

The Role of Relational and Operational Performance in Business-to-Business Customers' Adoption of Self-Service Technology

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The authors explore whether and why business-to-business customers using service relationship designs—service delivery systems that promote repeated personal interactions between a customer and a specific service provider—will adopt self-service technology (SST). Their results show that these customers associate operational performance gains and relational performance losses with a prospective SST. Whereas perceived operational performance gains increase customers' intention to adopt SST, perceived relational performance losses decrease it. However, these main effects are moderated by customers' purchase frequency and their enacted service design, which refers to the way that customers actually experience firms' intended service designs. Specifically, the positive effect of perceived operational performance gains on customers' intention to adopt SST was weaker for customers with higher purchase frequency. Similarly, the negative effect of perceived relational performance losses on customers' intention to adopt SST was strongest for customers who had enacted strong service relationships.

Keywords: *self-service technology; service relationships; technology adoption*

Information technology is revolutionizing the way organizations interact with their customers. Front-office operations are currently undergoing dramatic changes as firms increasingly rely on information technology for service automation, customer relationship management, and service customization (e.g., Colby and Parasuraman 2003; Piccoli et al. 2004). Indeed, Rayport and Jaworski (2005) maintain that the customer-firm interface has become the new frontier of competitive advantage as firms struggle to differentiate themselves in an era of increasing commodification.

The need for better and more cost-effective customer services is driving many firms to implement self-service technology (SST) (Bitner, Ostrom, and Meuter 2002). "SSTs are technological interfaces that enable customers to produce a service independent of direct service employee involvement" (Meuter et al. 2000, p. 50). Organizations, however, need to pay close attention to both the design of their service delivery systems and their customers' intentions to use different service channels because customers' perceptions of a company and its brand are shaped by their impressions of the customer-firm interface. Dabholkar and Bagozzi (2002) highlighted that key questions firms need to ask include "(1) whether to offer technology-based self-service, (2) how to design it to appeal to differ-

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ent consumers, (3) to which type of consumer to promote such service options, and (4) how to do so" (p. 185).

In our research, we address some of these questions. In particular, we explore whether and why business-to-business (B2B) customers in service relationship designs, namely, service delivery systems that promote repeated personal interactions between a customer and a specific service provider (Guttek 1995), will adopt SST. Whereas past research has investigated social bonding (Selnes and Hansen 2001) and focused on business-to-customer (B2C) service environments (Dabholkar 1996; Dabholkar and Bagozzi 2002; Dabholkar, Bobbitt, and Lee 2003; Selnes and Hansen 2001), our contribution lies in (a) exploring the B2B context and (b) focusing on customers' SST adoption decision. Investigating customers' SST adoption in a research context characterized by established B2B service relationships is important for a number of reasons.

First, firms are concerned about introducing SST for fear of diminishing the relational aspects of their service design (Gremler and Gwinner 2000; Selnes and Hansen 2001). *Relational performance*, which refers to those aspects of a service "that enhance the service firm's closeness to customers" (Stank, Goldsby, and Vickery 1999, p. 430), has traditionally been instantiated through a service design of relationships that facilitate social bonding between customers and providers. Relational performance (Vickery et al. 2004) and social bonds (Selnes and Hansen 2001) are key antecedents of customer loyalty. Thus, compromising relational performance through the implementation of an impersonal, SST-based service channel could have detrimental effects on a firm's overall performance. Although such concerns may be warranted in all service settings, they should be particularly pronounced in B2B environments, which are characterized by repeated personal interactions between specific customers and providers (Anderson, Hakansson, and Johanson 1994; Pujari 2004). Thus, increasing our understanding of B2B customers' perceptions about SST's impact on relational performance and the role that these perceptions play in their SST adoption decision promises to generate valuable insights for B2B service firms. Furthermore, such research addresses a gap in the literature because most prior research on customer SST adoption (e.g., Curran, Meuter, and Surprenant 2003; Dabholkar 1996; Dabholkar and Bagozzi 2002) has focused on B2C service environments.

Second, one of the reasons that firms implement SST is to improve the *operational performance* of their services, namely, those aspects of a service design that "contribute to [its] consistent quality, productivity and efficiency" (Stank, Goldsby, and Vickery 1999, p. 430). Achieving these operational goals through SST implies a new division of labor between customers and service providers. An SST-based customer-firm interface requires customers to

do more of the service work themselves (Dabholkar and Bagozzi 2002; Moon and Frei 2000). Even though prior research has shown that customers associate many benefits with SST, including an increased sense of control, faster turnaround time, and improved service efficiency (e.g., Bateson 1985; Meuter et al. 2000; Dabholkar, Bobbitt, and Lee 2003), the bulk of this research—exceptions include Pujari (2004) and Schultze (2003)—has focused on B2C services, where transactions are typically less frequent and less complex than in B2B environments (Vickery et al. 2004). This suggests that there are unanswered questions about customers' willingness to adopt SST in situations where self-service might present a significant drain on customers' resources.

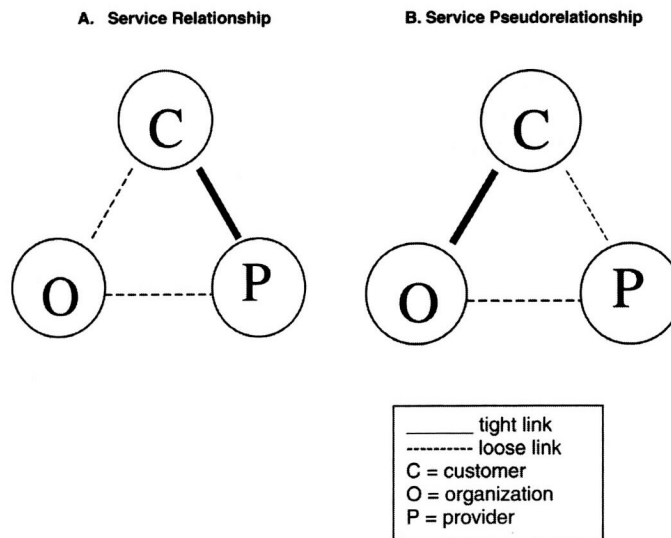
Third, given the importance of both relational and operational performance in B2B environments and the anticipated impact of SST on both these dimensions, one interesting question is the extent to which these two dimensions of service performance factor into customers' SST adoption decision. To date, there appears to be no research that considers both dimensions simultaneously in one SST adoption model, although Stank, Goldsby, and Vickery (1999) demonstrated the effect of relational and operational performance on B2B customers' satisfaction and loyalty.

In this article, we explore the role that both relational and operational performance play in B2B customers' SST adoption decision. On the basis of the extant literature on technology adoption and service design, as well as insights gained from interviews we conducted with our case study organization, BizPrint,¹ we develop four hypotheses about the antecedents of SST adoption for B2B customers using a service relationship design, namely, a service delivery system that promotes repeated personal interactions between a customer and a specific service provider. And although our interview data did inform our hypothesis development, we adopt the conventional genre for an academic paper and develop our hypotheses by relying exclusively on prior literature. We then describe BizPrint and the elicitation interviews that we conducted with both providers and customers. Next, we describe the survey method we used to test our hypotheses. Finally, we discuss our results, the implications of our findings, and the limitations of this study. We conclude with suggestions for future research.

ANTECEDENTS OF CUSTOMER SST ADOPTION

Prior research (Curran, Meuter, and Surprenant 2003; Meuter and Bitner 1998) suggests that customers will perceive SST as having both positive and negative effects on

FIGURE 1
The C-O-P Triangles



service performance. Potential advantages include cost savings, reduced waiting time, and higher customization, whereas potential disadvantages include problems in dealing with the technology and uncertainty around resolving errors (e.g., Dabholkar, Bobbitt, and Lee 2003; Pujari 2004). Furthermore, customers will only be motivated to use SST if they anticipate a net benefit from doing so (Bitner, Ostrom, and Meuter 2002; Curran, Meuter, and Surprenant 2003).

The cost-benefit paradigm in evidence here, which originates from the literature on behavioral decision making (Beach and Mitchell 1978; Kahneman and Tversky 1979), has also been applied to technology adoption decisions (Davis 1989). Compeau and Higgins (1995) highlighted that technology adoption research “maintains that individuals would use computers if they could see that there would be positive benefits (outcomes) associated with using them” (p. 189). For example, the Technology Adoption Model, one of the most extensively applied theories in information systems research (Venkatesh and Davis 2000), identifies perceived usefulness (the degree to which a person believes that using a particular system would enhance his or her job performance) and perceived ease of use (the degree to which a person believes that using a particular system would be free from effort) as the key components in the cost-benefit analysis that underlies users’ adoption decision. This theory suggests that improvements in productivity (gains) through technology adoption come at the price of effort (loss).

Our ensuing arguments about the antecedents of customers’ SST adoption, therefore, focus on gains and losses that customers anticipate from using SST. Furthermore,

our conceptualization of the gains and losses associated with SST adoption builds on Stank, Goldsby, and Vickery’s (1999) distinction between relational and operational service performance. Therefore, we now outline how customers’ anticipated gains and losses related to the relational and operational dimensions of service performance will influence their decisions to adopt SST.

The Impact of SST on Relational Performance

Relational performance in B2B service environments typically involves service providers who proactively seek to understand customers, who make recommendations for increasing customers’ competitiveness, and who cooperate with customers (Vickery et al. 2004). Relational performance is, therefore, interpersonal in nature and typically accrues to those customers who invest in an ongoing relationship with a service firm and its employees. As such, relational performance has traditionally been instantiated through service designs that facilitate repeated personal interactions between customers and specific providers.

To better understand how service designs affect relational performance, we rely on the C-O-P triangle (Guttek and Welsh 2000) from the management literature,² which conceptualizes all service interactions in terms of loose or tight links between three parties: the customer (C), the service organization (O), and the individual service provider (P). The two service designs that are relevant to our study are *service relationships* and *service pseudorelationships* (Guttek 1995). These service designs are depicted as different patterns of linkages among the three parties in Figure 1.

Service relationships are characterized by a tight C-P link (see Figure 1A), which signifies that a customer engages in repeated service transactions with the same provider (Guttek and Welsh 2000). The customer and provider come to know each other as role occupants, as acquaintances or even friends, all the while forming social attachments that enhance their exchange (Gremler and Gwinner 2000; Mills and Morris 1986). Over time, service relationships grow stronger as the customer and provider develop trust and rapport, which engender a sense of obligation, goodwill, and reciprocity between them (Adler and Kwon 2002).

The customer and provider also become increasingly interdependent because the provider must gain knowledge about the customer's needs and preferences in order to provide high-quality service. Such knowledge is gleaned during successive interactions between the provider and customer, involving feedback that is both direct and informal. Also, the expectation of an infinite number of future interactions (or at least the inability to know when the last interaction will occur) induces customers and providers to cooperate for their mutual gain. This latter effect is known as the *shadow of the future* (Axelrod 1984). If the future casts a sufficiently long shadow, no formal controls and contracts are required to govern a service relationship because it is in both the customer's and the provider's best interest to cooperate.

Whereas firms expect to gain customer loyalty, repeat business, and referrals from a service design of relationships, customers expect to gain confidence, social, and special treatment benefits (Gwinner, Gremler, and Bitner 1998; Reynolds and Beatty 1999a). *Confidence benefits* are associated with the psychological value of risk reduction. For example, customers who lack product knowledge or technical expertise can reduce the psychological stress associated with decision making by relying on a trusted service provider to assist them or even make the decision for them (Reynolds and Beatty 1999b). *Social benefits* are associated with feelings of belonging, familiarity, friendship, personal recognition, and social support. For example, some customers value the ability to build a relationship that goes beyond the work setting with their service provider. *Special treatment benefits* relate to the economic value of service relationships such as customization—of both price and service—that customers might receive in exchange for their loyalty.

The relational benefits that accrue in service relationships are difficult to replicate in an SST-based channel. As Yen and Gwinner (2003) pointed out, social benefits cannot be replicated at all. And confidence benefits that come from knowing and trusting a service provider to act in one's best interest are compromised because the customer assumes more responsibility for the accuracy and quality of service delivery when using SST. Special treatment

benefits are also undermined because service delivered through a SST-based channel is more programmatic and impersonal. In fact, Piccoli et al. (2004) showed that "the current web sites of customer service leaders generally neglect to support customer needs for guidance (customer knowledge uncertainty) and personalized service (interaction based on the customer's expressed preferences or learned from prior interaction)" (p. 444). Therefore, customers accustomed to service relationships may regard SST as a threat to relational performance.

However, as Selnes and Hansen (2001) pointed out, firms have two options when implementing SST, namely, the "replacement route" and the "resource route." In the replacement route, SST can be used to replace personal interactions with arm's-length transactions executed via SST, compromising the social bonds between customers and providers. In the resource route, however, SST can be used to execute simple, administrative tasks, thereby freeing up providers' time to deal with more complex, consultative tasks and to build social bonds with customers. However, Schultze and Orlikowski (2004) showed that in practice, the resource route is also likely to undermine social bonds because it reduces interaction frequency between customers and providers. Furthermore, it potentially introduces inconsistency into service delivery because of the challenges associated with seamlessly integrating the provider-based and the SST-based channel. So even if firms introduce SST to complement rather than replace service relationships, relational performance may be compromised.

We, therefore, hypothesize the following:

Hypothesis 1: Customers who perceive SST as a threat to relational performance in service relationship designs will be less likely to adopt SST than customers who do not.

Customers' experienced relational performance, however, may vary because firms' service delivery systems can be flawed and unreliable. Also, through their own actions, customers can subvert or alter a given service design to fit their own needs. Therefore, the relational performance of customers' *enacted* service design may be different from the relational performance that firms anticipate from an intended service design. For example, although a firm may have designed a service delivery system that promotes strong service relationships between customers and service providers, customers who do not want to socially bond with a specific provider (Meuter et al. 2000) or who are not satisfied with their current provider may instead engage in weak service relationships or service pseudo-relationships (Guttek 1995).

In *service pseudorelationships*, customers engage in repeated interactions with a service *organization* rather

than a specific provider. Therefore, pseudorelationships are characterized by a tight C-O link (see Figure 1B). A customer's successive contacts with a firm typically involve different, yet functionally equivalent, providers. And although customers do expect to interact with the firm in the future, there is no shadow of the future to prevent service providers from acting in opportunistic and self-interested ways during onetime interactions with customers. As a result, organizations monitor provider behavior and seek customer feedback to ensure satisfactory service quality, which is the extent of relational performance in service pseudorelationship designs.

Customers who enact pseudorelationships, therefore, may not perceive SST as a threat to relational performance in service relationship designs because they are not socially attached to a specific provider, and they experience a different type of relational performance than that anticipated from service relationship designs. Similarly, customers who enact weak relationships also may not perceive SST as a threat to relational performance in service relationship designs because they have not developed sufficient interpersonal rapport with their provider to feel a sense of obligation toward this individual. In contrast, customers who enact strong relationships may be the only ones to perceive SST as a threat to relational performance in service relationship designs because they have developed tight social bonds with their provider (Selnes and Hansen 2001) and stand to lose the confidence, social, and special treatment benefits that they are accustomed to (Czepiel, Solomon, and Suprenant 1985; Gremler and Gwinner 2000; Gwinner, Gremler, and Bitner 1998). We therefore hypothesize the following:

Hypothesis 2: The relationship between perceived threat and customers' adoption of SST will be moderated by the customer's enacted service design such that the negative effect of perceived threat on customers' adoption of SST will be strongest for customers who enact strong service relationships.

The Impact of SST on Operational Performance

Operational performance in B2B service environments relates to the "physical features of the service, e.g., the characteristics of delivery, that define and capture form, time and place utilities of the service" (Stank, Goldsby, and Vickery 1999, p. 430). Typical examples of operational performance include ontime service delivery, service reliability (accuracy and dependability), and service effectiveness (meeting scope of service requirements).

Numerous gains in operational performance are associated with customers' SST adoption. Respondents in Pujari's (2004) research on B2B customers' satisfaction with SST cited the following SST-enabled efficiency improvements

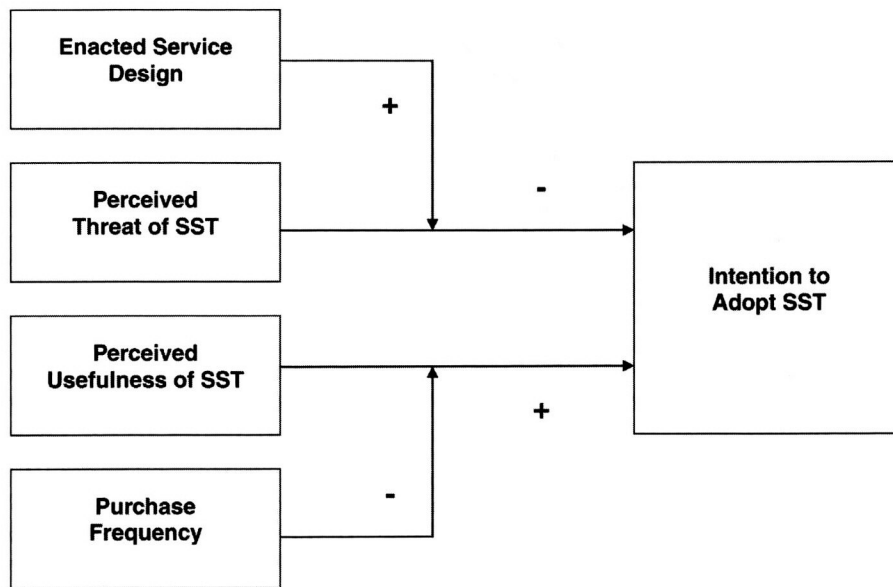
listed in order of importance: improved speed (turnaround time), improved process efficiency, saved labor hours (time and cost), technology reliability (SST works), real-time accessibility, convenience, and quick help. Research in B2C environments also suggests that SST adoption is driven by SST-enabled improvements to operational performance. Benefits that accrue to B2C customers who use SST include increased service speed, increased convenience, increased customer control, increased ease of use, increased enjoyment, reduced wait time, reduced interactions with service providers, and reduced costs (Dabholkar 1996; Meuter and Bitner 1998; Meuter et al. 2000; Dabholkar, Bobbitt, and Lee 2003).

As a whole, these findings suggest that the primary antecedent to B2B customers' SST adoption is the technology's perceived usefulness, namely, "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis 1989, p. 320). Interestingly, Dabholkar and Bagozzi (2002) concluded that perceived usefulness was irrelevant to the study of SST adoption in a B2C context. However, we regard it as key to capturing the operational performance gains that B2B customers associate with SST, especially because IT adoption research has consistently found perceived usefulness to be the most important antecedent of IT adoption (e.g., Adams, Nelson, and Todd 1992; Hendrickson, Massey, and Cronan 1993; Igbaria et al. 1997; Mathieson 1991; Szajna 1994; Venkatesh and Davis 2000). We, therefore, hypothesize the following:

Hypothesis 3: Customers who perceive SST as an enhancement to the operational performance of their enacted service design will be more likely to adopt SST than customers who do not.

However, customers with higher purchase frequency may perceive SST to be less useful than customers with lower purchase frequency because they assume more coproduction responsibilities in SST-enabled service environments (Dabholkar 1996; Schultze and Bhappu 2005). Coproduction is the direct involvement of customers in the design, delivery, and marketing of products and services that they themselves consume (Schultze and Bhappu 2005). Given the sheer volume of their service transactions, customers with higher purchase frequency have to expend more effort to personally complete service transactions via SST than customers with lower purchase frequency. In SST-enabled environments, after all, it is the customer—rather than the provider—who is responsible for determining the customer's service needs and for inputting the necessary information to process service requests. Also, given that B2B service transactions are generally complex and frequently require customization (Vickery et al. 2004), customers with high purchase frequency may find

FIGURE 2
Antecedents of Customers' SST Adoption in Business-to-Business Service Relationship Designs



NOTE: SST = self-service technology.

their increased involvement in, and responsibility for, coproducing their service via SST to be particularly onerous. Therefore, we hypothesize the following:

Hypothesis 4: The relationship between perceived usefulness and customers' adoption of SST will be moderated by purchase frequency such that the positive effect of perceived usefulness on customers' adoption of SST will decrease as customers' purchase frequency increases.

A summary of all our hypothesized relationships is depicted in Figure 2.

METHOD

To better understand SST adoption among B2B customers, we conducted an in-depth analysis of BizPrint, a manufacturer of custom-printed office products (e.g., checks, forms, and stationery). Its 1 million mostly small-business customers (all located in North America) had historically been able to engage in repeated service transactions with one of its 400 service providers, all of whom were franchisees that distribute BizPrint products exclusively.

In early 2000, BizPrint decided to implement an SST that allowed customers to go online to complete such routine transactions as placing orders, checking the status of their order, and accessing their account information. Pre-

viously, customers had to either call or fax their service provider to accomplish these tasks. Throughout the planning and development of the new SST, BizPrint's management assured its providers that they would not be replaced by the technology because their relationships with customers were regarded as the firm's key differentiator. Therefore, BizPrint was striving to maintain its service relationship design, although customers could enact service designs of weak relationships or pseudorelationships.

INTERVIEWS

In fall 2000, we conducted semistructured 30-minute phone interviews with 10 BizPrint providers and 15-minute phone interviews with 15 customers. Such *elicitation* interviews are typically used to generate insights and vocabulary that help researchers develop survey measures grounded in a particular research setting (Harrison, Mykytyn, and Riemenschneider 1997). We, the authors, repeatedly read the interviews and identified common themes in the interviewees' comments. These themes included what customers valued about BizPrint's current service design, the importance of provider accountability to customer satisfaction, the perceived impact of SST on service relationships, and anticipated service enhancements related to SST. As indicated earlier, our research model and its hypotheses emerged through an iterative process of analyzing our interviews and reading the literature on service design and technology adoption. To contextualize our research model and hypotheses, we present

TABLE 1
A Sample of Interview Quotes

SST as a threat to relational performance

Customer: I would very much like to see a body or know that there is somebody that I know just from a service standpoint. . . . I mean, it's in there in cyberspace someplace, and I have no one I can talk to. I would like to have a contact, and I'd really like it to be [my existing BizPrint provider]. I mean, because he knows the firm, and he knows what our ordering pattern has been. I mean, I wouldn't want to give that up in order to have everything online.

Provider: I'd have to be much more staying in touch with them [the customers that went online]. I'd have to be more, just calling to see how everything's going. Just to get that personal touch in there, I still think. Or else, they could do that [business] with any other company then.

Provider: I think if a customer could reorder online and I could monitor it to make sure that it's within the bounds of their normal reorder. Because, see, a customer sometimes doesn't know because of turnover whether they ordered 600 checks or 6,000 checks, so if I see a customer that's ordered 600 checks a year, and all of a sudden he's ordering 6,000, we call them up and say "Check that out!" Or if they say the starting number [of a check order] is 12001, and I think the starting number should be 14000 because he has another 2,000 checks there that he's not aware of. And so if I were out of the middle of that mix, there would be more problems and hard feelings in some instances.

Interviewer: Now in the context of this Internet ordering, would you still want [your provider] to review your orders as he does now?

Customer: Well, that's hard to say if he's going to lose his job.

Interviewer: Or you don't think that [your provider's review of your online orders] would be necessary once you're able [to place orders via the Internet]?

Customer: I don't know. Would they get paid if I'm going straight through [the Internet to the firm] and not through them [the provider]? . . . I would think they need to be involved.

SST as an enhancement to operational performance

Customer: [SST would make transactions] faster . . . it expedites a whole lot.

Provider: Well, it would diminish the personal contact, and that would be fine because in a lot of situations people call and leave a message for me, and even though the girls [at the provider's office] try and screen it, they still want to talk to me, and then when I call [the customer] back, I find out they want to place an order of checks. Well, that's insane! And there's no reason that that couldn't be placed over the Internet and that when I'm in their area we can't have a cup of coffee and chat about the grandchild or whatever.

Customer: I think that's [an online catalog] a good option. And also if you can go onto somebody's Web site, you can find out what other products they have.

Provider: I guess the way I would see the Internet having an impact is that I would like to get my customers to go there first of all and get a good idea of some of the things that we have.

NOTE: SST = self-service technology.

a summary of the insights we gained from these interviews. Table 1 contains a sample of the interview quotes describing how BizPrint customers and providers perceived SST's impact on the relational and operational performance of their enacted service designs.

SST as a Threat to Relational Performance

BizPrint customers believed that SST would depersonalize their current service by reducing person-directed, dyadic interaction with their providers. BizPrint providers were similarly concerned about the depersonalizing effects of SST. Some felt that SST would actually increase the need for them to make personal contact with customers to add some "personal touch" back into their customers' online experience. They believed that this was the only way to differentiate themselves from other online vendors and thereby foster customer loyalty. In other words, providers felt that they would only be able to ensure high-quality service and cultivate service relationships with their customers if they remained the single point of accountability in the SST-enabled ordering process, which, in fact, was the service design that BizPrint was pursuing.

However, a number of BizPrint customers assumed their provider would be replaced by SST or would not get credit for orders placed online. In other words, customers

were concerned about their provider's role and viability if SST were introduced. These customers' concerns about provider welfare were indicative of the strong social bonds that characterize service relationships.

SST as an Enhancement to Operational Performance

Both BizPrint customers and providers acknowledged that SST would improve their efficiency and productivity at work by automating tasks and by increasing the availability (24 × 7) of BizPrint's ordering service. Both customers and providers suggested that increased access to information through an online product catalog, for example, would enhance service transactions.

In summary, our interviews captured some of the anticipated positive and negative effects of SST on service performance. Both customers and providers expressed concern that the migration of transactions to a SST might threaten the relational aspects of their service. Customers even envisaged a situation in which the technology might possibly replace their provider. However, both groups also recognized the operational benefits of using SST. Taken as a whole, these interviews corroborated our hypotheses and provided us with key insights about the gains and losses that BizPrint customers associated with SST adoption.

Surveys

To test our hypotheses, we developed a survey, which included items that were developed from statements that our interviewees made. As a pilot test, the survey was first mailed to 25 randomly selected BizPrint customers, 13 of whom completed and returned it. We made some minor changes in the wording and order of some questions based on this pilot test. The final survey was then mailed by BizPrint to 2,500 randomly selected customers. The customers that we had previously interviewed and contacted for the pilot test were not part of this final survey sample. Customers who returned their completed survey (pilot and final) were entered into a drawing for twenty-five \$50 prizes and three Palm Pilots, which BizPrint provided. The odds of winning these prizes were stated clearly in BizPrint's cover letter that accompanied the surveys. A reminder card was sent to the final survey sample 10 days after the survey packet had been mailed. Customer service agents in two BizPrint call centers also telephoned 500 customers randomly selected from the 2,500 customers in the final survey sample, reminding them to complete and return their surveys. All these efforts were aimed at ensuring a satisfactory response rate.

Response Rate

We received 383 completed surveys (15% response rate) in postage-paid envelopes addressed directly to us. Interestingly, the reminder phone calls to customers revealed that some Canadian customers, who were French speaking, were unable to complete our English survey. Furthermore, 7% of the phone calls made were to incorrect or disconnected phone numbers, raising questions about the accuracy of the mailing addresses. Unfortunately, we had no way of assessing how many mailed surveys were returned because of incorrect mailing addresses or customer business closures. We can, therefore, only assume that the "real" response rate was somewhat higher than 15%.

Survey Measures

Enacted service design. Although BizPrint had a service relationship design, we anticipated that some customers had service pseudorelationships because they engaged in repeated contact with BizPrint but not with a specific provider. Therefore, to first distinguish between customers who did and did not have a service relationship with a BizPrint provider, we used the following question: "Is there a particular person you usually contact to purchase BizPrint products, that is, someone you consider your BizPrint representative?" According to Gutek et al. (1999), customers who respond affirmatively to this question have

service relationships because they interact with a specific provider who they know personally. Of the 383 customers who responded to the final survey, 258 customers had service relationships, 107 customers had pseudorelationships, and 18 customers did not answer the screening question. Therefore, the latter 18 customers were dropped, leaving us with a sample of 365 customers.

To further distinguish between customers who had strong versus weak service relationships, respondents who indicated that they had a BizPrint representative were instructed to complete survey items about the features of their service relationships (Gutek et al. 2000). We calculated an index score of customers' responses to these questions (see Table 2) and then performed a median split to categorize their service relationships as strong or weak. The 13 customers with the median index score were classified as having weak service relationships. This categorical transformation enabled us to create a dummy variable for *enacted service design* with the following three categories: 1 = service pseudorelationship, 2 = weak service relationship, and 3 = strong service relationship. Of the 365 customers in our sample, 107 customers had pseudorelationships, 133 customers had weak service relationships, and 120 customers had strong service relationships. Data on the features of service relationships was missing for 5 customers. Therefore, these 5 customers were dropped, resulting in a final sample of 360 customers.

Purchase frequency. Similar to Gutek et al. (1999), we used the following question to measure how often customers purchased BizPrint products: "How many times have you purchased BizPrint products in the past 12 months?" There were six response categories: *0 times, 1-3 times, 4-6 times, 7-9 times, 10-12 times, and 13 or more times.*

Perceived threat of SST. To measure whether customers perceived SST as a threat to relational performance in service relationship designs, we developed questions based on insights gained from our interviews with BizPrint providers and customers. These questions are listed in Table 2. We calculated an index score for perceived threat of SST by taking the mean of customers' responses to these questions.

Perceived usefulness of SST. To measure whether customers perceived SST as an enhancement to operational performance in service relationship designs, we used Davis's (1989) Perceived Usefulness Scale. These questions are listed in Table 2. We calculated an index score for perceived usefulness of SST by taking the mean of customers' responses to these questions.

Intention to adopt SST. To assess customers' SST adoption, we measured their intention to use SST, which is a known antecedent of actual adoption and is frequently used as a proxy for actual adoption (Harrison, Mykytyn,

TABLE 2
Survey Questions

Features of Service Relationship^a

- FEA1: I am a loyal customer of my BizPrint representative.
 FEA2: I know my BizPrint representative well.
 FEA3: My BizPrint representative knows me well.
 FEA4: I value the advice that my BizPrint representative provides me.
 FEA5: I trust my BizPrint representative.
 FEA6: The service I receive from my BizPrint representative is personalized just for me.
 FEA7: If I were dissatisfied with the service I received, I would speak directly to my BizPrint representative about the problem.

Perceived Threat of SST^a

- Using my BizPrint representative's Web site would . . .
 THR1: Hurt my BizPrint representative's business.
 THR2: Eliminate the personal service that I currently receive from my BizPrint representative.
 THR3: Destroy the relationship that I currently have with my BizPrint representative.

Perceived Usefulness of SST^a

- Using my BizPrint representative's Web site would . . .
 USE1: Improve my performance at work.
 USE2: Increase my productivity at work.
 USE3: Enhance my effectiveness at work.
 USE4: Be useful to me at work.

Intention to Adopt SST^a

- I would use the BizPrint Web site . . .
 ADPT1: To learn about the products that BizPrint sells.
 ADPT2: To learn about volume discounts on products that BizPrint sells.
 ADPT3: To learn about the prices of BizPrint products.
 ADPT4: To purchase products, including reorders.
 ADPT5: To check my order status.
 ADPT6: To check my account status.

NOTE: FEA = feature; THR = threat; USE = usefulness; ADPT = adopt.
 a. 1 = *strongly disagree*, 5 = *strongly agree*.

and Riemenschneider 1997). We developed questions based on the service features that BizPrint planned to make available to customers online (see Table 2). We calculated an index score for intention to adopt SST by taking the mean of customers' responses to these questions.

RESULTS

Descriptive Statistics

Descriptive statistics and correlations for all study variables are listed in Table 3. Of the 383 survey respondents, 269 were women and 103 were men. Eleven respondents did not indicate their gender. Ninety percent of customers described their ethnicity as "white, European," and 66% of them described their office as having an urban location. The respondents, on average, worked 39.5 hours per week, had worked in their current position for 11.6 years, had 17.7 years of related work experience, and

worked in a business that employed an average of 9.7 full-time equivalents.

When comparing the responses of early (1st week) and late (2nd and 3rd week) respondents to test for non-response bias (Armstrong and Overton 1977), we found no significant differences in their demographic profile. However, respondents with strong service relationships were significantly more likely to have returned their surveys early.

Factor Analysis and Scale Reliability

Exploratory factor analysis of the survey questions extracted three factors (see Table 4). The factors converged after five iterations using oblique rotation, which allows the factors to be correlated while still satisfying the postulate of factorial causation (Kim and Mueller 1978). Cronbach's alphas (see Table 4) indicated that the questions, as specified by our hypothesized factor structure, formed reliable measurement scales.

TABLE 3
Descriptive Statistics and Correlation Matrix

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Intention to adopt SST	3.80	0.862	1.00								
2. Enacted service design	2.04	0.794	.101*	1.00							
3. Perceived threat of SST	2.84	0.935	-.067	.185***	1.00						
4. Perceived usefulness of SST	2.93	0.928	.600****	.014	-.096*	1.00					
5. Purchase frequency ^a	2.40	0.923	.136**	.314****	.026	.066	1.00				
6. Satisfaction ^b	4.46	0.894	.120**	.094*	.020	-.016	.111**	1.00			
7. Gender ^c	1.28	0.448	-.029	.107*	-.022	-.076	-.055	-.038	1.00		
8. Year born (19__)	54.6	11.9	.209****	.046	-.027	.218****	.204****	-.015	-.163***	1.00	
9. Survey response ^d	1.26	0.440	.020	-.163***	.068	-.082	-.072	-.028	.031	.012	1.00

NOTE: SST = self-service technology.

a. 1 = very dissatisfied to 5 = very satisfied.

b. 0 = 0 times, 1 = 1-3 times, 2 = 4-6 times, 3 = 7-9 times, 4 = 10-12 times, 5 = 13 or more times.

c. Female = 1, male = 2.

d. Early = 1, late = 2.

* $p < .10$. ** $p < .05$. *** $p < .01$. **** $p < .001$.

TABLE 4
Factor Analyses^a (Oblique Rotation)

Survey Item	Factor 1	Factor 2	Factor 3
	Perceived Threat of SST ($\alpha = .954$)	Perceived Usefulness of SST ($\alpha = .932$)	Intention to Adopt SST ($\alpha = .938$)
THR1	.791	.071	-.021
THR2	.885	-.170	-.033
THR3	.924	-.176	-.147
USE1	-.094	.962	.550
USE2	-.087	.973	.564
USE3	-.075	.972	.577
USE4	-.143	.842	.636
ADPT1	-.054	.444	.860
ADPT2	-.054	.490	.881
ADPT3	-.068	.530	.917
ADPT4	.129	.577	.848
ADPT5	-.044	.542	.880
ADPT6	-.064	.567	.849

NOTE: The numbers in italics indicate the cross-loadings for the items hypothesized to indicate the given factor. SST = self-service technology; THR = threat; USE = usefulness; ADPT = adopt.

a. Factor correlations: $r_{1,2} = -.10$, $r_{1,3} = -.08$, $r_{2,3} = .58$.

Regression Analyses

We performed a stepwise multiple linear regression to assess the impact of various independent variables (see Table 5) on our dependent variable of intent to adopt SST. We included customers' satisfaction with purchasing BizPrint products in the past 12 months in Step 1 of the regression to control for any effects that satisfaction might have on customers' intentions to adopt SST. As indicated in Table 5, customer satisfaction did not have a significant effect on intention to adopt SST.

Hypothesis 1 predicted that customers who perceived SST as a threat to relational performance in service rela-

TABLE 5
Regression Analyses

Dependent Variable	Intention to Adopt SST
Control	
Satisfaction (β)	.067
Independent variables	
Perceived threat (β)	-.178****
Perceived usefulness (β)	.878****
Past 12-month purchase frequency (β)	.499****
Enacted service design (β)	-.093
Perceived Threat \times Enacted Design (β)	.023****
Perceived Usefulness \times Frequency (β)	-.146****
Adjusted R^2	.469
F(df)	34.6**** (7, 259)

NOTE: SST = self-service technology; β = standardized betas. **** $p < .001$.

tionship designs would be less likely to adopt SST than customers who did not. We tested this hypothesis by regressing perceived threat of SST on intention to adopt SST. As indicated in Table 5, perceived threat of SST did have a significant negative effect on intention to adopt SST. Therefore, Hypothesis 1 was supported.

Hypothesis 2 predicted that the relationship between perceived threat and customers' adoption of SST would be moderated by enacted service design such that the effect of perceived threat on customers' adoption of SST would be strongest for customers who enacted strong service relationships. We tested this hypothesis by regressing the interaction between enacted service design and perceived threat of SST on intention to adopt SST. As indicated in Table 5, this interaction had a significant effect on intention to adopt SST. Furthermore, subgroup analysis confirmed that the effect of perceived threat on customers' adoption of SST was strongest for customers with strong



service relationships ($F_{\text{pseudo}} = 0.51, p = .48$; $F_{\text{weak}} = 2.4, p = .13$; $F_{\text{strong}} = 3.9, p = .05$). Therefore, Hypothesis 2 was supported.

Hypothesis 3 predicted that customers who perceived SST as an enhancement to the operational performance of their enacted service design would be more likely to adopt SST than customers who did not. We tested this hypothesis by regressing perceived usefulness of SST on intention to adopt SST. As indicated in Table 5, perceived usefulness of SST did have a significant positive effect on intention to adopt SST. Therefore, Hypothesis 3 was supported.

Hypothesis 4 predicted that the relationship between perceived usefulness and customers' adoption of SST would be moderated by purchase frequency such that the positive effect of perceived usefulness on customers' adoption of SST would decrease as customers' purchase frequency increased. We tested this hypothesis by regressing the interaction between purchase frequency and perceived usefulness of SST on intention to adopt SST. As indicated in Table 5, this interaction had a significant effect on intention to adopt SST. Furthermore, subgroup analysis confirmed that the positive effect of perceived usefulness on customers' adoption of SST was weaker for customers who had purchased products seven or more times in the past 12 months than for customers who had purchased products six or less times in the past 12 months ($F_{0 \text{ times}} = 11.0, p = .01$; $F_{1-3 \text{ times}} = 100.1, p = .00$; $F_{4-6 \text{ times}} = 73.9, p = .00$; $F_{7-9 \text{ times}} = 0.57, p = .46$; $F_{10-12 \text{ times}} = 2.18, p = .24$; $F_{13+ \text{ times}} = .61, p = .46$). Therefore, Hypothesis 4 was supported.

DISCUSSION

The results of our study confirm that B2B customers perceived SST as a threat to the relational performance of service relationship designs, which reduced their intention to adopt SST. BizPrint customers anticipated that SST would damage the relationship that they currently had with their service provider, hurt their provider's business, and eliminate the personal service that they received from their service provider. The negative effect of this perceived loss of relational performance on customers' intention to adopt SST was strongest for customers who enacted strong service relationships because they had developed tight social bonds with providers and stood to lose the confidence, social, and special treatment benefits that they were accustomed to.

At the same time, however, these B2B customers acknowledged the operational advantages that SST afforded their work performance. BizPrint customers anticipated that SST would be useful to them at work by enhancing their effectiveness, increasing their productivity, and im-

proving their performance. However, the positive effect of these perceived enhancements on customers' intention to adopt SST was weaker for customers with higher purchase frequency who would invariably assume more coproduction responsibilities once they adopted SST.

Given the importance of both relational and operational performance in B2B environments, our results do provide some insight into the extent to which these two dimensions of service performance factor into customers' SST adoption decision. The standardized betas (β) listed in Table 5 suggest that the main and moderating effects related to operational performance have a stronger influence on customers' intention to adopt SST than do the main and moderating effects related to relational performance. In other words, BizPrint customers regarded the gains associated with SST as outweighing the losses.

From an organizational standpoint, these findings suggest that firms seeking to introduce SST should highlight its operational performance benefits to customers. Particular attention should also be paid to the coproduction concerns of customers with high purchase frequency. Furthermore, firms will need to reassure customers with strong service relationships that the relational performance of their enacted service design will be preserved in the SST-enabled channel. Interestingly, past research (Gutek et al. 1999) suggests that customers with strong service relationships have the highest purchase frequency. Indeed, this was the case in our sample (see significant correlation in Table 3). Therefore, it is particularly important for firms to address the concerns and needs of these customers because they are typically firms' *best* customers. One strategy that firms can employ, to reassure these customers that SST is intended to complement rather than replace their existing provider-based service channel, is to allow service providers to remain the single point of accountability for all service delivery, both on- and offline.

Limitations

Our findings need to be considered in light of the limitations of this research. We need to recognize the case-specific setting of this study when interpreting our results and identifying implications for research and practice. For example, it is important to note that most BizPrint customers are owners or office managers of small businesses. Furthermore, BizPrint providers are franchisees and, therefore, also small-business owners, who cultivate customer networks through active participation in their local small-business community. So the way in which BizPrint providers serve and build service relationships with their small-business customers may be quite distinct from, for example, the way in which customer service employees relate to non-business customers. As a result, the concerns expressed by

BizPrint customers during our interviews about the viability of their service provider's business in the face of SST deployment may be highly specific to our B2B sample.

Given the B2B focus of this study, some may argue that our findings are not applicable to B2C service relationships. However, it is important to note that the C-O-P triangle (Gutek and Welsh 2000) is not specific to B2B service relationships. In fact, most of the prior research on the C-O-P triangle has been done in B2C environments. Therefore, while we acknowledge that service relationship designs are less prevalent in B2C settings than in B2B settings, we expect our findings to generalize to service delivery systems that promote repeated personal interactions between customers and specific providers. Furthermore, the processes that BizPrint sought to automate through its SST can be found in most organizations, irrespective of whether they sell commodity or custom products and whether they serve businesses or consumers. Ultimately, however, the generalizability of our research findings can only be assessed through replications in other settings.

We also need to acknowledge two limitations related to our measures. First, we developed a new scale for perceived threat of SST. Even though the scale items loaded onto one factor and demonstrated adequate reliability, this construct is much richer in meaning than we are able to capture with our three items. We, therefore, recommend further development of this scale. Second, to incorporate customers with pseudorelationships into our data analysis, we had to create a dummy variable called enacted service design. To do this, we sacrificed the richness captured by the seven questions measuring features of service relationships. Again, future research should attempt to develop a richer measure for enacted service design.

CONCLUSIONS

Our results show that B2B customers in service relationship designs associate operational performance gains and relational performance losses with a prospective SST. Perceived operational performance gains increase customers' intention to adopt SST, whereas perceived relational performance losses decrease it. However, these main effects are moderated by customers' purchase frequency and enacted service design. In particular, the positive effect of perceived operational performance gains on customers' intention to adopt SST was stronger for customers with lower purchase frequency. Similarly, the negative effect of perceived relational performance losses on customers' intention to adopt SST was strongest for customers who enacted strong service relationships. Nevertheless, the operational advantages afforded by SST are

the primary driver of customers' SST adoption decisions in B2B service environments.

Our research highlights a number of avenues for future research, in addition to the scale development opportunities that we highlighted in the Limitations section. Given that we studied SST adoption in service relationship designs, future research should explore SST adoption in service pseudorelationship designs, which allow customers to enact *service encounters* (Gutek 1995) in addition to service relationships and service pseudorelationships. Service encounters are not characterized by any tight links between customers and service providers or between customers and service organizations. Customers and providers in service encounters have no expectation of future interaction at all. Therefore, it would be interesting to learn to what extent, if any, relational performance considerations affect customers' intention to adopt SST in service pseudorelationship designs.

Finally, future research should explore customer adoption of SST in service environments where the goals of providers and customers are at odds and their motivations to build service relationships are not aligned. For example, in car sales, providers are typically interested in building service relationships with their customers to generate repeat sales and referrals. However, given the negative stereotypes that plague car sales associates, many customers would rather use Internet-mediated, car-buying services (e.g., Autobytel) to avoid direct contact with both the car sales associate and the dealership. In this context, it would be interesting to assess whether and how a firm's efforts to leverage SST to improve operational performance affect relational performance.

NOTES

1. A pseudonym.
2. The C-O-P (customer, organization, provider) triangle bears much resemblance to the Pyramid Model (Parasuraman 2000), which is frequently used in the marketing literature.

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