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Digital Transformation in Banking: Exploring Value Co-Creation in Online Banking Services in India

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ABSTRACT

Information Technology (IT) use has the potential to enhance firms' capacity to build and sustain competitive advantages. Though a rich literature notes how IT use continues to change the nature, scale, and scope of service delivery, surprisingly few studies have addressed the digital transformation processes through which the introduction of new IT-enabled online services are introduced in firms and industries. To address this issue, we identify and examine the processes through which IT may create or impair business value in service processes. To theorize these processes, we adopt a service-dominant logic perspective that views the customer as a co-creator of firm value and analyze some observed risks, tensions, and socio-technical challenges associated with the introduction of an online banking service system in India. Drawing on the findings, we present implications for IT strategy research and discuss in particular how firms can avoid unexpected value destruction when they increase customer participation in the delivery of online services to create value.

KEYWORDS

Service-dominant logic; value co-creation; online banking

Introduction

Understanding how information technology (IT) contributes to a firm's value creation processes has long been of interest to Information Systems (IS) researchers. While many firms have made substantial investments in IT, both researchers and practitioners still struggle to pinpoint IT's contribution to business performance (Kohli & Grover, 2008). Recent studies on the business value of IT suggest that the importance of information management aspects of IT capability is growing (Bhatt & Grover, 2005; Cotteleer & Bendoly, 2006; Kohli & Grover, 2008; Marchand, Kettinger, & Rollins, 2000). Few studies, however, have empirically examined the digital transformation processes through which the introduction of new IT-enabled online services are introduced in firms and industries. To this end, this paper examines the processes through which IT use may create or impair business value.

IS research has long observed how IT holds the potential to fundamentally alter the nature, scale, scope of service processes in firms. In enabling new forms of organizing and inter-firm relationships, IT thus may play a highly strategic role in contexts as diverse as the mining industry (Westergren & Holmström, 2012), the pulp and paper industry (Arvidsson, Holmström, & Lyytinen, 2014; Rönnbäck, Holmström, & Hanseth, 2007), the car industry (Svahn, Mathiassen, & Lindgren, 2017), and the logistics industry (Rai, Pavlou, Im, & Du, 2012). These experiences demonstrate how the rise of online services, e.g., driven by social networks, mobile, and big data, trigger digital transformations of key business operations in virtually all industry domains and affects contents and processes, as well as organizational structures, as firms need to establish management practices to govern these. As such, while the society as a whole is facing rapid and radical digital transformations due to the global diffusion and ubiquity of IT, it must be acknowledged that digital transformation is

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a complex and cumbersome undertaking (Berman, 2012) and typically occurs over extended time periods (Sebastian et al., 2017).

Extant research suggests that IT holds the potential to enhance the capacity of firms to sustain competitive advantages. Such competitive advantages can be reached by improving the strategic potentials of products and services (Nevo & Wade, 2010), by providing strategic benefits through efficient use of IT-enabled resources (Nevo & Wade, 2011), or by enhancing the awareness and strategic use of IT their operations (Baptista, Newell, & Currie, 2010). While such effects are frequently noted in IS research and well understood, there is a dearth of research that understands business value creation from the customer's perspective, which is the focus of our investigation. Such understanding is increasingly important as IT enables organizations to compete in a global arena with heterogeneous customer groups while simultaneously becoming increasingly homogenous in its composition due to the prevalence of standards and component reuse. With this in mind, we articulate a view of business value as the outcome of dynamic co-creation processes that involves socio-technical interactions among customers, technology, organizations, and information (Arvidsson & Holmström, 2013, 2018; Maglio & Spohrer, 2008).

To articulate our view, we build our research on the service-dominant logic (SDL) (Vargo & Lusch, 2004a, 2004b, 2006b). The concept of SDL emerged as an alternative to the traditional, foundational and goods-dominant paradigm that underline most understandings of economic exchange and value creation in service processes (Vargo & Lusch, 2004a). A key foundational premise of SDL is that the customer is always a co-creator of value, as the value of service ultimately results from its use (Vargo & Lusch, 2004a, 2006, 2008a). Accordingly, we theorize customers as active participants in the creation of firm value from new IT-based services. Specifically, we aim to understand how firms make use of customer participation to create firm-level benefits that in turn can be used to build and sustain competitive advantages (Vargo, 2008). Anchored in an SDL perspective, this article centers on the following research question: *How can IT resources be used to improve service quality through customer participation in value creating activities?* To address this question, we report our findings from an empirical study on the introduction of online banking service systems in India, focusing on customer's experiences.

In the remainder of this paper, we first review relevant literature that details the relationship between IT use and co-creation of value and articulate our theoretical view. We then examine the value co-creation process associated with the online banking service through this lens to explore features that have enhanced or impaired customer participation in value co-creation processes, then recommend practices that may be generally beneficial. In so doing, we identify and examine mechanisms through which IT resources may create or impair business value in service processes. Having observed risks, tensions, and socio-technical challenges associated with the introduction of an online banking service system in India, we offer some implications for IT strategy research and discuss how firms can avoid unexpected value destruction as they promote customer participation in the delivery of IT-based services to create business value.

Related Research

IT and the Co-Creation of Value

The relationship between IT and organizational performance has been a subject of longstanding academic research and intense discussion (Grover & Kohli, 2012). The co-creation of IT-based value research stream encompasses research focused on IT's business value, the economic impacts of IT and other manifestations at the level of the firm or network of firms (Kohli & Grover, 2008). Recognizing that IT blurs the boundaries between producers and consumers of products and services, research in this stream theorizes links between IT and co-creation of value. In this vein, studies have emphasized the role of new IT resources in facilitating novel interactions, communication, and collaboration between multiple, dispersed actors with different knowledge and assets (Kohli & Grover, 2008). This literature shows that to sustain advantages from IT-based co-creation, there

must be incentives for stakeholders to continue participate within the service system, and emergent values must somehow become shared among the different stakeholders in acceptable ways (Westergren & Holmström, 2012). To examine these issues, researchers have adopted various theoretical, conceptual, methodological and analytical approaches to examine the relationship between investments in technology and payoffs realized in terms of enhanced organizational performance (Kohli & Devaraj, 2003). These approaches share the main premise that competitive advantage is generated through value-adding initiatives enabled by critical resources that span across firm boundaries and are embedded in inter-firm resources and routines (Dyer & Singh, 1998).

While numerous studies have examined the capacity of IT to increase users' participation in the creation of service value, clear explanations of the processes whereby IT may support firms and enhance their performance are scant. For example, most studies simply assume IT is a source of sustainable competitive advantage (e.g., Melville, Kraemer, & Gurbaxani, 2004; Piccoli & Ives, 2005). Furthermore, many studies on the business value of IT (e.g., Dewan, Michael, & Min, 1998; Melville et al., 2004; Piccoli & Ives, 2005) assume that value is based on the capacity to position IT as a strategic resource with inimitable qualities (Barney, 1991, 2001). Reviews of the literature indeed frequently note that there is an assumption that IT resources play strategic roles in enhancing performance at either the process or firm level (Kohli & Devaraj, 2003; Melville et al., 2004; Piccoli & Ives, 2005). While such a link between IT resources and firm value is frequently theorized, it has yet to be conclusively supported empirically. Thus, robust grounding is called for to fully understand IT's roles and effects on firm-level performance. In particular, we need to adopt a broader perspective of how IT influences value creation processes within firms to improve understanding of the IT-performance relationship, recognizing that attempts to create business value through IT may well prove detrimental. This is not the least necessitated by the fact that firm-level competition thanks to IT is increasingly global why strategic efforts that create business value in one context can impair it in another.

Seeing that co-creation of value is of increasing importance for firms providing IT services, we next present SDL as a vehicle for examining and explaining online banking relationships, since it enables us to extend understanding of relevant antecedents, processes, and outcomes in this context. SDL is of particular relevance to IS research, because IT often blurs boundaries between producers and consumers of products and services. Contemporary mobile platforms, for example, are not only updated periodically by the producers, but also allow and encourage users to tailor the products to their needs through customer-oriented apps, typically developed by a third party. Against this backdrop, firms that learn how to create, develop and govern relationships between key stakeholders through novel IT use may gain and sustain significant strategic advantages (Yoo, Boland, Lyytinen, & Majchrzak, 2012).

Service-Dominant Logic

SDL has emerged as a perspective to explain how products and services create value (Barrett, Davidson, Prabhu, & Vargo, 2015). By contrast with the traditional goods-centered view, SDL views value creation as a process that is inseparable from consumption, and therefore directs attention to how organizations apply their knowledge and skills to influence the situated interests, understandings, and motivations that shape the customers service and product use (Vargo & Lusch, 2004a, 2008a).

SDL is a theory that explains value co-creation between firms and customers (Vargo & Lusch, 2004a). SDL defines "service" as the application of specialized competencies for the benefit of an actor (Lusch, Vargo, & O'Brien, 2007). As such, SDL emphasizes that service is the fundamental component of economic exchange (Bettencourt, Lusch, & Vargo, 2014). Goods are an only distribution mechanisms for service provision, not a unique expression of value (Vargo & Lusch, 2004a). Firms are described as contributors, not simply product providers, to help customers accomplish one or more jobs (i.e., achieve a goal, resolve a problem, or satisfy demand) (Bettencourt et al., 2014; Bettencourt & Ulwick, 2008). Another contribution of SDL is that it challenges traditional value creation logic, which implies that value is transferred from firms to customers. SDL builds on the idea that value is customer-centric and co-created by both firms and customers (Bettencourt et al.,

2014). As such, value co-creation research defines co-creation as joint actions by a customer and a service provider through direct interactions (Grönroos, 2012).

Through 10 foundational premises (see Table 1), SDL aims to re-conceptualize the role of products and services in economic exchange: it shifts our understanding of how organizations sustain competitive advantages in their interactions with stakeholders (Lusch et al., 2007). Vargo and Lusch (2008c) and emphasizes how firms, regardless of whether they offer products or services, depend on building the necessary capacities to establish their unique competencies as infrastructural aspects in customers' life. In this way, service and product innovation are argued to take consumption at the heart of the value-creation process. The application of SDL thus goes beyond development of novel services *per se*, and should instead be understood as grounded in firms' ongoing need to refine and reinvent their collaborations with customers, partners, and employees (Vargo & Lusch, 2008a), and to respond rapidly to the changes in their perceived needs that such transformations bring about.

In this manner, SDL can provide philosophical and conceptual foundations for explorations of organizations' users (and misuses) of IT in value co-creation processes (Maglio & Spohrer, 2008). In particular, SDL allows value-co-creation to be perceived as a complex process involving socio-technical interactions between customers, organizations, technology and value propositions, which connect and provide bases for shared knowledge and communication between internal and external agents (e.g., objects, languages, laws, measures, and methods). This shifts the understanding of value from something fixed to a view of value as a dynamic and emergent co-creation (Lusch, Vargo, & Wessels, 2008). From an SDL perspective, the notion of value co-creation stresses the idea of value-in-use, further shifting attention to how customers create value through consumption (Vargo & Lusch, 2004a). Noting how IT uses are becoming increasingly complex (Barrett et al., 2015), we argue that SDL provides a potent perspective for IS research. Indeed, in various industries, encouraging customers to be "value co-creators" is held to constitute the next frontier (Dong, Evans, & Zou, 2008). In particular, SDL offers a framework to understand how different value configurations generate varying processes of value co-creation and shifts attention to complementarities between organizations (Teece, 2010). It also facilitates studies of "value-in-customer-use" by fundamentally rethinking both value and value co-creation within organizational systems.

Against this backdrop, the role of IT in the production of value can be understood in relation to how it enables, enhances and transforms organizational knowledge processes to involve customers in the creation of local meanings and values. Such a perspective views customers not as passive receivers of

Table 1. Foundational premises of SDL (adapted from Vargo & Lusch, 2008a).

Foundational Premises (FPs)		Explanation/Justification
FP1	*Service is the fundamental basis of exchange.*	*The application of operant resources (knowledge and skills), "service" is the basis for all exchange. Service is exchanged for service.*
FP2	*Indirect exchange masks the fundamental basis of exchange.*	*Goods, money, and institutions mask the service-for-service nature of exchange.*
FP3	*Goods are distribution mechanisms for service provision.*	*Goods (both durable and non-durable) derive their value through use – the service they provide.*
FP4	*Operant resources are the fundamental source of competitive advantage.*	*The comparative ability to cause desired change drives competition.*
FP5	*All economies are service economies.*	*Service (singular) is only now becoming more apparent with increased specialization and outsourcing.*
FP6	*The customer is always a co-creator of value.*	*Implies value creation is interactional.*
FP7	*The enterprise cannot deliver value, but only offer value propositions.*	*The firm can offer its applied resources and collaboratively (interactively) create value following acceptance, but cannot create/deliver value alone.*
FP8	*A service-centered view is inherently customer-oriented and relational.*	*Service is customer-determined and co-created; thus it is inherently customer-oriented and relational.*
FP9	*All economic and social actors are resource integrators.*	*Implies the context of value creation is networks of networks (resource-integrators).*
FP10	*Value is always uniquely and phenomenologically determined by the beneficiary.*	*Value is idiosyncratic, experiential, contextual, and meaning laden.*

established "goods" but as crucial partners in the creation of both present and future value. The underlying rationale is that "there is no value until an offering is used – experience and perceptions are essential to value determination" (Vargo & Lusch, 2006, p. 44). In line with recent theorizing on the material and discursive aspects of IT, an SDL-view of IT resources thus holds service and product delivery as necessarily relational and reciprocal, involving multi-dimensional processes that blend together interaction, dialog, collaboration and consumption (Cova & Dalli, 2009; Vargo & Lusch, 2008a). Most relevant studies emphasize how SDL can improve organizations' ability to create value, but the potential ability of these multi-dimensional processes to result in "value co-destruction", contrary to strategic intents, has also been raised (Plé & Chumpitaz Cáceras, 2010). Value co-destruction is defined here as an interactional process between actors that results in a strategic decline of one or more key stakeholders in the wider value system. Extant research suggests that it often originates from an imbalance between firms and their customers. However, the results of such co-destruction may not be the same for all organizations and actors involved in the process (Woodruff & Flint, 2006). Other factors that may lead to value co-destruction are 'misuses of resources', i.e., the integration and/or application of available resources in a service system in a manner that is considered startling and/or inappropriate by users (Harris & Ogbonna, 2006; Plé & Chumpitaz Cáceras, 2010). However, little is known of how such outcomes emerge and how they may be avoided as new online service is delivered and used. Specifically, while previous studies have explained how firms participate in value co-creation and how their value is created (Bettencourt et al., 2014), the customer perspective is not adequately addressed.

Research Methodology

Research Site

The State Bank of India (SBI) is the largest government banking service in India. It was founded in 1955 but originated from the Bank of Calcutta, established in 1806. Traditionally, SBI has relied on service employees to create value and provide service to its customers. Increasingly, however, SBI is shifting towards a new logic of organizing, where formerly manual processes of value creation are mediated through IT. For example, SBI has installed ATM service centers for its customers to withdraw money by themselves. Similarly, SBI has implemented online networking service systems for its customers. Through strategic IT uses, SBI provides a range of banking products and services that connect a vast network of branches in India and overseas. Typically, overseas products and services target non-resident Indians (NRIs) and include, for example, FOREX transactions that involve SBI accounts and online banking services. SBI's continuous IT-based innovation has resulted in notable increase in its customer base. It has also generated new value streams for SBI through (for example) strategic links with providers of pension funds, general insurance, custodial services, private equity, mobile communication and point of sale devices, and advisory services. The increasing importance of IT's strategic role is apparent in SBI's steady increase of market share and widening scope of services. Currently, SBI is determined to increase use of IT and gain further strategic advantages in a highly competitive sector by employing cutting-edge technology and innovative new banking models that further increase its customers' participation in key value-creation processes.

Data Collection

This paper reports findings from a qualitative study of mobile banking services in India. The data were primarily collected through semi-structured interviews (Yin, 2003), but we also collected data from SBI's official website. The semi-structured interviews targeted SBI's online customers and were designed to acquire rich information on the problems and prospects of increased customer-participation through strategic IT use in service delivery processes. We conducted 22 interviews in total, each lasting 35–50 minutes. Twelve of the interviews were conducted face-to-face with NRI customers of SBI, the others were conducted over the phone with Indian customers known to use SBI's online banking services.

Given the complex nature of the online services, it was impossible to identify interviewees *a priori*, and therefore 'snowball sampling' was used to identify interviewees (Biernacki & Waldorf, 1981). Snowball sampling or respondent-driven sampling may be valuable in situations where the sensitive nature of the behaviors in the population or because members of the target population are difficult to distinguish from members of the general population (Salganik & Heckathorn, 2004). To identify the first respondents in our study, we initially identified SBI customers among faculty and students at Umeå University and then applied a snowball sampling method for our research study. In order to start a referral chain and to identify additional SBI customers and potential respondents for our study, we raised the questions like "Did you get help from anyone, or did you help anyone, with the use of Online SBI services?" to the first respondent in order to nominate other customers with similar key characteristics. The same questions were raised to the second respondent in order to identify a third potential respondent and so on. However, not all the NRI's with online SBI account fulfilled the key characteristics for this study. Some customers had an online account without having much experience of it. As such, we conducted interviews only with respondents who had significant experience of using Online SBI services. The next step was to choose the appropriate number of interviews. As described by Fusch and Ness (2015), the chosen number of informants depends on the purpose of the study. The notion of saturation is key here, which is when the data gathering process reaches a point where additional interviews do not result in any more findings or perspectives. We, therefore, decided to interview people we found relevant until we reached a point where the answers started to become similar. When the answers did not show on any relevant different ways of reasoning from the informants we interpreted this as reaching saturation. In our case, we reached a degree of saturation where we considered the data collection complete after 22 interviews.

All the interviews were audio recorded and later transcribed to facilitate in-depth analysis. The interviews were structured around a battery of questions that concerned the customers' experience of participating in value co-creation processes and intended to guide theory development (Miles & Huberman, 1994). Table 2 outlines our understanding of the value co-creation process from the customers' perspective.

Data Analysis

To analyze the acquired data, we structured information embedded in responses to the interview questions and obtained from SBI's website into themes, based on the key theoretical constructs identified in the extant research. More specifically, our purpose was to facilitate elucidation of customers' experience of their participation in value creation. This process was also guided by the emerging service activity resource table, presented above, and helped us gain insight into activities that promoted or impaired, value co-creation. To this end, we also considered how each service that SBI used in order to add value for the customer was received and perceived by their customers. Through this process, we were able to gain key insight into the customers' experiences of SBI's online service system and the degrees to which the resources employed synergistically facilitated (or impaired) value co-creation from the customers' perspective. Ultimately, the data analysis focused our attention on three major themes: 1) The *risk factors* associated with the resources used to deliver the online service, 2) The *challenges* faced by customers in value co-creation processes and 3) The *complexity* of the online service systems.

Results

We illustrate the detailed workings of the proposed conceptualization of the customer as a co-creator of firm value in relation to the introduction of IT-enabled banking service systems in India. Our account is structured into three dimensions: (1) Risk factors related to the resources integrated with

Table 2. SBI's service activity resource table.

Service Activity (Value Added Service)	Functions	Value Creating Resources (Facilities)
e-TDR/STDR	*Get a fixed deposits account and access to related services instantly*	*Available to open term deposit accounts online*
SBI e-Tax	*Pay direct, indirect & state government taxes online*	*Available for paying all kinds of central and state government taxes*
SBI e-File	*Fill your income tax returns online*	-
SBI-Instant Pay/SBI-oxipay	*Make instant payment for utility bills*	*Electricity bills, telephone bills, mobile top-up, DTH recharge, etc.*
SBI e-Ztrade	*Buying & selling shares*	*Stock market trading, Gold trading, NRI trading, etc.*
Fund Transfer	*Transfer funds to any bank accounts*	*Available for transferring funds inter-bank and to other banks*
E-tickets	*Booking travel tickets online*	*Trains, flights, hotels, tourist attractions etc.*
Online Shopping	*Convenient, instantaneous shopping*	*Available for buying any online products*
Mutual Fund Investment	*Access to diverse investment plans*	*Equity, liquid and hybrid schemes, fixed maturity plans, etc.*
Online Fee collection	*Online payment of examination fees*	*Available for paying SSC & UPSC examination fees*

the online services; (2) Challenges facing customers in the value co-creation processes; and (3) Complexity in the online service systems.

Risk Factors Related to the Resources Integrated with the Online Services

SBI made a significant move into mobile banking in 2012, and with the advent of smartphones and 3G services, mobile banking services have become increasingly popular with Indian customers. Typical activities include conducting balance inquiries, account transactions, utility payments, and other banking activities using mobile phones. By radically increasing the ability of their customers to create value by involving the user in core banking processes, SBI hoped to tap into the strategic potential of using IT to widen both the reach and scope of their services. As our analysis will show, however, the strategic uses of IT employed by the SBI were not risk-free. To enhance security, SBI's online banking service system and ATM service system resources were integrated with other service systems that aimed to make processes transparent to the customer.

When a customer withdraws money through an ATM or transfers/receives money through online transactions, related information is transferred through text messages to the customers' mobile devices via systems integrated with SBI's overall service system. In order to complete an online transaction process, customers need to type in a security code that as transmitted to their mobile device as a form of the second authentication (Figure 1).

While SBI viewed the integration of mobile devices as a value-adding security precaution, from the customer's perspective it was not without issues. For example, during money transactions, the security code necessary to proceed with the transaction was often not received on time on the customers' mobile devices. Due to the lack of clear feedback, such events caused customers to frequently perceive the undesired outcome as caused by user mistakes, in turn triggering new, often futile, attempts to successfully complete the process. Even when the security code was received on the mobile device on time, customers also reported that sometimes they were still met with an error message stating that the code number was incorrect: by the time that the customer entered the code, the webpage might have canceled the request automatically forcing the customer to re-login to proceed with the transaction. Because of these problems many customers complained that the online service, which purpose was to drive customer value through the novel and strategic uses of IT, have made the banking experience more arduous.

Challenges to efficient co-creation of value through strategic uses of IT were reflected upon by many of the interviewed customers. Two of the customers described difficulties they had faced due to imperfect integration of their mobile devices with the banking service system as follows:

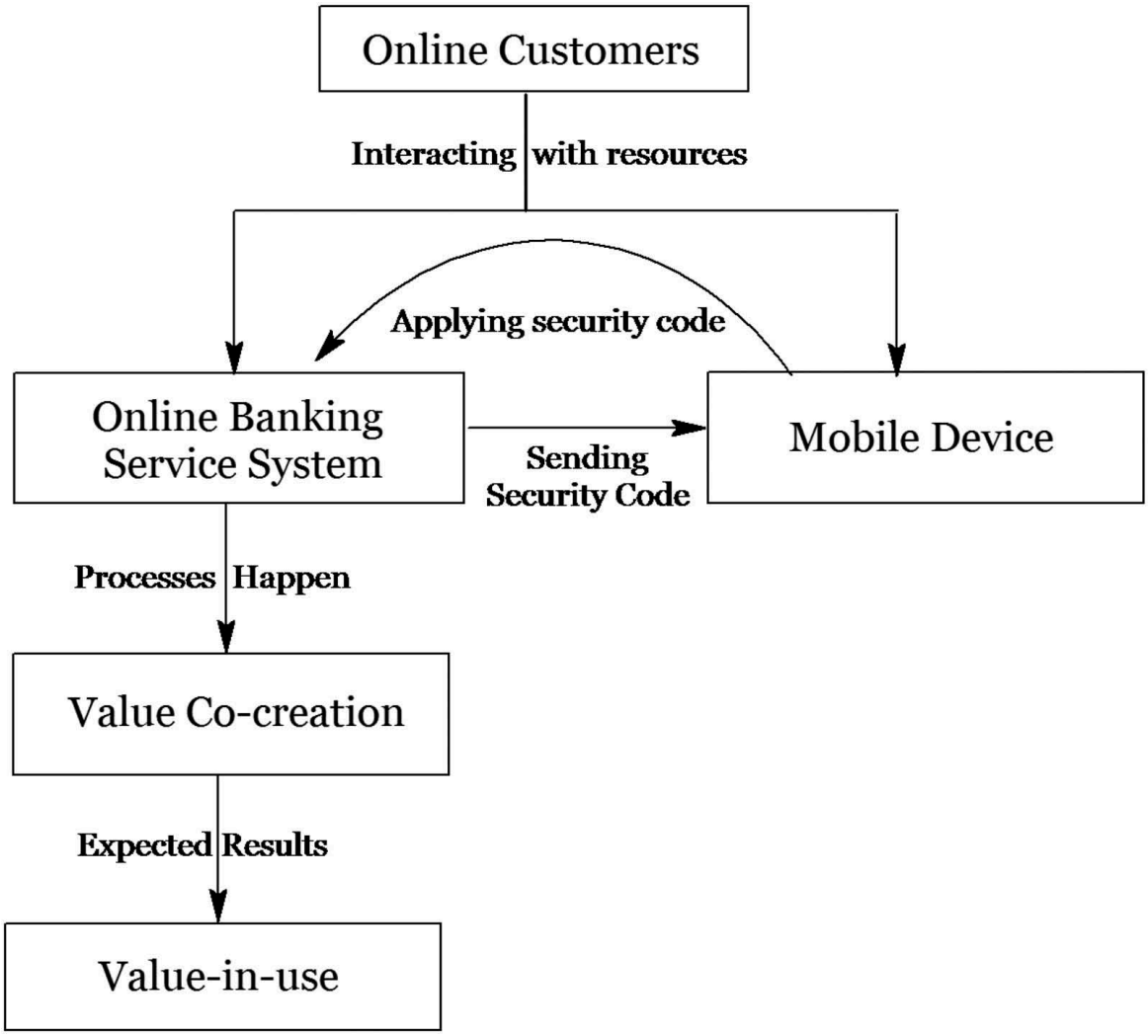

Figure 1. Structure of the value co-creation process from a customer's perspective.

> *"If I lose my mobile, I cannot do any transaction with my online banking service. In this situation, I cannot add a new mobile number to the banking service system, because there is no option available to add mobile numbers in the online banking system."*

> *"I [have] to keep the same mobile number for a long time because of this integration and lack of options in [the] online system to change the mobile number. Because of this issue I feel uncomfortable to use this bank service."*

The challenges of coupling a safe online service with efficient uses of IT from the customers' perspective was also evident in SBI's attempt to expand the use of online banking services to NRI customers through offering a new form of NRI account. As stated by one of these customers:

> *"I am in a foreign country. I have an NRI account but the account is integrated with Indian mobile numbers and there is no option available to integrate my foreign mobile number. Because of this issue, if I want to do any transaction I [depend] on another person [who is an Indian resident, because only they can receive the security code] and I have to call them to get that code to complete my transaction."*

> *"As an NRI customer, I integrated my account with a foreign mobile number by submitting a Visa document, when I was visiting India. Unfortunately, I lost my mobile phone, after that I was unable to integrate my new mobile number with the bank services. There are no online options available and they recommended me to resubmit the document in person directly to the bank."*

To summarize our findings concerning customer's experiences of the integration of resources (mobile devices) with SBI's online banking service system, major risk factors for value co-creation include:

(1) The delay in receiving security codes on integrated mobile devices.
(2) The lack of options to change mobile numbers linked to the service.
(3) The imbalance in the value proposition system for NRI customers.
(4) Only one gateway is not suitable for all the customers.

Challenges Facing Customers in the Value Co-Creation Processes

Our case reveals how any self-service technology ultimately depends on the value created in use. Specifically, value co-creation processes depend on the capability of the customers to use the technology, and the quality of the service systems resources employed in the delivery of self-service. In this vein, our analysis identified several challenges from the perspective of SBI's customers in the realization of value from the online banking system. One salient challenge was described by an interviewed customer as follows:

> *"Facilities to create new accounts are included in the online banking service. It is convenient and supposed to save time compared to a direct visit to the bank. However, after filling all the necessary information and while attempting to submit the application form, the process still showed the error message 'contact branch.'"*

Instances like this were reported as key sources of frustration by the customers, and negatively affected their experiences of participating in supposedly value-creating processes. Another challenge that surfaced through our analysis is captured by the following quote:

> *"Employees of the banks are less interested [in providing] the online banking services to customers living in non-urban areas, because these customers are not familiar [with online banking] and they frequently call bank employees to get help regarding the online service process. They are not willing to spend time for them."*

While it is understandable that SBI preferred customers who were already proficient in the use of IT and IT-based self-services, common errors created the impression among some respondents that the bank's use of IT decreased rather than increased the value derived from the IT-based services. This challenge also highlighted the key role that helps desk information plays in online banking services, at it proved key to whether non-proficient users would eventually be able to confidently participate in the value creation afforded by self-service technologies. In other words, support of the broader user group was necessary to guide customers' efforts to fulfill individual needs using them. Though the quality of the help desk information is thus critical and important for mobile banking to succeed, regarding the help desk a customer said that:

> *"The given help desk information is not sufficient for the new customers to start the process by themselves. Banking service providers should think about providing help desk in a simple manner and must be understandable by common people."*

> *"Visiting the bank is quite easy compared to reading up on a lot of rules and regulations. It gives a more confident feeling and I don't want to take risk to try new self-services on my own."*

In this vein, we also found that the online facilities for handling deposit accounts and e-tax services posed challenges for value co-creation in SBI's service provision. Despite the intention to provide these services to improve the bank's ability to provide a wide range of value streams for its customers, the interviewed customers argued that many of the service activities did not create value at all from the perspective of the customer. One commented that:

> *"I don't like to [deposit funds through the online system] because [I have too little knowledge and lack confidence due to the paucity of relevant information]. If I directly visited the bank, I can get more information and it is possible for me to ask and clarify all my doubts. This would not be possible [using the] online banking service."*

> *"Easy to visit the bank rather than reading up on of rules and regulations for fund deposit in the online services. Moreover, it is easier to get a loan using an Agreement Bond Paper [hard copy] compared to processing in through the online services."*

Similarly, the greater risks and uncertainties associated with online transactions when using the e-tax service that customers perceived, in comparison to face-to-face interactions at a local branch, appeared to be obstacles to the efficient use of IT in this manner to strategically improve the customers' banking experience and sense of value from SBI services:

> *"Paying tax is one of the most important and sensitive processes for everyone and I am not willing to take risk in this process by using [an] online banking service."*

These challenges were exacerbated by the bank's attempt to widen its reach through the use of English in the online services system. We found that the language used in service provision strongly influence customers' experience. In India, for example, people prefer to speak their regional languages, rather than English. In this vein, one of the customers stated that:

> *"SBI bank is the centralized service systems in India; however, they were not providing language options in the online banking systems as in ATM services."*

To summarize our findings regarding customers' experiences in the use of self-service technology to create value, key obstacles include:

(1) Difficulties in creating new accounts through the online service system.
(2) The lack of language options available in the system.
(3) Ineffective communication and lack of awareness about the benefits of new service activities.
(4) The lack of interest among service employees in guiding and providing online services for their customers.
(5) An imbalance of value propositions in the new service activities.

Complexity in the Online Service Systems

SBI viewed IT-enabled variety and customer flexibility as key drivers of value, and core aspects of the mission to diversify the bank's portfolio of products and services offered to an increasing customer base. However, our findings indicate that the value propositions offered through the IT-based banking services were perceived by the customers as complex rather than flexible. For example, one of the customers commented:

> *"In order to add an inter-banking account number, the activation time takes 24 hours and [the transaction process] also takes 24 hours. It makes the customers tense if they are in an emergency situation. In that case, they feel online banking-service technology is not helpful whenever they require."*

> *"I can't use my money when I need it. It's my money so I should be able to control it. I can't even take out money frequently from the ATM because there is a money limitation."*

The fact that account numbers had to be entered in various ways in different services, and even within specific services, was another key obstacle to the efficient creation of service value from the customers' perspective. A recent customer said:

> *"When I wanted to add an account number in the online banking service I was very confused where to add it. Moreover, I have tried to get help from the information desk given on the online service and found it insufficient and [stopped trying to solve] the issue. I think, every new customer will face the same problem when they try it."*

The NRI customers are playing major role in creating value using self-service technologies. But the customers see challenges in this process:

"As am NRI customer, I tried to exchange the foreign money to my SBI account directly, but there is no clear and open statement given about [when and how much money would credit] money exchange information. So I am using foreign money exchange mediators."

"I don't know about how to exchange the foreign money using self-service technology. It may be my lack of awareness about it, but the information is not very clear"

To synthesize our empirical findings regarding risk factors, challenges, and complexities associated with SBI's online services:

(1) A key risk factor from the customer's perspective was the poor integration of mobile devices with the online banking system.
(2) The complexities identified from the customer's reported experiences originated from an imbalance of value propositions in the online banking system, which frustrated customers' efforts to derive value-in-use from the online service systems.

Discussion

In the following, we review the detailed analysis of the mobile banking case relative to our research question: *How can IT resources be used to improve service quality through customer participation in value creating activities?* Extant literature on SDL focuses on how systems and processes can enhance the value-in-use for the service providers (Lusch and Vargo, 2008b). It is based on the notion that customers create value when they perceive a need or desire for a given type of product or service rather than in its consumption (Vargo & Lusch, 2004a, 2008a; Vargo, Maligo, & Akaka, 2008). According to SDL, however, service systems may either increase or reduce value-in-use (Lusch & Vargo 2006a ; Lusch et al., 2007; Plé & Chumpitaz Cáceras, 2010). Value can be co-created through highly interactive effects of service systems that integrate IT-enabled resources and all other systems and factors that influence value-in-use. Since these include customers' needs and perceptions, both operand and operant resources interactively influence the process according to SDL. However, extant literature provides little empirical guidance on how to build sustainable advantages through value co-creation processes.

Our findings revealed how enhancement of service quality, in terms of improving customer participation and satisfaction, was essential for enabling value co-creation and for increasing value-in-use through associated processes. Thus, as illustrated in Figure 2, and discussed in more detail below, an effective IT strategy must have a multi-dimensional focus, incorporating flexibility, user-friendliness, and provision of clear, customer-oriented information and systems. Failure to incorporate any of these elements may have profoundly negative rather than positive consequences for value co-creation, regardless of the efficiency of the core IT systems.

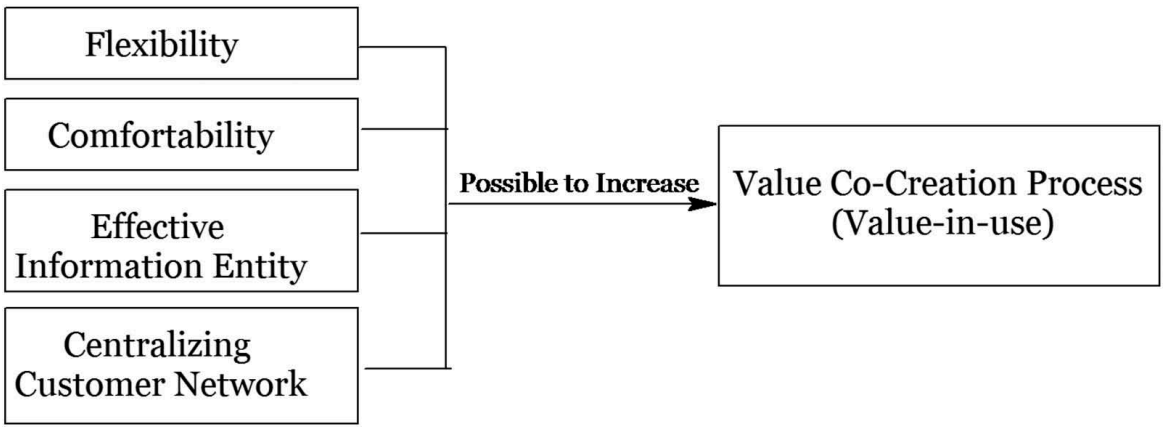

Figure 2. The multi-dimensional focus required for an effective IT strategy to enhance value co-creation.

Flexibility and User-Friendliness

SBI offered integrated services based on the use of mobile devices (to receive security codes) with online service systems in attempts to facilitate customers' access to the banking facilities and broaden the range of products that can be readily offered. In SDL terms, the bank provided a new set of value propositions intended to allow customers to derive value-in-use (Figure 1). However, our respondents reported that new banking services also raised several difficulties for SBI's online customers, in accordance with previous suggestions that misuse of resources in the management of distribution channels may result in value co-destruction (Plé & Chumpitaz Cáceras, 2010, p. 434). Notably, neither the online customer interface nor the front-line bank staff allowed the customer to change the mobile number logged during the creation of their account, which proved problematic not the least for international customers. Furthermore, customers often did not receive security codes fast enough to complete transactions before being logged out, obliging them to re-start the process. Automatic sign out is implemented in the online banking service to improve security but was a major source of frustration for the customers. In addition, flaws in the integration of mobile devices with the online banking service system were causing problems for NRI customers, because only Indian mobile numbers could be used to access the services. Thus, they depend on other people to co-create value through the online system. This is another example of intentional misuse of resources that destroys, rather than produces, value-in-use (Figure 3), with potentially detrimental consequences for a firm's performance (Plé & Chumpitaz Cáceras, 2010). The lack of flexibility of the resources (mobile devices) integrated with the online service system, and the imbalance of the integrated resources, were found to be major barriers for value co-creation. These and other identified risk factors that may lead to co-value destruction, rather than intended co-production, are outlined in Figure 3.

In order to avoid value co-destruction, we propose that flexibility and user-friendliness should be primary elements of any IT strategy involving a customer interface because customers are always co-creators of value according to SDL and they can only derive value-in-use through the interface (Vargo & Lusch, 2008a). Indeed, "there is no value until an offering is used", and value-in-use is governed by the customers' experience and perceptions (Vargo & Lusch, 2006, p. 44). Moreover, service providers should ensure that their resources are integrated sufficiently well to provide intended services, both during their development and implementation.

Clarity of Information

From an SDL perspective, SBI's IT-enabled and help desk information services are technology and information entities, respectively, that have key intended roles in the value co-creation process of the online banking service. Before the introduction of the online systems, this process was mediated through face-to-face interactions between the customers and banks' front-line employees, providing ample opportunities for customers to clarify their needs and acquire detailed information about the services and products offered. However, this was a highly time-consuming (and hence costly) process for both the bank and its customers. Thus, there were obvious advantages in providing an online information desk, to allow customers to acquire information and resolve problems rapidly without going to a physical branch (and tying up the time of front-line employees), creating substantial value-in-use. In practice, the respondents mentioned severe obstacles in accessing online services for activities such as depositing funds, e-trading and filing tax returns despite following the information provided via the help desk. They did not want to take risks when completing these sensitive processes via online banking, as they considered the help desk information to be incomplete, yet lacked sufficient knowledge and confidence to proceed alone. Thus, the help desk provides an example of accidental misuse of resources resulting in value co-destruction (Plé & Chumpitaz Cáceras, 2010) rather than the intended enhancement of value-in-use (Vargo & Lusch, 2006, 2008a). In addition, the front-line staff in branches could not help the customers to resolve problems encountered when using the online system, resulting in another misuse of resources, in the form of role conflicts.

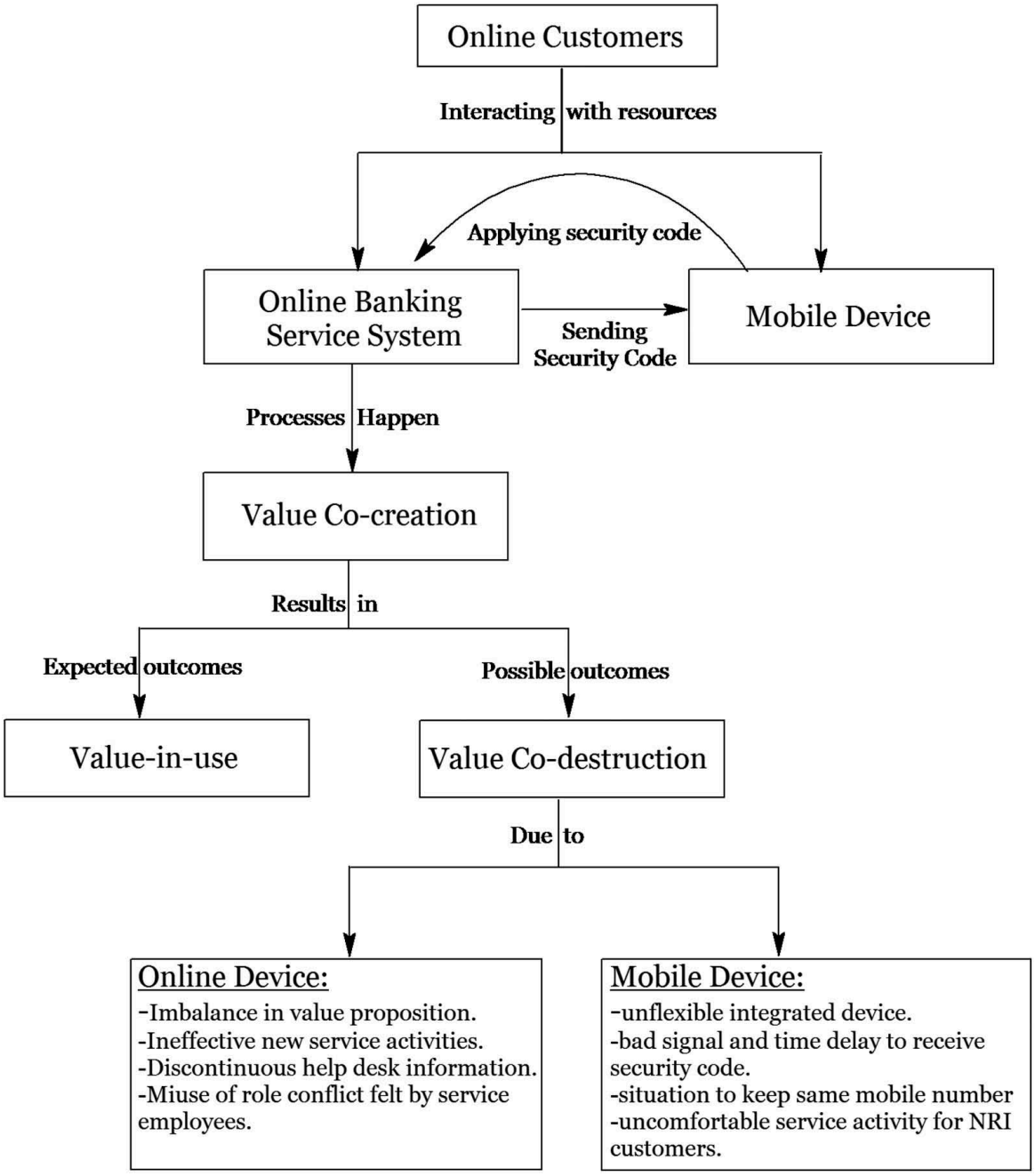

Figure 3. Risk factors for value-in-use identified in the case study.

The introduction of inherently risky online banking services clearly poses major challenges for value co-creation from customers' perspectives and their experiences. The identified problems are consistent with previous descriptions of challenges for value co-creation processes that are associated with the introduction of new service systems (Dominguez-Péry, Ageron, & Neubert, 2013), particularly IT-driven service innovations, e.g., due to the lack of established procedures, methods, and tools for developing them. As noted by Vargo and Lusch (2004a), the customer's ability to create value often depends on the amount of information, knowledge, skills and other operant resources that they can access and use from their supplier or their environment. Hence, to avoid such problems causing value co-destruction rather than co-creation our study suggests that it is essential to provide highly user-friendly customer interfaces, fully taking into account the customers' level of knowledge and general familiarity with e-services. In addition, it may often be advisable to maintain

call centers with staff who are sufficiently qualified to provide the simple, effective guidance that non-proficient users require (rather than merely parroting answers to 'Frequently Asked Questions' provided on a set script). We argue that taking such considerations to the heart is becoming all the more important as IT use makes competition global.

Customer-Orientation

IT-enabled service systems can provide resources for customers that are reliable, predictable, consistent and substantially more efficient than human front-life staff, and thus greatly enhance value co-creation (Barrett et al., 2015). Furthermore, their introduction allows the range of services and products offered to be greatly enhanced at relatively little cost. However, each addition to the online services (and associated security measures) increases the complexity of their utilization by customers, threatening one of their most superficially attractive features: simplicity relative to comparable human-mediated service systems. For instance, it takes two steps – adding the recipient's account number via an inter-banking link and the transfer *per se* – and about two days for an SBI customer to transfer money to a customer of another bank online, rather than the single step mediated by a human agent. This can be stressful when the transfer is urgent, providing an example of value co-destruction due to intentional misuse of the service system resources in the management of distributed channels (Plé & Chumpitaz Cáceras, 2010). Thus, there is a clear need to maintain continuous awareness of *how* and *why* customers may use IT-enabled self-service systems during their development (and all stages thereafter) to ensure that the systems meet their needs and hence enhance (rather than destroy) value-in-use.

Clearly, implementing an effective IT-enabled service system that increases value co-creation is not straightforward, as it must incorporate robust security measures, offer a wide range of products, provide clear information in a customer-appropriate format via suitable media channels *and* offer all the services required by customers while maintaining a simple, user-friendly interface. Thus, it is essential to ensure that changes designed to enhance any of these aspects do not have greater negative effects on the others. Rigorous beta-tests and interactive facilities, such as fora to obtain feedback from customers about their experiences, can be highly valuable in this context. Such measures may allow value proposition-based business organizations to shift (cautiously) towards open innovation in IT-enabled service activities, incrementally improve the systems and customer interfaces, and enhance both awareness of the practical experiences of their customers in the value co-creation context and their opportunities to interact with customers. All of this may help efforts to build or maintain competitive advantages. It should be said that these are highly interactive processes: customer participation can strongly enhance capabilities of firms to provide suites of flexible, customer-oriented services, but the quality of services offered, and the behavioral outcomes of value co-creation processes strongly influence customer participation in turn (Bolton & Saxena-Iyer, 2009; Zhang, Ye, Chen, & Wang, 2011).

In summary, this study supports the view that IT-enabled service systems can play an important role in value co-creation processes (Nevo & Wade, 2011). They can clearly provide firms multiple benefits (Baptista et al., 2010) by enhancing value co-creation with customers (Zhang et al., 2011), helping efforts to develop both upstream- and downstream-focused capabilities, and refining business strategies (Grover and Kholi, 2012; Kohli & Grover, 2008). However, the implemented services must be flexible, user-friendly, provide tailored information, interactive, and highly sensitive to the shifting needs and proficiencies of the customers (Figure 2). Tackling these challenges will be increasingly important as IT makes the world more connected.

Conclusions

To remain competitive, today's firms are increasingly engaged in co-creation of value with customers through use of self-service technologies. However, as clearly illustrated by the case study of SBI's online banking service systems, there are several risk factors that may result in value co-destruction. These include obstacles associated with lack of flexibility of the systems *per se* and/or their integration with auxiliary devices (here mobile phones), which may severely impair customer's experiences and perceptions of the

systems (and hence value-in-use). Other major factors include complexity and customers' difficulties in acquiring required information in an appropriate format. Thus, flexibility and user-friendliness must be primary elements of any IT strategy involving a customer interface, because customers are always co-creators of value according to SDL and they can only derive value-in-use through the interface. There is huge and increasing potential for co-creating value with customers through interactive self-service systems, but this is accompanied by notable risks of value co-destruction, driven by several mechanisms as illustrated by the case study. Therefore, IT strategies and service systems must be carefully tuned to customers' needs in multiple dimensions to boost value-in-use.

Our findings build on and extend previous finings that has acknowledged how digital transformation is a complex and cumbersome undertaking (Berman, 2012) and typically occurs over extended time periods (Sebastian et al., 2017). As such, our findings demonstrate the role that digital technology plays in such transformations. Specifically, the main contribution of this paper lies in the indications that incorporating IT strategy within the conceptual framework of SDL can provide a fruitful avenue for analyzing online services, and attempts to align IT strategy with business strategy through focusing on the co-creation of value with customers while mitigating associated risks. While there are some similarities in the organizational culture of the organizations in India and those in the West, the influence of the national culture still presents some differences. Like in earlier studies (see Okunoye & Karsten, 2002), our findings reveal some distinctive issues that require global consideration. Specifically, while the online services in our case demonstrate patterns that are similar to the patterns we can see across the globe, organizations will face different challenges depending on the growth strategies they pursue and the heterogeneity of the customer base and how well different user groups can be served. Future research is in this regard needed not the least when it comes to clarifying how global firms tackle the associated challenges of digital transformation.

Notes on contributors

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Website Link

http://www.statebankofindia.com/

Appendix A

Interview questions

- Are you using an online banking service? How flexible is it for you?
- Which type of service account do you have?
- What type of service activities are using frequently? Are they flexible for achieving your needs?
- Did you try the newly introduced service activities? How did you feel, is it easy or tough to do?
- Which type of service activity did you feel was complex in an emergency situation? Why?
- Which type of information is required to support your service activity to make it easy?
- What do you think about SBI's online accounts and other banking service systems?
- Have you struggled with any service activity processes? Why?
- When trying new services, is the given information enough for you to get the new experience?
- Have you discussed self-service banking systems with anyone and based on what?
- Do you know what service activities are available in SBI online bank systems? Have you tried any of them?
- Do you feel any type of service activity is complex while doing the process online?
- Do you have any suggestions for increasing the value co-creation process?
- Do you know about what other customers are struggling to do in the online banking processes?
- Would you like to include any further information/ideas in this interview?