IT-ENABLED CUSTOMER SERVICE SYSTEMS DESIGN, DELIVERY AND THE RESULTING CUSTOMER SATISFACTION AND VALUE

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IT-ENABLED CUSTOMER SERVICE SYSTEMS DESIGN, DELIVERY AND THE RESULTING CUSTOMER SATISFACTION AND VALUE

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Customer service has become a critical component of what a firm offers to its customers to generate customer value. Since there is a lack of strong conceptual foundation for the service economy, the science of service has become an important research topic. This dissertation contains two papers: a theoretical piece titled "IT-Enabled Customer Service Systems: An Interdisciplinary Review and Integrated Framework" and an empirical piece titled "The Impact of a Portfolio of Service Delivery Systems: A Longitudinal Multi-Channel Approach."

In the first paper, I used a structured methodology to review 757 articles drawn from information systems, marketing, and operations management literature; and then coded a subset of 142 articles into an integrated framework. The literature has identified six functionalities of customer service systems and the effect of technical/social attributes of the systems on these functionalities and customer value. This work makes two contributions. First, it organizes the interdisciplinary research around an integrative framework that should prove useful to both research and practice. Second, the review and analysis of the literature offers the basis for future research directions.

I took one of the suggestions for future research that emerged from the theoretical piece and developed the empirical piece from it. I employed a longitudinal multi-channel approach base on an archival dataset of 389 hotels of a lodging chain to explain the conflicting results of the outstanding customer service systems literature.

The results indicate that (1) the implementation of an IT-enabled incremental customer service channel leads to a disruption of the customer service process and that the true value of this investment does not surface until the new multi-channel service delivery process has stabilized; (2) this IT-enabled incremental customer service channel does not operate in isolation, but complements the existing channels. My findings suggest that when a firm integrates a self-service channel with a personal-service channel it releases employees from routine tasks so that they can focus on consultative tasks. Thus, both scholars and practitioners should consider the combined effect of the portfolio of the customer service delivery channels in order to ensure the optimal design of multi-channel IT-enabled customer service systems.

BIOGRAPHICAL SKETCH

Tsz-Wai Lui holds a Bachelor of Science in Food Science from Fu-Jen Catholic University, Taiwan, and a Master of Management in Hospitality from Cornell University in Ithaca, New York. Prior to pursuing her Master and Ph.D. degrees, Tsz-Wai held operational positions in both the front and back of the house of two five-star hotels in Taipei, Taiwan.

Tsz-Wai's research has been published by the Center of Hospitality Research (CHR) and in The DATABASE for Advances in Information Systems. She is a chapter author for the free electronic textbook initiative, the Global Text Project, and most recently has contributed to the Handbook of Research on Contemporary Theoretical Models in Information Systems as a contributor of the chapter titled, "Toward a Theory of IT-enabled Customer Service Systems."

To my parents, with love

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CHAPTER 1

IT Enabled Customer Service Systems: An Interdisciplinary Review and Integrated Framework

Introduction

Although services have accounted for more than 70% of the U.S. GDP (Horn, 2005; IBM, 2007), there is a lack of a strong conceptual foundation for the service economy (Chesbrough & Spohrer, 2006). Therefore, the "science of service" has become an important research topic for those who subscribe to the view, "There is no such thing as a service industry. There are only industries whose service components are greater or less than those of other industries. Everybody is in service (Levitt, 1974, p. 41)." Nowadays, the service component is an essential part of products offerings in every industry. Customers buy products and services to fulfill a need or to solve a problem. The evolution of service over the past few decades has recently produced a new paradigm, the service-dominant logic (Vargo & Lusch, 2004), claiming that service provision, rather than tangible products, represents the fundamental unit of economic exchange. For example, we buy a car for transportation. Even tangible products are increasingly defined in terms of what the consumer needs (e.g., transportation), rather than what the manufacturer produces (e.g., cars) (Shostack, 1977; Cook et al., 1999), as a testament to the increasing value of the facilitating service that wraps the product. Such supplementary services are an integral part of the customer value proposition that the firm offers to its own customers (Shostack, 1977; Woodruff, 1977). They contribute a growing portion of customer value—defined as the customer's "overall assessment of the utility of a product based on perceptions of what is received and what is given" (Zeithaml, 1988, p. 142).

Customer service is now a critical source of differentiation in the competitive race—for both service businesses and manufacturing firms who are moving aggressively to provide their customers with integrated product/service solutions rather than traditional products (Sheehan, 2006). More specifically, differentiation in the marketplace is increasingly coming from those supplementary services built around the core product, rather than from the quality of the product alone (El Sawy & Bowles, 1997). The firm seeks to maximize customer value during every interaction no matter when, where, or how the transaction takes place (Watson et al., 2005). The increasing embeddedness of information technology affords companies a chance to provide high quality and personalized service at reasonable costs so as to create economic value (Rust & Miu, 2006). More generally, it is the co-evolution of customer service and information technology that constantly challenges assumptions about customer service and creates opportunities to push the frontier of customer service that underlies the rise to prominence of the interdisciplinary service science movement (Chesbrough & Spohrer, 2006) and the emergence of the service-dominant logic (Vargo & Lusch, 2004; Day, 2004; Deighton & Naravandas, 2004; Gummesson, 2004; Hunt, 2004; Prahalad, 2004; Rust, 2004; Shugan, 2004).

Given the centrality of information systems, in this paper, I conceptualize their role as enablers of customer services, and I review the outstanding cross-disciplinary literature in order to theorize the nomological network of constructs that explains how information systems impact customer value through service. The information systems discipline brings a distinct integrative research perspective to this area of study, allowing it to become a reference discipline for service science research (Baskerville & Myers, 2002). My contribution toward this objective consists in mapping current knowledge in this area and in producing a theoretical framework that integrates the cross-disciplinary research on customer service systems spanning information systems,

marketing, and operations management literature. Despite the complexity of assembling a review in an interdisciplinary field (Webster & Watson, 2002); my work seeks to extend beyond the focus on self-service and Web-based service systems that has characterized much of the work in information systems and marketing, in order to provide a general model of IT-enabled customer service. My work focuses on supplementary services (defined next) because supplementary services affect product and service organizations indistinctively. Moreover, supplementary services are fairly standardized across domains. It is therefore possible to produce a general theory of IT-enabled customer service as it pertains to supplementary services.

In the next section, I will start with the proposed theoretical framework and explain the key concepts in the framework. Then, I will present more detailed propositions with supports from the past literatures. The paper concludes with suggestions and implications for future research.

Customer Service

The concept of "service" has been explored extensively in different disciplines. Early attempts to define "service" tended to be illustrative (Judd, 1964) and focused on the defining attributes of service: intangible, dynamic, subjective, ephemeral, perishable, and inseparable from production and consumption (Judd, 1964; Shostack, 1977; Zeithaml et al., 1985; Sampson & Froehle, 2006). While to date there is not one accepted definition of the term service, a general definition used by the U.S. government describes service as "a change in the condition of a person, or a good belonging to some economic entity, brought about as a result of the activity of some other economic entity with the approval of the first person or economic entity" (Hill, 1977; p. 318). More recently, the proponents of the service-dominant logic state that services are: "the application of specialized competencies (knowledge and skills)

through deeds, processes and performances for the benefits of another entity or the entity itself" (Vargo & Lusch, 2004, p.2). These definitions touch upon different aspects of service—intangibility, customers' input, knowledge and information-intensity, and a positive change in condition. However, due to the intangibility and the inextricable relationship between goods and services, it is more appropriate to apply classification schemes of services in accordance with the purpose of the research, instead of giving service a single definition to encompass the full diversity of service (Cook et al., 1999). For the purpose of this paper, I classify services in to two categories: services "for the customer" and services "to the customer" (Wemmerlöv, 1990). The first kind represents the core benefits the customer receives. For example, the core service of an auto body shop is car maintenance. In this paper, my focus is on the later one, representing the set of services that surround the core product offerings. An example of this kind of supplementary services of the auto body shop will be the caretaking of car owners, such as providing shuttle services after they drop off their vehicles. I discuss this type of service in detail in the following section.

Supplementary Services

Supplementary services represent the identifiable intangible activities that the organization enacts in order to enable a customer to benefit from the firm's product or core service. Consider limousine service; the core service customers pay for is transportation. The courteous, hospitable driver who describes the landmark encountered on the trip is offering a supplementary service that increases customer value beyond what's possible through the core transportation service. Supplementary services include information provision, consultation, order taking, hospitality, caretaking, exceptions handling, billing, and payment (Lovelock, 1994). These services enable the fulfillment of needs emerging at different stages of the customer-

service life cycle (CSLC) (Ives & Learmonth, 1984, Piccoli et al., 2001). The CSLC theorizes the role of technology as an enabler of superior customer service identifying four major phases that customers traverse in their interactions with a firm—establishing requirement, acquisition, and ownership (Piccoli et al., 2001). Table 1-1 provides a description of each kind of supplementary services (Lovelock, 1994) with reference to the CSLC phase they typically occur in. It is important to note that each kind of supplementary service can be provided in more than one phase of the customer service life cycle.

IT-Enabled Customer Service Systems

Customer service is one of the functions that has been deeply affected by the advent of information technology (Ives & Learmonth, 1984; Keen, 1991; Piccoli et al., 2001), and the impact will likely intensify rather than diminish in the future (DeVries, 2008). IT-enabled customer service systems are the collection of information systems that mediate and enable the performance of supplementary services so as to increase overall customer value by improving customer service interaction value—the overall utility realized by customers using the service system (Piccoli et al., 2004). That is, deploying IT-enabled customer service systems, a firm can foster efficiency (e.g., speeding check-out for the online retailer by storing customer information) and

Table 1-1: Descriptions and examples of supplementary services (adapted from Lovelock, 1994)

Supplementary Services	Description	Examples of Services That Fulfill Needs at Different Phases of CSLC
Information Provision	The services that provide information about the company (e.g., location and service hours) and the product offerings (e.g., usage instruction).	*Requirement phase*: answering frequently asked questions *Acquisition phase*: tracking delivery status *Ownership phase*: informing product upgrade information *Retirement phase*: informing disposal options
Consultation	The services that engage customers in a conversation to probe the customers' requirements and provide them with a tailored solution	*Requirement phase*: suggesting complimentary products *Acquisition phase*: customizing products and services to the individual *Ownership phase*: responding to customer feedback
Order Taking	The services that involve application acceptance to memberships or subscriptions, order entry, and reservation of seats, tables, hotel rooms, etc.	*Acquisition phase*: confirming order placement *Retirement phase*: canceling or modifying order
Hospitality	The services that involve considering the customer's needs and taking care of the customer	*Acquisition phase*: providing entertainment while waiting for products or services to be delivered
Caretaking	The services that involve looking after the customer's possessions	*Ownership phase*: providing child care
Exceptions	The services that fall outside the normal service delivery, including special requests, problem-solving, handling compliments, and compensating customers for performance failure	*Requirement phase*: handling special diet requests in advance of service delivery *Ownership phase*: providing warranties against product malfunction *Retirement phase*: providing refunds or compensation against product malfunction
Billing	The services that inform the customer of a change of product/service in a timely and accurate manner.	*Acquisition phase*: providing invoices of the transaction
Payment	The services that involve collecting the charges from the customers	*Acquisition phase*: handling alternative methods of payment, such as cash, check, and credit cards.

effectiveness (e.g., providing customers with precise and timely product information) in service delivery, and in some contexts they have become a competitive necessity (Bonfield, 1996). But as technology continues to evolve, there are opportunities for innovative uses of IT to reshape supplementary services that raise the bar on service differentiation and operations, as well as after-sales services (Karimi et al., 2001). For example, Giant Food Stores, a large regional supermarket chain, adopted a "technology as business enabler" strategy and installed a network of in-store kiosks for customers to place orders for the deli and pharmacy departments, access recipes, check out bonus-card saving, locate products, and so on (Reda, 2006). By providing their customers with a set of supplementary services through new technology, including order taking and information provision, Giant Food Stores provides its customers with a better shopping experience and differentiates itself from its competitors.

The information systems literature has a growing tradition of interest in customer service and service systems in general (Ives & Learmonth, 1984, El Sawy & Bowles, 1997; Ray et al., 2005; Brohman et al., 2003; Orman, 2007). However, much of this work focuses on Web-based customer services (Dillon & Reif, 2004; Piccoli et al., 2004; Yeung & Lu, 2004; Lightner, 2004; Liang et al., 2006; Levenburg & Klein, 2006; Cenfetelli et al., 2008). I seek to broaden this perspective due to the importance of a coordinated and integrative multichannel customer service strategy that recognizes the many technology-mediated and technology-enabled avenues for customer service available to modern organizations (Rayport & Jaworski, 2004; Arnowitz & Dykstra-Erickson, 2007).

Theoretical Framework

The literature review is organized around an integrative framework that explicitly models the process through which IT-enabled customer service systems produce customer value (Figure 1-1).

Customer service systems represent the collection of information systems an organization implements to fulfill customer needs. As socio-technical systems, customer service systems encompass both a technical and a social subsystem (Bostrom & Heinen, 1977). As customer needs vary throughout the customer service life cycle, service provision typically occurs through a collection of systems. A simple hotel stay requires a reservation system when a traveler seeks the room, a property management system when the traveler checks in, and a guest accounting system to credit loyalty points.

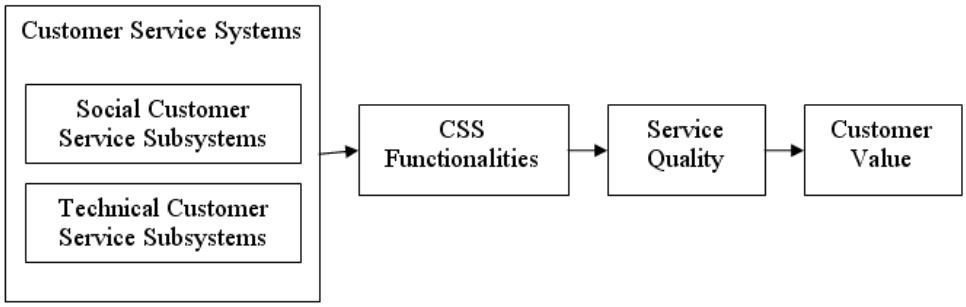

Figure 1-1: Theoretical framework

Service provision is enabled by the functionalities of customer service systems. Functionalities represent the set of capabilities associated with electronic devices—hardware and software—that enable the "deeds, processes and performances" that service providers or customers (in the case of self-service) use to transition from pre-service (need condition) to after-service (need-fulfilled condition). Consider the purchase of an automobile. The customer must determine the specific features of the

vehicle by gathering and interpreting information about available cars (requirements phase of the CSLC). An interactive Website that allows customers to see and to read about the specifications of a firm's own fleet provides the appropriate functionality—in this case through self-service.

Organizations develop these functionalities in order to provide higher service quality. Service quality is defined as the consumers' judgment of overall excellence or superiority about services and includes five dimensions: tangibles, reliability, responsiveness, assurance, and empathy (Parasuraman et al., 1988). These dimensions mainly apply to the face-to-face service context (Buttle, 1996; Yang et al., 2004; Svensson, 2006); therefore, the dimensions of service quality are broadened to include the following ones in the technology-enabled service context: efficiency, system availability, fulfillment, privacy, compensation, and contact (Parasuraman et al., 2005). Finally, the quality-value-loyalty chain (Parasuraman & Grewal, 2000) suggests that service quality, being harder to imitate than product quality and price, affects the customers' perceived benefits, a key component of customer value. In summary, beyond a product's basic benefits, providing supplementary services differentiates a company's offerings from that of its competitors and sustains loyalty by enhancing customer value (Jones & Sasser, 1995).

In the appendix, I discuss the methodology used to perform an extensive literature review designed to surface the state of the art in the emerging literature about customer service systems. Based on this literature review I provide the conceptual model and a set of research propositions.

Literature Review

The literature review is organized around the theoretical framework that models the impact of customer needs and customer service systems on customer value.

Figure 1-2 depicts the nomological network that emerges from my literature review and the research propositions describing the relationships amongst the constructs.

Functionalities of Customer Service Systems

In this section I review the interdisciplinary research that, to date, has mapped the functionalities offered by customer service systems (Table 1-2). Keeping with the focus on customer needs, I organize the data by macro-functionality, rather than focusing on the specific tools a firm may have implemented. I offer an analysis of the outstanding body of work and provide propositions for further work.

Table 1-2: Concept matrix: Functionalities provided by customer service systems

	Methodology	Sensing the Needs	Provide Information	Personalization	Transaction and Payment	Problem-Solving	Relationship Building
Berkley & Gupta, 1994	Theory	**x**	**x**				
Dev & Ellis, 1991	Theory			**x**			
Dillon & Reif, 2004	Survey	**x**	**x**				
Erevelles et al., 2003	Survey	**x**			**x**	**x**	
Furey, 1991	Theory		**x**				
Gwinner et al., 1998	Interview/survey						**x**
Hennig-Thurau et al., 2002	Survey						**x**
Liang et al., 2006	Experimentation			**x**			
Lightner, 2004	Analyze Websites		**x**	**x**	**x**	**x**	
Lin, 2007	Survey		**x**				
Negash et al., 2003	Survey		**x**				
Piccoli et al., 2004	Multi-method			**x**			**x**
Rowley & Slack, 2003	Theory		**x**	**x**	**x**		**x**
Sisodia, 1992	Theory	**x**		**x**			
Sivabrovornvatana et al., 2005	Interview				**x**		
Srinivasan et al., 2002	Survey			**x**			
Tseng & Hwang, 2007	Experimentation					**x**	
Yen & Gwinner, 2003	Survey						**x**

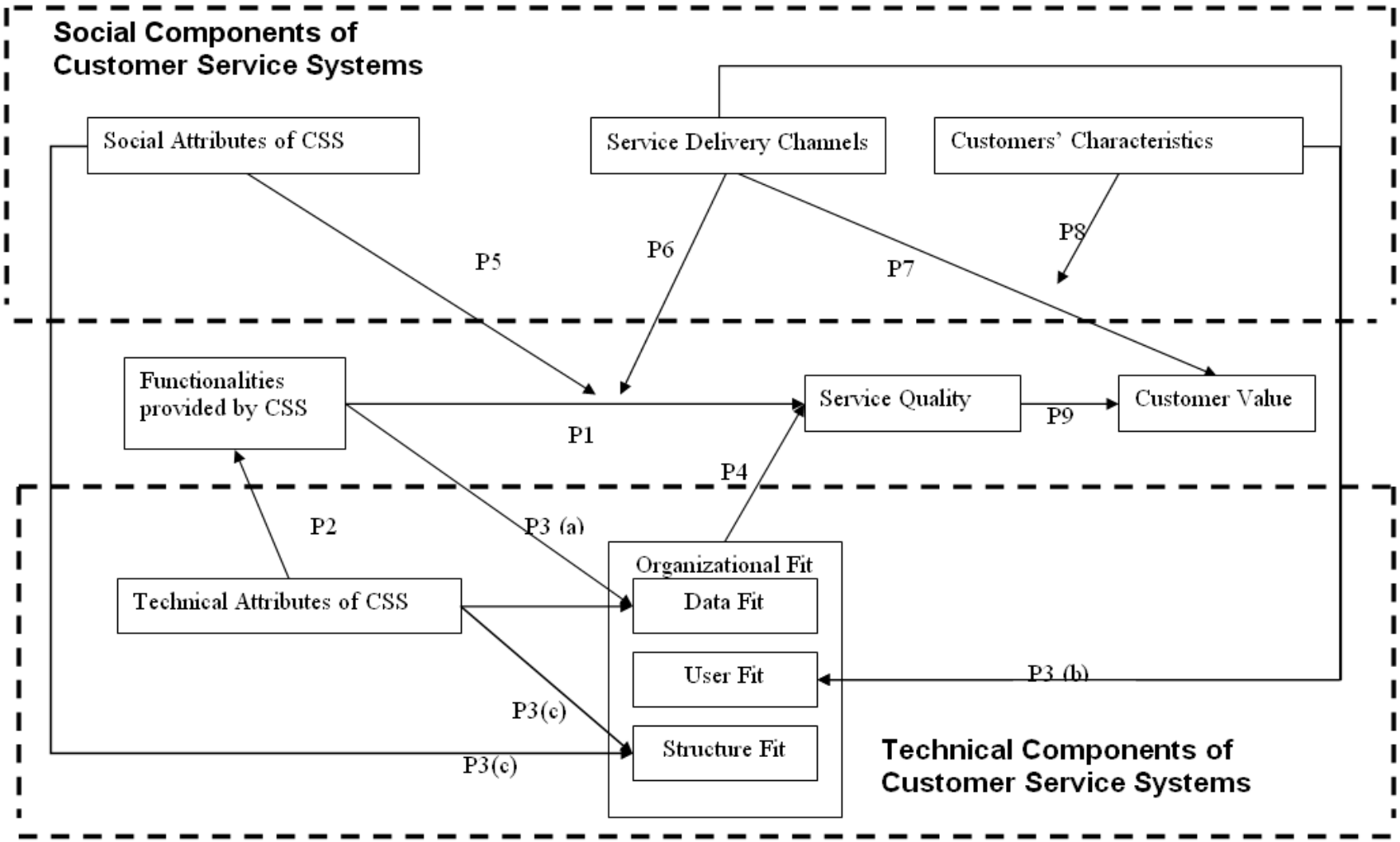

Figure 1-2: Detailed conceptual model

Sensing Customers' Needs

The service-dominant logic recently introduced in the marketing literature has as one of its main tenets the centrality of knowledge and information about customer needs (Vargo & Lusch, 2004). With completed information about its customers (Brohman et al., 2003), a firm can anticipate customers' needs and requests, thus being responsive to them (Vargo & Lusch 2004; Sisodia, 1992). This functionality also enables the business to react to customers' needs and requests promptly and effectively, providing the customer with the knowledge necessary to make a purchase (Dillon & Reif, 2004) and consuming the products and services (i.e., the third stage of the customer service life cycle). Finally, being able to predict customer needs also helps businesses handle complaints effectively (i.e., the last stage of the customer service life cycle), which in turn enhances service quality (Erevelles et al., 2003). For example, Four Seasons Hotel in Los Angeles has a customer database that stores which guests are allergic to down and need foam pillows or the kimonos and special tea sets it keeps on hand for its Japanese clients (Berkley & Gupta, 1994). As a result, service quality is enhanced because the organization can be proactive and responsive to customer needs.

Providing Information

The literature shows that organizations can provide quality services and generate customer value by disseminating valuable information to their customers (Furey, 1991). Extending the notion of Information Systems Success (DeLone & McLean 1992), I propose that quality of the information provided by the company affects customer satisfaction through increasing service quality. Providing reliable information about the product of interest and alternative products facilitates

customers' information acquisition and processing that enable customers to locate and select products and services that satisfy their needs (Alba et al., 1997), thus improving service quality. This functionality is even more important when customers purchase products and services over the Internet where they rely on mediated representation of the products and services to acquire information (Dillon & Reif, 2004). The ability to inform customers about the relevant product alternatives in a timely and accurate fashion will increase user satisfaction (Negash et al., 2003; Lin, 2007). Therefore, businesses that can provide more reliable information about their products will be able to achieve higher service quality.

Personalization

Personalization, the ability to tailor products, services, and the transactional environment to individual customers, increases the probability that customers will find something they wish to buy (Srinivasan et al., 2002). In this situation, service providers, not only provide product information, but also exchange information with the customers. The customer provides some information about themselves, and customer service systems make recommendations or provide additional information to facilitate the customer's decision making. A personalized product offering that shows that the company wants to provide individualized service enhances service quality.

Moreover, this notion of "personalization" of the transactional environment is expected to emerge with the evolution of Web sites when businesses wish to create within-industry differentiation and barriers to imitation (Piccoli et al., 2004). This is especially important in the information age when customers are overloaded with information. Being able to deliver personalized information that accurately fits customer needs will enhance customer satisfaction (Liang et al., 2006). Customers will be able to complete the transaction more efficiently when the transactional

environment (e.g., the Website) is customized and, as a result, they will tend to perceive higher service quality.

Facilitating Transactions and Payments

Technology allows service providers to access customers' data in a faster and more accurate fashion so as to increase the customers' confidence of the reliability of the transaction process, reduce waiting time, enhance the responsiveness of the service providers to customers' feedback, ensure the accuracy of the payment process, and give customers individual attention (Sivabrovornvatana et al., 2005). Flexibility with respect to payment options also enhances customer services by providing more means for customers to finish a transaction (Erevelles et al., 2003). For example, kiosks that sell rail tickets at railway stations provide an alternative method to purchase a rail ticket (Rowley & Slack, 2003). As a result, customers will have more access to the resources needed to complete their transaction and payments and experience less frustration. Therefore, customer service systems that provide different means for customers to process their transaction and payment will tend to receive a higher service quality evaluation.

Problem Solving

The functionality that solves customers' problems includes detecting errors, correcting errors and, at the same time, minimizes the disruption of consumption of the core products and services (Erevelles et al., 2003). One way to solve customers' problems is to have the answers for a set of frequently asked questions that can solve customers' problems, saving time over providing solutions through emails or online requests. This approach limits service delays because emails and online requests rely on manpower to reply the customers' requests. Having this functionality can

significantly reduce the service cost and provide more efficient and effective customer service (Tseng & Hwang, 2007), thus enhancing service quality.

Relationship Building

Relational benefits (Gwinner et al., 1998), the value (i.e., confidence benefits, social benefits, and special treatment benefits) created through the interpersonal interaction between customer and service providers are the antecedents of customer satisfaction with the service (Hennig-Thurau et al., 2002; Yen & Gwinner, 2003). Customer service systems can provide functionalities that draw people into a community or a relationship with a retailer. These functionalities, for example, special offers, service enhancements, and other added-value features, can enhance relationships with and commitment to a retailer (Rowley, 2000). For example, supermarkets have introduced loyalty schemes over the past few years, which usually involve the customer being given a magnetic strip card that can be swiped when the customer makes a purchase (Rowley & Slack, 2003). Once a customer has an entry in the database, further records of customer purchases can be added, so that ultimately it is possible to build a profile of individual customer purchasing habits. With this information, businesses can establish an on-going relationship with their customers, provide products and services more appropriate for the customers and, as a result—with time—enhance customer value (Piccoli et al., 2004).

Clearly, different functionalities impact different aspects of service quality. For example, the relationship-building functionality will have a positive impact on the empathy aspect of the service quality, while transaction and payment functionality have a positive impact on reliability. In general, I propose that there should be a positive relationship between functionalities provided by customer service systems and service quality. When a customer service system provides a new functionality that

fulfills the emerging customers' need or enhances the performance of the existing functionality, the service quality will increase; therefore, I propose:

Proposition 1: Functionalities provided by customer service systems will enhance service quality.

Technical Attributes of Customer Service Systems

In this section, a list of technical attributes of customer service systems was extracted from reviewing the interdisciplinary research, and is presented in Table 1-3. These technical components of the customer service systems enable and/or constrain the functionalities provided by customer service systems to fulfill customer needs (summarized in Table 1-4).

System Quality

The important dimensions of system quality in the customer service context include reliability, responsiveness, flexibility, accessibility and pervasiveness. A reliable and responsive customer service system is necessary in providing any kind of functionalities of the system, as it ensures that the right kind of functionality will be delivered to the right customers through the right channel in a timely manner (Choi et al., 2006). System reliability positively impacts service quality through the effects of effective decision making and efficient task completion (Bharati & Berg, 2003). Flexibility, another dimension of system quality, also enables a firm to implement IT applications to support customer service more efficiently and effectively (Ray et al., 2005) as it facilitates rapid development and implementation of IT applications that

Table 1-3: Concept matrix: Attributes of technical components of customer service systems

	Methodology	System Quality	Data Quality	Networks Connectivity	Security and Privacy
Bancel-Charensol, 1999	Theory		**x**	**x**	
Beatty et al., 1996	Observation/interview		**x**		
Berkley & Gupta, 1994	Theory	**x**			
Berkley & Gupta, 1995	Theory		**x**		**x**
Berry & Gresham, 1986	Theory		**x**		
Berry & Parasuraman, 1997	Theory		**x**		
Bharati & Berg, 2003	Survey	**x**			
Bhatt & Troutt, 2005	Survey		**x**		
Brohman et al., 2003	Theory		**x**		
Brown, 1997	Theory			**x**	
Choi et al., 2006	Survey	**x**			
Cooper et al., 2000	Single case study		**x**		
Dawes & Rowley, 1998	Multiple case studies			**x**	
Day, 1994	Theory		**x**	**x**	
De Búrca et al., 2006	Survey		**x**		
Delene & Lyth, 1989	Theory		**x**		
Dev & Ellis, 1991	Theory		**x**		
Domegan, 1996	Survey		**x**		
Ellram et al., 1999	Survey			**x**	
Gilmore & Pine, 1997	Theory		**x**		
Glynn & Brannick, 1998	Archival		**x**		
Harper, 1988	Theory		**x**		
Hull & Cox, 1994	Interview		**x**		
Ives & Mason, 1990	Theory		**x**	**x**	
Ives & Vitale, 1988	Single case study		**x**		
Jarvenpaa & Ives 1994	Theory	**x**	**x**	**x**	
Lambert, 1992	Theory		**x**		
Manrodt & Davis, 1992	Theory		**x**		
Moriarty & Swartz, 1989	Theory		**x**		
Nguyen et al., 2007	Theory		**x**		
Niketic & Mules, 1993	Theory			**x**	
Rathnam et al., 1995	Survey		**x**		
Raval 1983	Theory		**x**		
Rayport & Jaworski, 2004	Theory	**x**			
Ray et al., 2005	Survey	**x**			
Ross, 2005	Theory			**x**	

Table 1-3 (Continued)

	Methodology	System Quality	Data Quality	Networks Connectivity	Security and Privacy
Rowley, 1999	Theory		**x**		
Sisodia, 1992	Theory		**x**		
Slater 1997	Theory		**x**		
Stamoulis et al., 2001	Single case study		**x**		
Teo et al., 2006	Single case study		**x**		
Torkzadeh et al., 2006	Survey		**x**	**x**	
Voss, 1983	Interview		**x**		
Wells et al., 1999	Theory		**x**	**x**	
Zhu & Nakata, 2007	Survey			**x**	
Zhu et al., 2002	Survey	**x**			**x**

Table 1-4: Impact of the technical attributes of customer service on the functionalities provided by the system

	Sensing Customer Needs	Providing Information	Personalization	Transaction and Payment	Service Recovery and Problem Solving	Relationship Building
System Quality	**x**			**x**		**x**
Data Quality	**x**	**x**	**x**	**x**	**x**	**x**
Communication Networks		**x**	**x**		**x**	
Security and Privacy				**x**		

enhance customer service process performance by enabling the organization to respond swiftly to customer needs and provide functionalities to take advantage of emerging opportunities.

Accessibility of the customer service system, that is, the number of accessible service-delivery points that are available when customers need them, also has an

impact on service quality (Zhu et al., 2002): the more service-delivery points available for customers to acquire services, the more convenient it is for customers to obtain services. This dimension of system quality is especially important when customers are using self-service technology because convenience, such as solving intensified need and saving time, is one of the main drivers of using the self-service channel (Meuter et al., 2000). Finally, when an information system has achieved pervasiveness, most people view it as part of the natural world. That is, the system is more noticeable by its absence than its presence (Birnbaum, 1997). A pervasive customer service system can provide new means of interaction and generate new experience for its users. It enables businesses to provide "customer-centric" services that alleviate shoppers' perceptions of confusion, stress, and routine during the shopping session and increases store loyalty (Kourouthanassis et al., 2007). Therefore, this technical attribute of customer service system enhances the functionality of relationship building.

Data Quality

Service encounters are socially interactive and information dependent. Organizations that employ a market-orientation strategy and develop market intelligence can learn the preference of individual clients and capture this information and use it to best advantage in serving clients' requirements (Moriarty & Swartz, 1989; Day, 1994; Berry & Parasuraman, 1997; Slater, 1997; Glynn & Brannick, 1998; Glynn et al., 2003; De Búrca et al., 2006; Zhu & Nakata, 2007; Berry & Gresham, 1986; Beatty et al., 1996; Teo et al., 2006). With complete and integrated customer information gained from market intelligence, businesses are able to sense the customers' needs and act proactively to satisfy its customers (Bessen, 1993; Berkley & Gupta, 1995) or even offer personalized services (Delene & Lyth, 1989; Sisodia, 1992; Gilmore & Pine, 1997; Cooper et al., 2000). Therefore, the greater the level of data

completeness, the greater the likelihood that customers will feel their needs are understood or will want to build a relationship with the company (Brohman et al., 2003) In sum, an organization that can collect complete data about its customers will be able to provide a variety of functionalities including sensing customers' needs, providing personalized services and building relationships with customers.

Data quality not only refers to customers' information but also information about the company and its products provided to the customers (Berkley & Gupta, 1995). This includes instructions about means of access to the service, such as hours of opening, information about the behavior expected from the customer, recommendations and warning, and conditions of access (Bancel-Charensol, 1999). Knowledge-based systems (Armstrong, 1992; Chang et al., 1996) can be used for customer supports pertaining to repetitive questions. Without a complete database, the employees will not be able to delivery the functionality of providing information. Finally, the accuracy of data ensures accurate billing and record and, therefore, is critical in providing functionalities involving transactions and payments (Berkley & Gupta, 1994; Zhu et al., 2002).

Communication Networks

Quality data that is available through integrated communication network allow businesses be more responsive to customers' needs (Bhatt & Troutt, 2005). A well-developed communication network ensures the collection of information required to define the individual customer's needs and to facilitate purchase and use of products is communicated to customer service personnel so that they understand which resources are necessary to satisfy the customer's need (Ives & Mason, 1990). These networks include both internal and external information distribution (Wells et al., 1999). Internal information distribution refers to the distribution of information within the

organization for the purpose of decision support (Day, 1994). On the other hand, external information distribution focuses on the exchange of information between organizations and customers so as to enhance the service interaction process (Day, 1994; Ellram et al., 1999; Zhu & Nakata, 2007). Then, both customer and service agent are better informed about the products or services on offer as well as the purchase habits of the customer (Brown, 1997; Torkzadeh et al., 2006). In sum, communication networks enable companies to activate open, productive dialogues with customers that are personalized to reflect each customer's needs (Ross, 2005). Without these communication networks, customer service agents will not have the accurate and reliable information necessary to provide needed functionalities to fulfill customer needs.

Security and Privacy

Customers normally expect that their records, especially financial information such as account and credit-card use, will be kept confidential (Berkley & Gupta, 1995). Customers are concerned with their privacy, in particular when using IT-based services such as are provided over the Internet. Concern about potential sharing of personal information affects customers' willingness to obtain services, especially those involving functionalities of transaction and payment (Zhu et al., 2002).

Table 1-4 summarizes the impact of the technical attributes of customer service systems on the functionalities provided by the system. Based on the syntheses of the literature, I propose the following:

Proposition 2: Different technical attributes of the customer service systems enable different sets of the functionalities provided by the customer service systems.

Organizational Fit

To understand the relationship among the technical components and social components of customer service systems as well as the functionalities, I adopted the concept of "organization validity" (Markus & Robey, 1983), defined as "a fit or match between a system and its organizational context," when implementing an information system, and I define, in this study, "organizational fit" as a fit between the customer service system and its organizational context. Literatures related to (a) data fit, (b) user fit, and (c) structure fit in the customer service context were reviewed and summarized in Table 1-5.

Table 1-5: Concept matrix: Organizational fit

	Methodology	Data Fit	User Fit	Structure Fit
Dawes & Rowley, 1998	Multiple case studies		**x**	
de Ruyte & Zuurbier, 1993	Interview	**x**		
Greer & Murtaza, 2003	Survey		**x**	
Jarvenpaa & Ives, 1994	Theory			**x**
Lee et al., 2005	Survey			**x**
Mahmood et al., 2001	Meta-analysis			**x**
Rayport & Jaworski, 2004	Theory		**x**	
Torkzadeh et al., 2006	Survey	**x**		
Zhu et al., 2002	Survey		**x**	

Data Fit

Data fit is defined as the degree of congruence between the data contained in the information systems and the functionalities provided by the systems, in terms of the user preferences for information content and format that are rooted in personal cognitive styles (Markus & Robey, 1983). In the theory of task-technology fit (Goodhue, 1995), "technologies" are tools used by individuals in carrying out their

tasks, and "tasks" are broadly defined as the actions carried out by individuals in turning inputs into outputs. When a technology can better assist an individual in performing his/her tasks, there is a higher degree of task-technology fit. In the context of customer service systems, the data quality of the systems (i.e. technology) affects the content and presentation of the information. For the service process (i.e., tasks) to be successful, the information should be clear and accurate to facilitate service providers' decision making (Torkzadeh et al., 2006). However, functionalities with different characteristics require different information context and format. For example, the functionalities that involves unstructured tasks (e.g., providing personalized services) require a more user-friendly information format that assists service providers in analysis, decision making, and control in the customer service strategy; while the information context and format will be trivial for the functionalities involving routine and repetitive tasks (e.g. facilitating transactions and payments). Therefore, I propose:

Proposition 3(a): The technical attributes of customer service systems and the functionalities provided by the systems together influence the data fit between the data in the customer service systems and the functionalities.

User Fit

I define user fit as the degree of congruence between a system and a user's cognitive process. Cognitive process refers to "the way people process information" (Markus & Robey, 1983, p. 208). Providing an interface that fits customer characteristics at each service encounter is a strategic decision that calls for the consideration of both costs and benefits (Rayport & Jaworski, 2004). The interface between customer and service provider may be best driven by customer needs, such as the level of involvement in the purchase (Dawes & Rowley, 1998). Three different types of interface are available from the service delivery channel: people-dominant

(e.g., a guest service agent), machine-dominant (e.g., a Website), or a hybrid of both (e.g., a live chat) (Rayport & Jaworski, 2004). When choosing the service delivery channel, a customer considers the effort involved in using the channel and the complexity of the service delivery process (Zhu et al., 2002). Customers are more inclined to choose the channel that is easier to use, consistent with their existing values, beliefs, and needs (Greer & Murtaza, 2003). For example, technology-readiness (Parasuraman, 2000) refers to people's propensity to embrace and use new technologies for accomplishing goals at home and at work. That is, people who are less technology-ready may find using new technology to be intimidating. In the context of customer service, these customers prefer a people-dominant channel or a machine-dominant channel that they have been used to before. As a result, there is a better fit between the system and the user when personal service is offered to them.

Proposition 3(b): The types of service delivery channel and customer characteristics together influence the user fit between the customers and the customer service systems.

Structure Fit

Structure fit is defined as the degree of congruence between a system and user's internal needs or motivation (Markus & Robey, 1983). A flexible system is more appropriate for an organic organizational structure and decentralized decision making; while a standardized system is more appropriate for a mechanistic organizational structure and centralized decision making (Markus & Robey, 1983). For example, a dynamic network organization that links, on an as-needed basis, teams of empowered employees, suppliers, and the customers to be able to solve one-time problems and provide personalized customer service will need a customer service system that is flexible, well-connected, and able to provide needed information at the

right time. In addition to the technological characteristics, management support also affects the use of technology by frontline service employees (Mahmood et al., 2001; Lee et al., 2005). When the management team provides technological users the opportunities to receive intrinsic rewards from the tasks, the motivation is increased and the employees are more likely to accept the systems; that is, a better fit between the customer service systems and the users' motivation. In sum, the technical attributes of the customer service system as well as its social attribute (e.g., organizational structure) together influence the structure fit between the customer service system and the organization. Therefore, I propose:

Proposition 3(c): The technical attributes of customer service systems and its social attributes together influence the structure fit between the customer service systems and the users' needs and motivations.

For a technology to have a positive impact on individual performance, the technology must be utilized and must be a good fit with the tasks it supports. That is, when a technology provides features and support that fit the requirements of a task, the performance of the user will be impacted (Goodhue, 1995). Therefore, organizational fit (i.e., data fit, user fit, and structure fit) can enhance employee performance (e.g., improved efficiency, improved effectiveness, and/or higher service quality). For example, the correspondence between task and information-presentation format (e.g. tables, graphs, and schematic faces) reduces the users' need to transform the mental representation and therefore, leads to superior task performance of individual users, according to cognitive fit theory (Vessey, 1991). In the context of customer service, the match between the characteristics of customer service systems and the tasks (i.e., providing the services) performed by guest-service agents and/or guests leads to superior task performance, and, hence, better service quality. Therefore, I propose that

when organizational fit is present, service quality is improved.

Proposition 4: Organizational fit is positively related to service quality.

Social Attributes of Customer Service Systems

The literature to date (summarized in Table 1-6) has identified the following characteristics of the social components of customer service systems: service-oriented culture, human capital, and organizational structure. Descriptions of the attributes and their impacts on service quality follow the table.

Table 1-6: Attributes of social components of customer service systems

	Methodology	Service-Oriented Culture	Human Asset	Organizational Structure
Adria & Chowdhury, 2002	Theory			**x**
Agnihothri et al., 2002	Theory	**x**	**x**	
Beatty et al., 1996	Observation and interview	**x**		
Bowen et al., 1989	Theory	**x**		
Brown, 1997	Theory		**x**	
Cooper et al., 2000	Single case study	**x**		
Dickey et al., 2007	Field study		**x**	
Farrell & Song, 1988	Theory	**x**		
Homburg et al., 2002	Survey	**x**		
Levenburg & Klein, 2006	Survey	**x**		
Mahmood et al., 2001	Meta-analysis		**x**	
Meyronin, 2004	Theory		**x**	
Narver & Slater, 1990	Survey	**x**		
Ray et al., 2004	Survey	**x**	**x**	
Schlesinger & Heskett, 1991	Survey		**x**	
Schneider et al., 1998	Archival	**x**		
Sutton & Rafaeli, 1988	Observation	**x**		
Torkzadeh et al., 2006	Survey		**x**	

Service-Oriented Culture

Service-oriented culture is defined as "employee perceptions of the practices, procedures and behaviors that are expected, supported and rewarded with regard to customer service and customer service quality" (Schneider et al., 1998, p. 151). Therefore, an organization with customer-oriented culture shows commitment to customers and views customer satisfaction as a priority (Levenburg & Klein, 2006). The service orientation of a business strategy includes the number of services offered, the number of customers services are offered to, and the extent to which these services are emphasized (Homgurg et al., 2002). These companies create "benefit bundles" that comprise products and services, rather than just the value of the product offerings (Narver & Slater, 1990; Homburg et al., 2002). Researchers have shown a positive link between a service-oriented business strategy and company performance (Homgurg et al., 2002; Agnihothri et al., 2002; Ray et al., 2004). For example, the First American Corporation, with a customer-relationship-oriented strategy in mind, provides personalized products through customers' preferred distribution channels (Cooper et al., 2000). In this situation service, in addition to products, has become a source of customer value.

As for customers, they often interact with a few frontline employees during a service encounter and typically develop an overall image of the emotions that members of a given organization display (Sutton & Rafaeli, 1988). Most importantly, even when employees are the ones to implement customer services processes, management must be committed to the employees and its customers to make it work (Beatty et al., 1996). With this commitment, management provides training to employees, respects and empowers employees to provide customers with solutions to their problems or needs. Therefore, even with the same functionalities, customer-

oriented employees are encouraged to create a warm emotional service environment for the customers and be responsive to customers' needs, which will attain a high quality of service (Sutton & Rafaeli 1988).

Human Assets

One of the major differentiating factors of services is the customer service agents' interpersonal skills and their unique know-how (Schlesinger & Heskett 1991). They are made manifest through the information given to customers, the style of welcome and interactions, the ability to listen and understand the needs of customers, the capacity to personalize service in real time, and the skilled handling of crises situations (Meyronin, 2004).

Important skills a service agent acquires include communication skill and technical skills. First, during the service encounter, successful communication between the customer and service agents are essential to ensure successful service delivery. Successful communication requires a shared understanding of context among partners (Dickey et al., 2007). When the customer fails to articulate his or her intention, it falls to the customer service agents to take the initiative and provide help. Therefore, the communication skills of a guest-service agent are important to ensure a successful service encounter. This has become even more important as computer-mediated communication is playing a more and more important role in the customer service encounter. Second, employees who have greater technical skills tend to have a higher level of usage of the customer service system (Mahmood et al., 2001). Therefore, their overall knowledge of the service process will be increased by acquiring information from the customer service systems. As a result, the employee can make better judgments at the point of customer contact and provide better services (Berkley &

Gupta, 1994). Therefore, with the same functionality, employees with higher level of skills provide service with higher levels of quality.

To enhance employees' skills and knowledge in order to impact customer service, companies need to provide them with training to ensure employees' compliance with the operating procedures so as to be able to deliver the expected services (Torkzadeh et al., 2006). Continuous training and support can affect employees' efficacy in service delivery (Agnihothri et al., 2002). For example, training ensures that customers have fewer number contacts with the company, interact with more knowledgeable employees, and experience fast and personalized service recovery (Brown, 1997)—with the same service encounter involving service recovery, a better-trained employee will be able to provide better service quality. Therefore, I propose that human capital moderate the relationship between the functionalities provided by the customer service system and service quality.

Organizational Structure

Decentralized decision making allows for employees to manage the process of customer service independently, using the full information and knowledge resources of the organization. This is the key to creating a high-touch operation for customers in which agents are empowered to make decisions that will improve customer satisfaction (Adria & Chowdhury, 2002).

Proposition 5: The social attributes of customer service system moderate the relationships between the functionalities provided by the systems and the service quality.

Service Delivery Channels

Customers evaluate service quality, not only on the outcome of the service, but also on the quality of the service delivery process (Han & Han, 2001). In this section I review the research that has addressed different types of service delivery channels, provide propositions based on their impact on service quality and customer value, and indicate attentions needed for future studies.

People form different attitudes toward different service delivery channels, and these attitudes vary from service to service at different times (Curran & Meuter, 2005). I define the service delivery channel as the medium through which service is delivered. To identify different types of service delivery channel, I adapted the five different customer service channels proposed by Froehle and Roth (2004): (A) technology-free customer contact, (B) technology-assisted customer contact, (C) technology-facilitated customer contact, (D) technology-mediated customer contact, and (E) technology-generated customer contact (self-service). Situations (A), (B), and (C) are "face-to-face" service encounters because the customer and customer service representative are physically co-located. In these cases, the interfaces are more people dominant. In situations (D) and (E), in which the customer and the customer service representative are not co-located are often referred to as face-to-screen, because the customer is generally using some sort of visual display (and/or audible interface) to interact with the service provider, and the interfaces are more machine dominant.

Different types of service interaction calls for different types of channel: people-dominant, machine-dominant, or a hybrid of both (Tinnila & Vepsalainen, 1995; Rayport & Jaworski, 2004). The manner in which a service is delivered may be more important when using personal service (e.g., friendliness of staff), whereas the outcome may be more important when using self-service channel (e.g., speed of the service process) (Beatson et al., 2006). For example, a personal service channel, which

is better at conveying empathy and handing exceptions, is a better channel in delivery functionalities like relationship building and service recovery. These face-to-face service encounters create personal connections and enjoyable interactions that ultimately affect customer satisfaction (Gremler & Gwinner, 2000).

On the other hand, a self-service channel, which excels in routine processing, is more appropriate for functionalities that perform simple and routine tasks (Selnes and Hansen, 2001), such as transaction and payment. Automated multimedia kiosks in retailing, for example, can be reliable, trustworthy, quick, and will never get bored, tired, or impatient, while presenting information through a variety of different media (Dawes & Rowley, 1998). The transaction functionality can be structured by the technology so that the experience is more standardized and consistent. This type of channel saves customers' time, gives the customer more control (Lee & Allaway, 2002), and provides the user with access to services at the time and location that are convenient for the customer. These conditions will have a positive effect on user satisfaction with the service (Yen, 2005; Meuter et al., 2000, Bitner, 2001). For example, tracking delivery status of orders may be better accomplished through Internet—because customers can view their order status at any time—than through a call centers. However, one risk of self-service channel is the reduction in customer loyalty through weakened social bonds (Selnes & Hansen, 2001; Salomann et al., 2007), because customers tend to trade with people they know—especially when the products involve high risk or/and when the customers have limited knowledge of the products (DiMaggio & Louch, 1998; Schultze, 2003)—and also to have a sense of obligation to a service-providing employee (Price & Arnould, 1999).

In sum, service delivery channels that are more people-dominant provide higher service quality when delivering services that require employees' judgment and engagement, while service delivery channels that are more machine-dominant provide

services in a more efficient fashion when performing tasks that are routine and repetitive. However, while customers generally develop separate, distinct attitudes toward the personal-service and self-service channel, these attitudes lead to a more global attitude toward the service firm (Curran et al., 2003). Therefore, even if companies distinguish service delivered through self-service vehicles from service delivered through customer service representatives as separate process implementations, they should look at options for integrating different channels (Selnes & Hansen, 2001; Salomann et al., 2007), and treat all channels as part of a larger customer experience continuum. Through different combinations of service delivery channels, companies are able to provide a higher level of customer service (Selnes & Hansen, 2001) Therefore, the combined effects of different service delivery channels should be considered, and I propose that that the service delivery channels and/or a mix of service delivery channels will have a moderating effect on the relationship between functionalities of customer service systems and service quality, because a certain delivery channel may be a better choice in delivering certain functionalities.

Proposition 6: The choice of service delivery channels moderates the relationships between the functionalities provided by the customer service systems and the service quality.

However, according to the summary of previous studies, presented in Table 1-7, only a few studies have discussed service delivery channels as integrated means of service delivery. However, most of the time, businesses keep the traditional channel and add a self-service delivery channel. In the future, it will be important for academic researchers to address service delivery channel as being composed of integrated solutions rather than separate channels.

Table 1-7: Concept matrix: Service-delivery channels

	Methodology	Types D and E (face to screen)	Types A, B, and C (face to face)	Channel Integration
Arnowitz & Dykstra-Erickson, 2007	Theory	**x**		
Beatson et al., 2006	Survey	**x**	**x**	
Bitner, 2001	Theory	**x**		
Bitner et al., 2002	Survey/interview	**x**		
Curran & Meuter, 2005	Survey	**x**		
Curran et al., 2003	Survey	**x**		
Curry & Penman, 2004	Interview/survey/archival			**x**
Dabholkar, 1996	Experimentation	**x**		
Dawes & Rowley, 1998	Multiple case studies	**x**	**x**	
DiMaggo & Louch, 1998	Archival		**x**	
Gremler & Gwinner, 2000	Interview	**x**		
Lee & Allaway, 2002	Experimentation		**x**	
Li et al., 2003	Survey			**x**
Meuter et al., 2005	Survey	**x**		
Price & Arnould, 1999	Survey/interview		**x**	
Rayport & Jaworski, 2004	Theory	**x**	**x**	
Rowley & Slack, 2003	Theory	**x**		
Selnes & Hansen, 2001	Survey	**x**		**x**
Tinnila & Vepsalainen, 1995	Theory		**x**	
Torkzadeh et al., 2006	Single case study	**x**		
Wells et al., 1999	Theory	**x**		
Yen, 2005	Survey	**x**		

In addition to the moderating effect on the relationship between the functionalities and service quality, the choice of service delivery channel also has a direct effect on customer value. I use the concept of service convenience (Berry et al, 2002), customer desire to conserve time and effort when obtaining services, to explain this effect. An increase in service convenience has been theorized to be associated with an increase in satisfaction (Berry et al., 2002). Different service delivery channels will have different levels of service convenience (i.e., the costs and efforts to acquire

the services), especially access convenience (time and effort needed to order or purchase a service), transaction convenience (the perceived time and effort needed to secure the right to use a service), and post-benefit convenience (the time and effort needed to reinitiate contact with a firm after the benefit has been received). For example, a customer who wants information about a product can either go to the store during business hours or obtain the information on the Internet. Therefore, the service delivery channel that fulfills a need with higher access convenience generates a higher level of satisfaction and customer value.

Moreover, the enjoyment aspect of computer software and games encourages customers to try new products. The novelty aspect of the new technology can make it a preferred service-delivery option for customers (Dabholkar, 1996). Finally, a person's belief that he or she has control, even in the absence of real control, will result in benefits similar to those associated with real control, and, as a result, will enhance the value of the service to the customer (Dabholkar, 1996). As I defined above, customer value comprises two components: benefits and costs. The increase in the benefits component (preserving time and effort, enjoying new technologies, and gaining control) perceived by customers results in increased customer value. Therefore, I propose the following:

Proposition 7: The choice of service-delivery channels influences customer value.

Customers' Characteristics

Customers' characteristics included in this study are individual traits (i.e., demographic characteristics and need for personal interaction), and experience with the technology (i.e., technology readiness). Based on the literature review summarized in Table 1-8, I propose that customers' characteristics will have a moderating effect on

the relationship between service-delivery channels and customer value. The details review of each dimension of customer characteristics is presented here:

Table 1-8: Concept matrix: Customer characteristics

	Methodology	Demographic	Need for Interaction	Experience With the Technology
Albrecht, 2003	Theory		**x**	
Beatson et al., 2007	Interview			**x**
Bitner et al., 2002	Survey/interview			**x**
Cambre & Cook, 1985	Survey			**x**
Compeau & Higgins, 1995	Survey			**x**
Curran & Meuter, 2005	Survey		**x**	**x**
Curran & Meuter, 2007	Survey			**x**
Curry & Penman, 2004	Interview/survey/archival		**x**	
Dabholkar, 1992	Experimentation		**x**	**x**
Dabholkar, 1996	Experimentation		**x**	**x**
Greer & Murtaza, 2003	Survey			**x**
Hedden & Gabrieli, 2004	Experimentation	**x**		
Lee, 2002	Archival	**x**		
Meuter et al., 2003	Survey			**x**
Meuter et al., 2005	Survey	**x**	**x**	**x**
Milligan & Hayes, 1997	Theory	**x**		
Salomann et al., 2007	Multiple case studies		**x**	
Schultze, 2003	Interview		**x**	
Simon & Usunier, 2007	Survey	**x**	**x**	
Walker et al., 2002	Survey			**x**
Wang et al., 2006	Survey			**x**
Weijters et al., 2007	Survey	**x**		
Wells et al., 1999	Theory		**x**	
Zhu et al., 2002	Survey		**x**	**x**

Demographic

Demographic variables considered include age, gender, income, and education level. The effects of age and gender are less clear, though there is a belief that younger

people and males are more likely to have higher levels of role clarity, motivation, and ability with respect to technology innovations than older people and females (Zhu et al., 2002; Meuter et al., 2005). Aging is associated with a decline in perceptual skills, working memory, processing speed, and the encoding of information into episodic memory (Hedden & Gabrieli, 2004). On the other hand, aging is also associated with cumulative learning processes and increases in life experience. Therefore, the perception of service complexity decreases with age: older customers are more willing to engage in complex face-to-face communication with service providers, especially when the speed of service is not a key factor for the customer (Simon & Usunier, 2007). A study of financial services suggests a similar result: that (1) younger customers are more open to direct means such as phone or online banking and (2) more affluent customers are less likely to need human interaction while acquiring financial services (Lee, 2002). Similarly, people exposed to higher levels of education are likely to engage in more comprehensive information gathering and processing efforts than less educated people, and. therefore, are likely to form a positive attitude toward using the self-service technology (Weijters et al., 2007). In sum, younger, more affluent, and more-educated customers will require less time and effort when acquiring service through self-service channel, therefore, the demographic characteristics of customers moderate the relationship between service-delivery channel and customer value.

Need for Personal Interaction

A need for interaction is a desire to retain personal contact with others during service encounters. Cognitive-experiential self-theory (Epstein, 1994) proposes that people have two parallel, interacting modes of information processing: a rational system and an emotionally driven experiential system. Interpersonal interaction relates

to the experiential system, whereas reasoning and problem solving mobilize the rational system. People who rely more on the experiential system, which is primarily non-verbal and intricately associated with affect, tends to experience more difficulty in navigating the interface associated with a self-service system because they do not perform well when the interaction is logical and sequential. However, they find it easier to follow the transmission of implicit and pragmatic messages during face-to-face communication (Simon & Usunier, 2007). A high need for personal interaction will lead to decreased interest in learning how self-service systems work and increase the effort needed to invest in learning self-service technologies (Meuter et al., 2005). Therefore, customers who have more of a need for personal interaction during the service encounter will experience greater customer value than customers with less of a need for personal interaction when using the people-dominant service delivery channel.

Experience with the Technology

Customers' previous experience with the technology will influence their feelings about using the IT-enabled customer service systems (Dabholkar, 1992), as experience with the technology may improve customers' confidence and willingness to use it (Walker et al., 2002). Based on the social cognitive theory, self-efficacy is the belief that one has the ability to perform a specific behavior (Compeau & Higgins, 1995). Individuals who have greater proficiency with the technology will find it easier to use and will have higher expectations of the outcome of using the technology (Walker et al., 2002; Wang et al., 2006). The more consumers interact with the customer service technology, the more skilled they become with the role they play in the service delivery process. This results in increased usage of the technology and in the overall satisfaction of the service delivery (Beatson et al., 2007). Therefore, customers are expected to place a higher value on the systems if they feel comfortable

using them (Zhu et al., 2002). That is, with the same customer service technology, customers who are more experienced in using the customer service technology will perceive higher customer value.

The previous use of related technology will also increase perceptions of self-confidence and guide behavior (Meuter et al., 2005). For example, people who have had more experience using the Internet are more likely to adopt the Web personalization functionality (Greer & Murtaza, 2003). The notion of technology readiness (Parasuraman, 2000) refers to people's propensity to embrace and use new technologies for accomplishing goals at home and at work. Most people today are likely to have been exposed to some technological products, such as ATMs, and have formed an attitude toward using such technologies. This general attitude influences the evaluation of new but similar situations (Dabholkar, 1996). Customers who have a positive attitude of mechanical dependability are more willing to adopt new technologies (Walker et al., 2002; Curran & Meuter, 2005), have positive anticipated outcomes from the service encounter and perceive higher service quality and, hence, higher customer value (Curran & Meuter, 2007). Therefore, I propose the following:

Proposition 8: The characteristics of customers moderate the relationships between the service delivery channel and customer value.

Customer Value

Customer value is the perception of a customer that involves the tradeoff between what he or she is receiving and what he or she is giving up to acquire and use a product or service (Woodruff, 1997)—the tradeoff between perceived worth of the product or service and perceived psychological and monetary sacrifices (Dodds et al., 1991). When a customer perceives a service to be of good quality, and it is of relatively low price compared to a competitor's product, it is considered to be a good

value (Han & Han, 2001). Superior supplementary services can, not only add benefit, but also reduce customer's nonmonetary cost such as time, effort, and mental stress (Parasuraman & Grewal, 2000). Therefore, a service that is of higher quality (the benefit component of customer value) is perceived to be more attractive and more valuable to the customer (Wang et al., 2004). Following this logic, I propose that there is a positive relationship between service quality and customer value. As seen from the summary of past studies (Table 1-9), some researchers have used customer satisfaction as the outcome of service quality (Cenfetelli, 2008; Lin, 2007). However, customer value is theorized and empirically tested to be the antecedent of customer satisfaction[1] (Chen & Quester, 2007). Therefore, I propose the following:

Proposition 9: Service quality has a positive influence on customer value.

Conclusions

I reviewed the abstracts of 740 articles from the information systems, marketing, and operations management literatures and identified 142 articles to be read in full and coded. Based on this review, I developed an integrative theoretical framework summarizing the interaction among functionalities of customer service systems and their technical/social attributes, as well as their impact on service quality and customer value. The review showed that the functionalities being studied by researchers currently involve *the capacities to sense customer needs, provide information, personalize service, facilitate transaction and payment process, solve*

[1] The relationship between customer satisfaction and customer value is an academic topic belonging to the marketing field. Therefore, the study will not address this relationship.

Table 1-9: Concept matrix: Service quality

			Dependent Variables	
	Methodology	Service Quality	Customer Satisfaction	Customer Value
Buttle, 1996	Theory	**x**		
Cenfetelli, 2008	Survey	**x**	**x**	
Dodds et al., 1991	Experimentation	**x**		**x**
Lin, 2007	Survey	**x**	**x**	
Parasuraman & Grewal, 2000	Theory	**x**		
Parasuraman et al., 1988	Scale development	**x**		
Svensson, 2006	Theory	**x**		
Wang et al., 2004	Face-to-face survey	**x**		**x**
Wang, et al., 2006	Survey	**x**		**x**
Yang & Fang, 2004	Content analysis	**x**		
Yang et al., 2004	Content analysis	**x**		
Zeithaml, 1988	Theory	**x**		**x**

problem and recover customer complaints, and build relationships. I found no formal definition of *functionalities of customer service systems*. Several researchers have used the stages of customer service life cycle as functionalities (e.g., Lightner, 2004; Cenfetelli et al., 2008). I argue that functionalities are the capabilities of customer service systems to fulfill these customer needs throughout the life cycle, but not the emerging customer needs throughout the cycle. Therefore, more research is needed to define the functionalities of customer service systems and to explore the functionalities that have not been fully addressed. For example, in Table 1-2, most studies addressed the functionalities that fulfill the need at beginning stages of the customer service life cycle (e.g. providing information and personalization). In the future, researchers should pay more attention to the functionalities needed during the last stage of the customer service life cycle, the retiring stage.

Second, as mentioned above, it is important to note that service can be delivered through multiple channels to customers, even during one transaction. Service delivery channel should be viewed as an integrated service delivery solution,

instead of as separate solutions. Both theoretical and empirical research is needed in the area of multiple service delivery channels. Finally, the final dependent construct is customer value in this paper. However, I suggest that the "customer service system interaction value", the overall utility realized by the customer using a customer service system, is a better measure of the impact of supplementary service. As the benefit components of customer value includes the benefits derived from the core product offerings as well as from additional services (e.g., support service, recovery service, and other extraordinary service that further satisfies customers), customer service interaction value will be a more precise measure of the benefits derived from supplementary service than customer value in general.

In summary, I have proposed an integrative framework of IT-enabled customer service systems and illustrated the components of the systems and the relationships among these components as well as the relationships between these components and customer value. I also identified several potential future research trends, including the quest of a precise definition for functionality of customer service systems, the analysis of the combined effect of different customer service delivery channels, and the development of the new concept of customer service interaction value. These issues are essential in providing a more complete picture of customer service systems to both academia and to practitioners.

APPENDIX: METHODOLOGY

To perform an extensive literature review, I followed the methodology proposed by Webster and Watson (2002) and performed a keyword search on ABI/Inform using a combination of the following keywords: customer service systems, customer service, information technology, information systems, functionality, self-service technology, service quality, service convenience, customer value. The search resulted in a total of 693 articles. I then examined all 693 titles and abstracts to evaluate whether the articles were relevant to IT-enabled customer service systems. After reviewing all the abstracts, 139 articles were then selected for in-depth review. Finally, a subset of 105 articles was coded in the concept matrices. To extend the scope of review beyond the original search result, I reviewed the backward-cited and forward-cited works for potential interest. Another 64 articles were reviewed and 37 of them were read in full and coded in the concept matrices. This results in a total of 142 papers coded in the concept matrices to develop an integrated framework for customer service systems.

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CHAPTER 2

The Impact of a Portfolio of Service Delivery Systems: A Longitudinal Multi-Channel Approach

Introduction

As products are now increasingly being defined as solutions for customers, rather than what the manufacturer makes (e.g., cars) (Vargo & Lusch, 2004; Shostack, 1977; Cook et al., 1999), customer service has emerged as a critical source of differentiation and competitive advantage (Ives & Learmonth, 1984; El Sawy & Bowles, 1997; Karimi et al., 2001; Sheehan, 2006). Both services and tangible goods are accompanied by facilitating supplementary services, including information provision, consultation, order taking, hospitality, caretaking, exceptions, and billing and payment (Lovelock, 1994). In fact, these supplementary services surround the core of almost all products and services.

"Customer service, operations, products, marketing strategies and distribution are heavily, or sometimes even entirely depend on information technology, " as Keen (1991) recognized almost 20 years ago (p. 23). With advances in information technology, customer service systems (CSS), defined as collections of information systems that provide supplementary customer services to fulfill customer needs (Piccoli et al., 2004), have become the enablers of superior service (Ives & Learmonth, 1984, Karimi et al., 2001; Piccoli et al., 2001). Moreover, nowadays more and more customers provide their own services through self-service systems, a special kind of CSS that enables technology-mediated customer contact by delivering fully automated service (Meuter et al., 2000; Froehle & Roth, 2004). Automatic teller machines, self-

check-in kiosk at airports, and online retailing systems represent common examples of such systems (Bitner et al., 2002; Kiviat, 2008).

To customers, self-service offers several benefits, including quicker access to anytime/anywhere service (Meuter et al., 2000). For example, FedEx, a leading global package-delivery company, provides a set of self-service capabilities on its Website that allows customers to review accounts, monitor shipments, schedule pickups, and so on (Song, 2003). Past studies of self-service channels' impact on customer satisfaction and financial performance have shown mixed results (David et al., 1996; Moon & Fret, 2000; Bitner et al., 2002; Howard & Worboys, 2003). In this study, I challenge several assumptions embedded in these previous studies to resolve the indecisive conclusions from previous research. First, I argue that, in most cases, self-service channels are integrated into a portfolio of service delivery channel, instead of replacing the traditional personal-service channel. For example, airlines offer self-service check-in through kiosk, but still remain the lines for personal services. It is important to note that the integration of service delivery channels may be able to provide a higher level of customer service (Li et al., 2003). A customer may start by looking at the company's Web site to search for product information but then may purchase the products at a physical store. In the banking industry, customers are more likely to adopt a new technology if a competent employee has demonstrated its benefits to them (Curry & Penman, 2004). Therefore, the combined effects of different service delivery channels should be considered. The impact of integrating multiple service delivery channels should be evaluated. Second, I argue that the implementation of a new technology will cause process disruption, which will lead to a negative impact at the initial stage of the implementation. Thus, researchers may be able to obtain a positive impact of the additional self-service channel only after the new service process is stabilized. Finally, I argue that the acquisition of the new technology

does not guarantee the adoption. Therefore, it is problematic to assume that the addition of the new self-service delivery channel will result in a positive impact.

The purpose of this paper is three-fold. I study the impact of IT-enabled service delivery system in a multiple-channel context, that is, the additional IT-enabled service delivery channel is integrated into a service delivery system portfolio, instead of operating as an isolated channel. I do this by evaluating the process efficiency and customer service evaluation from, not only the customers who have used the added IT-enabled channel, but also from the ones who have used the traditional personal-service channel. Studying both sources allows us to resolve the mixed results from previous studies of self-service technology. Finally, I contribute to the understanding of the role of IT and customer service systems (Lui & Piccoli, 2009) in customer service delivery. Specifically, with my dataset I am able to test the impact of an incremental service delivery channel on proximal outcomes (speed of service and customer service) and a distal outcome (revenue).

The paper is organized as follows: I first present the key definition of service and multiple service delivery channels. I then identify the problematic assumptions and limitations embedded in previous studies that could lead to the inconclusive results to date of service delivery channels and develop hypotheses. Next, I describe the data and measures I have obtained and the methodology used to test the research hypotheses. Finally, I discuss the results of the data analysis and the implications for research, as well as directions for future research.

Theoretical Framework

Integrating a new self-service channel into the original customer service process will enhance process efficiency, not only for customers who use a self-service channel, but for customers who do not, as customer service representatives can focus

on serving the customers who choose not to serve themselves. In this study, I explore the effect of service delivery systems on those customers who use the new self-service technology and on those who choose not to use it but who benefit from it. The results highlight the importance of considering self-service technology as part of a service system portfolio instead of as an isolated technology.

Multiple Service Delivery System

Service is defined as "a change in the condition of a person, or a good belonging to some economic entity, brought about as a result of the activity of some other economic entity with the approval of the first person or economic entity" (Hill, 1977, p. 318). Since, more recently, service has emerged as a valuable unit of exchange in economy, recent literature provides a broader definition of service: a process by which a firm applies its specialized competence (knowledge and skills) to co-produce customer value with its customers (Vargo & Lusch, 2004). Multichannel service is a service that is delivered through two or more channels. (Sousa & Voss, 2006)

Generally customer service can occur through various service channels: (1) technology-free customer contact—customers directly interact with customer service agents; (2) technology-assisted customer contact—customers interact with customer service agents who are using technology to serve customers; (3) technology-facilitated customer contact—customers and customer service agents, both located at the same place, interact with the technology together; (4) technology-mediated customer contact—customers and customer service agents interact with each other through technology; (5) technology-generated customer contact (self-service)—customers obtain fully automated self-service and no human service agent intercedes (Froehle &

Roth, 2004). A combination of the above channels forms the multiple service delivery systems.

Mixed Results of the Additional Self-Service Channel

Previous work in this area has shown that self-service can increase service speed, providing customers with more control (Lee & Allaway, 2002), as well as offering users access to services at convenient times and locations and, thus, positively affecting their satisfaction (Meuter et al., 2000; Bitner, 2001; Yen, 2005). In short, providing self-service saves customers time and effort. The notion of service convenience (Berry et al., 2002) relates to a customer's desire to conserve time and effort. The literature identifies five types of service convenience: (1) decision convenience, (2) access convenience, (3) transaction convenience, (4) benefit convenience, and (5) post-benefit convenience. The literature theorizes a direct link between service convenience and customer satisfaction (Berry et al., 2002). From the organization's standpoint, implementing self-service enables cost reductions, superior efficiency, improved customer satisfaction and loyalty, and/or accessibility to new customer segments (Bitner et al., 2002). For example, on average, the cost of a completed call handled by an interactive voice-response system is $0.45, on average, whereas the cost is $5.50 if the call is handled by a service agent via telephone[2] (Nickell, 2001).

Although previous work has shown various benefits of self-service technology, some studies have also shown a nonsignificant or negative impact of self-service

[2] According to the May 2001 study by Gartner Group, "Contact Center Self-Service Costs" average $5 if by e-mail, $5.50 if by phone, and $7 if by chat. Web and IVR self-service, by comparison, average just 24 cents and 45 cents, respectively.

technology (David et al., 1996; Moon & Fret, 2000; Bitner et al., 2002; Howard & Worboys, 2003). The elimination of customer-employee interaction reduces the social bonds (Selnes & Hansen 2001). Also, providing only self-service leaves customers frustrated and annoyed in many cases, because when companies do less, customers have to do more (Moon & Fret, 2000). For example, when a customer uses an airline's Website to search for a flight ticket, the customers have to perform several repetitive searches if the departure date is flexible. As another example, A McKinsey & Company publication describes a company that introduced a service technology solution that resulted in a $16 million loss. The loss was attributed to a number of factors, including rate of customer usage, need for follow-up help, and absence of cross-selling opportunities (Bitner et al., 2002).

I argue that these mixed results of the research are due to the implicit assumption that the newly added self-service channel operated as an isolated channel and researchers have evaluated the impact of the single channel instead of a portfolio of the channel. This gives rise to two problems. First, the additional self-service channel affects not only the customers who choose to self-serve, but also the customers who choose not to. Different kinds of service interactions call for the use of different types of interfaces: people-dominant, machine-dominant, or hybrid (Tinnila & Vepsalainen, 1995; Rayport & Jaworski, 2004). The manner in which a service is delivered may be more important when using personal services (e.g., friendliness of staff), whereas the outcome may be more important when using self-service technology (e.g., the speed of the process) (Beatson et al., 2006). Therefore, a people-dominant interface that is better at conveying empathy and handing exceptions (Gremler & Gwinner, 2000; Schultze, 2003) is best suited to deliver functionality such as relationship building and problem recovery. On the other hand, a machine-dominant interface that excels in routine processing is more appropriate for functions such as

processing transactions and payments. While each channel has its pros and cons, researchers should evaluate the impact of all the channels available to customers, and companies should look for opportunities to integrate self-service technology with personal contact (Salomann et al., 2007; Selnes & Hansen, 2001). Second, the impact of information technology stems from actual usage rather than the investment in it (Devaraj & Kohli, 2003), but firms cannot force customers to adopt the new service technology; therefore, the acquisition of the additional self-service channel does not guarantee its successful deployment and a positive effect.

Moreover, though the implementation of new information technology could enhance efficiency and/or effectiveness; it also causes disruption at the beginning of the implementation of a technological innovation. This process disruption at the beginning may cause a negative effect on outcomes. Finally, revenues gained by a company through productivity will be hard to notice because there might be losses in other divisions/departments of the company. The effectiveness of a specific customer service process involving the self-service channel should be incorporated into the research model, as a firm's overall financial performance depends on the net effects of all of the business processes, not only the one I am focusing on in this study (Ray et al., 2004). Therefore, in the research hypotheses presented in below, I use a longitudinal multi-channel approach to reconcile the assumptions made in the previous studies so as to broaden the understanding of the effects of integrating a self-service channel into a service delivery system portfolio and to explain the productivity paradox, the discrepancy between the investment in information technology and the output, of hotel-industry technology (David et al., 1996).

Process Disruption After the Implementation of IT Investment

Whereas previous work in IT infrastructure has theorized that IT infrastructure investments are disruptive (Aral & Weill, 2007) due to their high up-front costs and long benefit-time horizons, I argue that other kinds of IT investments should also have this disruptive characteristic because they perturb existing business processes, due to the modification of organizational practices and procedures (Johnson & Rice, 1987). This modification of business processes requires both individual and organizational learning to obtain necessary knowledge and skills to perform the new processes, what is known as the knowledge barrier (Attewell, 1992). The disruptive character of the investment in the incremental self-service channel is particularly evident because the adoption of the self-service channel depends on customers, the technology users (Cenfetelli et al., 2008). One major characteristic of service is its *inseparability of production and consumption* (Zeithaml et al., 1985), that is, customers are the co-producers of the service process. More specifically, in the context of self-service, customers produce service by themselves without any intervention from human employees. Therefore, the benefits of the incremental self-service channel will not come to fruition until customers adopt the new technology (Figure 2-1). However, organizations cannot implement a traditional training program for customers as they do for employees. Customers need to engage in a social learning process (i.e., looking at other customers as guides for appropriate behavior) and operant learning. (i.e., reinforcement systems employed by firms to encourage customers who do their "jobs" correctly) (Halbesleben & Buckley, 2004; Goodwin, 1988). As a result, customers take a longer time than employees when overcoming the knowledge barrier.

Also, for a technological innovation to be truly valuable it must be routinized, that is, an innovation must become a stable and regular part of the organizational procedures and behavior (Zmud & Apple, 1992). In the case of adding a self-service

channel, both customers and employees need to acquire knowledge and skills pertaining to the new technology and to go through the learning process until the new technology is incorporated within the organization's operational work systems. Customers' input uncertainty (Larsson & Bowen, 1989), defined as insufficient information to perform the task, is critical to successful self-service co-production (Meuter et al., 2005). The more customers interact with self-service systems, the more they know what is expected of them and the more skilled they will be in their role and, as a result, they can enjoy the intended benefits of self-service (Beatson et al., 2007). I argue that the outcome of the implementation of the self-service channel (i.e., the

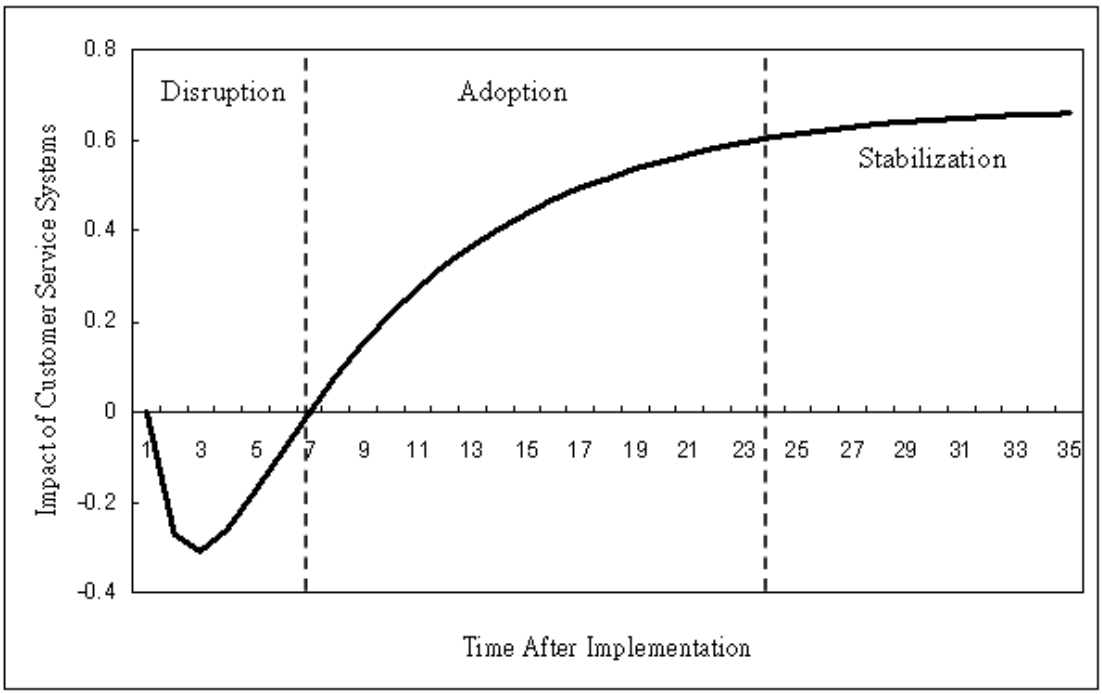

Figure 2-1: Disruption phase of information technology investment

financial performance) should decrease during the learning phase and then increase after the new process is routinized. Therefore, I propose:

Hypothesis 1.1: The financial impact of the usage of the incremental service delivery channel is moderated by stabilization of the service process.

Hypothesis 1.2: The financial impact of the failure of the incremental service delivery channel is moderated by stabilization of the service process.

Actual Performance of the Additional Self-service Channel

Customers' experience of service delivery nowadays is dependent on a combination of traditional communication channels and electronic channels (Li et al., 2003). Cognitive-experiential self-theory (Epstein, 1994) proposes that people have two parallel, interacting modes of information processing: a rational system and an emotionally driven experiential system. Interpersonal interaction relates to the experiential system, whereas reasoning and problem solving mobilize the rational system. People who rely more on the experiential system, which is primarily nonverbal and intricately associated with affect, tend to experience more difficulties navigating the technological interface, as they do not perform well when the interaction is logical and sequential. However, they find it easier to follow the transmission of implicit and pragmatic messages during face-to-face communication (Simon & Usunier, 2007).

Therefore, customers who are likely to embrace and use new technologies for accomplishing goals (Parasuraman, 2000) can choose to use the self-service channel to obtain the service they need. As a result, they perceive that they can achieve their goal in a more efficient fashion (Parasuraman et al., 2005), as self-service systems respond to user requests faster due to the elimination of human intermediaries, which reduces

the scope of human error and the time spent rectifying errors (Chathoth, 2007). Another kind of customer, the one who relies on the experiential system of their brain, prefers a higher level of personal interaction. The combination of personal service and self-service channels accommodates both needs. For example, today kiosks allow guests to check in, get their keys, and check out without ever talking to a hotel employee. Adding such a self-service channel frees up employee time for other kinds of personal interaction. This enhances the responsiveness dimension of service quality, the extent to which employees are willing to help and respond to customer needs (Parasuraman et al., 1985). In summary, adding a self-service channel to complement the personal-service channel benefits both kinds of customers by either enhancing the efficiency of the service process or better attending to customers' needs for personal interaction. Therefore, service process speed will improve because customers who prefer self-service channels will be able to serve themselves. The overall level of customer service improves because not only a speedy service process enhance customer service (Palmer, 2002; McKinney et al., 2002), but also customers' needs are accommodated through their preferred service delivery channel (Hui & Bateson, 1991). Therefore, I propose:

Hypothesis 2.1: The usage of the incremental service channel positively impacts service process efficiency and, as a result, customer service level.

In addition to the adoption of self-service systems, the correct technical functioning and the accuracy of service promise also to affect the quality of customer service (Zeithaml et al., 2000). However, self-service technologies are extremely prone to failure and failures in a self-service context are very frustrating to customers, because it is more difficult to provide service recovery through self-service channels (Bitner et al., 2002). A previous study showed that technology failure, the breakdown

of service delivery at the point at which the customer interacts with the technology, is the most common type of incident that leads to customer dissatisfaction when customers use self-service channels (Meuter et al., 2000). In addition, if the system is not working properly, extra labor hours will be needed to rectify the technological problems and the customers will not be able to obtain service via their preferred channel. This will have a negative effect on both the reliability and the responsiveness dimensions of service quality. Therefore, I propose:

Hypothesis 2.2: The failure of the incremental-service channel negatively impacts service process efficiency and then customer service level.

Financial Performance

The concept of quality-value-loyalty chain posits that a service that is of higher quality (the benefit component of customer value) is more attractive to and perceived to be of greater value to the customer; therefore affects customers' future behavioral intention (Parasuraman & Grewal, 2000). Customer services that create value for customers drives a company's profitability and growth (Heskett et al., 1997) because satisfied customers are likely to spend more per trip, on average, than dissatisfied customers and are less likely to leave the customer base than are dissatisfied customers (Anderson & Sullivan 1993, Jones & Sasser, 1995; Ho et al., 2006). Therefore, I propose the following hypothesis:

Hypothesis 3.1: Customer service level positively affects financial performance.

When companies implement an additional service delivery channel to automate the operative tasks by having customers serve themselves, employees are released from performing these tasks and they can then allocate more time to engaging in the complex customer interactions that are required in consultative tasks. This has the

effect of increasing customer loyalty (Selnes & Hansen, 2001). For example, when customers check in through kiosks in a hotel lobby, the routine operative task of issuing room keys is taken care of by a machine. When a customer asks for information after check-in (no matter which channel he or she uses), it requires an employee's personal judgment as to which information to provide and how to manage the interaction. Therefore, even though check-in speed does not increase, the personal attention increases customer loyalty. Customer loyalty is a predictor of customer future behavior because it corresponds to the motivation, or lack of motivation, to continue or/and expand the relationship with the firm (Fornell, 1992; Richins, 1983).

In addition, previous research shows that consumers who can make their own choices are more intrinsically motivated than consumers engaging in activities wherein there are no choices (Zuckerman et al., 1978). This freedom of choice results in positive attitudes toward the product or service (Barczak et al., 1997). Based on the Attribution theory; people attribute more responsibility to themselves when they perceived a higher freedom of choice (Arkin et al., 1976). In general, the higher intrinsic motivation and higher perceived responsibility to the process outcome leads to a positive attitude toward the core product/service and a positive evaluation of the service provider, which leads to positive word of mouth and loyal behavior (Reinders et al., 2008) as well as willingness to pay a premium (Sierra et al., 2009). On the other hand, failures of self-service systems force customers to use the traditional service channel and reduce customers' perceived control. In sum, use of the self-service channel gives customers a sense of control and shared responsibility, which positively affects whether customers will return and spend in the future. A failure of the self-service channel will have a negative impact. Therefore, I propose the following hypothesis:

H 3.2 Use of an incremental service channel positively affects financial performance.

H 3.3 Failure of an incremental service channel negatively affects financial performance.

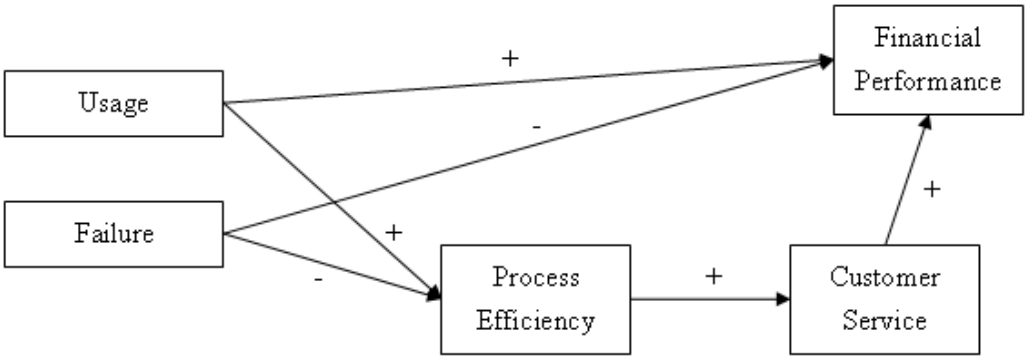

Figure 2-2: Research model

Methodology

The context of this study is the lodging industry. I obtained archival data from a major hotel chain in the United States for this study. The data used in the analysis are based on 389 hotels across two family brands (312 hotels belong to Brand A and 77 hotels to Brand B) that have already installed kiosks and have kiosk-usage and financial-performance information for 2006 and 2007. Both brands are in the upscale lodging segment, but Brand A offers an all-suite concept. With the aim of providing greater choice and control/convenience for guests, reducing guest waiting time, improving guests' check-in experience, and, ultimately, reducing front-desk staff costs, the lodging chain started the kiosk implementation project in 2000. The primary rollout of the kiosk implementation started in 2005 and the kiosk had become a brand standard by the end of 2007. In addition to the property-level data pertaining to kiosk-

and financial-performance by month, I also obtained individual-level guest information and survey data following their stay at any of the properties during 2006 and 2007.

Measures

I measured usage of the incremental self-service channel through customer kiosk check-in usage, computed as a ratio of check-in through the self-service kiosk and the total number of arrivals during a given month. I measured the failure of the incremental-self-service channel as a ratio of completed check-ins and through the self-service kiosk and the total number of attempted kiosk check-ins during a given month. The speed of the customer service process was measured by using a one-item measure from the lodging chain's standard post-stay survey. Customer service level was obtained using a five-item scale derived from the same post-stay survey. The scale included the following items: overall experience, overall service, overall value, overall accommodation, and overall arrival experience (see Appendix A for detailed information). Finally, I used the RevPAR (revenue per available room) Index as a measure of financial performance. RevPAR is the standard measure of revenue in the hotel industry, which takes into account the average rate that a property is able to charge per room and the property's occupancy percentage. The RevPAR Index is a measure computed by Smith Travel Research, an industry research firm that evaluates individual properties' RevPAR relative to competitors. A RevPAR of 100 points indicates that the hotel has the same RevPAR as its competitors. A RevPAR of more than 100 points indicates that the hotel has a higher RevPAR than its competitors; a RevPAR of less than 100 points indicates that the hotel has a lower RevPAR than its competitors.

Lagged Financial Effect

When introducing a new technological innovation, a company must incorporate it into the operational or managerial work system so that it brings value to the company (Zmud & Apple, 1992). This incorporation increases as users gain experience with the innovation. In the context of self-service, customers perform a six-step adoption process: (1) awareness, (2) investigation, (3) evaluation, (4) trial, (5) repeated use, and (6) commitment (Attewell, 1992; Bitner et al., 2002). First, customers must be aware that the self-service channel exists. They are then likely to collect additional information about the technology that may become the basis for a judgment. If a customer judges it to be appealing, he or she is more likely to try the new technology. In turn, the initial trial of the technology can lead to repeated usage and commitment, depending on how the customer reacts to the trial experience. The benefits of the self-service systems (i.e., the enhancement of customer service) will be realized only when the organization's customers adopt the technology. Moreover, the more customers that interact with the self-service system, the more skilled they become with their role and the more benefits they perceive (Beatson et al., 2007; Meuter et al., 2003). The intended customer base must become comfortable using the self-service channel and prefer this method over traditional ones (Kauffman & Lally, 1994).

Therefore, even the lagged financial impact of IT investment applies to a business's processes (Devaraj & Kohli, 2003); it should be even more pronounced in customer service processes. I computed the average number of days between two hotel stays by the same guests from guest-behavior data at the individual level. The average return cycle was 79.64 days (81.21 days for Brand A and 78.74 days for Brand B). Therefore, I lag the financial performance measure, RevPAR Index, for three months,

as I expect the financial effect of self-service channel performance will occur when customers return to the hotel next time.

Data Analysis and Results

Disruptive Nature of Technology

To test hypothesis 1, I ran the following regression model, using the Cochrane-Orcutt estimation method to adjust for autocorrelated errors in the time series data (Cochrane & Orcutt, 1949):

$$\text{RevPAR Index Lag} = \beta_0 + \beta_1 \times \text{Month} + \beta_2 \times \text{Usage} + \beta_3 \times \text{Failure} + \beta_4 \times \text{Stabilization} + \beta_5 \times \text{Brand} + \beta_6 \times \text{Stabilization} \times \text{Usage} + \beta_7 \times \text{Stabilization} \times \text{Failure} + \beta_8 \times \text{Brand} \times \text{Usage} + \beta_9 \times \text{Brand} \times \text{Failure}.$$ [3]

Stabilization is a dummy variable that represents the stabilization of the new customer service process after the implementation of the self-service channel; where 0 is the group of hotels that installed kiosks for less than 2 years (i.e., the un-stabilized group) and 1 represents the groups of hotels that had kiosks installed for more than 2 years (i.e., the stabilized group). The regression result presented in Table 2-1 shows that when the kiosks are installed for less than 2 years, usage of the technology has a negative impact (b = -0.531) on *RevPAR Index with 3-month lag*. However, when the kiosks have been installed for more than 2 years, the impact of the *usage* on *RevPAR Index Lag* is positive (-0.531+1.288 = 0.757). Therefore, hypothesis 1.1 is supported. *Failure* has a negative impact on *RevPAR Index Lag* and this relationship is not

[3] The interaction term *usage* x *failure* was originally included in the model for completeness. The results do not tangibly change, and there is scant theoretical justification for such interaction. Therefore, I have omitted the term from further analysis.

contingent upon the stabilization of the process. Hence, hypothesis 1.2 is not supported.

Table 2-1: Regression result

R	R^2	Adjusted R^2	Std. Error	Durbin-Watson
0.224	0.050	0.049	24.308	1.999

	B	Std. Error	Beta	T	Sig.
Month	-0.005	0.089	0.000	-0.056	0.956
Usage	-0.951	0.354	-0.093	-2.687	0.007
Failure	0.002	0.041	0.002	0.059	0.953
Stabilization	0.010	1.331	0.000	0.007	0.994
Brand	-10.357	1.299	-0.209	-7.974	0.000
S x Usage	1.654	0.353	0.167	4.691	0.000
S x Failure	-0.025	0.041	-0.016	-0.605	0.546
B x Usage	-0.410	0.311	-0.024	-1.321	0.187
B x Failure	-0.086	0.041	-0.058	2.080	0.038
(Constant)	125.679	1.448		86.768	0.000

Impacts of Multichannel Service Delivery Systems

To test hypotheses 2 and 3, I used structural-equation-modeling techniques to analyze a subset of data that contains the group of hotels that installed kiosks after January 2006 (including 130 hotels in Brand A and 33 hotels in Brand B) as kiosk check-in had stabilized in these hotels and the true benefits of the IT investment should have been realized. I used a component-based method called partial least squares and use PLS-Graph to perform SEM-based analysis. Unlike a covariance-based method (such as LISREL and AMOS), PLS does not generate fit statistics; therefore, the model is evaluated by assessing the significance of the paths and R-squares of the final dependent variable. Bootstrapping, a nonparametric approach for estimating the precision of the PLS estimates, was performed to test statistical significance of each path coefficient using t-tests (Chin, 1998). I chose partial least

squares over a covariance-based SEM for the following reasons: (1) constructs in covariance-based technique require at least four indicators per construct whereas one item in PLS; and (2) PLS accounts for measurement error and should provide a more accurate estimate of interaction effects such as mediation (Chin, 1998).

Measurement Model

As *customer service* is a multi-item construct, I first evaluated construct validity for the customer service construct by way of convergent and discriminant validity. As shown in Table 2-2, the composite reliability of 0.943 and average variance extracted (AVE) of 0.768 demonstrated that the customer service construct fulfills the criterion of convergent validity. In Table 2-3, the square root of the variance shared between the customer service construct and its items (0.876) is greater than the correlations between the customer service construct and other constructs in the model, showing satisfactory discriminant validity (Fornell & Larcker, 1981).

Table 2-2: Convergent validity

Composite Reliability	0.944
AVE	0.771
Loadings	
Overall Experience	0.9390
Overall Service	0.9105
Overall Value	0.8620
Overall Accommodation	0.8544
Overall Arrival	0.8181

Table 2-3: Discriminant validity

	1	2	3	4	5	6
1. Usage	1.000					
2. Failure	-0.095	1.000				
3. Process Speed	-0.013	-0.058	1.000			
4. Customer Service	0.009	-0.051	0.651	0.878		
5. Financial Performance	0.142	-0.106	0.097	0.120	1.000	
6. Brand	-0.118	0.136	-0.090	-0.038	-0.343	1.000

Table 2-4: Descriptive statistics of variables

	Mean	S.E.	Median	S.D.	Range	Min.	Max.
Usage	2.92	0.07	2.04	3.05	30.63	0.03	30.66
Failure	19.55	0.38	14.94	16.81	100	0	100
Experience	8.41	0.03	8.62	1.25	9	1	10
Service	8.65	0.03	8.92	1.16	9	1	10
Value	7.82	0.04	8	1.60	9	1	10
Accommodation	8.56	0.03	8.86	1.24	9	1	10
Arrival	8.69	0.03	9	1.19	9	1	10
Check-in Speed	8.91	0.03	9	1.21	9	1	10
Customer Service	9.65	0.03	9.86	1.28	9.68	1.74	11.42
RevPAR Index Lag	124.43	0.55	121.77	23.98	201.65	59.81	261.46

Structural Model

To test the mediating effects in hypothesis 2.1 and 2.2, I performed a series of steps recommended by Baron and Kenny (1986) and used the PLS result to conduct a Sobel test (Figure 2-3). First, there should be a significant relationship between the independent variable (*usage*/*failure*) and the dependent variable (*customer service*). Then, there should be a significant relationship between the independent variable (*usage*/*failure*) and the mediator (*process speed*). Finally, there should be a significant relationship between the mediator (*process speed*) and the dependent variable (*customer service*), and the relationship between the independent variable (*usage*/*failure*) and the dependent variable (*customer service*) should be significantly reduced when the mediator is added. Table 2-5 shows the results of each step of testing the mediating effect of *process speed* on the relationship between *usage*/*failure* and *customer service*.

Table 2-5: Mediating test result (Process speed as a mediator)

	Speed			Customer Service			Both		
	Path	T	S.E.	Path	T	S.E.	Path	T	S.E.
Usage-Speed	-0.0280	1.2718	0.0220				-0.0280	1.2718	0.0220
Failure-Speed	-0.0490	2.1238	0.0231				-0.0490	2.1238	0.0231
Usage-Service				-0.050	0.2239	0.0223	0.0200	1.3638	0.0147
Failure-Service				-0.0490	2.1217	0.0231	-0.0140	0.8454	0.0166
Speed-Service							0.6530	30.5646	0.0214

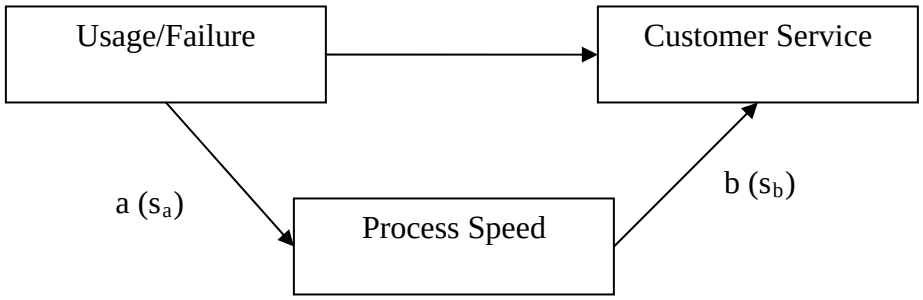

Figure 2-3: Sobel test

Sobel test: $z = (a \times b) \Big/ \sqrt{b^2 \times s_a^2 + a^2 \times s_b^2}$, where s_a is the standard error of a (the un-standardized regression coefficient for the association between the independent variable and the mediator) and s_b is the standard error of b (the un-standardized regression coefficient for the association between the mediator and the dependent variable). I could not establish the mediating effect of *process speed* on the relationship between *usage* and *customer service* because the relationship between *usage* and *process speed* is not significant. That is, step 1 of the mediating test process is not fulfilled. To test the mediating effect of *process speed* on the relationship between the *failure* and *customer service*, I performed the Sobel test. The z-value

provided by the Sobel test was -2.4491 (p-value = 0.014). Therefore, the indirect effect of *failure* on *customer service* via *process speed* is significantly different from zero. The path between *failure* and *customer service* is not significant in the complete model (i.e., the relationship is significantly reduced); it follows that the relationship between *failure* and *customer service* is fully mediated through *process speed*. Therefore, I claim that hypothesis 2.2 is supported, while hypothesis 2.1 is not.

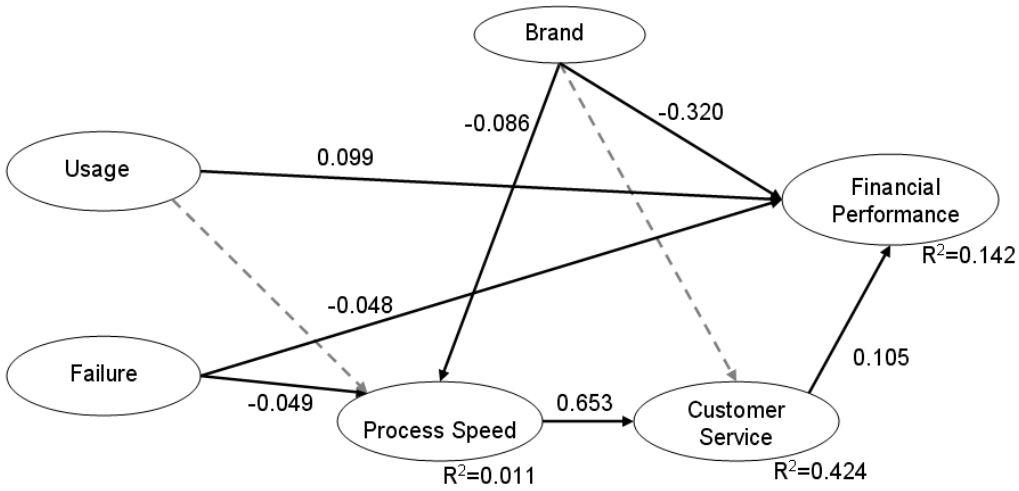

Figure 2-4: Structural model result (solid lines represent the significant paths)

Table 2-6: Path coefficient, t-statistics, and standard error of the structural model

	Path	T	S.E.
CIU-Speed	-0.0280	1.1946	0.0234
CIF-Speed	-0.0490	2.1458	0.0228
Brand-Speed	-0.0860	3.5246	0.0244
Speed-CS	0.6530	31.1927	0.0209
Brand-CS	0.0210	1.3408	0.0157
CS-Financial	0.1050	4.2466	0.0247
CIU-Financial	0.0990	4.6068	0.0215
CIF-Financial	-0.0480	2.3109	0.0208
B-Financial	-0.3200	16.9220	0.0189

Figure 2-4 is the graphical representation of the PLS results, where dotted lines indicate the insignificant path and solid lines, the significant ones. *Brand* is included in the model as a control variable. Table 2-6 further shows the details result of each path coefficient, t-statistics and the standard errors of the paths. As hypothesized, *customer service* has a positive effect on financial performance with a 3-month lag ($p < 0.001$). The term *usage* is positively correlated with financial performance ($p < 0.001$) while *failure* is negatively correlated with financial performance ($p < 0.01$). Therefore, hypothesis 3.1, hypothesis 3.2, and hypothesis 3.3 are all supported.

Discussion

In this study I seek to explain the mixed results of IT-enabled service delivery systems in previous studies. More specifically, I evaluate the impact on customer service and financial performance when firms add a self-service channel to a traditional personal-service channel. I theorize that the lagged financial performance affected by the IT investment, the disruptive nature of technology, and the assimilation gap between the deployment and the adoption of the technology are the causes of these mixed results. Moreover, I added a process-level measure to complement a remote measure of the success of an IT investment (service process speed). The results show that when firms implement a new technology, the impact of the investment on financial performance is negative at the beginning due to the disruption of the original business processes. The impact of a failure of the incremental self-service channel on financial performance is not contingent upon the stabilization of the new service process. In other words, a reliable operation of self-service technology is a necessary condition for superior financial performance, regardless of the length of time the technology has been implemented.

During this disruption phase, the output of the business process suffers because the new process has not been a stable and regular part of organizational procedures and behavior. Not until the users of the new technology have overcome the knowledge barrier and the new business process has become a regular practice, can the technological innovation realize its value. Therefore, when researchers and practitioners seek out the benefits of a customer service technological innovation, they should give IT investments enough time to endure the disruption phase. This gives rise to another research question: How long is long enough?

Even the findings of this research suggest a positive impact of service delivery systems after the stabilization of the new customer service process, how long should we I wait before declaring an IT project as a failure? If we discontinue the project too early, we might abandon a project that would have had a positive impact in the future. On the other hand, if we continue to support an IT project that has had a negative impact initially, we might waste even more time and money on a project that would ultimately fail. Many things can affect the length of the disruption phase, such as how well the original process functions and how radical a departure the new technology is from the original one. Among seven common categories of risk inherent in IT projects (Baccarini et al., 2004), *human behavior,* in addition to *time* can signal a disruption in the process. While we consider employees' inability to complete required tasks as a reason to cause the failure of an IT initiative, companies maybe able to turn this human behavior around. That is, the employees, or customers in the case of service delivery systems, are still trying to overcome the knowledge barrier and to obtain necessary knowledge and skills to perform the tasks. Researchers can investigate how much time is needed to turn the behavior around, in order to establish guidelines for length of disruption process of different kinds of IT investments. Moreover, as I argued earlier, in addition to IT infrastructure investment, other kinds of IT

investments should also have this disruptive characteristic. Current classification of IT investment (Aral & Weill, 2007) points out that transactional IT investment should bring in immediate benefits. The data prove that even a transactional investment (i.e., check-in kiosks) that is made to automate the process goes through a disruption phase. Therefore, a more thorough classification of IT investments is needed.

In hypothesis 2, as expected, *failure* has a negative effect on *customer service* and this relationship is fully mediated through service process speed. This result is consistent with previous studies of a self-service context, establishing the importance of the reliable operation of self-service systems, which are sometimes plagued by technological breakdowns and difficulties in service remedy when no service personnel are present. However, the R^2 of *process speed* is a low 1%. A low R^2 was expected because the kiosks performed only one of the services during check-in (i.e., issuing room keys) and not everyone checks in through kiosks. However, this R^2 is lower than expected; there are two possible reasons for this. First, *process speed* is an aggregated measure from the individual-level data and has a ceiling value of 10. This reduces the range of variation of the variable and deflates the R^2. Second, *process speed* is a measure of the customers' perception of the speed of the check-in process, not an actual measure. However, the *failure* is an actual measure of the kiosk performance. This may obscure the real correlation that exists and causes a low R^2.

Unexpectedly, *usage* does not have an impact on *process speed*. That is, a higher level of *usage* does not improve service *process speed*. I argue that while the self-service channel takes care of a routine task (i.e., check-in of hotel guests), employees may spend more time performing consultative tasks. Therefore, hotel guests may not perceive a faster check-in process because the focus of the check-in process shifts from routine tasks to consultative tasks. To support my inference, I ran an additional PLS analysis, adding ADR Index, an index that compares a property's

average daily room rate against that of its competitors', into the research model. The results are shown in Figure 2-5 and Table 2-7. While controlling the effect of *usage* on *RevPAR Index Lag*, *usage* still has a significant positive impact on ADR Index, that is, no matter which check-in methods customers use, front-desk agents, released from the routine check-in task due to customers' use of self check-in, can spend more time on a consultative task (e.g., up-selling and/or cross-selling the hotel products); an immediate increase in the property's room revenue is realized.

In this additional analysis, I broke down *RevPAR Index* into *ADR Index* and *Occupancy Index*, an index that ranks a property's occupancy percentage against that of its competitors. The result shows the effect of different dimensions of performance of the incremental IT-enabled service channel. While the *usage* of the self-service channel positively impacts *ADR Index Lag*, the *failure* of the self-service channel mainly impacts *Occupancy Index Lag*. That is, the usage of the additional IT-enabled channel affects customers' willingness to pay a premium for the core product, but the failure of the channel impacts customers' willingness to return. Researchers can further explore the impact of different self-service channel performance dimensions in different industries. For example, industries with a high theoretical repurchase rate (e.g., bookstores) should focus on reducing the technological failure of the IT-enabled service channel so as to maintain the customer base. Industries with low theoretical repurchase rate (e.g., weddings and cruise lines) should focus on encouraging customers to use the additional service channel in order to increase the firm's ability to charge a premium price as well as to increase employees' opportunities to up-sell and cross-sell various products and services. In sum, while organizations distinguish between services delivered through self-service versus customer service representatives, customers themselves do not. This inclusion of the relationship between the *usage*/*failure* of the self-service channel and financial performance (both

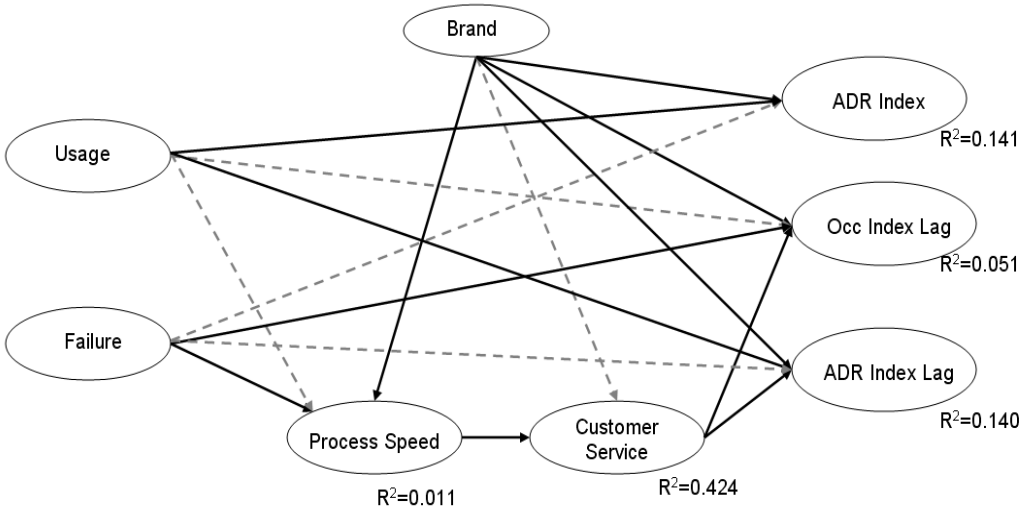

Figure 2-5: PLS result when adding ADR Index into the model (solid lines represent the significant paths)

Table 2-7: Path coefficient, t-statistics, and standard errors of path

	Path	t-statistics	S.E.
Usage-Speed	-0.0280	1.2106	0.0231
Failure-Speed	-0.0490	2.0963	0.0234
Brand-Speed	-0.0860	3.7023	0.0232
Speed-CS	0.6530	31.5909	0.0207
Brand-CS	0.0210	1.2820	0.0164
CS-ADR Index Lag	0.0610	2.7213	0.0224
Usage-ADR Index Lag	0.1200	5.3328	0.0225
Failure-ADR Index Lag	0.0160	0.7985	0.0200
B-ADR Index Lag	-0.3360	18.2460	0.0184
CS-Occupancy Index Lag	0.0970	4.0982	0.0237
Usage-Occupancy Index Lag	0.0270	1.2731	0.0212
Failure-Occupancy Index Lag	-0.0830	3.3890	0.0245
B-Occupancy Index Lag	-0.1640	6.6768	0.0238
Usage-ADR Index	0.1130	5.4117	0.0209
Failure-ADR Index	0.0100	0.4609	0.0217
B-ADR Index	-0.3460	19.9438	0.0173

lag and no lag) into the research model guides managers to plan for future CSS implementations in terms of a mix of service delivery channels. Researchers can further investigate this differential effect of the performance of an incremental self-service channel on different industries in order to offer practitioners who implement self-service technology with different contexts and goals a clear guideline for which performance dimensions of self-service channel they should focus their resources on.

Finally, *usage* does have a positive impact on financial performance (*RevPAR Index Lag*). Therefore, even usage of the self-service channel does not improve customer service through a more efficient process, customers are willing to return more and/or pay a price premium for having the freedom to select the service channel. While firms can benefit by offering a portfolio of service delivery channels, the optimal mix of the channels cannot be determined. A past study has shown that, while having no options has a negative impact on customer satisfaction, offering too many choices does not guarantee a positive return (Reinders et al., 2008). In other words, adding more service delivery channels may incur costs but not significant benefits. Therefore, firms need to pay special attention when adding any new service delivery channel to the delivery channel portfolio, striving toward maximum customer service and financial improvement.

Conclusion

This paper makes three significant contributions. First, it contributes to the understanding of the mixed result of technology investment in the context of the service industry by introducing the notion of process disruption after the implementation of new technology (the study represents an initial first attempt to investigate this phenomenon). Although I have show that technology implementation has a negative impact at the beginning and a positive impact after the new process is

stabilized, further studies are needed to investigate the different stages of the technology assimilation—the disruption phase, the adoption phase, and the stabilization phase (Figure 2-1).

Second, even if a company implements a service delivery system through personal contact and through electronic channels as different processes, customers do not. To meet and exceed customers' expectations, organizations must treat all channels as part of a portfolio of service delivery channels. Even within self-service channels, there are different options (e.g., Websites, virtual worlds, and kiosks). In this study, I only examined two channels—a traditional personal-service channel and a self-service kiosk channel. While many studies to date have considered one service delivery channel in isolation (Cenfetelli et al., 2008; Curran & Meuter, 2005; McKinney et al., 2002; Palmer, 2002), future research can explore the effect of a portfolio of service delivery channel on one business process, as well as the effect of the hybrid channels throughout the customer service lift cycle (e.g., look for products on the company's Website, ask detailed information by calling a call center, and purchase at a physical store).

Finally, this study extends the knowledge of IT-enabled customer service system, specifically in the context of self-service technology. The research examines the impact of the performance of self-service technology on customer service and financial performance. The two main benefits of introducing a self-service channel are to improve process efficiency and to enhance customer service. Nevertheless, rather than using an objective measure, I used a single item measure for *process speed*, obtained from guests' evaluation. As a result, the measure of process speed is a proxy because it is a measure of based on customers' perceptions. Future research could include an objective measure of the ratio of input and output of the process (e.g., the ratio between the labor costs of the check-in process and the number of customer

check-ins) in order to present a holistic view of the impact of the portfolio of service delivery systems.

APPENDIX A: SURVEY QUESTIONS USED

- For the following areas, please rate your satisfaction with THIS Hilton hotel, using a 10 point scale, where "10" represents "Extremely Satisfied" and "1" represents "Extremely Dissatisfied" with a "N/A" column at the end."

  Speed/efficiency of check-in process

- On this hotel stay, how satisfied were you with: (a 10 point scale)

  Quality of Pre-arrival/arrival experience?

  Overall experience?

  Overall service?

  Overall value?

  Overall accommodation?

APPENDIX B: OBJECTIVE MEASURES

- Kiosk Attempted Check in Count per month at each property
- Kiosk Successful Check in Count per month at each property
- RevPAR Index per month at each property
- ADR Index per month at each property

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