THE INFLUENCE OF ANTECEDENTS OF PERCEIVED RISK ON SATISFACTION AND BEHAVIORAL INTENTION TOWARD SELF-SERVICE TECHNOLOGIES: AN EMPIRICAL STUDY

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ABSTRACT

Customer risk perceptions of self-service transaction is a critical determinant to adoption or rejection of technology-led self-service. The aim of this study is to examine the influence of two exigent antecedents—technical reliability and technology trust of perceived risk on customer satisfaction, and behavioral intention toward self-service technologies (SSTs). A conceptual framework was proposed and its subsequent hypotheses were tested. Results of the study indicate that when the degree of perceived risk is abated customer have a propensity to be satisfied with SSTs followed by positive behavioral intentions toward SSTs and would like to continue with technology-enabled services. The study also reported that high technical reliability and technology trust are two most important antecedents of perceived risk which help to lessen perceived risk and thus increase the satisfaction. Implications for executives, further research direction and shortcomings of the study have also been placed in the study.

KEY WORDS
PERCEIVED RISK; TECHNOLOGY TRUST; TECHNICAL RELIABILITY; SATISFACTION; BEHAVIORAL INTENTION; SSTs

1. INTRODUCTION

1.1 Background of the Study: Today’s fast-paced world is becoming increasingly characterized by technology-facilitated transactions and growing numbers of customers interact with technology to create service outcomes instead of interacting with a service firm employee (Meuter et al. 2000). Self-service technologies (SSTs), the way of empowering customer to enjoy their own service en-

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counteracting by means of the interaction with electronic service interfaces or machines without interacting with a firm’s service employee (Shih-Chih et al., 2009), are now widely accepted by the both service providing firms and customers for their tremendous lure. (Meuter et al. 2000; Scherer, 2013). Increases in labor costs and innovations in technology have contributed to the growth of this technology-based self-services (Dabholkar, 1996, Lin and Hsieh, 2006). This accelerating growth in technology-based self-service today is giving rise to questions about the acceptance of such forms of service delivery by all kinds of customers and under different situational contexts (Dabholkar & Bagozzi, 2002). Since these new technologies have transformed the nature of customer communication and service (Howard and Worboys, 2003), it is necessary to investigate how customers assess the attributes of SSTs and how service outcomes are affected (Lin and Hsieh, 2006). However, researchers warn that there are several elements to consider in order to guarantee the successful implementation of these technologies (Considine & Cormican, 2016; Eoghan & Kathryn, 2016).

The choice of SSTs creates relatively great advantages for firms in terms of productivity and cost-savings (Dabholkar, 1996). Rapid technological development, increasing labor cost, improving productivity of technology and enhancing technical intelligence of customer are influencing the service provider to deploy various technologies. Against a question, why organizations are introducing SSTs at rapid pace?, Bitner et al. (2002) identified three most important reasons behind this, namely-(i) to reduce cost, (ii) to increase customer satisfaction and (iii) to reach new customer segments.

The personal decision made by regular users to choose a certain kind of product or service was called adoption (Kotler and Keller, 2006) and self-service technologies make customers to be exposed to technology media in the service delivery process inevitably. Therefore, the customers’ attitude to the use of technology will affect their adoption behaviors (Xiaoren, Xiangdong & Ling, 2013). Although SSTs is now critical component of services delivery mode, unsurprisingly not all customer entered into the using of SSTs or are ready to embrace them (Lin & Shieh, 2007). Traits of both SSTs and individual customers are considered responsible behind it. The attitudes and behaviors of users affected the use of SSTs and in return impact on the intention of the users had received wide attractions among researchers (Dabholkar and Bagozzi, 2002; Xiaoren et al., 2013. ). In service research area, many papers are written on the influencing factors of choosing SSTs by consumers. Enjoyment (e.g., Dabholkar 1996), convenience (e.g., Collier and Kimes, 2013), customization (e.g., Lin and Hsieh, 2011), as well as functionality and design (e.g., Zhu, Nakata, Sivakumar, & Grewal, 2013), for instance, all determine how customers perceive the related risks and benefits associated with the use of technology-based self-services.
From the traits, perceived risk associated with SSTs is mostly responsible one. Johnson et al. (2008) suggest that satisfaction is negatively influenced by perceived risk. Technology or internet behavioral intentions of customers are greatly influenced by customer satisfaction (Taylor, Celuch, & Goodwin, 2002). Since SSTs replacing the way of service delivery tremendously, therefore, the practitioner and researchers need to have insight how to reduce perceived risk and what are its important antecedents to improve customer satisfaction and behavioral intentions toward SSTs.

1.2 Use of SSTs in Bangladesh: This study was undertaken in Bangladesh, which has an estimated population of about 164 million people living on 147 thousand square kilometers of land. In 2009, the country ranked 146 on the Human Development Index (Borg, Larsson, Östergren, Rahman, Bari, & Khan, 2012). Bangladesh, one of the developing countries of South Asia, is enjoying rapid advancement of technology in the IT sector. To cope up with the increasing challenges of globalization, businesses are continuously trying to improve their services whereas by reducing the costs. Different types of self-service technologies are introduced in the Bangladeshi service market to provide the customers more comfort, flexibility, enjoyment and speed. The successful implementation of the SSTs and its acceptances among the customers can not only reduce the costs of operations but also improves the end-users’ experiences. The commonly used self-service technologies in Bangladesh include ATMs, Internet banking, Mobile banking, Internet shopping, Prescription ordering, Internet information search, Online registration, KIOSK, Distance learning/training etc. The banking sector of Bangladesh is commonly applying several types of self-service technologies (ATMs, Cell phone banking, internet banking, and banking kiosks) and successfully doing financial transactions with the clients. Moreover, some public and private service providers have introduced the online registration, distance learning/training programs. Some prominent online marketers like Bikroy.com, Ekhaney.com etc. are also satisfying their customers through online shopping experiences. Recently, Grameenphone and Banglalink the top two Bangladeshi cellular service providers have launched Kiosks to make their service more competitive.

The successful application of self-service technologies comes true when the highest possible number of targeted customers accept it willingly. Customers’ technology readiness (TR) should be taken into account in order to accurately predict the perception and behavior of customers (Parasuraman, 2000). In Bangladesh, from the last few years the computer and internet technologies are becoming cheaper and easy to access due to the engagement of both public and private organizations and besides this, the technology awareness of people is also rapidly increasing (Karmakar & Wahid, 2000). So, more peoples are widely using technologies in their daily life. But there has been little research examining consumers’ readiness to adopt,
willingness to use, or evaluation of SSTs and any consequent influence on behavior (Lin and Hsieh, 2006). According to them, a research framework that explains the antecedents and consequences of customers’ assessments of SSTs is still underdeveloped. So, in this study we attempt to develop a conceptual framework for identifying the current extent of customers’ perceived risks for SSTs adoption and how it is influencing their satisfaction and retention in Bangladesh.

1.3 Self-service Technology and its types: The term “Self-Service Technology” (SSTs) was first used by Meuter et al. (2000). According to him “Self-service technologies (SSTs) are technological interfaces that enable customers to produce a service independent of direct service employee involvement”. He also mentioned that SSTs are increasingly changing the way customers interact with firms to create service outcomes. Castro, Atkinson and Ezell (2010) identify self-service as process of shifting services to the consumers is that the consumers are given the opportunity to do the scanning, bagging and paying for the products or service, customized the products to his taste and so on (Otekhile&Zeleny, 2016). Zeleny (2009) claims that the self-service process often involves technology (machine or computer) used in transforming inputs (materials, information or service) into products which could be physical goods, services or information.

From these above definitions, two important dimensions of a technology-based self-service can be identified: First, the active participation of the customer with the company in service production. That is, the customer is a co-producer of the service (Vargo and Lusch, 2008). And second, the delivery of this service is done through technology instead of a service employee. Actually, the first one is very common and ancient feature developed with the concept of service but the second one is the additional here. As the customers are interacting with a machine instead of a person during the service process, they may need to have self-efficacy, technology reliability and trust on the technology to accept it fully.

According to Considine & Cormican (2016), Self-service technology (SST) adoption has been cited by businesses as a critical element in controlling costs and improving customer experience. That’s why businesses are continuously adding new types and updating the existing self-service technologies. Table 1 is showing several kinds of common self-service technologies used by the businesses now-a-day:

| TABLE-1: CATEGORIES AND EXAMPLES OF SSTS IN USE |
|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Interface Purpose | Telephone/Interactive Online/Internet | Voice Response | Interactive Kiosks | Video/CD* (Typically linked to other technologies to provide customer services & transactions.) |
| Customer service | · Telephone Banking · Flight Information · Order Status | · Package Tracking · Account Information | · ATMs · Hotel checkout |
2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

After extensively reviewed the related literature, the authors found the research gap and developed a conceptual model. The model with relevant hypotheses is presented in figure 1.

2.1 Technical Reliability and Perceived Risk with SSTs

Perceived reliability is the belief and confidence of customers that a technology will deliver the services as it is intended to do without embracing any error and inconsistency. A potential user of technology-based services is not likely to use if he or she perceived that new technology is unreliable and believes faulty outcome likely to arise (Dabholkar, 1996). Ganguli & Roy (2010) opined that security and reliability can increase the customers’ confidence level and trim down customers’ perceived risk in using technology-based banking services as well as play a significant impact on satisfaction. Therefore, the hypotheses are:

H1a: Technical reliability negatively affects perceived risk toward self-service technologies.

H1b: Technical reliability has positive impact on customer satisfaction with self-service technologies.

2.2 Technology Trust and Perceived Risk with SSTs

Reliable performance of SSTs and expectation that they will work consistently is trust in self-service technologies (Johnson, 2007), which is one of the outcomes of cognitive assessment of performance beliefs received from using SSTs (McAllister, 1995). The belief of gains or losses may arise from a transaction is typically known as risk (Mayer, Davis, & Schoorman, 1995; Pavlou, 2003). Perceived risk is consumer’s belief about the e-transaction’s probable tentative negative outcomes (Kim, Ferrin, & Rao, 2008). Trust is obligatory when risk associated (Corritore, Kracher, & Wiedenbeck, 2003; Mayer et al., 1995; Pavlou, 2003). Perceived risk has significant negative association with trust (Pavlou, 2003). Thus, with the increase of trust perceived risk decreases (Lewis & Weigert, 1985; Luhman, 1979; Mayer et al., 1995). Furthermore, Liu (2012) shows positive association between trust and customer satisfaction. Hence, we can offer following hypotheses from the above evidences:
H2a: Customers’ trust toward self-service technologies negatively affects perceived risk.

H2b: Customers’ trust toward self-service technologies has positive influence on customer satisfaction.

2.3 Perceived Risk and Customer Satisfaction with SSTs

Customer satisfaction is the realization of customer’s needs, requirements, and goals at expected level from consumption of a product or services (Oliver, 1997). Satisfaction reflects the extent of positive feelings a consumer experienced from a service encounter (Lin & Shieh, 2006). Many researchers found that intention to use e-service or intention to make e-transaction is negatively influenced by perceived risk (Kim et al., 2008; Chang & Chen, 2008; France & Lemuria, 2008). Johnson, Bardhi, & Dunn (2008) also identified that satisfaction is negatively influenced by perceived risk. Thus, the following hypothesis is proposed for this study:

H3: Customers’ perceived risk is negatively related to customer satisfaction with SSTs.

2.4 Customer Satisfaction with SSTs and Behavioral Intentions Toward SSTs

Repurchase intentions, possibility of recommending, devotion and behavioral intentions are significantly and positively influenced by customer satisfaction (Cronin Jr Brady, & Hult, 2000; Dabholkar, 1994). Satisfaction is significantly correlated with technology enabled communication and future intentions (MacDonald & Smith, 2004). Positive behavioral intentions toward technology can be increased by satisfaction (Taylor, Celuch & Goodwin, 2002). Lin & Hsieh (2006, 2007) found that behavioral intentions toward using SSTs are significantly and positively influenced by customer satisfaction. Word of mouth and reuse or repurchase or loyalty intentions towards SSTs are unsurprisingly and positively inclined by customer satisfaction (Taylor et al., 2002; Yoon, 2002). So, the hypothesis is:

Figure 1. Conceptual model of the study
H4: Customer satisfaction has positive impact on behavioral intentions toward self-service technologies.

3. RESEARCH METHODOLOGY AND SURVEY INSTRUMENT DEVELOPMENT

150 questionnaires were distributed in three sections among the Executive MBA students of a University in the Chittagong Metropolitan City of Bangladesh. The primary characteristics of the respondents are they were all students. Each section consists of 50 students from whom almost 70-80% students were involved in business or service. The authors considered only the respondents those who have their earning sources and at the same time they are students too. We have found total 107 respondents met both categories. After eliminating invalid responses, 95 questionnaires were found useable. Therefore, they were predicted frequent users of SSTs like e-stock trading, online shopping, e-banking etc.

Survey instrument was developed incorporating five constructs. For technology trust, we used three-item scale of Johnson (2007). Five-item scale for each technical reliability and perceived risk were adapted from Walker, Craig-Lees, Hecker, & Francis (2002). Three-item American Customer Satisfaction Index (ACSI) scale for customer satisfaction was adapted from Fornell. SmartPLS 2, and SPSS 20 software packages were used for statistical analysis.

4. ANALYSIS AND RESULTS

4.1 Demographic Profile of the Respondents

Table 2 reports the demographic profile of the study respondents and their respective frequency.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Percentage</th>
<th>Variables</th>
<th>Percentage</th>
<th>Variables</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>64(67.4%)</td>
<td>Service</td>
<td>65(68.4%)</td>
<td>Experience</td>
<td>1-3 years</td>
</tr>
<tr>
<td>Female</td>
<td>31(32.6%)</td>
<td>Business</td>
<td>25(26.3%)</td>
<td>of service,</td>
<td>4-6 years</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-35 years</td>
<td>49(51.6%)</td>
<td>others</td>
<td>5(5.3%)</td>
<td>business or</td>
<td>7-9 years</td>
</tr>
<tr>
<td>36-45 years</td>
<td>34(35.8%)</td>
<td>others</td>
<td>10 &amp;above</td>
<td>5(5.3%)</td>
<td></td>
</tr>
<tr>
<td>46 &amp; above</td>
<td>12(12.6%)</td>
<td></td>
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</table>

4.2 Validity and Reliability of the Data and Instruments

Smart PLS 2, a structural equation modeling software based on partial least square, was used for finding statistical results. Bootstrapping results were used to confirm the significance of the results. Hair Jr, Hult, Christian, & Marko, (2014) has recommended that moving forward the analysis if it holds the calculated values not beyond the threshold limits. It’s been reported that the internal consistency reliability shown by composite reliability (CR) value should be at least 0.7.
and convergent validity measured by Average Variance Extracted (AVE) that should be at least 0.5 too. For having discriminant valid instrument, the square root of the average variance extracted (AVE) of each construct should always be higher than the correlation with other instruments. In addition, Cronbach’s alpha (CA) value above 0.60 is suitable for work (Hair Jr et al., 2014; Urbach & Ahlemann, 2010). The calculated results reveal that minimum AVE, CR, and CA are 0.651, 0.904, and 0.866 respectively which are above the cut off value (See Table 3). Besides, square root of AVE of each construct is above its correlation with other constructs in this study. Therefore, these results are valid and reliable for further study (Hair Jr et al., 2014; Urbach & Ahlemann, 2010).

### TABLE 3 VALIDITY AND RELIABILITY OF THE INSTRUMENTS

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>Mean</th>
<th>SD</th>
<th>AVE</th>
<th>CR</th>
<th>CA</th>
<th>R²</th>
<th>Latent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI</td>
<td>2.12</td>
<td>0.817</td>
<td>0.817</td>
<td>0.931</td>
<td>0.888</td>
<td>0.648</td>
<td>1. BI</td>
</tr>
<tr>
<td>CS</td>
<td>1.93</td>
<td>0.539</td>
<td>0.839</td>
<td>0.940</td>
<td>0.904</td>
<td>0.891</td>
<td>2. CS</td>
</tr>
<tr>
<td>PR</td>
<td>2.07</td>
<td>0.897</td>
<td>0.651</td>
<td>0.904</td>
<td>0.866</td>
<td>0.729</td>
<td>3. PR</td>
</tr>
<tr>
<td>TR</td>
<td>1.94</td>
<td>0.871</td>
<td>0.719</td>
<td>0.927</td>
<td>0.902</td>
<td>0</td>
<td>4. TR</td>
</tr>
<tr>
<td>TT</td>
<td>1.93</td>
<td>0.818</td>
<td>0.844</td>
<td>0.942</td>
<td>0.908</td>
<td>0</td>
<td>5. TT</td>
</tr>
</tbody>
</table>

4.3 Path Structural Model

Hair Jr et al., (2014) mentioned that path co-efficient with a standardized value above 0.20 are good indicator for social and behavioral science research of a sample size below 1000. Figure 2 reports the path co-efficient (â), percentage of variance explained (R²), and the indicators’ loading. In addition, bootstrapping results reported t- and p-values in order to verify the significance of the hypotheses. Reported standardized co-efficient (âs) of path relationships are- CS à BI is 0.805 (t-value=10.86, p<0.000), PR à CS is -0.350 (t-value=1.845, p<0.06), TR à CS is 0.223 (t-value=1.703, p<0.089), TR à PR is -0.483 (t-value=3.073, p<0.002), TT à CS is 0.414 (t-value=2.293, p<0.003), and TT à PR is -0.385 (t-value=2.509, p<0.012) found significant at different p values. Those indicators indicated that all hypotheses are proved significantly. To be noted from the figure (2) that CS explains 64.8 per cent of variance (R²) of BI, PR explains 89.1 per cent variance (R²) of CS, and TT and TR explain 72.9 per cent variance (R²) of PR.

5. DISCUSSIONS AND IMPLICATIONS FOR MANAGEMENT

The study is an effort to demarcate how technical reliability and technology trust influence customer satisfaction and behavioral intention through reducing perceived risk as antecedents of perceived risk. The results of this study are also similar with other studies done in different countries by using same or other instru-
ments. The most important finding of this research is the lack of trust is very high among the SSTs users in Bangladesh. It happens because of low security and lack of technical reliability of SSTs and hence increased the perceived risk associated with SSTs among the service receiver using SSTs in Bangladesh. Result reported negative relationship between technical reliability and perceived risk. Higher technical reliability helps to reduce the perceived risk and also influence to increase customer satisfaction with SSTs. These findings for the propose hypotheses 1a and 1b are similar to the findings with Ganguli & Roy (2010). Technology trust is another important antecedent of perceived risk and customer satisfaction. The research also reveals that technology trust negatively affects perceived risk and also positively influences customer satisfaction. These results of hypotheses 2a and 2b are also affirm the previous study of Pavlou (2003) and Liu (2012). Therefore, higher technology trust would definitely lead to mitigation of risk and thus increases the customer satisfaction with SSTs. A critical factor for customer satisfaction is perceived risk, which influence customer satisfaction negatively. The proposition 3 is consistent with the findings of Johnson et al. (2008). The study also found that behavioral intention toward SSTs is significantly and positively influenced by customer satisfaction. The finding for hypothesis 4 is also similar with the research of Taylor et al. (2002).

Incremental advancement of self-service technology (SST) is dramatically changing the modes of delivering services and services industries’ business practices. Moreover, services industries have no other alternative competitive modes of delivering services choice than SSTs. Therefore, services industries must pay attention to the abatement of perceived risk associated with SSTs. The constructs—technology trust and technical reliability identified in this study could work as guiding principles for the management of services industries to reduce perceived risk.
associated with technology to keep the customer with SSTs. Service industries should focus on how to reduce the risk connected with SSTs. They should spotlight on the mechanisms of building trust as well as to enhance the reliability of SSTs. They are supposed to keep close eyes on malfunctioning or failure of SSTs to increase reliability of SSTs and trust with SSTs. These strategies will help them to reduce perceived risk and thus increase customer s satisfaction with SSTs as well as a changed positive behavioral intention toward SSTs.

6. CONCLUSIONS

Small number of sample size could be possible limitation of this study to generalize the findings. Considered only two antecedents- technical reliability and technology trust of perceived risk can be mentioned as another shortcoming of the study. However, future studies can address these limitations adopting large volume of sample size. Other antecedents like quality of SSTs, perceived ease of use, capacity of customer would help future research to verify the research model. Although sample size is not sufficient still this study contributes to the existing literature by focusing how to increase customer satisfaction through reducing perceived risk. This ultimately leads positive behavioral response of customers toward SSTs and to retain customers for the long run business development. By applying the findings of this paper, businesses can take measures to improve their customer trust toward the self-service technologies.

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