jayachandran et al. (2004) argue that customer orientation and customer response are two markedly different concepts. Although customer orientation capability reflects propensity to monitor customer needs, customer response capability represents the ability of a CSU to meet customer needs effectively and quickly (Jayachandran et al. 2004; Martin and Grbac 2003). We next draw on the arguments from the marketing literature to identify and examine the impacts of a CSU's customer orientation and customer response capabilities on its customer service performance.

Customer Orientation Capability as an Antecedent to Customer Service Performance

The concept of customer orientation has been examined extensively at both the individual and aggregate levels. At the individual level, customer orientation often assesses an employee's (especially a salesperson's) customer focus across the stages of a sales process (e.g., Franke and Park 2006; Hartline et al. 2000; Homburg et al. 2011; Hunter and Perreault 2007; Saxe and Weitz 1982). In general, customer orientation represents a culture characterized by continuous monitoring of customer needs and enhancement of customer value (Deshpande and Webster 1989; Han et al. 1998; Kohli and Jaworski 1990; Narver and Slater 1990). CSUs across a customer-centric organization may espouse the development of localized customer orientation capabilities in their CSUs. Such a capability may help a CSU to develop a shared cognition comprising

> the set of beliefs that puts the customer's interest first, while not excluding those of all other stakeholders such as owners, managers, and employees, in order to develop a long-term profitable enterprise (Deshpande et al. 1993, p. 27).

Following these conceptualizations of customer orientation, we define customer orientation capability as the ability of a CSU to monitor the needs of its customers and enable its business strategies with a focus on customer needs.

Customer orientation capability represents a culture of managing a CSU's operations with a focus on customer needs and is an invaluable capability for enhancing performance of a customer service process (Brady and Cronin 2001; Desphande et al. 1993). CSUs with greater customer orientation capability may have the ability to develop a customer-focused business model that considers customer satisfaction to be the core purpose of business (Neill et al. 2007). Hence, such CSUs are likely to better sense customers' interests and prioritize these over those of other stakeholders. Units with greater customer orientation capability have the ability to foster a culture that emphasizes a constant focus and high level of commitment to serving customer needs. Such a customer-oriented culture may also make employees friendlier and more service-oriented, and may enhance customers' attitudes toward the CSU's services (e.g., Brady and Cronin 2001; Goff et al. 1997). For instance, more customer-oriented salespersons are found to enhance customers' willingness to pay (Homburg et al. 2009; Pihlstrom and Brush 2008) and prior research has also found that greater customer orientation enhances the interest of customers to transact with the firm and purchase related products (Siders et al. 2001). Overall, customer orientation capability of a CSU will enable the CSU to have long-term relationships and enhance customer value, service perceptions, and satisfaction (Dean 2007; Han et al. 1998; Homburg et al. 2011; Jones et al. 2003). Given these

arguments, we contend that customer orientation capability will have a positive impact on service performance. Thus, we hypothesize

H1: Customer orientation capability of a CSU will positively influence the customer service performance of the unit.

Customer Response Capability as an Antecedent to Customer Service Performance

Besides enhancing the propensity to monitor and strategize based on customer needs, CSUs need to develop abilities that enable quick and effective responses to meet customer needs. Jayachandran et al. (2004) argue that customer response has two dimensions: expertise and speed. Response expertise characterizes the effectiveness with which a CSU responds and response speed assesses how quickly the unit can respond to customer needs. Based on the two dimensions, we define customer response capability of the CSU as its ability to quickly and effectively respond to customer needs and wants.

With a growing focus on enhancing customer-side performance, firms espouse to offer a quick and effective response to customer needs. Customer response capability of a CSU enhances its service performance by helping it serve contemporary customers who want the right product, when they want it, and where they want it. Units with greater response capability aid quick and effective development of new products and services to serve their customer needs. A case in point is Tesco, a leading UK retailer that customizes its offerings across varied stores, such as hypermarts and neighborhood stores, to create a customer-centric experience (Rust et al. 2010). Due to the advanced customer response capability of its stores, families with newborn babies (on their first time shopping for diapers) get coupons from the retailer for toys, baby wipes, and beer (for the fathers whose frequency of visiting bars is reduced due to the new baby). Superior customer response capability at Tesco stores helps them to configure their service offerings to meet customers' latent needs. Such quick and effective response may enhance customers' perceptions of service performance. Further, CSUs with greater customer response capability are likely to quickly and effectively address any customer grievances or complaints (Homburg et al. 2007; Jayachandran et al. 2004). Overall, units with greater customer response capability possess advanced routines to meet customer needs and enhance customers' service experiences. Thus, we hypothesize

H2: Customer response capability of a CSU will positively influence the customer service performance of the unit.

Information Quality: The Digital Design Aspect for Building Customer Service Capabilities

Using arguments from coordination theories,[3] we next propose that information quality of a CSU enhances customer orientation and customer response capabilities of a CSU. Coordination theories assess patterns of interactions between actors who have diverse goals and who are engaged in performing activities that require varied resources (Malone and Crowston 1994). Digital technologies facilitate such coordination and may influence the structure of activities within organizations (Malone and Crowston 1994). Following the arguments for coordination, we contend that digitally enabled information quality helps build customer orientation capability and customer response capability by facilitating strategic and operational coordination, respectively.

Digital Design: Information Quality

Earlier work assessing organizational impacts of digital technologies emphasized a focus on *investments* in these technologies (e.g., Bharadwaj et al. 1999; Hitt and Brynjolfsson 1996; Menon et al. 2000). *Usage* of digital technologies became a key focus in this stream of research after studies focusing on investments found mixed (or negative) effects of these technologies on performance (Barua et al. 1995; Byrd and Marshall 1997; Devaraj and Kohli 2003; Fichman and Kemerer 1997, 1999; Francalanci and Galal 1998; Lee and Barua 1999; Loveman 1994; Mishra and Agarwal 2010; Mishra et al. 2007; Zhu and Kraemer 2005; Zhu et al. 2006). Going beyond the acquisition and usage of digital resources, related research has identified *digital design* as an antecedent to superior performance. Prior research in the domain has focused on varied aspects of design, such as sophistication of IT infrastructure (Armstrong and Sambamurthy 1999), flexibility of IT infrastructure (Broadbent and Weill 1997; Kumar 2004; Langdon 2006), and information systems service quality (Au et al. 2008; Kettinger and Lee 2005). Information quality is one such aspect of digital design that has received a great deal of attention in recent research. Information quality has been found to influence various outcomes, such as knowledge sharing behavior (Durcikova and Gray 2009), mobile device adoption (Kim and Han 2011), trust in the IT artifact (Vance et al. 2008), user loyalty (Zhou et al. 2010), and customer satisfaction (Kekre et al. 1995).

[3]Coordination theories, characterized by Crowston (1997, p. 159), are a still-developing body of "theories about how coordination can occur in diverse kinds of systems" (Malone and Crowston 1994, p. 87).

We propose that information quality is an important aspect of a firm's digital technology design (DeLone and McLean 1992; Wixom and Todd 2005). Although the quality of information may have several characteristics, four characteristics that are often emphasized are (1) completeness, which refers to the extent to which the digital technologies provide all information required by the employees to perform tasks in the customer service process; (2) accuracy, which refers to the extent to which the information provided by the digital technologies is correct; (3) format, which refers to the presentation of information provided by the digital technologies; and (4) currency, which characterizes the extent to which the information provided by the digital technologies is the most recent and updated information (Wixom and Todd 2005).

The four information quality characteristics may differ across CSUs (e.g., branches) of a service organization (e.g., a bank). Further, the level of completeness, accuracy, format, and currency of information form the quality of information available to employees across the unit. For instance, digital technologies used in a CSU may provide employees more complete information about customer transactions across different interfaces, such as ATMs or other vending machines, Internet, and physical visits to the unit (McGovern and Moon 2007). CSUs may also vary in terms of accuracy of information due to variance in activities to collect and collate data from multiple sources (Strong et al. 1997). For example, inaccuracies in information may arise due to sloppiness of an IS worker or inaccurate queries in a database. Information quality may also be perceived to be poorer in CSUs that are not able to present the results of user queries in a well-formatted and visually appealing manner (Underwood 1999). Similarly, information quality across CSUs may also vary due to currency of information. For example, a CSU with low quality information may not have the information on a customer's most recent transactions.

Information Quality Impacts on Customer Orientation Capability

Building customer orientation capability entails greater *strategic coordination* in the CSU. Developing customer orientation capability entails building and routinizing a culture whereby the unit monitors its customers' needs and strategizes with a focus on customers. CSUs that develop customer orientation capability structure new business activities with a focus on customer service and satisfaction (Brady and Cronin 2001; Kennedy et al. 2003). Because a CSU's strategies and activities are traditionally focused on accounting-based measures of profitability, strategic coordination amongst diverse actors is imperative to build and diffuse a new, customer-oriented culture and routines.

Information quality, an important aspect of digital design, facilitates strategic coordination amongst a CSU's executives. Such strategic coordination entails dialogs and sharing of narratives that help develop routines to systemically identify profitable customer segments, link organizational offerings to the needs and desires of customer segments, and identify ways to make profits through enhancement of customer service (Klein et al. 2006; Neill et al. 2007; Strong et al. 1997; Weick 1995). Because of the tightly managed time schedules of a CSU's strategists, they have limited absorptive capacity to absorb new information, making information quality an important enabler of such strategic coordination. Lack of high quality information may increase the strategists' information over-load and hinder their strategic coordination for building customer-oriented routines. The impacts of information quality for increased strategic coordination and building customer-oriented routines is increasingly becoming evident (Levitt 2004; MacMillan and Selden 2008; Selden and MacMillan 2006). MacMillan and Selden (2008) observed the relationship between information quality and customer orientation at a successful cement company that built a technically high quality product that lacked customer friendliness. A patented additive that decreased the cost and enhanced compressive strength of cement also made the cement less "workable" for the construction worker. Although the product had an adverse influence on customers' interests, the firm primarily focused on cost-accounting based strategies and lacked high quality information about customers. Because it lacked customer-side information, the firm could not engage in the strategic coordination needed to assess the increase in profits by developing customer-oriented routines. Following these arguments, we propose that high quality information is an important factor for building customer-oriented routines.

Besides helping build customer-oriented routines, high information quality enables the strategic coordination requisite to diffuse these routines throughout a CSU, and access to high quality information may help strategists convince customer service managers and process owners to adopt customer-oriented routines. Because customer-oriented routines rely on a lot of information regarding customers, products, and markets, availability of more complete, accurate, timely, and well-formatted information may help executives to perform their tasks better. For example, information related to market intelligence may help such managers become more productive as they will be able to more effectively manage their resources to serve customers (Homburg et al. 2011; Kohli and Jaworski 1990; Maltz and Kohli 1996). Further, low information quality in a CSU may limit the strategic coordination between strategists and customer service executives of the CSU. Due to the limited absorptive

capacity of these organizational actors, low information quality will hinder effective decision-making of executives to understand and evaluate customer-oriented routines. Hence, in CSUs with higher information quality, executives are more likely to associate customer-oriented routines with enhanced productivity and are likely to develop a positive attitude toward such routines. Indeed, evidence from leading organizations, such as GE Healthcare and Best Buy, suggests that the flow of high quality information enhances the diffusion of customer-oriented routines (Gulati 2007). Thus, in CSUs with higher information quality, strategic coordination to champion a customer-oriented culture by seeking managers' buy-in to customer-oriented routines is likely to be more effective.

Given these arguments, we contend that high quality information may facilitate strategic coordination that helps reorient the existing routines and activities of a CSU to be customer-oriented. That is, higher information quality will help build and diffuse routines that instantiate a culture of customer orientation across a CSU. Thus, we hypothesize

H3: Information quality of the customer service process within a CSU will positively influence the customer orientation capability of the unit.

Information Quality Impacts on Customer Response Capability

Besides facilitating routines to sense customer needs and wants, information quality enables *operational coordination* for building customer response capability in a CSU. Customer response capability enables quick and effective response to customer needs, and building such a capability entails routinization of search, collection, classification, sorting, and simplification of information from various sources (Day 1994; Deshpande et al. 1993; Harkness et al. 1996; Homburg et al. 2007; Jayachandran et al. 2004; Narver and Slater 1990; Rust et al. 2010). CSUs with high information quality possess a digital design that facilitates varied forms of operational coordination to build such routines. First, high information quality may facilitate intra-organizational coordination to enhance the effectiveness of customer service managers. As reflected in the hiring strategies of large firms, such as Procter and Gamble (P&G), data mining and analytics are core competencies of contemporary customer service managers (Rust et al. 2010). Complete, accurate, well-formatted, and current information may make such customer service managers more productive by enhancing the efficiency of mutual coordination among them. Because of such operational coordination, customer service managers will be able to better identify complex patterns of customer behavior by collecting, combining, analyzing, and disseminating information across the CSU. That is, CSUs with high information quality will facilitate intra-organizational coordination to enable boundary-spanning activities for quick and effective customer response.

Second, by helping a CSU manage its relationships with various third parties, high quality information may facilitate operational coordination in interorganizational arrangements. For example, a firm with higher quality information about their partners' production runs, inventory, delivery schedules, and plant capacities may be more quick and effective in fulfilling customers' needs. Finally, by enabling operational coordination for product development, high quality information in a CSU may also help in developing and customizing product and service offerings based on customers' inputs. For example, Tumi, a leading marketer for high-end luggage and accessories, used high quality customer information from its point-of-sale outlets to quickly and effectively offer customized bags that suit its frequent business travelers' needs (for ease of packing, unpacking, and mobility) (Selden and MacMillan 2006). Similarly, the case example of Tesco (above) shows the impacts of high quality information on the ability of a CSU to customize its products. Tesco's stores use high quality information collected through its loyalty card (the Clubcard) to customize offerings based on events in customers' lives (Rust et al. 2010).

Based on these arguments, we propose that information quality is an important antecedent to customer response capability because it enables operational coordination to routinize activities for quick and effective customization of services in response to unmet customer expectations. Thus, we hypothesize

H4: Information quality of the customer service process within a CSU will positively influence the customer response capability of the unit.

Moderating Impacts of Process Sophistication in Building Customer Service Capabilities

Because building capabilities entails routinization of various work activities within the customer services process, characteristics of the underlying process are often an important influence in capability-building dynamics (Eisenhardt and Martin 2000; Teece et al. 1997). We propose that sophistication of a CSU's customer service process will moderate the relationships between information quality and the two customer service capabilities. Processes often vary in sophistication due to differences in process complexity and information

intensity (Karimi et al. 2007). Process complexity characterizes nonroutineness, difficulty, uncertainty, and interdependence within a customer service process (Karimi et al. 2007), and the intensity of customer service process information is the amount of information processing required to effectively manage activities within the process (Karimi et al. 2007; Porter and Millar 1985).

Moderating Impacts of Process Sophistication in Building Customer Orientation Capability

Sophistication of a customer service process is likely to influence the relationship between information quality and customer orientation capability of a CSU, such that information quality is likely to have a stronger impact on customer orientation capability in CSUs with more sophisticated customer service processes. Because of more complex and interconnected activities, CSUs with more sophisticated customer service processes require greater strategic coordination to build a shared culture of customer orientation. Due to greater process sophistication, strategic coordination enabled by high information quality becomes more important to enable customer-oriented dialog among various organizational actors, facilitate testing of profitable customer strategies, and disseminate a customer-oriented culture (Rust et al. 2010; Thomke 2003). Because of strategists' limited absorptive capacities, high information quality is even more important to build and diffuse a customer-oriented culture in a CSU with a more sophisticated customer service process, as it becomes a stronger enabler of strategic coordination. In a more sophisticated process, nonroutine, difficult, and uncertain interconnections among customer service activities require higher information quality for effective coordination and meaningful dialog among strategists. In a CSU with a more sophisticated customer service process, due to the increased complexity of activities, it is harder to assess the impacts of customer-oriented routines on a firm's profitability. For example, more complete, accurate, current, and better formatted information is important for strategists in such a CSU to fully assess the impacts of switching to customer-oriented routines to manage the CSU. Hence, strategic coordination to build customer-oriented routines is more effective when higher quality information is available to strategists to identify tradeoffs in shifting to customer-oriented routines and evaluating costs and feasibility of developing customer-oriented strategies.

In such a CSU, higher information quality also aids strategic coordination to seek managers' and process owners' buy-in to customer-oriented routines. A sophisticated customer service process has more complex and information-intense activities. Information quality has a greater value in a more information-intense process than in a less information-intense process because of its greater impact on process outcomes (Porter and Millar 1985). Similarly, greater information quality is more important for managing nonroutine, difficult and uncertain interdependencies in performing complex customer-oriented activities. Hence, managers in CSUs with more sophisticated processes are likely to place greater importance on information quality in assessing the usefulness of customer-oriented routines. Because of greater need for quality information to perform customer-oriented activities in such a CSU, usefulness of higher information quality is likely to be higher for managers and process owners. Hence, higher information quality will be even more consequential for managers' and process owners' favorable attitude toward adoption of customer-oriented routines facilitating managerial buy-in of customer-oriented routines.

Overall, higher information quality will be even more relevant for strategic coordination that enables the building and diffusion of customer-oriented routines within a CSU with a more sophisticated customer service process. Thus, we hypothesize

H5: The relationship between information quality and customer orientation capability will be moderated by process sophistication such that the impact of information quality will be greater in CSUs with more sophisticated customer service processes.

Moderating Impacts of Process Sophistication in Building Customer Response Capability

In addition to its role in building customer orientation capability, we argue that process sophistication moderates the relationship between information quality and customer response capability of a CSU. Specifically, information quality is likely to be even more influential for operational coordination associated with customer response capability in a CSU with a more sophisticated customer service process. Coordination theories explain this moderating impact. According to these theories, the degree of interconnectivity and complexity influence the extent of coordination needed (Malone and Crowston 1994). Because greater interconnectivity and complexity are characteristics of a more sophisticated process, such a process requires greater operational coordination to manage more complex and information-intense activities. Higher information quality enables greater operational coordination needed in such CSUs. Specifically, higher information quality is more important to enable intra-organizational coordination to offer a quick and effective response to customer needs. More accurate, timely, complete,

and well-formatted information helps reduce uncertainty, perform difficult activities, and manage greater interdependencies in intra-organizational activities. Hence, higher information quality becomes even more consequential for customer response capability as it facilitates speedy and effective combination, processing, and communication of information, and quick and effective execution of complex and information-intense customer service activities (Haeckel 1999; Jayachandran et al. 2004; Lee et al. 2008).

Further, due to the increased sophistication of the customer service process, there is a greater need for interorganizational coordination to manage complex and information-intense activities between the CSU and its partners. To manage such a sophisticated customer service process, there is a greater need for operational coordination. High information quality enhances operational coordination as it helps increase connectivity with customers' applications, ensures integrity of data/information across the firm, provides real-time visibility into a supplier's systems to observe in-transit inventory, and synchronizes operations across a more complex network of producers and consumers (Rai et al. 2006). Furthermore, a more information-intense process is easier to disaggregate and is often outsourced to harness specialized expertise of third-party organizations, such as FedEx (Apte and Mason 1995; Mithas and Whitaker 2007; Overby 2008; Quinn 1992). High information quality is especially effective for operational coordination and becomes more important to manage the disaggregated components of such an outsourced process (Rottman and Lacity 2006; Sobol and Apte 1995).

Finally, in a CSU with a more sophisticated customer service process, high quality information also becomes more important in enabling operational coordination for product development and customization. Because of complex and information-intense activities, development and customization of services entails greater information processing and requires operational coordination across various functional areas and activities. High quality information becomes a stronger influence to enable such information processing activities for coordinating product development and customization activities involving varied organizational roles, resources, and activities (Gulati 2007).

Overall, in a CSU with a more sophisticated customer service process, high information quality becomes more important for building customer response capability as it facilitates operational coordination related to intra-organizational, inter-organizational, and product and service development. Thus, we hypothesize

H6: The relationship between information quality and customer response capability will be moderated by process sophistication such that the impact of information quality will be greater in CSUs with more sophisticated customer service processes.

Method

We tested our model using data collected from a large Indian bank with several branches, hereinafter BANK. The banking context is an appropriate setting to test our model for a few different reasons. Against the backdrop of the recent financial crisis, a focus on customer service has been of particular importance to the banking industry. Although all organizations have faced several challenges in maintaining their customers and increasing their customer base, the banking industry is especially prone to this issue. Due to the collapse of several of the large and established banking institutions, the economic crisis has directly affected customers' perceptions of banks (Ernst and Young 2011). As a result, several retail banks have had to emphasize their focus on service performance. To compete and grow in this era of low customer trust in financial institutions, banks have to swiftly accelerate their innovation around banking products and service offerings. Sensing and responding to changing customer needs is imperative to protect and increase market share at a time when customer loyalty is no longer guaranteed (Ernst and Young 2011).

The data for the study were collected through surveys administered across several branches of BANK. The survey data were collected from three sources in each branch: branch managers responsible for the customer service process within a branch, IS managers responsible for developing and managing IS resources used within customer service process in each branch, and the actual customers who used the services at each of the branches.

Setting

BANK is a large bank, with several thousand branches across the country.[4] BANK is broadly comparable with mid-sized U.S. banks, such as Capital One, in terms of revenue and

[4]With liberalization of the economy and emergence of privately owned banks, the banking sector in India is steadily growing. Banks are looking to IT to improve operational efficiency and increase customer satisfaction (Tater et al. 2011). Some of the major developments include installation of a core banking system, payment and settlement systems for fund transfer, Internet banking, mobile banking, automated teller machines, and smart-card based initiatives (RBI 2007) (see Appendix A).

profit, and is comparable to large U.S. banks, such as Wells Fargo, in terms of number of branches. Although BANK is one of the top-five Indian banks, like other Indian banks, BANK has smaller average deposits per account and lesser revenue and profits when compared to large US banks. Given the availability of low-cost human resources in India, BANK has more employees compared to a typical U.S. bank. Also, similar to others in the Indian banking industry, as a means to grow its market share in an increasingly competitive environment, BANK had enhanced its focus on digital technologies.[5]

Across branches of BANK, there is considerable variability in the constructs that we study. Although comparisons should be made with extreme caution due to scale differences, the variability in some of the commonly used service constructs, such as IT asset flexibility and service climate, is comparable to the variance reported by studies in U.S. contexts (e.g., Ray et al. 2005). Across the branches of BANK, use of generic technologies decreases and technical skills increase with the increase in the size of the branch. The customer service and IS departments of BANK are largely decentralized, with each branch maintaining its own customer-facing service personnel who report to the branch manager and IS support service personnel who report to the IT manager in the branch. As BANK grew to become one of the top-five banks in India, many branches of BANK came into existence through acquisitions spanning several years. Consequently, to some extent, these branches have retained their original culture and processes. Hence, the customer service processes examined in our study are locally specific to the branches of BANK. Empirical evidence of the local character of the process is also seen in the variance in customer orientation capability and customer response capability across BANK's branches. Overall, BANK offers a good context for testing a theory of localized capabilities (see also Appendix A).

Participants

The participants in the study were employees of BANK (i.e., IS managers and branch managers) and customers of the specific branches at BANK from which we collected data from the employees. BANK randomly selected 500 branches for our data collection, which served as our sampling frame. The surveys were administered to IS managers, branch managers, and customers at these branches of BANK. The IS manager is the respondent for the information quality scale. Data about customer service capabilities (i.e., customer orientation capability and customer response capability) were obtained from the branch manager.[6] Finally, data on customer service performance were collected by surveying the customers of the branches (i.e., actual users of these services). Of the branch managers and IS managers that formed our sampling frame, we received usable responses from 170 matched respondents, resulting in a response rate of 34 percent. The data from customer service performance were collected from the archival records of customer responses during the year across all 170 branches. Based on the demographics of the branch managers and IS managers who responded to the survey, BANK assured us that the sample was fairly representative of the branch managers and IS managers employed by BANK. Based on the descriptive statistics of the branches in our sample, such as revenue, customer size, and investment in IT, we found the branches to be representative of BANK overall.

Measures

All of our measures were created or adapted from scales that have been validated in prior research. The scales were customized wherever needed to make them relevant to the context of our study, and special care was taken to ensure that the scales were applicable to IS managers and branch managers of BANK. Table 2 presents our items and the modeling of the various constructs.

Information quality of the CSU was measured using the scale developed by Wixom and Todd (2005). Nelson et al. (2005) and Wixom and Todd identified the most commonly used dimensions of information quality as *completeness*, *accuracy, format*, and *currency*. In using the scale, we assess information quality produced by the IT systems used in the branch by using a 12-item scale, with 3 items to measure each dimension of information quality (Wixom and Todd 2005).

Customer orientation capability was measured using the six-item scale used by Im and Workman (2004) and is closely related to Narver and Slater's (1990) measure of market orientation. *Customer response capability* was measured using a scale developed by Jayachandran et al. (2004). This scale measures customer response through two aspects: *response speed* and *response expertise*. Response speed was measured using a five-item scale and response expertise was measured using a three-item scale.

[5]Due to our nondisclosure agreement with BANK, we are unable to reveal specific details that will identify BANK.

[6]Note additional data on customer service performance were also collected from the branch manager. More details of these are presented later in the section titled "*Post Hoc Robustness Analysis*."

Table 2. Measurement of Constructs

Latent Construct	Type	Sub-construct	Type	Items
Information Quality (Wixom and Todd 2005)	Formative	Complete-ness	Reflective	Please rate the quality of information provided by your branch's IT systems used in the customer service processes.
				The IT systems used:
				____ provide a complete set of information.
				____ produce comprehensive information.
				____ provide all the information needed.
		Accuracy	Reflective	The IT systems used in this branch produce correct information.
				There are few errors in the information obtained from the IT systems.
				The information provided by the IT systems is accurate.
		Format	Reflective	The information provided by the IT systems is:
				____ well formatted.
				____ well laid out.
				____ clearly presented on the screen.
		Currency	Reflective	The IT systems provide the most recent information.
				The IT systems produce the most current information.
				The information from the IT systems is always up-to-date.
Process Sophistication (Karimi et al. 2007)	Formative	Process Information Intensity	Reflective	Please rate the extent of information processing and complexity involved in the customer service processes.
				Our customer service processes require a significant amount of information processing.
				There are many steps in our customer service processes that require frequent use of information.
				Information used in the customer service processes needs frequent updating.
				Information constitutes a large component of our products/services to customers.
		Process Complexity	Reflective	The customer service processes often cut across multiple functional areas.
				We frequently deal with ad hoc, nonroutine business processes.
				We generally have a high degree of uncertainty in our customer service processes.
				A majority of our customer service processes are quite complex.
Customer Orientation Capability (Im and Workman 2004)	Reflective	NA	NA	Please rate the ability of this branch to closely monitor the needs of the customers.
				Our business objectives are driven primarily by customer satisfaction.
				We constantly monitor our level of commitment and orientation to serving customers' needs.
				Our strategy for competitive advantage is based on our understanding of customers' needs.
				Our business strategies are driven by our beliefs about how we can create greater value for customers.
				We measure customer satisfaction systematically and frequently.
				We give close attention to repeated customer service.
Customer Response Capability (Jayachandran et al. 2004)	Formative	Response Speed	Reflective	Please rate this branch's ability to satisfy customer needs through effective and quick responses.
				When we identify a new customer need, we are quick to respond to it.
				Customer complaints are not quickly responded to in this branch.
				When we find that customers are unhappy with the appropriateness of our product/service, we take corrective action immediately.
				We believe in being proactive to shape market demand than being reactive.
				When we find that customers would like us to modify a product/service, the departments involved make concerted effort to do so.
		Response Expertise	Reflective	We can easily satisfy the new needs of customers.
				We can satisfy customers' needs much better than other branches.
				We have a reputation for effectively meeting customers' demands.

Table 2. Measurement of Constructs (Continued)

Latent Construct	Type	Sub-construct	Type	Items
Customer Service Performance (ACSI) (Fornell et al. 1996)	Index Score	NA	NA	Please rate the service received from this branch in terms of:
				Overall satisfaction.
				Expectancy disconfirmation (performance that falls short of or exceeds expectations).
				Performance versus your ideal product or service in the category.
Customer Service Performance (Unit Assessment) (Ray et al. 2005)	Reflective	NA	NA	The customer service unit gives customers prompt service.
				Customer service representatives are never too busy to respond to customers.
				Customer service representatives are empowered to solve customers' problems.
				When the customer service unit promises to do something for a customer by a certain time, it does so.
				When a customer has a problem, the customer service unit shows sincere interest in solving it.
				The customer service unit performs the service accurately the first time.
				Customer service representatives understand customers' specific needs.
Customer Service Performance (Relative Assessment) (Homburg et al. 2002)	Reflective	NA	NA	Relative to other branches, our branch's performance this year is much better compared to the previous year on the following attributes:
				____ achieving customer satisfaction.
				____ keeping current with customers.
				____ providing customer benefit.
				____ retaining existing customers.
				____ attracting new customers.
				____ building a positive branch image.
				____ attaining desired market share.
				____ attaining desired growth.

The business process variable, *process sophistication*, is composed of two dimensions: *process information intensity* and *process complexity*. The two dimensions of *process sophistication* were measured using the scales developed by Karimi et al. (2007). We adapted the scales to specifically assess information intensity and complexity of customer service process. Process information intensity and process complexity were both measured using four-item scales.

The dependent variable in our study is *customer service performance*. BANK measured customer service performance using the American Customer Satisfaction Index (ACSI). The ACSI is a market-based three-item index of customer satisfaction for firms across various industries, and serves as a nationally and internationally accepted measure of customer service performance (e.g., Fornell et al. 1996). The ACSI is a customer-reported customer satisfaction score, based on a three-item scale that measures the quality of customer service as experienced by the customer. Specifically, the ACSI score was calculated by BANK based on three aspects of the customer experience: overall satisfaction, disconfirmation of customer expectations, and how the performance delivered fares against the customer's ideal product or service in the category. BANK then provided us the ACSI score for each branch. In addition to ACSI, we use two other measures of customer service performance to test the robustness of our findings. We measured customer service performance based on the assessment of the customer service unit's performance by the branch manager (unit assessment). This measure has been used in prior research by Ray et al. (2005). Additionally, we adapted the measure used by Homburg et al. (2002) to measure the customer service performance of the branch relative to other branches of BANK (relative assessment).

Control Variables

To test the impacts of the quality of IS resources, we control for various other variables that may be associated with customer service processes in firms. Flexibility of IT infrastructure has been found to be an important antecedent to process performance (Ray et al. 2005; Saraf et al. 2007). We control for *IT asset flexibility* by using the scale from Saraf et

al. (2007) to assess the flexibility of IT assets within a CSU. Besides the flexibility of IT assets, overall IT investment, technical skills, and generic technologies may play an important role in customer service performance (Ray et al. 2005). Hence, we control for *IT investment*, *technical skills* and *generic technologies* in a branch using scales from Ray et al. (2005). Branches may also differ based on the *service climate*, which is an important driver of customer service performance (Hansen and Wernerfelt 1989; Ray et al. 2005; Schneider et al. 1992; Schneider et al. 1998). Hence, we control for a branch's service climate using a seven-point Likert scale by adapting items from Ray et al. (2005) to the customer service context. In addition to information quality, *system quality* is another aspect of IS quality. Hence, we expect system quality to be correlated with the two customer-service capabilities and control for the effects of a CSU's system quality using the scale from Wixom and Todd (2005). Further, because branch size is known to be correlated with customer service performance (Ray et al. 2005), we control for *branch size* (number of employees in the branch). Finally, to avoid any bias due to the management style of the CSU head, we controlled for the demographics of the branch head, such as *age*, *gender*, *organizational tenure*, and *organizational position.* These variables were each measured using one item.

Results

In addition to first-order constructs, our model includes second-order formative and second-order reflective constructs. We employed partial least squares (PLS), a component-based structural equation modeling (SEM) technique that allows for modeling multiple interdependent relationships and second-order constructs (Anderson and Gerbing 1988), to analyze the data. The use of PLS has been suggested to test models that include formative constructs and test novel propositions that have limited prior theory (Gefen et al. 2011; Rai et al. 2006) and in cases where new measures are being tested (Gefen et al. 2011). The software package SmartPLS, version 2.0 (Ringle et al. 2005) was used to analyze the data. We employed a bootstrapping method (1,000 iterations) to compute significance levels.

Measurement Model

As a first step, we examined the results of the measurement model estimation. Appendix B shows the loadings and cross-loadings of the first-order constructs. All items loaded on their respective first-order constructs with loadings greater than 0.70, with five exceptions, whose loadings were still greater than or equal to .65. Also, all cross-loadings were less than or equal to .40, with six exceptions, wherein the cross-loadings were still less than .45. In PLS, researchers note that the sufficient criterion to meet discriminant and convergent validity is that the items load above 0.50 on their associated first-order construct and the loading within the constructs is higher than the loading across the constructs (Choudhury and Karahanna 2008; Wixom and Todd 2005). All of our scales meet this criterion. This provides support for discriminant and convergent validity (see Table 3).[7] The internal consistency reliabilities of all scales were found to exceed the 0.70 threshold. The second-order construct of information quality was modeled by estimating the weights of the first-order constructs—completeness (.34***), accuracy (.38***), format (.35***) and currency (.30***). Similarly, the second-order construct of process sophistication was modeled by estimating the weights of the first-order constructs—process information intensity (.48***) and process complexity (.55***). The second-order construct of customer response capability was modeled by estimating the weights of the first-order constructs—response speed (.44***) and response expertise (.48***).

Structural Model

The results of the structural model testing are presented in Tables 4 and 5. We mean-centered the variables before calculating interaction terms (Aiken and West 1991). An examination of the variance inflation factors (VIFs), all of which were less than 4, suggested that multicollinearity is not a concern. The condition index in all cases was within acceptable limits and just a little over 1. Customer orientation capability had a significant positive effect on customer service performance, thus supporting H1. Similarly, a customer response capabiity had a significant positive impact on customer service performance, thus supporting H2. Information quality had a significant effect on both customer orientation capability and customer response capability, thus supporting H3 and H4 respectively. Next, we tested for the interactions, wherein the

[7]We also examined the item-construct correlations for the first-order constructs. The correlations indicated that the items for the first-order constructs have higher correlations with their respective first-order construct than with another construct (Choudhury and Karahanna 2008; Rai et al. 2006). We also assessed discriminant-validity for the second-order constructs based on the Fornell-Larcker (1981) test. As suggested by Fornell and Larcker, a construct is distinct from other constructs if the square root of the average variance extracted (AVE) for it is greater than its correlations with other latent constructs. As shown in Table 3, using this criterion, our constructs meet the criterion for discriminant validity (see Chin 1998; Choudhury and Karahanna 2008).

Table 3. Reliabilities, Descriptive Statistics, AVEs and Correlations

	ICR	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. IT asset flexibility	.73	5.10	1.20	.66																
2. IT investment	NA	120040	30890	.14*	NA															
3. Technical skills	.70	5.78	0.78	.13*	.14*	.71														
4. Generic technologies	.73	5.01	0.75	.08	.07	.04	.70													
5. Age (note 4)	NA	41.22/ 32.44	7.21	.03	.02	.02	.04	NA												
6. Gender	NA	73 women		.05	.04	.04	.02	.10	NA											
7. Org. tenure	NA	10.20	4.28	.02	.04	.02	.04	.07	.03	NA										
8. Branch size	NA	133.80	29.20	.15*	.12*	.08	.03	.08	.03	.02	NA									
9. Service climate	.73	4.34	1.28	.16**	.10	.03	.01	.02	.02	.04	.13*	.71								
10. System quality	NA	4.71	1.77	.14*	.07	.07	.04	.04	.08	.05	.12*	.16**	NA							
11. Information quality	NA	4.91	1.60	.12*	.03	.02	.02	.01	.04	.01	.15*	.13*	.25***	NA						
12. Process sophistication	NA	4.80	1.54	.08	.05	.05	.04	.04	.02	.03	.14*	.13*	.16**	.15*	NA					
13. Customer orientation capability	.70	4.45	1.23	.20**	.08	.06	.06	.05	.14*	.08	.14*	.21***	.25***	.30***	.21***	.75				
14. Customer response capability	NA	4.38	1.38	.24***	.13*	.06	.04	.04	.08	.05	.13*	.20**	.24***	.26***	.29***	.37***	NA			
15. CSP (ACSI)	NA	39.8	16.00	.15*	.08	.03	.01	.06	.10	.08	.13*	.21***	.20**	.20**	.24***	.40***	.39***	NA		
16. CSP (UNIT)	.70	4.08	1.55	.18**	.10	.06	.02	.05	.05	.05	.15*	.21***	.22***	.22**	.25***	.42***	.46***	.67***	.71	
17. CSP (REL)	.74	4.13	1.61	.21***	.18	.07	.04	.09	.05	.09	.14*	.15*	.23***	.24***	.19**	.44***	.44***	.60***	.64***	.73

Notes:
1. ICR: Internal consistency reliability; Off-diagonal elements are correlations between constructs.
2. Diagonal elements are the square root of the shared variance between the constructs and their measures.
3. NA: Not Applicable; *p < 0.05; **p < 0.01; ***p < 0.001.
4. CSP: Customer service performance; ACSI: American Customer Satisfaction Index; UNIT: Unit performance; REL: Relative performance.
5. Descriptives of first-order constructs for information quality: M (SD): completeness: 4.48 (1.81), accuracy: 4.90 (1.75), format: 4.95 (1.84), and currency: 4.70 (1.55).

Table 4. Structural Model Results: Predicting Customer Service Capabilities

	Customer Orientation Capability		Customer Response Capability	
	Control Variables	Full Model	Control Variables	Full Model
R^2	.13	.23	.15	.30
Change in R^2		.10***		.15***
Control Variables				
IT asset flexibility	.13*	.08	.14*	.12*
IT investment	.05	.04	.04	.02
Technical skills	.04	.03	.05	.04
Service climate	.03	.02	.03	.03
Generic technologies	.04	.03	.08	.02
Age	.05	.04	.05	.03
Gender	.03	.02	.05	.02
Organizational tenure	.04	.02	.04	.02
Branch size	.13*	.10	.10	.08
System quality	.23***	.22***	.24***	.21***
Information quality (IQ)		.26***		.29***
Process sophistication (PS)		.10		.06
Interaction Effects				
IQ × PS		.24***		.30***

Note: *p < 0.05; **p < 0.01; ***p < 0.001.

Table 5. Predicting Customer Service Performance

	Customer Service Performance (ACSI)		Customer Service Performance (Unit Assessment)		Customer Service Performance (Relative Assessment)	
	Control Variables	Full Model	Control Variables	Full Model	Control Variables	Full Model
R^2	.08	.22	.10	.24	.13	.26
Change in R^2		.14***		.14***		.13***
Control Variables						
IT asset flexibility	.08	.06	.14*	.12*	.17**	.14*
IT investment	.04	.04	.02	.02	.10	.05
Technical skills	.05	.04	.04	.03	.05	.04
Service climate	.02	.01	.04	.03	.03	.01
Generic technologies	.05	.02	.07	.03	.03	.02
Age	.02	.01	.07	.03	.04	.02
Gender	.04	.03	.04	.02	.05	.03
Organizational tenure	.02	.01	.04	.02	.02	.01
Branch size	.02	.02	.02	.01	.05	.03
System quality	.13*	.10	.14*	.08	.14*	.10
Main Effects						
Customer orientation capability		.34***		.31***		.34***
Customer response capability		.33***		.41***		.42***

Note: *p < 0.05; **p < 0.01; ***p < 0.001.

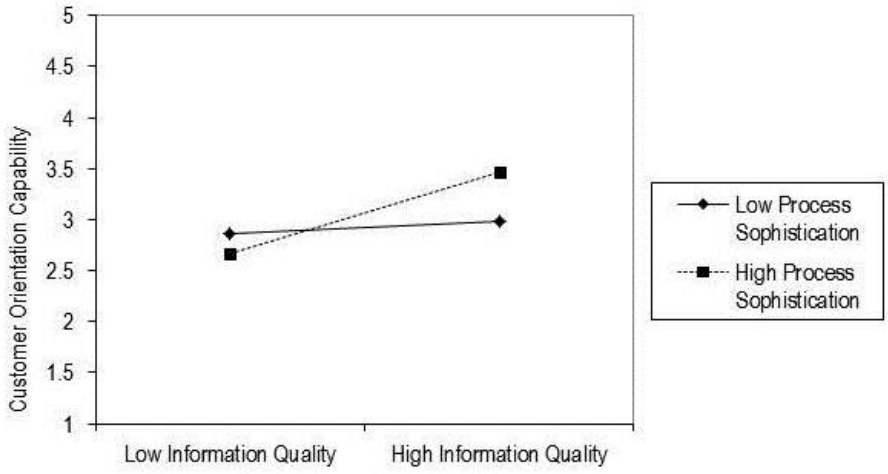

Figure 2. Interaction Plot of Information Quality and Process Sophistication on Customer Orientation Capability

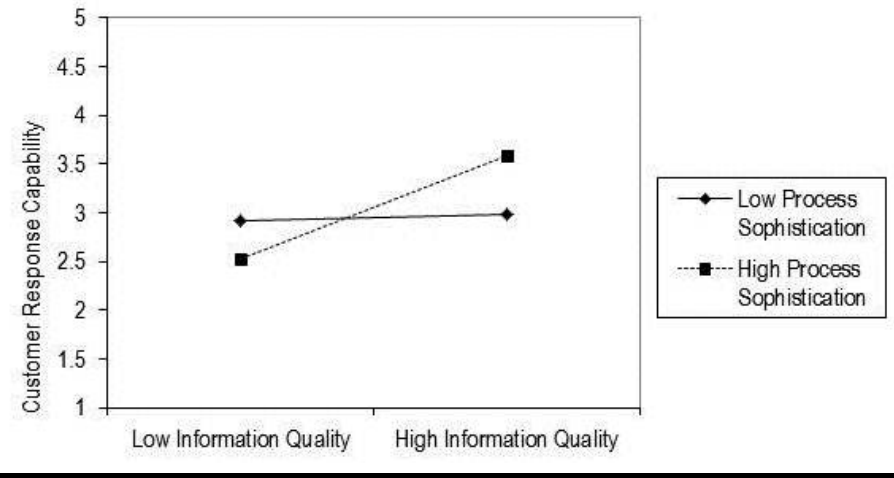

Figure 3. Interaction Plot of Information Quality and Process Sophistication on Customer Response Capability

influence of information quality on each of the two customer service capabilities (i.e., customer orientation capability and customer response capability) is moderated by process sophistication. We found that the interaction between information quality and process sophistication on customer orientation capability was positive and significant, thus supporting H5. Process sophistication interacted with information quality to influence customer response capability, thus supporting H6. In sum, all of our hypotheses were supported.

To better understand the nature of the moderation by process sophistication, we plotted the interactions following the guidelines of Aiken and West (1991). The interactions were plotted one standard deviation above and below the mean for information quality, and are presented in Figures 2 and 3. Figure 2 shows that information quality has a greater impact on customer orientation capability when process sophistication is higher. Interestingly, as shown in Figure 2, for low levels of information quality, having a simple process (low process sophistication) is more beneficial for customer orientation than a more sophisticated process (high process sophistication). Observing the interaction plot in Figure 3, we see that both information quality and system quality have a greater impact on customer response capability for higher process sophistication. Similar to the pattern observed in Figure 2, Figure 3 suggests that at low levels of information

quality, higher customer response capability can be achieved by having lower process sophistication. A slope differences test (see Dawson and Richter 2006) revealed a significant difference between the slopes across low and high levels of process sophistication.

Post Hoc Robustness Analysis

As noted earlier, in addition to ACSI, we measured customer service performance based on the scale used by Ray et al. (2005) and the scale adapted from Homburg et al. (2002). These scales are used to test the robustness in the prediction of the ultimate dependent variable (i.e., customer service performance). We observed similar results, shown in Table 5, with the use of these two different scales of customer service performance, thus supporting the robustness of our findings.

We also examined the nature of interactions of information quality and system quality with the two first-order dimensions of process sophistication (i.e., process information intensity and process complexity). The plots (not shown) indicated that the direction of interaction of the first-order dimensions of process sophistication with information quality is similar to that of the interaction of process sophistication with information quality, thus supporting the robustness of the pattern of interactions.

Discussion

We advanced a theory of customer-side digital business strategy by highlighting the relationships between digital design and customer service performance of a firm. Specifically, we examined the impacts of information quality—an aspect of digital design—on customer service performance by identifying the mediating impacts of localized customer service capabilities. The capability-building dynamics are assessed for two localized customer service capabilities (i.e., customer orientation capability and customer response capability) across CSUs of a service organization. The two capabilities represent a CSU's propensity to act and ability to act in response to customers' ever-changing needs and wants. Because these capabilities are built within CSUs, our work highlights the sophistication of a CSU's customer service process as a moderator of the relationship between information quality and customer service capabilities. The model was empirically tested by collecting data from 170 customer service processes across as many branches of a bank. The findings indicate that information quality of a CSU is a significant determinant of its customer service capabilities. Further, the relationships between information quality and customer service capabilities are stronger in a CSU with a more sophisticated customer service process. Our examination of customer-side capability-building dynamics makes key theoretical contributions to the literature on digital business strategy.

Theoretical Contributions

By focusing on capability-building dynamics in customer-side operations, our work extends prior research that has primarily focused on digital business strategies to build production-side capabilities. Our study contributes to this research by focusing on customer-side capability-building dynamics and arguing for a shift in the digital business strategy from resource acquisition to capability building (Makadok 2001; Ray et al. 2005). Capability-building is a new perspective in the research on digital business strategy (Pavlou and El Sawy 2011; Sambamurthy et al. 2003). Customer-side capability-building dynamics are relatively less studied and prior research has primarily focused on leveraging digital technologies to build production-side capabilities, such as just-in-time and customer–supplier participation capabilities in manufacturing plants (Banker et al. 2006), reconfigurability in new product development process (Pavlou and El Sawy 2006), and competitive process capabilities for external resource management (Rai and Tang 2010). By building a theory of customer-side capabilities, our research extends prior examination of customer-side digital business strategies that focus on the direct impacts of digital technologies or skills on customer service performance (Ray et al. 2005).

By presenting a theory of localized digital business strategy, our study may give an impetus to research on glocalization of services (Cavusgil and Cavusgil 2012; Ghemawat 2007; Sheth 2011; Steenkamp and de Jong 2010). Although digital technologies are widely known to be important for global operations, our study extends prior research on glocalization by showing ways to leverage digital technologies to enhance localized adaptation in service operations. Further, our focus on the customer-side digital business strategy could start a new debate and aid new research on the alignment between global and digital business strategies (Ghemawat 2007). For example, future research may identify digital business strategies to coordinate global plans and local adaptations (Ghemawat 2007), to customize product and offerings across different cultures (Thompson and Arsel 2004), to aid fusion between local and global markets (Sheth 2011), and to influence consumer attitudes toward global and local products (Steenkamp and de Jong 2010).

Because the focus of our study is on local (here, CSU) dynamics, we offer a process-level understanding of the impacts of

digital technologies. Specifically, our findings of a significant interplay between digital technologies and process sophistication empirically validate the role of process characteristics in capability-building dynamics. In doing so, we present a nuanced understanding of the moderating impacts of process dynamics in leveraging digital technologies in local operations and answer calls for a micro-level process focus in examining digital dynamics within customer service processes (Ray et al. 2005). Drilling further into the process-level impacts, through a *post hoc* analysis, we found that the moderating impact of process sophistication is significantly greater for building customer response capability than for building customer orientation capability. Consistent with prior research showing limited impacts of centralized IT resources, our study suggests that a strategic focus on a central pool of digital technologies and IT skills may not be sufficient for increased service performance in local operations (Ray et al. 2005). In sharp contrast, we argue that a digital business strategy focused on localized capability-building may lead to a significant increase in localized service performance (Chase 1978, 1981; Lusch et al. 2007). To offer a richer understanding of the impacts of digital technologies, future research may simultaneously focus on centralized and localized dynamics in a firm's customer-side digital business strategy. In addition, findings regarding contingency impacts of local context (i.e., the moderating role of process sophistication) are likely to open new domains of future research. Specifically, researchers may focus on the other contingencies that may moderate the impacts of digital technologies. For example, future research may examine the impacts of localized intra-organizational contingencies, such as the unit's culture and service climate, on service performance (Castrogiovanni 1991; Glick 1985; Ray et al. 2004; Walumbwa et al. 2010). More research is also needed to examine the role of governance mechanisms (e.g., centralized, decentralized, or federal) in a firm's digital business strategy to leverage customer-side digital technologies (Sambamurthy and Zmud 1999).

Our study also contributes by highlighting the role of localized digital design in a firm's customer-side digital business strategy. This focus on localized design of digital technologies has a backdrop in the broader literature on business value of IT. In this literature, researchers are gradually moving away from a focus on IT investments. Recent research has used alternate conceptualization of digital technologies, such as IT functionalities (Pavlou and El Sawy 2006) and actual use of IT applications (Devaraj and Kohli 2003; Mishra and Agarwal 2010). In contemporary business environments, the relative ubiquity of digital technologies implies that merely investing in digital technologies or enhancing their usage may not be sufficient for a firm to gain competitive advantage. Against this backdrop, our study contributes by suggesting a customer-side digital business strategy that is focused on digital design. Although information quality—an aspect of digital design—is found to influence customer service capabilities, our theory and associated analyses are at the level of overall information quality and we do not assess impacts of individual dimensions of information quality in building customer service capabilities. Indeed, the four dimensions of information quality may vary in their impacts on the two customer service capabilities. Furthermore, impacts of each dimension may be different for building the two capabilities—namely, customer response capability and customer orientation capability. Future research should be conducted at a dimension level analysis to extend the literature on information quality (Gorla et al. 2010; Urbach et al. 2010; Vance et al. 2008; Wixom and Todd 2005; Zhou et al. 2010). In general, by doing a dimension level analysis to assess the impacts of digital design, future research may assess specific features of good digital design and their role in a firm's digital business strategy. Future research may also assess dynamics to build effective digital designs in a firm. For example, researchers may examine the impacts of governance modes for structuring information systems (Aral and Weill 2007) and appropriate IT management practices (Xue et al. 2008) on a CSU's information quality.

Our findings are also likely to open up new domains of research to assess behavioral aspects of a firm's digital business strategy. Our findings indicate that although information quality impacts on customer service capabilities increase with an increase in process sophistication, impacts of low levels of information quality are worse for a CSU with a more sophisticated customer service process than they are for a CSU with a less sophisticated customer service process. Behavioral dynamics may underlie these unhypothesized findings. For example, low quality systems are more likely to be circumvented by customer service managers. Under time pressure, customer service managers are known to offer an affective, rather than a well thought-out cognitive, response to customer demands (Homburg et al. 2007). In our context, this may indicate that for a CSU with a less sophisticated customer service process, bypassing digital routines (that facilitate a cognitive response) and relying on a heuristic response may enhance the overall speed and effectiveness of response. However, such bypassing of digital technologies may not have a desirable outcome in a CSU with more sophisticated customer service process. These arguments indicate that behavioral dynamics may play an important role in a firm's capability-building strategy. However, in prior literature, behavioral impacts in capability-building are less studied. Although such dynamics are not a focus of our study, it may catalyze a new stream of inquiry that reveals the behavioral side of digital business strategy (e.g., Walsh 1995). For example, future research may examine a customer's

expectations from a firm's digital business strategy and impacts of a firm's ability to meet such expectations on customer satisfaction and intentions to transact with the firm (McKinney et al. 2002). Future research may also focus on behavioral dynamics underlying capability-building efforts of a firm. Such a focus on behavioral issues is likely to further enrich the literature on digital business strategy.

For future research, our findings also highlight the vast and untapped research potential at the intersection of IS and marketing. Although digital technologies offer the technical platform to realize the economic impacts of varied marketing processes (Reinartz et al. 2004), little prior research has examined the dynamics to harness these technologies for superior marketing outcomes. Building on our study, future research may examine how marketing outcomes are influenced by other aspects of digital design, such as IS infrastructure portfolios (Byrd and Turner 2000), flexibility of IT assets (Duncan 1995; Ray et al. 2005; Saraf et al. 2007), and sharability and reusability of IS (Duncan 1995). A focus on digital design is especially important as the marketing literature highlights the complexity in leveraging digital technologies, such as those related to sales or Internet marketing, that often have limited or even negative effects (Hunter and Perreault 2007; Lee and Grewal 2004). More research on effective digital business strategies to harness digital technologies may lead to enhanced marketing performance. For example, future research may examine mechanisms by which firms leverage their digital technologies to enhance their marketing capabilities. Studies on good digital design will further contribute to marketing research studying dynamics related to acquisition and development of a robust technological infrastructure for enhancing marketing effectiveness (Reinartz et al. 2004; Srinivasan et al. 2002), and offer insights to the IS literature by studying organizational design and performance impacts of digital technologies (Nevo and Wade 2010; Pavlou and El Sawy 2006; Rai and Tang 2010).

One of the limitations of our work is the focus on two capabilities to study customer-side digital business strategy may be considered *ad hoc*. Indeed, firms build specific capabilities that are most suited to their business context, competition in markets, and past commitments. In his work on marketing capabilities, Day (1994) argued that "as yet little is known about how to identify these distinctive capabilities" (p. 50), and suggests that criteria that may guide the selection of capabilities are the ease with which such capabilities may be identified in an organizational context and their relevance for core processes in the domain. In the marketing context, Day identified two capabilities: market sensing and customer linking capabilities. Our study is more narrowly focused on one domain of marketing: customer service. Analogous to prior work, we believe that the two capabilities—customer orientation capability and customer response capability—represent two critical customer service capabilities of a CSU. These represent a CSU's propensity to monitor and strategize with a customer focus, and respond to customer needs and wants respectively. Logically, the two may represent the abilities that enhance a CSU's disposition to customer service and enable customer-focused actions, respectively. Although there is theoretical and logical validity in our choice of the two capabilities, we note that future research may identify other relevant customer-related capabilities that enhance the overall customer service performance of a firm.

Given our focus on localized capability-building dynamics, we collected data from multiple CSUs of one organization. Although the focus on only one organization helps control for extraneous factors that may influence the results in a multi-organizational study, it may limit the generalizability of our findings. Such a tradeoff between generalizability and internal validity is often a dilemma that researchers face in deciding on an appropriate research design (McGrath et al. 1982). We chose a research design that offers greater internal validity and offers a good test of our theory of customer-side digital business strategy. Future research should address this limitation by examining the generalizability of our model to other settings. For example, future research may examine if effective customer-side digital business strategy for localized operations is as effective as it is for nonlocalized services.

Managerial Implications

With the growing role of services in the economy, our study has many practical implications for enhancing a firm's customer service performance. In contemporary firms, use of digital technologies and franchise arrangements are two key means to enhance service performance. Our study suggests that senior executives in service organizations may need to evolve a localized digital business strategy to leverage their digital technologies across their own and their franchisee's CSUs. Across these CSUs, digital technologies may help develop customer service capabilities. Because they are rooted in the local context, such capabilities may be harder to imitate or substitute. Hence, localized customer service capabilities may be a sustained source of long-term competitive advantage. Further, significant impacts of local information quality imply that business strategists need to prioritize initiatives to enhance local digital designs. For example, managers may enhance their focus on initiatives, such as ISO 9126 (or CMM), to improve information quality across their CSUs (Boegh et al. 1999; Gorla et al. 2010).

Our study also has important implications for financial organizations, such as banks. There is a growing focus on

local operations across these financial institutions. According to an estimate by McKinsey, Europe's retail banking operations may be spending €10 billion or more for modernizing local branches (Bidmead et al. 2007). Similar investments in localized operations in the retail financial industry have been planned in the United States and other countries. However, even with an increased focus on physical design of local CSUs, banks have not been able to enhance their customer service performance (Bidmead et al. 2007). Our study recommends a focus on digital technologies and offers ways to leverage these technologies for enhanced service performance in local operations. Overall, given the current interest in enhancing and reinventing local operations in banks, our study offers insights regarding digital business strategies that may help the banks offer an efficient response to new challenges in their customer markets (Bidmead et al. 2007). For example, banks may vary their digital designs for each CSU based on their customer service goals in the local markets and the sophistication of customer service processes. In addition, our findings have important implications for the Indian financial industry. Banks in India are increasing their focus on digitizing their service operations. With the increase in the use of digital technologies, effective customer-side digital business strategies are important to leverage such technologies for enhanced service performance. The bank in our study is a leading Indian bank and our findings have implications for digital business strategies across the Indian banking industry that contributes about 5 percent to the Indian GDP.

The findings also have implications for firms, such as Walmart and Starbucks, that are glocalizing their operations to serve the huge middle class that is growing rapidly due to a rise of multiple economic centers across the world (Thompson and Arsel 2004). Our findings of interactions involving process sophistication and information quality are likely to have prescriptive value for such firms. Specifically, firms may refine their customer-side digital business strategy considering these interactions. Based on the sophistication of customer service processes and goals of customer service performance, firms may customize their initiatives to build effective digital designs across CSUs. In sum, by revealing process interactions in customer-side digital business strategy, our study is likely to be valuable for localization of customer-side digital business strategy.

Conclusions

Our research builds a theory of customer-side digital business strategy that shows how to leverage digital technologies for building a customer-centric organization. With the growing interest among firms in becoming more customer-centric, our study suggests leveraging digital technologies to build localized customer service capabilities across CSUs of an organization. To build such localized customer service capabilities, we emphasize a greater focus on the appropriate digital design that is in line with the sophistication of a CSU's customer service process. A notable strength of our study is that we use multiple sources of data collected from 170 CSUs to empirically test our model. Our study leads to a better understanding of customer-side digital business strategy and is likely to open many new areas for future research on digital business strategy.

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SPECIAL ISSUE: DIGITAL BUSINESS STRATEGY

LEVERAGING DIGITAL TECHNOLOGIES: HOW INFORMATION QUALITY LEADS TO LOCALIZED CAPABILITIES AND CUSTOMER SERVICE PERFORMANCE

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Appendix A

Indian Banking Context

The Indian banking sector has undergone rapid transformation since 1991—the year India started a series of economic reforms. As part of the reforms, along with public sector banks, private sector banks started operations in the country. Due to the rapid reforms of the banking sector and the increased competition, Indian banks are now featured prominently on the global stage. Estimates indicate that 22 Indian banks are in the list of top-1000 banks and 5 of them feature in the list of top-500 banks (Singh 2007). BANK, the bank studied by us, is one of these top banks.

The Indian banking sector is a relevant context as it plays a significant role in the growth of the Indian economy. Like other nations, India's banking sector is a key contributor to the national GDP (see Table A1[1]). Although Indian banks play an important role in Indian GDP, in comparison to their global counterparts, the Indian banks are smaller in terms of capital base and assets. For example, the biggest Indian bank, State Bank of India, has a market capitalization of under $10 billion compared to the market capitalization of $243 billion for Citigroup (Singh 2007). Although Indian banks are smaller in terms of the size of their capital base and assets, they are ahead of their global counterparts in terms of efficiency. Except for Bank of America and Citigroup, not too many of the global giants match Indian banks in terms of ROA—an important metric indicating efficiency (Dun & Bradstreet 2010; Singh 2007). Similarly, Indian banks are on par with the two global giants in terms of non-performing assets (NPAs), a key metric denoting efficiency of operations (Dun & Bradstreet 2010; see Table A2). These arguments indicate that, although comparatively smaller, service operations in Indian banks are quite sophisticated and well managed.

Usage of advanced digital technologies may be the reason for high efficiency in Indian banks. Because Indian banks adopted advanced digital technologies later than their global counterparts, they have been able to avoid varied legacy systems. In designing their digital infrastructure, Indian banks have adopted advanced digital design concepts, such as distributed computing. In building such advanced digital designs, Indian banks have benefitted from the vast availability of highly skilled and low cost technology talent in the country. As a result, the spending in the Indian banks is less than $11 per account on IT systems and services compared to an average spend of $76 per account in European banks (see Table A3). The low spending rates on digital technologies indicate a greater potential for adoption of such technologies in future. Greater

[1] McKinsey & Company (2007) is the basis for the findings in Table A1, Table A3 and Table A4. McKinsey & Company, in association with the Indian Banks' Association, profiled 14 leading banks in India based on five proprietary surveys that compared leading Indian banks with their global peers. The five surveys were McKinsey's Personal Financial Services Survey, Excellence in Retail Banking Survey, Organizational Performance Profile Survey, Asset Liability Management Survey, and IT Benchmarking Survey.

Table A1. Banking to GDP Ratio Across Countries

Country	% Contribution of Banking to GDP
China	6.5
USA	5.3
India	5.1
UK	4.8
Malaysia	2.6
Thailand	2.5

Source: McKinsey & Company 2007

Table A2. Comparison of Performance Ratios in Banks Across Developed and Developing Countries

	Country	ROA	ROE	NPL to Total Loans
Developed Countries	Australia	0.6	11.3	1.1
	Japan	0.2	4.9	1.8
	Singapore	1.1	11.1	2.3
	UK	-0.1	-2	3.3
	US	0.1	0.9	5.4
Emerging Countries	Brazil	1.2	13	4.5
	Russia	0.7	4.9	9.6
	India	1	12.5	2.4
	Indonesia	2.6	35.9	3.8
	China	1.1	NA	1.6
	Philippines	1.1	9.4	4.6

Source: Dun & Bradstreet 2010

Table A3. Technology Spending by Indian and European Banks (in US$ 000s)

	IT Spend[a] / Banking FTE*	IT Spend / 1000 Accounts	Network Spend / Access Point	(Desktop + Helpdesk) Spend / Desktop
Best Indian banks[b]	2.4	10.2	7.0	0.4
India	6.2	15.9	11.9	0.5
Sample average	9.1	n/a	11.7	1.0
European bank average[c]	21.2	76	n/a	1.5

Source: McKinsey & Company 2007

*FTE indicates full time equivalent employees

[a]IT spend is obtained from McKinsey's IT benchmarking survey. IT spend captures total spending on IT across categories, activities, and frequencies (i.e., recurring or one-time). Network spend and desktop spend are two categories of IT spending.

[b] Sample set of best banks in India includes 5 leading private and foreign banks.

[c] As with the Indian banks, European bank average was obtained from a sample of the leading banks in Europe.

use of digital technologies may help the Indian banking sector to counter the varied challenges it faces. Although Indian banks have done well in increasing shareholder value, allocating capital and contributing to GDP growth, they are facing challenges regarding financial inclusion and management of intermediation costs.

Especially, financial inclusion is an important goal in the Indian context because Indian households have one of the highest saving rates in the world, but Indian banks have little access to these funds. On an average, Indians save approximately 32.4 percent of their income (McKinsey & Company 2007). Household savings account for approximately 70 percent of India's gross national savings. However, because of geographical fragmentation, the financial system can access only 47 percent of these savings. Most of the savings deposits of Indian banks (60 percent) are from urban households even though the urban households constitute only 27 percent of the population. Further, the banking sector faces challenges in managing the intermediation cost and the cost of lending continues to remain high in India in comparison to lending costs in other countries (see Table A4). Because there is a greater scope to further grow the use of digital technologies, they are likely to play an important role in enabling the Indian banking sector to meet its challenges. Because of being representative of Indian banking services, BANK offers a good context to test our theory of customer-side digital business strategy.

Table A4. Intermediation Costs in Banks Across Countries

Country	Difference Between Lending Rate and Deposit Rate (In Percentage)
India	5.1
Thailand	4.0
China	3.4
USA	2.9
Singapore	2.4

Source: McKinsey & Company 2007

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Appendix B

Loadings and Cross-Loadings

	COMP	ACCU	FORM	CURR	PII	PCOM	SPE	EXP	ORI	CSP-REL	CSP-UNIT
COMP1	0.74	0.17	0.19	0.40	0.17	0.15	0.13	0.10	0.07	0.19	0.13
COMP2	0.73	0.15	0.40	0.13	0.14	0.17	0.08	0.10	0.17	0.16	0.14
COMP3	0.71	0.41	0.12	0.17	0.15	0.16	0.40	0.15	0.19	0.24	0.23
ACCU1	0.37	0.70	0.13	0.13	0.17	0.18	0.20	0.24	0.25	0.27	0.22
ACCU2	0.35	0.73	0.14	0.14	0.22	0.24	0.23	0.21	0.27	0.30	0.32
ACCU3	0.34	0.74	0.15	0.16	0.15	0.17	0.10	0.18	0.14	0.36	0.31
FORM1	0.30	0.07	0.77	0.17	0.12	0.13	0.14	0.16	0.15	0.17	0.32
FORM2	0.31	0.13	0.75	0.19	0.21	0.24	0.23	0.22	0.21	0.10	0.15
FORM3	0.44	0.17	0.70	0.16	0.15	0.13	0.12	0.13	0.17	0.19	0.24
CURR1	0.38	0.19	0.25	0.74	0.12	0.16	0.15	0.17	0.20	0.23	0.21
CURR2	0.31	0.21	0.26	0.73	0.13	0.14	0.16	0.10	0.14	0.17	0.20
CURR3	0.30	0.24	0.22	0.71	0.10	0.16	0.17	0.24	0.22	0.17	0.15
PII1	0.31	0.17	0.14	0.17	0.74	0.13	0.44	0.17	0.27	0.20	0.19
PII2	0.34	0.23	0.17	0.15	0.71	0.12	0.10	0.12	0.13	0.17	0.19
PII3	0.30	0.21	0.12	0.14	0.73	0.17	0.12	0.10	0.14	0.14	0.20
PII4	0.33	0.24	0.10	0.10	0.70	0.14	0.10	0.17	0.16	0.21	0.24
PCOM1	0.31	0.22	0.15	0.17	0.35	0.74	0.13	0.16	0.17	0.24	0.20
PCOM2	0.24	0.17	0.16	0.20	0.32	0.75	0.12	0.15	0.12	0.27	0.12
PCOM3	0.21	0.15	0.17	0.22	0.17	0.80	0.18	0.14	0.17	0.20	0.17
PCOM4	0.20	0.17	0.19	0.24	0.19	0.75	0.19	0.10	0.12	0.28	0.28
SPE1	0.20	0.19	0.21	0.23	0.14	0.17	0.71	0.17	0.13	0.25	0.24
SPE2	0.20	0.24	0.24	0.21	0.22	0.15	0.74	0.19	0.14	0.21	0.23
SPE3	0.21	0.22	0.20	0.20	0.26	0.14	0.77	0.22	0.14	0.20	0.22
SPE4	0.24	0.21	0.22	0.17	0.27	0.19	0.70	0.15	0.17	0.20	0.20
SPE5	0.19	0.15	0.10	0.28	0.11	0.12	0.66	0.16	0.15	0.08	0.14
EXP1	0.14	0.14	0.12	0.24	0.10	0.13	0.19	0.73	0.13	0.05	0.12
EXP2	0.16	0.10	0.14	0.23	0.12	0.05	0.18	0.74	0.12	0.04	0.17
EXP3	0.15	0.07	0.16	0.22	0.13	0.08	0.30	0.72	0.16	0.01	0.10
ORI1	0.14	0.13	0.12	0.21	0.14	0.41	0.32	0.14	0.70	0.07	0.13
ORI2	0.16	0.12	0.17	0.17	0.17	0.32	0.33	0.10	0.71	0.15	0.10
ORI3	0.24	0.12	0.16	0.16	0.15	0.37	0.17	0.11	0.73	0.14	0.14
ORI4	0.22	0.13	0.15	0.31	0.17	0.37	0.15	0.12	0.74	0.10	0.16
ORI5	0.27	0.28	0.12	0.30	0.24	0.21	0.17	0.14	0.70	0.12	0.12
ORI6	0.21	0.24	0.13	0.32	0.21	0.22	0.13	0.19	0.69	0.13	0.17
CSP-REL1	0.17	0.21	0.14	0.34	0.20	0.27	0.21	0.24	0.13	0.65	0.35
CSP-REL2	0.19	0.20	0.12	0.30	0.21	0.14	0.22	0.23	0.10	0.68	0.32
CSP-REL3	0.15	0.22	0.19	0.32	0.19	0.15	0.10	0.07	0.17	0.71	0.35
CSP-REL4	0.14	0.26	0.22	0.17	0.18	0.17	0.11	0.14	0.24	0.74	0.32
CSP-REL5	0.13	0.24	0.24	0.15	0.15	0.24	0.17	0.19	0.20	0.77	0.35
CSP-REL6	0.12	0.10	0.29	0.16	0.17	0.21	0.22	0.21	0.21	0.72	0.31
CSP-REL7	0.17	0.16	0.31	0.19	0.22	0.24	0.24	0.28	0.17	0.70	0.41
CSP-REL8	0.20	0.15	0.32	0.24	0.21	0.21	0.30	0.21	0.15	0.71	0.32
CSP-UNIT1	0.21	0.13	0.33	0.22	0.23	0.22	0.22	0.23	0.13	0.30	0.69
CSP-UNIT2	0.24	0.17	0.30	0.21	0.24	0.30	0.29	0.21	0.12	0.44	0.72
CSP-UNIT3	0.22	0.20	0.17	0.20	0.19	0.10	0.24	0.15	0.30	0.32	0.74
CSP-UNIT4	0.23	0.22	0.19	0.17	0.16	0.13	0.27	0.17	0.18	0.45	0.77
CSP-UNIT5	0.24	0.20	0.25	0.12	0.15	0.14	0.30	0.30	0.28	0.40	0.70
CSP-UNIT6	0.22	0.17	0.26	0.13	0.14	0.17	0.31	0.32	0.21	0.37	0.73
CSP-UNIT7	0.21	0.15	0.14	0.16	0.17	0.14	0.13	0.12	0.20	0.30	0.72