

# Determinants of the continued use of self-service technology: The case of Internet banking

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## Abstract

This study focuses on buyers' continued use of self-service technology (SST). This area is often neglected because most studies focus on buyers' adoption or acceptance of SST. In comparison to new buyer acquisition, continued use is a cost-effective market strategy aimed at retaining buyers. Based on a sample of 1831 Estonian Internet banking customers, we find that continued use of SST is positively affected by buyers' perceived usefulness. We also find that continued use of SST is negatively affected by multichannel satisfaction. As our results show, two important issues are facing developers of SSTs and sellers using SSTs: First, continued use of SST is achieved when the buyer finds the SST useful. Second, SSTs need to be considered in the context of all channels in the buyer–seller interface because the buyer does not separate the service offering of an SST from other channels. The benefits associated with using SSTs will increase if these strategic issues are taken into account.

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**Keywords:** Self-service technology; Internet banking; Perceived usefulness; Multichannel satisfaction

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## 1. Introduction

Increasingly, the role of face-to-face interaction between suppliers and buyers is being replaced with self-service technologies (SSTs), which allow the buyers to produce and use these services by themselves, without direct contact with any employees of the firm. Although it is evident that SSTs are gaining in popularity as a method of doing business, it is less clear what the drivers for buyers' continued use of this kind of service are (Yen and Gwinner, 2003).

An answer may be provided by the increasing body of research on information systems usage (Bhattacharjee, 2001). Research based on innovation diffusion theory (Rogers, 1995) has examined attitudinal variables that affect usage behavior, and the technology acceptance

model (TAM) (Davis et al., 1989) has examined attitudinal variables that influence behavioral intentions, which they find affect actual use. Whereas these theories add substantially to our understanding of why technologies are adopted and used, they do not explicitly focus on the continued use of the technology. Previous research has shown that consumer adoption and continuance behavior is influenced by different factors (Fernandes et al., 2006). Because more resources are required to attract a buyer than to retain an existing one, it is particularly important to analyze buyers' continued use of the technology (Reichheld and Sasser, 1990). In addition, as buyers gain experience using a technology, their needs and wants change (Blake et al., 2005). To continue to meet their needs and wants, sellers must, therefore, be aware of these changes. The goal of this study is to contribute to the innovation theories by investigating buyers' continued use of an SST. The initial acceptance of a technology is an important first step; however, the eventual success of the technology depends on its continued use (Bhattacharjee, 2001).

The purpose of this article is to conceptualize, develop, and validate independent variables that convey continued

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usage of Internet banking, an SST. In accordance with previous research (Bhattacharjee, 2001; Davis et al., 1989), we identify users' perceived usefulness of and satisfaction with Internet banking as indicators of their continued usage of this SST.

The rest of this article is organized as follows: We begin with a discussion of buyers' continued usage and antecedents of perceived usefulness and multichannel satisfaction. Based on the literature review, we propose three different hypotheses. After the literature review, the methods and data analysis are presented. Finally, the results of this study are presented, followed by a discussion of the implications.

### 1.1. Literature review

Buyers' continued use is central to the survival of SSTs. Market shares and revenues of a firm depend on both the number of initial adopters and the number of continued users (Bhattacharjee, 2001). The importance of buyers' continued usage versus initial adoption is evident from the fact that acquiring new buyers may cost as much as five times more than retaining existing buyers, based on the costs of searching for new buyers, setting up new accounts, and initiating new buyers to the use (Bhattacharjee, 2001). If a firm in the insurance industry increases its buyer retention by 5 percent, it conveys savings in operating costs by 18 percent (Bhattacharjee, 2001). Therefore, for sellers that use SST, it is crucial to focus on buyers' continued usage.

Buyers' continued usage depends on their acceptance of the technology and their satisfaction with service delivery. Whereas most studies examine these antecedents separately, it is likely that they both have an effect on buyers' continued use. The reason that these two antecedents of buyers' continued use have not been previously combined is that they build on two different research streams: technology acceptance and service/relationship marketing. In terms of technology acceptance, perceived usefulness has been found to be a good indicator of how a product or service relates to the buyers' or sellers' context. As defined by Davis et al. (1989), perceived usefulness is "the extent to which a person perceives increased benefits from using the SST." This definition emphasizes user context by asking users to focus on perceived benefits to them, regardless of the properties of the SST itself. Even though an SST may be considered excellent, users will not perceive it as useful if it does not provide a benefit to them. The situation specificity of the users' evaluation of usefulness is central because attitudes that are situation-specific are more likely to influence actual behavior (Foxall and Yani-de-Soriano, 2005). Research has often provided weak links between attitude and behavior (Wicker, 1969), but the theory of reasoned action provided a stronger link with the introduction of behavioral intention and behavioral expectation as intermediaries between attitude and behavior (Ajzen and Fishbein, 1980; Leone et al., 1999;

Warshaw and Davis, 2001). Recent research has found that controlling for the situation in which attitudes relate to behavior provides an even stronger means of establishing a link between attitudes and behavior (Foxall and Yani-de-Soriano, 2005; McBroom and Reed, 1992). Because a user's perceived usefulness of an SST is inherently situation-specific, this paper accepts that their perceived usefulness of an SST influences their behavior and is an antecedent of SST usage.

The second antecedent of continued use is buyer satisfaction, which is considered as the primary motivation for continued usage (Oliver, 1980). Buyers who are satisfied tend to continue their usage, whereas dissatisfied buyers discontinue their usage (Gianni and Franceschini, 2003; Paré et al., 2005). Studying buyers' level of satisfaction has interested many researchers, especially in the field of marketing (Cho and Park, 2001). Because the buyers' level of satisfaction is believed to affect the buyers' purchasing behavior, firms have focused on improving it (Cho and Park, 2001; Oliver, 1980). Every interaction between the firm and the buyer is a service encounter influencing the buyer's attitudes; therefore, all encounters should be considered (Oliva et al., 1992). Satisfaction refers to the SST offering, which means that satisfaction is usually an amalgamation of all channels into an interface between the selling firm and the buyer. For instance, the buyer may use the Internet to search for information during the pre-purchasing stage and then visit an individual store to make the final purchasing decision (Peterson et al., 1997). In addition, buyers may want to go shopping as part of a pleasure experience and use the Internet for conducting an information search or other purchases (Balasubramanian et al., 2005). For satisfaction to be context-specific, the multichannel exchange situation must also be considered. Research studies focusing on buyer channels have identified that most buyers make use of both the Internet and stores (Rangaswamy and Van Bruggen, 2005), and that the consumers brand loyalty in the traditional market positively correlates with the attitudes towards the brand's online channels (Wang et al., 2006a), which is why the definition of buyer satisfaction used in this study comprises all channels that firms use. We use the term *buyer multichannel satisfaction* to emphasize this point.

### 1.2. Perceived usefulness

If buyers believe that a certain application will help improve job performance, they will be more likely to use it than if they do not realize the application's usefulness (Davis et al., 1989). Davis et al. (1989) and many other researchers (Cheng et al., 2006; Doll et al., 1998; Gerrard and Cunningham, 2003; Karahanna et al., 1999; Venkatesh and Davis, 2000) have realized that perceived usefulness has a strong influence over buyers' acceptance of an application. Because perceived usefulness is a primary motivator of technology acceptance, it is reasonable that it

may also influence subsequent continuance of the technology (Bhattacharjee, 2001).

Davis et al. (1989) consider perceived usefulness as a direct predictor of the buyer's intention to use the technology. This connection between perceived usefulness and the buyer's intention to use the technology is supported in a study by Cheng et al. (2006). Although the connection between perceived usefulness and the intention to use was originally derived in the context of technology acceptance, it is also likely to function in the context of technology continuance (Bhattacharjee, 2001).

**H1.** Buyers' usage of Internet banking is positively associated with their perceived usefulness of Internet bank use.

Research has found that creating a path between perceived usefulness and information systems use reduces the association between satisfaction and usage (Rai et al., 2002). Because a technology may provide benefits that are not easily available through other means, its usage may occur irrespective of a buyer's overall satisfaction with the system (Rai et al., 2002).

### 1.3. Multichannel satisfaction

Satisfaction is an ex-post evaluation of buyers' experience with a service and results in a positive feeling, indifference, or a negative feeling (Devaraj et al., 2002). The key to building and retaining a loyal base of long-term buyers is satisfaction (Bhattacharjee, 2001). According to Bhattacharjee (2001), a positive correlation exists between the intention to continue usage and satisfaction. Buyers' satisfaction with an innovation directly affects their intention to use and the actual usage (Davis et al., 1989; Karahanna et al., 1999).

Satisfaction is determined by assessing the expectation of the technology and the confirmation of expectation following actual use (Bhattacharjee, 2001). Buyers' satisfaction is the result of an evaluative process that contrasts pre-purchase expectations with the perception of performance during and after the consumption experience (McQuitty et al., 2000). Lower expectations and/or higher performance result in greater confirmation, which in turn positively influences buyer satisfaction and the intention to continue usage (Bhattacharjee, 2001). Research has shown that satisfaction influences buyers' loyalty; however, more recent studies have revealed that the influence of satisfaction over loyalty is rather complex (Hennig-Thurau, 2002; Reichheld, 1996). Generally, the dimensions of satisfaction that are associated with a service include service quality, product quality, price, and location (Skogland, 2004). However, what influences the buyers' level of satisfaction differs depending on whether the services are reached through traditional offline channels or through online channels; for online services, factors such as site design and payment methods must also be considered (Cho and Park, 2001).

When buyers find a particular channel to be convenient, time efficient, and price saving, they will be satisfied with the general effectiveness and efficiency of the electronic channel (Devaraj et al., 2002). However, where multiple channels are used, buyers rarely consider them in isolation from each other (Balasubramanian et al., 2005; Peterson et al., 1997; Rangaswamy and Van Bruggen, 2005), which is why satisfaction with a particular channel is inextricably linked to multichannel satisfaction in the interface between buyer and seller. In addition, buyers will find the interaction experience gratifying if the supplier is responsive, concerned, and reliable throughout the process (Devaraj et al., 2002).

**H2.** Buyers' level of multichannel satisfaction with their bank is positively associated with their Internet banking continuance.

If buyers continue using the Internet with improved results, the confirmation of better than expected results can influence the perceived usefulness in a positive direction. However, if continued usage generates worse results, this disconfirmation negatively affects the pre-established perceived usefulness (Hayashi et al., 2004). Today, buyers have easy access to alternative sources to purchase products and services. For buyers to continue using a particular channel, they must, therefore, perceive that the channel offers better choices than the alternatives (Devaraj et al., 2002). Perceived usefulness affects the level of satisfaction, which affects the expectations of future benefits, thereby influencing information systems usage (Rai et al., 2002).

**H3.** Buyers' perceived usefulness of Internet bank use is positively associated with their multichannel satisfaction with the bank.

## 2. Data and methods

Because of the complexity and highly involved nature of financial services, the banking market provides a useful environment for examining customer satisfaction and loyalty. Empirical data for this study were collected via a survey of Internet banking users. The Internet banking context was selected because banking is an information-intensive activity (Bhattacharjee, 2001). The sample was drawn from the buyer base of Eesti Ühispank (Union Bank of Estonia), Estonia's second largest bank. This bank has 26 percent of the market share in the local market and has a wide and diverse range of buyers, thus providing a representative subsample of all Estonian bank buyers. The database was obtained from the bank's marketing department; however, because of confidentiality considerations, the bank itself carried out the random selection procedure. It was agreed beforehand that the sample would be representative of the buyer base covering all buyer groups across the country, thus allowing us to generalize our results back to the population from which they were chosen. This survey was conducted from 3 to 31 January 2003.

Of the 9000 questionnaires sent out to bank buyers, 1831 usable responses were received. Because we did not have the current addresses of 330 intended respondents, these particular questionnaires could not be delivered. This survey resulted in a response rate of 21.12 percent, which is good considering the length of the questionnaire, the importance of the topic to the respondents, and the fact that it was mainly a mailed survey. Table 1 presents the demographic overview of the respondents. Of the 1831 respondents, 56 percent were female, the median age was between 36 and 40 years, 46.2 percent had a university degree, and 42.8 percent had used Internet banking for more than 3 years. In addition to background questions, respondents were asked, for example, to assess their satisfaction with all the interaction channels and the perceived usefulness of Internet banking.

The data were processed using LISREL, a structural equation modeling technique that traces structural relations in a set of data (Anderson and Gerbing, 1988; Bollen, 1989; Hayduk, 1987; Jöreskog and Sörbom, 1993). We assess the validity of our structural model in three dimensions: (1) nomological validity, meaning the validity of the entire model; (2) convergent validity, representing the homogeneity of constructs in the model; and (3) discriminant validity, referring to the degree of separation between constructs. There is an ongoing debate regarding which measures should be chosen to assess nomological validity (Bollen and Long, 1993). Three frequently used measures are (1) the goodness-of-fit index (GFI), which checks for sample size effects and should be above 0.90; (2) the root mean-squared error of approximation (RMSEA), which measures population discrepancy per degree of

freedom and should be below 0.08; and (3) the comparative fit index (CFI), which checks for non-normal distributions and should exceed 0.90 (Bollen, 1989; Murtha et al., 1998). Convergent validity is confirmed if indicators load only on their constructs (Bollen, 1989; Jöreskog and Sörbom, 1993). Discriminant validity is confirmed if indicators do not load on more than one construct.

Group analysis with LISREL is conducted by testing for equivalence across groups. The sample was split into different groups for the group analysis to assess whether the continuance of Internet banking is affected by different buyer characteristics. The sample was split into groups depending on the buyers' age, sex, education, family income, living place, frequency of Internet banking use, years in the bank, and, finally, years in the Internet bank.

## 2.1. Construct validity

### 2.1.1. Perceived usefulness

We compiled three dimensions into this construct: the price savings dimension, a time saving dimension, and a convenience dimension (see Table 2). Past research has shown that consumers derive value for services that are offered at the right price, given the quality (Lee and Overby, 2004). Online consumers can browse several retailers to find the lowest price for the service they desire. In addition, firms offering their services over the Internet often offer lower prices than firms with an extensive system of branches. Research has also found that part of the perceived benefits of Internet usage is the convenience associated with online shopping based on the effort involved (Doolin et al., 2005). In addition, the dimension of time saving has been proposed by previous research (Doolin et al., 2005). Therefore, based on previous research, we decided to compile these three dimensions into the construct of perceived usefulness.

### 2.1.2. Multichannel satisfaction

Online activities cannot be considered in isolation because in a multichannel environment, service providers may reach consumers using a mix of channels, including offices, mail, telephone, and the Internet (Montoya-Weiss et al., 2003). In a relational multichannel context, such as the financial market, alternative channel assessments influence overall satisfaction and online channel use. Therefore, to determine what influences consumers' usage of Internet banking, it is important to evaluate not only online satisfaction but also overall multichannel satisfaction. To study consumers' overall multichannel satisfaction, we compiled two variables into the construct. Including the variable of overall satisfaction with the main bank was motivated by the preceding discussion. In addition, research has found that the service range is crucial (Rowley, 1998); therefore, we decided to include how satisfied the consumers are with the range of banking services into the construct of overall multichannel satisfaction.

Table 1  
Demographic characteristics

	Frequency	Valid percentage
<i>Gender</i>		
Male	794	44
Female	1009	56
<i>Age (years)</i>		
≤25	455	25.1
26–35	370	20.4
36–45	384	21.2
46–55	349	19.3
≥56	252	13.9
<i>Education</i>		
Primary school	50	2.8
Secondary school	401	22.3
Secondary special	504	28
University degree	760	42.2
Postgraduate degree (PhD, MBA)	87	4.8
<i>Personal income</i>		
≤192 €	459	26.6
193–320 €	352	20.4
321–512	441	25.6
513–769	259	15.0
≥770	213	12.4



Table 2  
The constructs and their indicators

Indicator	Abbreviation	Factor loading	<i>t</i> -value	<i>R</i> <sup>2</sup> value
<i>The construct perceived usefulness</i>				
Question: Do Internet banking services have better prices than office services?	Bestpric	0.54	19.57	0.29
Question: Is Internet banking more convenient to use than other banking methods?	Conveni	0.98	28.00	0.95
Question: I value speed in my banking transactions	Valusped	0.49	17.34	0.24
<i>The construct multichannel satisfaction</i>				
Question: How satisfied are you with the range of banking services?	Satrange	0.61	4.17	0.38
Question: How would you evaluate your overall satisfaction with your main bank?	Satisfac	0.89		0.79
<i>The construct internet bank continuance</i>				
Question: How often do you use Internet banking to pay your bills?	Payint	1.00		1.00

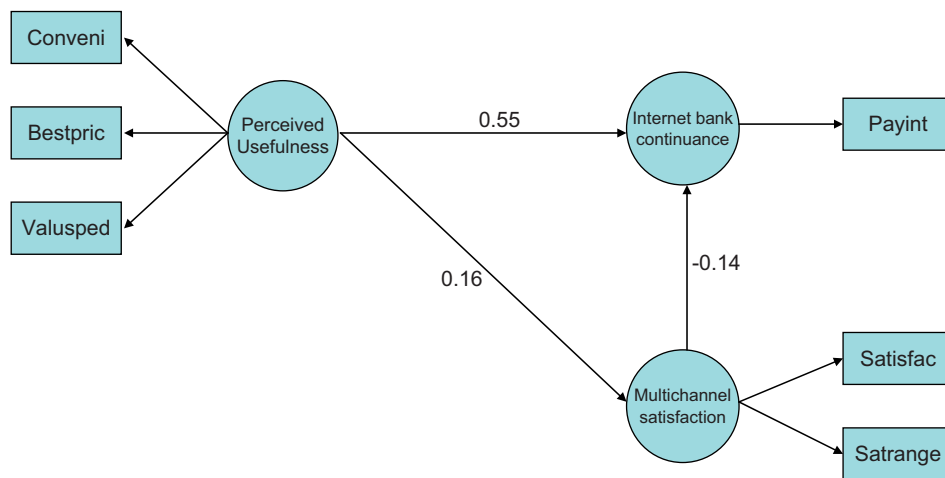


Fig. 1. Structural model of the effect of perceived usefulness and multichannel satisfaction on Internet banking continuance.

### 2.1.3. Paying bills using Internet banking

Previous research has found that frequency of usage is a suitable measure of Internet usage (Doolin et al., 2005; Thompson, 2001). In addition, other research studies have determined that frequency of purchasing is an appropriate measure of a direct shopping experience (Jarvenpaa et al., 2000). Consistent with these findings, this study measures actual behavior using frequency of usage as a variable in this construct. Internet banking usage was measured in terms of frequency of usage of Internet banking to pay bills, which was measured on a 5-point scale, ranging from (1) never to (5) very often.

## 3. Results

The three hypotheses presented earlier in this article were tested collectively in a structural equation model (Fig. 1). Hypothesis H1, which states that perceived usefulness has a positive effect on Internet banking usage ( $\beta = 0.55$ ), is

supported by the structural model. Multichannel satisfaction was also determined to have an effect on Internet banking usage; however, the structural model indicated that this effect was negative, not positive, as in Hypothesis H2 ( $\beta = -0.14$ ). This result thus shows that increased multichannel satisfaction causes decreased Internet banking usage. These results confirm that perceived usefulness has a positive effect on multichannel satisfaction ( $\beta = 0.16$ ), as stated in Hypothesis H3.

### 3.1. Results of group analyses

There is reason to believe that the model developed may vary with consumer demographics (Bhatnagar and Ghose, 2004). We performed several group analyses to test the robustness of the model and for any deviations in consumer demographics. The group analyses themselves can be categorized into two groups: First, we examine traditional demographic variables (age, sex, education,

income, and living place); second, we examine factors that relate to Internet banking (frequency of Internet banking usage, years in Internet bank, and years in bank).

Group analysis with the LISREL method involves testing for equivalence across groups. In doing so, the three major components of a structural model (construct relations, indicator relations, and error covariances) are set so that they are equal in all groups (Jöreskog and Sörbom, 1993, p.53). If key statistical estimates for validity are not confirmed, then the structural model differs between groups. These differences may be minor, such as one error covariance differing, or they may be major, as in cases where the causal structure is fundamentally different. The conceptual interpretation of the extent of differences between groups helps us determine whether the groups are similar or different, and if different, in what respects. Another way of doing group analysis with LISREL has been suggested by Bollen (1989), who recommends that the two groups be set free of each other, which means that additional equality constraints have to be gradually imposed on them. He also recommends that the least constraining parameters be tested first, followed by the more constraining ones. A basic hierarchy for this procedure is to test first for equivalence of construct relations, then for equivalence of indicator coefficients across groups, and finally for equivalence of error covariance structures. The purpose of the group analysis in this study is to validate the model, which means that we want to find out if the model differs across groups, and if so, how. Therefore, we begin by determining if the groups are equal and then by studying how they differ.

Testing the model's generalizability among different groups of Internet banking users revealed that the model is identical for groups of people of different age, sex, living place, and education (Table 3). The model differs for groups of people with various levels of personal income. For buyers with higher incomes, the effect of perceived usefulness on continued use is stronger than for buyers with lower incomes. A possible explanation for this result is that people with higher incomes actually use the bank and Internet banking more often, and as a consequence, the effect from perceived usefulness to continuance is stronger.

No differences were found between those who have been customers with the bank for a long period of time and those who have been customers for a short period of time. However, there are differences regarding Internet bank usage. The model is significant at the 5 percent level for buyers who have used Internet banking for less than 3 years; however, the model is not significant for buyers that have used it longer. A possible explanation is that multichannel satisfaction and perceived usefulness have an effect on Internet banking usage primarily in the first three years of usage. Studies find that learning in business relationships is fast in the beginning and then increases at a decreasing rate (Levinthal and Fichman, 1988). Because perceived usefulness confers an element of learning, our

Table 3  
Results of group analyses<sup>a</sup>

Selection variable	Groups studied	Differences	Nature of difference
Age	Young (below 50)	No difference	n.a.
	Older (over 50)		n.a.
Sex	Female	No difference	n.a.
	Male		n.a.
Education	Low (Less than university degree)	No difference	n.a.
	High (At least university degree)		n.a.
Living place	Rural	No difference	n.a.
	Urban		n.a.
Income	Low	Differences	Stronger effect from perceived usefulness to continuance, as compared with baseline model in Fig. 1.
	High		Weaker effect from perceived usefulness to continuance, as compared with baseline model in Fig. 1.
Years in bank		No difference	n.a.
Years in Internet bank	Less than 3 years	Differences	Model similar to baseline model in Fig. 1.
	Longer than 3 years		Insignificant model
Frequency of IB use	Low (up to 3 times per month)	Differences	Weaker effect from perceived usefulness to continuance, as compared with baseline model in Fig. 1.
	High (more than once a week)		Stronger effect from perceived usefulness to continuance, as compared with baseline model in Fig. 1.

<sup>a</sup>n.a.

results may indicate that perceived usefulness has an effect on continued use primarily in the beginning of Internet banking usage. For buyers who use Internet banking more frequently, the effect of perceived usefulness on continued use is stronger than for buyers who use the Internet less frequently. This finding may be interpreted as pointing out

that the frequency of interaction with Internet banking leads to higher continued use.

To conclude the group analysis, we find that the model is valid in different groups in terms of age, sex, education, living place, and years in bank. However, the length of time and frequency that buyers have been using Internet banking, as well as their personal income, are characteristics that influence the buyers' attitudes. In conclusion, it appears that perceived usefulness has a stronger effect on continued use in the first three years for users who have a relatively high income and who are more frequent users of Internet banking. An interpretation is that the learning that takes place when perceived usefulness affects continued use persists according to the volume and prior state of knowledge about Internet banking.

#### 4. Discussion

The purpose of this study was to conceptualize, develop, and validate independent variables that convey continued usage of Internet banking, an SST. Based on previous research (Bhattacharjee, 2001; Davis et al., 1989), we identify perceived usefulness and satisfaction as indicators of continued use. After deciding which service provider to use, buyers usually have several different interaction channels through which they can interact with the provider, and the buyers' evaluation of the service provider, therefore, is usually based on an amalgamation of all the channels. Because the buyers' satisfaction with the service provider is based on all the interaction channels, the channels are related and should, therefore, be studied in relation to each other. For example, the buyers' satisfaction with Internet banking is probably affected by their general satisfaction with the service provider. To find out how their satisfaction with all the interaction channels influences their Internet banking usage, we studied the buyers' multichannel satisfaction.

This empirical study supports Hypotheses H1 and H3, but Hypothesis H2 was found to have a negative effect, rather than the positive one that was predicted. These findings suggest that Internet usage in a multichannel context is influenced not only positively by the potential users' perception of its usefulness but also negatively by their overall satisfaction with the service provider and their additional distribution channels. This study has shown that perceived usefulness is a crucial determinant whether buyers will continue their usage or not. If buyers perceive Internet banking to be useful, they will be more likely to use it. However, buyers' satisfaction with traditional interaction channels in the bank may restrict their usage of Internet banking. If buyers perceive Internet banking to be useful but, at the same time, have high multichannel satisfaction, they tend to avoid using Internet banking.

Buyers' satisfaction is one factor that influences the buyers' loyalty, but satisfaction does not guarantee loyalty. Historically, it has been assumed that if buyers are satisfied,

they will also be loyal (Nordman, 2004). However, recent research has shown that buyers' satisfaction is not a guarantee of loyalty (Bloemer et al., 1998; Bowen and Chen, 2001; Fornell, 1992; Ganesh et al., 2000; Mittal and Lassar, 1998). An increase in satisfaction does not necessarily result in an equal increase in loyalty (Söderlund, 1998). Companies that conduct satisfaction surveys report that between 80 and 90 percent of the buyers are satisfied or very satisfied; however, buyers are, in spite of their satisfaction, breaking up relationships and switching brands (Stauss and Neuhaus, 1997). Research has found that between 65 and 85 percent of buyers who had switched service providers had been either satisfied or very satisfied with their previous service provider (Reichheld, 1996). However, research has also found that high levels of satisfaction with currently used systems negatively affect the likelihood of adoption of new ones (Chau and Tam, 1997). This study shows that buyers' satisfaction with traditional banking may serve as an obstacle to their continuance of Internet banking. Buyers' perception of Internet banking as useful results in their continuance of Internet banking usage, but if buyers are also satisfied with traditional banking, they seem to prefer traditional banking channels. This study, therefore, shows that the perception of a channel as useful does not guarantee loyalty.

Previous research has shown that buyers, despite being satisfied with a service provider, often change service providers because they perceive it to be advantageous. The results of our study, however, show the opposite. Even though buyers perceive it to be advantageous to continue their Internet banking usage, they yield to their overall satisfaction with traditional banking. The conclusion might be that satisfaction only is secondary when it concerns choice of provider; however, when it concerns choice of interaction channel, satisfaction is number one and the perceived usefulness is secondary.

This study has some limitations. The first one is that our findings regarding determinants of the continued use of SSTs might not be generalizable to continued use of other innovations. Another limitation is that this study is conducted only in Estonia, and therefore, the findings in this study may be specific to the culture in this country.

Future research could study how the results hold in a cross-cultural study. In Estonia, the adoption of Internet banking has been rapid, and therefore, it would be interesting to compare the Estonian case with other markets, where the adoption not has proceeded as rapidly as in Estonia. Further research could also study other innovations than Internet banking, innovations that not has been implemented to the same extent as Internet banking has. Mobile phone banking may be a good example.

Another interesting area of future research would be to study continued SST use in relation to other channels. We take a first step by finding that multichannel satisfaction is important for continued use, and future research could study the influence of specific channels, such as branch, phone, or agent delivery.

Future research could also more clearly separate the perceived usefulness of the SST from its content, and the context in which it is used. Again, we identify the importance of the perceived usefulness of SST for continued use. Future research could clarify to what extent the effect of perceived usefulness on SST continued use may differ, for instance depending on the service content of the SST, or the context of the service use. Similarly, involvement and loyalty could also be incorporated into the model (Wang, Pallister and Foxall, 2006b). Perhaps this could also provide an avenue towards an answer of how convenience and perceived usefulness in consumer decision-making (Kucuk and Krishnamurthy, 2007).

#### 4.1. Managerial implications

Attracting new buyers and influencing them to adopt SSTs is important. However, because of the high cost involved in searching for new buyers and initiating them to SST usage, it is even more important to keep existing buyers and influence them to continue their usage of SSTs.

Perceived usefulness is crucial for buyers' continued usage of SSTs, a finding already known from previous research (Bhattacharjee, 2001). However the results of this study indicate that it is important to consider buyers' SST usage in the context of all channels in the buyer–seller interface because buyers do not separate the service offering of an SST from other channels. This study shows that perceived usefulness is a crucial determinant whether buyers will continue their usage of an SST or not. If the SST is perceived useful, buyers will more likely continue their usage. However, if buyers perceive the SST to be useful but, at the same time, are satisfied with traditional interaction channels, it may restrict the buyers' usage of the SST, prompting them to use other channels. The conclusion, therefore, might be that in addition to perceived usefulness, buyers' multichannel satisfaction should be considered important.

The level of services provided through the alternative channels can influence buyers' usage of SSTs. To influence consumers to use SSTs instead of traditional channels, the service provider can vary the service levels across channels. For example, branch services could be reduced by offering fewer branches, shorter business hours, or fewer employees. However, it is important to consider how alternative channels may be complementary to the SST when evaluating the service provider. If the alternative channels are reduced, it may result in less multichannel satisfaction, which may lead the consumer to switch service providers. Another way to increase the consumers' continued use of SST is to improve the SST so that it is perceived even more useful and the use of other channels is no longer an option.

#### References

Ajzen, I., Fishbein, M., 1980. *Understanding Attitudes and Predicting Social Behavior*. Prentice-Hall, Englewood Cliffs, NJ.

- Anderson, J.C., Gerbing, D.W., 1988. Structural equation modeling in practice: a review and recommended two-step approach. *Psychological Bulletin* 103 (3), 411–423.
- Balasubramanian, S., Raghunathan, R., Mahajan, V., 2005. Consumers in a multichannel environment: product utility, process utility, and channel choice. *Journal of Interactive Marketing* 19 (2), 12–30.
- Bhatnagar, A., Ghose, S., 2004. Online information search termination patterns across product categories and consumer demographics. *Journal of Retailing* 80 (3), 221.
- Bhattacharjee, A., 2001. Understanding information systems continuance: an expectation-confirmation model. *MIS Quarterly* 25 (3), 351–370.
- Blake, B.F., Neuendorf, K.A., Valdiserri, 2005. Tailoring new websites to appeal to those most likely to shop online. *Technovation* (25), 1205–1214.
- Bloemer, J., de Ruyter, K., Peeters, P., 1998. Investigating drivers of bank loyalty: the complex relationship between image, service quality and satisfaction. *International Journal of Bank Marketing* 16 (7), 276–286.
- Bollen, K.A., 1989. *Structural Equations with Latent Variables*. Wiley, New York.
- Bollen, K., Long, J.S., 1993. *Testing Structural Equation Models*. Sage, Newbury Park, CA.
- Bowen, J.T., Chen, S.L., 2001. The relationship between buyer loyalty and buyer satisfaction. *International Journal of Contemporary Hospitality Management* 13 (4–5), 213–217.
- Chau, P.Y.K., Tam, K.Y., 1997. Factors affecting the adoption of open systems: an exploratory study. *MIS Quarterly* 21 (1), 1–24.
- Cheng, J.M.-S., Sheen, G.-J., Lou, G.-C., 2006. Consumer acceptance of the Internet as a channel of distribution in Taiwan—a channel function perspective. *Technovation* 26, 856–864.
- Cho, N., Park, S., 2001. Development of electronic commerce user-buyer satisfaction index (ECUSI) for Internet shopping. *Industrial Management + Data Systems* 101 (8–9), 400–405.
- Davis, F.D., Bagozzi, R.P., Warshaw, P.R., 1989. User acceptance of computer technology: a comparison of two theoretical models. *Management Science* 35 (8), 982–1003.
- Devaraj, S., Fan, M., Kohli, R., 2002. Antecedents of B2C channel satisfaction and preference: validating e-commerce metrics. *Information Systems Research* 13 (3), 316–333.
- Doll, W.J., Hendrickson, A., Deng, X., 1998. Using Davis's perceived usefulness and ease-of-use instruments for decision making: a confirmatory and multigroup invariance analysis. *Decision Sciences* 29 (4), 839–869.
- Doolin, B., Dillon, S., Thompson, F., Corner, J.L., 2005. Perceived risk, the Internet shopping experience and online purchasing behavior: a New Zealand perspective. *Journal of Global Information Management* 13 (2), 66–88.
- Fernandes, K.J., Raja, V., White, A., Tsinopoulos, C.-D., 2006. Adoption of virtual reality within construction process: a factor analysis approach. *Technovation* 26, 111–120.
- Fornell, C., 1992. A national buyer satisfaction barometer: the Swedish experience. *Journal of Marketing* 56 (1), 6–21.
- Foxall, G.R., Yani-de-Soriano, M.M., 2005. Situational influences on consumers' attitudes and behaviour. *Journal of Business Research* 58 (4), 518.
- Ganesh, J., Arnold, M.J., Reynolds, K.E., 2000. Understanding the customer base of service providers: an examination of the differences between switchers and stayers. *Journal of marketing* 64 (3), 65–87.
- Gerrard, P., Cunningham, J.B., 2003. The diffusion of Internet banking among Singapore buyers. *International Journal of Bank Marketing* 21 (1), 16–28.
- Gianni, G., Franceschini, F., 2003. A new model to support the personalised management of a quality e-commerce service. *International Journal of Service Industry Management* 14 (3), 331–346.
- Hayashi, A., Chen, C., Ryan, T., Wu, J., 2004. The role of social presence and moderating role of computer self efficacy in predicting the continuance usage of e-learning systems. *Journal of Information Systems Education* 15 (2), 139–154.



- Hayduk, L.A., 1987. *Structural Equation Modeling with LISREL*. The Johns Hopkins University Press.
- Hennig-Thurau, T., Gwinner, K.P., Gremler, D.D., 2002. Understanding relationship marketing outcomes. *Journal of Service Research* 4 (3), 230–247.
- Jarvenpaa, S.L., Tractinsky, N., Vitale, M., 2000. Consumer trust in an Internet store. *Information Technology and Management* 1, 45–71.
- Jöreskog, K.G., Sörbom, D., 1993. *LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language*. Lawrence Erlbaum Associates Publishers, Hillsdale, NJ.
- Karahanna, E., Straub, D.W., Chervany, N.L., 1999. Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly* 23 (2), 183–213.
- Kucuk, S.U., Krishnamurthy, S., 2007. An analysis of consumer power on the Internet. *Technovation* 27, 47–56.
- Lee, E.J., Overby, J.W., 2004. Creating value for online shoppers: implications for satisfaction and loyalty. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior* 17, 54–67.
- Leone, L., Perugini, M., Ercolani, A.P., 1999. A study of three models of attitude-behavior relationships in the studying behaviour domain. *European Journal of Social Psychology* 29, 161–189.
- Levinthal, D.A., Fichman, M., 1988. Dynamics of interorganizational attachments: auditor-client relationships. *Administrative Science Quarterly* 33, 345–369.
- McBroom, W.H., Reed, F.W., 1992. Toward a reconceptualization of attitude-behavior consistency. *Social Psychology Quarterly* 55 (2), 205–216.
- McQuitty, S., Finn, A., Wiley, J.B., 2000. Systematically varying buyer satisfaction and its implications for product choice. *Academy of Marketing Science Review* 10.
- Mittal, B., Lassar, W.M., 1998. Why do buyers switch? The dynamics of satisfaction versus loyalty. *Journal of Services Marketing* 12 (3), 177–194.
- Montoya-Weiss, M.M., Voss, G.B., Grewal, D., 2003. Determinants of online channel use and overall satisfaction with a relational, multi-channel service provider. *Academy of Marketing Science* 31 (4), 448.
- Murtha, T.P., Lenway, S.A., Bagozzi, R.P., 1998. Global mind-sets and cognitive shift in a complex multinational corporation. *Strategic Management Journal* 19 (2), 97–114.
- Nordman, C., 2004. *Understanding Buyer Loyalty and Disloyalty—The Effect of Loyalty-Supporting and—Repressing Factors*. Swedish School of Economics and Business Administration, Helsinki, Finland.
- Oliva, T.A., Oliver, R.L., MacMillan, I.C., 1992. A catastrophe model for developing service satisfaction strategies. *Journal of Marketing* 56 (3), 13.
- Oliver, R.L., 1980. A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research* 17, 460–469.
- Paré, G., Lepanto, L., Sicotte, C., 2005. Evaluating PACS success: a multidimensional model. In: *Proceedings of the 38th Hawaii International Conference on System Sciences*.
- Peterson, R.A., Balasubramanian, S., Bronnenberg, B.J., 1997. Exploring the implications of the Internet for consumer marketing. *Journal of the Academy of Marketing Science* 25 (4), 329–346.
- Rai, A., Lang, S.S., Welker, R.B., 2002. Assessing the validity of IS success models: an empirical test and theoretical analysis. *Information Systems Research* 13 (1), 50–69.
- Rangaswamy, A., Van Bruggen, G.H., 2005. Opportunities and challenges in multichannel marketing: an introduction to the special issue. *Journal of Interactive Marketing* 19 (2), 5–11.
- Reichheld, F.F., 1996. Learning from buyer defections. *Harvard Business Review* 74 (2), 56–69.
- Reichheld, F.F., Sasser Jr., W.E., 1990. Zero defections: quality comes to services. *Harvard Business Review* 68 (5), 105–111.
- Rogers, E.M., 1995. *Diffusion of innovations*, fourth ed. The Free Press, New York, 518 p.
- Rowley, J., 1998. Internet food retailing: the UK in context. *British Food Journal* 100 (2), 85.
- Skogland, I., Siguaw, J.A., 2004. Are your satisfied buyers loyal? Cornell hotel and restaurant administration. *Quarterly* 45 (3), 221–234.
- Stauss, B., Neuhaus, P., 1997. The qualitative satisfaction model. *International Journal of Service Industry Management* 8 (3), 236–249.
- Söderlund, M., 1998. Buyer satisfaction and its consequences on buyer behaviour revisited—the impact of different levels of satisfaction on word-of-mouth, feedback to the supplier and loyalty. *International Journal of Service Industry Management* 9 (2), 169–188.
- Thompson, T.S.H., 2001. Demographic and motivation variables associated with Internet usage activities. *Internet Research* 11 (2), 125.
- Venkatesh, V., Davis, F.D., 2000. A theoretical extension of the technology acceptance model: four longitudinal field studies. *Management Science* 46 (2), 186–204.
- Wang, H.-C., Pallister, J.G., Foxall, G.R., 2006a. Innovativeness and involvement as determinants of website loyalty: II. Determinants of consumer loyalty in B2C e-commerce. *Technovation* 26, 1366–1373.
- Wang, H.-C., Pallister, J.G., Foxall, G.R., 2006b. Innovativeness and involvement as determinants of website loyalty: III. Theoretical and managerial contributions. *Technovation* 26, 1374–1383.
- Warshaw, P., Davis, F., 2001. The accuracy of behavioral intention versus behavioral expectation for predicting behavioral goals. *Journal of Psychology* 119 (6), 599–602.
- Wicker, A., 1969. Attitude versus actions: the relationship of verbal and overt behavior responses to attitude objects. *Social Issues* 25, 41–78.
- Yen, H.J.R., Gwinner, K.P., 2003. Internet retail customer loyalty: the mediating role of relational benefits. *International Journal of Service Industry Management* 14 (5), 483–500.