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## **The Influence of Technology Anxiety on Consumer Use of Self-Service Technologies in Sri Lankan Banking Industry: Moderating Role of Demographics**

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### **Abstract**

Exploration of new technology is transforming many industries, specially the banking sector. Banking industry can be considered one of the sectors where self-service technologies are most commonly used in Sri Lanka. Their conversion to self-service technologies is aimed at the improvement of productivity and service quality, while reducing the costs. Self-service technologies have a major effect on how customers interact with the service providers. However, the customers do not always choose to use self-service technologies, nor do they accept changes as enhancements. Most of the researches have emphasized the interpersonal factors' influence on service encounters; therefore, it is crucial that further studies focus on how customers interact with self-service technologies. Further, earlier studies did not make a proper distinction between technology-based self-services and labor-intensive self-services. It is important that a study focuses on how consumer interaction with technology-based services is influenced by their anxiety about technology. Based on a sample of 200 consumers, the research aims to discover the usage frequency of self-service technologies in the banking industry, and the impact of technology anxiety factor on the usage. The research findings show that respondents with higher technology anxiety are reluctant to use self-service technology. In addition, the moderating effects of age, gender and education level were analyzed and it was found that the impact of technology anxiety on consumer use of self-service technology is affected by the moderating factor of demographic characteristics (Age, Gender and Education level).

**Keywords:** Self-Confidence, Self-Service Technologies, Technology Anxiety, Venturesomeness

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## 1. Introduction

Many of the service providers and retailers have converted into using a wide range of technologies in their systems, which have enabled the customers to use the service without direct interaction with the employees of the firm. The platform which facilitates this is known as self-service technologies. Self-service technologies are technological interfaces that enable customers to produce a service independent of direct service employee involvement (Meuter, Ostrom, Roundtree, & Bitner, 2000).

It is evident that the innovations and advancements introduced to self-service technologies will grow continuously to become a critical component in the interaction process between a firm and customers. Banking sector adopting such technology-based interactions will assist them in achieving long-term success in the business. The significance of self-service is growing in the modern world, and is considered a key alteration in the nature of services provided.

The role that technology plays in the delivery of services has begun to be explored by various researchers (e.g., Dabholkar, Meuter et al). Traditional marketplace interaction between a customer and an employee is being replaced by a market-space transaction (Rayport & Sviokla, 1995). With the growth of new technologies, it is important to explore the ability and willingness of customers to use these new technologies (Meuter, Ostrom, Bitner, & Roundtree, 2003). Anxiety arises from the inability or lack of self-confidence in effectively managing or controlling the technology (Oyedele & Simpson, 2007). This is one of the major reasons why consumers' technology anxiety would affect the usage of self-service technology.

Existing studies have exposed that technology anxiety is a common phenomenon, shared by most people. Therefore, it is crucial that the issue is well addressed, with the intention of improving the effectiveness of the increased computerization taking place in the society.

Despite the increased accessibility to the self-service technologies in the Sri Lankan banking sector, only slight attention has been given to the factors influencing the usage of these self-service technology options. Customers have been granted the opportunity to pick between interaction with the staff, and the use of self-service technologies. Customers will not use a self-service technology option unless they perceive an advantage of using it, and feel comfortable with the technology (Meuter, Ostrom, Bitner, & Roundtree, 2003). Consumer anxiety about using technology specifically focuses on the individual consumer's state of mind regarding his or her ability and willingness to use technology-related tools (Meuter, Ostrom, Bitner, & Roundtree, 2003). Technology anxiety tends to rise when consumers are sensitive

to services involving monetary transactions, especially banking activities, since there is a possibility of losing both money and information due to privacy and security reasons.

Facilitation of necessary technological resources and conditions is critical for the consumers to overcome the technical difficulties they face while banking. Positive perceptions regarding the use of functional devices or supporting infrastructure may lessen a consumer's fears about using technology-mediated services (Yang & Forney, 2013). Degree of impact that technology anxiety has on the use of self-service technologies is influenced by demographic factors such as age, gender and education level of the consumers.

The study mainly focuses on the role that technology anxiety plays on influencing the use of banking sector's self-service technologies. To explore the study area, three objectives have been set along with three research questions. The participants of the study were invited to fill a questionnaire that examines technology anxiety with an 18 item scale. It will also identify the usage frequency of the self-service technologies by the consumers. The findings will be analyzed to comprehend the impact of the dependent variable on the independent variable with demographics taken as a moderating factor.

With improved knowledge and understanding of the issues, service providers in the banking sector will be able to offer better self-service technology options to their customers, by effective management and implementation.

### **1.1. Research problem**

Although researches on interactions between service providers and service consumers have been conducted extensively, only a few have investigated the customer interactions with technological interfaces. With the proliferation of the self-service technologies, there is an emerging necessity for extension from interpersonal research areas to technology-oriented studies.

Consumer use of self-service technologies is considered to be a growing body of research. Yet, there is more to be learnt about this area of research. Existing researches have focused mainly on either a single self-service technology or on a diverse range of self-service technologies (eg: Vending machines, ATMs, Automated car rentals). None of the researchers seem to have attempted to examine the specific range of self-service available in the banking sector, one of the industries in which self-service technologies are heavily used. There are researches which have been conducted for the purpose of developing self-service technology user profiles based on demographic characteristics. Yet, those researches have not been able to explain the effect that demographic characteristics have on technology usage consistently.

For instance, a meta-analysis investigating age and adoption of innovative technologies found that approximately half of the 228 studies established no relationship (Meuter, Ostrom, Bitner, & Roundtree, 2003).

As technology became a critical factor in businesses, the concern about technology anxiety and the effect it has on individuals increased. There are many papers published about the anxiety towards technology since 1980s. Yet to date, studies which have done a comprehensive appraisal of technology anxiety are insufficient.

## **2. Literature review**

### **2.1. Use of self-service technologies**

Increasing number of customers prefer interacting with technology to interacting with service employees when creating service outcomes. Many service providers and retailers have begun to use a wide range of technologies, including the internet, to allow customers to produce and consume services electronically without direct contact with firm employees, and these technological interfaces have been called self-service technologies (Meuter M. L., Ostrom, Bitner, & Roundtree, 2003). Accordingly, self-service technologies can be properly defined as technological interfaces that enable customers to produce a service independent of direct service employee involvement (Meuter M. L., Ostrom, Roundtree, & Bitner, 2000).

It is observed that the advancements and innovations of technology will grow continuously and become a key component of customer-firm interactions. These technology-based customer-firm interactions will be critical to the long-term success of a business. Customer self-service systems should make sure that their consumers can easily check what type of information is collected, whether the information is correct, and how this information is used in and outside the organization (Hwang & Kim, 2007).

Role of self-service technologies in the delivery of services has been a recent area of exploration. Traditional marketplace interaction between a customer and an employee is being replaced by a market space transaction (Rayport & Sviokla, 1995). The market space is a virtual arena where transactions take place through technological channels, no longer requiring the physical presence of both the buyer and the seller (Rayport & Sviokla, 1995). Self-service technologies are a classic example of market space transactions in which no interpersonal contact is required between the buyer and seller (Meuter, Ostrom, Roundtree, & Bitner, 2000). A service can be performed better through a self-service technology than by relying on a service provider (Dabholkar, 1996). However some consumers prefer not to use

technology-based self-service because they prefer interacting with employees (Bobbitt & Dabhokar, 2001).

Customers' reluctance to adopt self-service technologies has become a hurdle for companies that want the full cost benefits of technological service innovations (Liljander, Gillberg, Gummerus, & Reil, 2006). The most prominent obstacle is persuading customers to try new self-service technologies for the first time, which often involves a significant behavioral change, in which patterns that are ingrained must be altered (Meuter, Bitner, Ostrom, & Brown, 2005). The customers are responsible to some extent in delivering the service in a way that satisfies them. For this the customers must coproduce the service processes. Across industries, firms are trying to develop stronger partnerships with their customers and to help them be better co-producers (Vargo & Lusch, 2004).

Self-service banking is growing rapidly as consumers do more of their day-to-day banking activities using ATMs, online banking, or mobile banking without the aid of branch personnel (Augustine, 2013). Use of self-service technologies in the banking sector minimizes the cost per transaction, increases the profitability of the institution, and offers the customers a convenient 24/7 service, enabling restriction-free banking hours. Traditional bank branches have had very limited customer hours, and self-service technologies which are available outside these hours clearly meet a recognizable consumer demand (Marr & Prendergast, 1993).

Despite the increasing availability, very little is known about factors influencing customer usage of these self-service technology options (Meuter, Ostrom, Bitner, & Roundtree, 2003).

## **2.2. Technology anxiety**

With the growth of new technologies, it is important to explore the ability and willingness of customers to use these new technologies (Meuter, Ostrom, Bitner, & Roundtree, 2003). The concept of technology anxiety is a developed version of computer anxiety. Computer anxiety can be defined as the tendency of individuals to be uneasy, apprehensive or fearful about current or future use of computers (Pararsuraman & Igarria, 1990). Studies have shown that computer anxiety is in fact a fairly common occurrence (Meuter, Ostrom, Bitner, & Roundtree, 2003). This anxiety is characterized by "excessive timidity in using computers, negative comments against computers and information science, attempts to reduce the amount of time spent using computers, and even the avoidance of computers in the place where they are located" (Doronina, 1995). Prior research conducted on computer anxiety has highlighted anxiety related to personal computers, yet the knowledge can be extended to anxiety related to technological tools in general. Technology anxiety is different from

computer anxiety, in that technology anxiety focuses on a user's state of mind about general technology tools, whereas computer anxiety is more narrowly focused on anxiety related to personal computer usage (Meuter, Ostrom, Bitner, & Roundtree, 2003). Technology anxiety specifically considers about the ability and willingness of the consumers to use technology-related tools. Likely, the anxiety arises from the inability or lack of self-confidence in effectively managing or controlling the technology (Oyedele & Simpson, 2007).

The concept of technology anxiety is measured by two dimensions, namely, self-confidence and venturesomeness.

Research has stated that believing in oneself is the key to personal success. The up keeping and improvement of self-esteem has always been recognized to be a vital human desire. Confidence in one's abilities generally enhances motivation, making it a valuable asset for individuals with imperfect willpower (Benabou & Tirole, 2002).

Venturesomeness is usually defined as willingness to accept risk in purchasing new products (Feldman & Armstrong, 1975). This is determined by requesting the individual to evaluate his own innovative behavior, or willingness to commence such behavior. Interest in new technology and change by venturesome people makes them ideal targets for high tech industries and companies that desire to achieve quick acceptance in the marketplace (Plog, 2002). Venturesomeness is sometimes regarded as a non-specific personality trait, and was addressed in terms of whether innovators display a greater willingness to accept risk in general rather than simply in the adoption of an innovation (Feldman & Armstrong, 1975)

### **3. Methodology**

#### **3.1. Research approach**

The aim of the study was to investigate the influence of technology anxiety on the consumer use of self-service technologies with the moderating role of demographics. This was essentially directed at investigating the nature of the relationship between the variables or how technology anxiety impacts the use of self-service technologies in the banking sector.

The theory and the hypotheses were developed based on the existing knowledge and theories, hence the use of a positivism philosophy. The findings of this research was interpreted based on the data collected through the survey.

Technology anxiety having an impact on the use of self-service technologies, being the theory of the study, it was used as the basis upon which hypotheses were built. The study tested the

hypotheses to either confirm or reject the theory. Therefore, the study followed a deductive reasoning approach.

### 3.2. Conceptual Framework

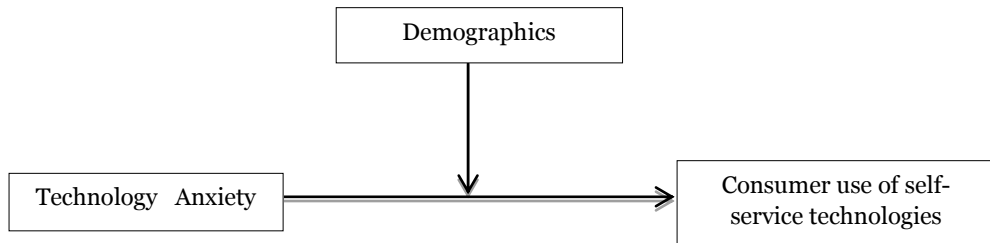


Figure 1: Conceptual Framework

### 3.3. Hypotheses

Considering the studies conducted previously, the hypotheses for the research were built as follows:

H<sub>1</sub>: Technology anxiety significantly influences the use of self-service technologies in the banking sector

H<sub>2a</sub>: Age has a moderating effect on the impact of technology anxiety on use of self-service technologies

H<sub>2b</sub>: Gender has a moderating effect on the impact of technology anxiety on use of self-service technologies

H<sub>2c</sub>: Education level has a moderating effect on the impact of technology anxiety on use of self-service technologies

H<sub>3</sub>: Customers use self-services in the banking industry frequently

### 3.4. Data Collection methods

The data required for the research was collected through a questionnaire-based survey. The type of the survey was single cross sectional survey. The questionnaire was designed to have 3 sections and was distributed among the respondents. To measure technology anxiety, 18 statements were measured on a seven-point likert scale ranked 1 for “Strongly Disagree” and 7 for “Strongly Agree”. The use of self-service technologies was measured according to the frequency of consumer usage of 8 self-service technologies in the banking sector. 1 was

assigned for “I have never used”, 2 was assigned for “I use infrequently”, 3 was assigned for “I use occasionally” and 4 was assigned for “I use regularly”. For the distribution of the questionnaire, only offline methods were used.

### 3.5. Population and sampling

The respondents, who were targeted for the research, were the customers of banks in Sri Lanka. Both male and female, people of different age categories and people with different education levels were taken into consideration, in order to compare the state of technology anxiety among the groups. The sample size was 200, picked from western and Southern provinces of Sri Lanka for convenience.

### 3.6. Methods of data analysis

The data gathered through the distribution of questionnaires was analyzed using SPSS software. For the purpose of analysing the relationship between technology anxiety and use of self-service technologies, correlation analysis was conducted.

To analyze how each dimension of technology anxiety influences consumer use of self-service technologies, a regression analysis was conducted. Mean was calculated to analyse the usage frequency of self-service technologies.

## 4. Data analysis and findings

### 4.1. Reliability Analysis

The internal consistency of the scales used in the research has been measured using Cronbach’s alpha.

Table 1: Reliability Analysis

	Number of Items	Cronbach’s Alpha
Technology Anxiety	9	.829
Self-confidence	6	.954
Venturesomeness	3	.945
Use of Self-service Technology	8	.746

As presented in the table above, all the scales display an excellent internal consistency. Technology anxiety has a Cronbach’s Alpha of 0.829 while self-confidence, venturesomeness



and use of self-service technology have 0.954, 0.945, 0.746 respectively. According to Malhotra and Birks (Malhotra & Birks, 2007), a Cronbach's Alpha value below 0.6, indicates an unsatisfactory level of internal consistency reliability. Since Cronbach's Alpha value of all the variables is above 0.6, all of them are shown to be reliable.

## 4.2. Demographic analysis

Out of the 200 respondents 24.5% are between the ages of 18 and 29. Age group of 30-39 contains 24% of the respondents. 23% belongs to the age group of 40-49. 22.5% of the respondents fall in the category between 50 and 59. The number of respondents above the age of 60, which is 6% of the sample, is relatively lower than the numbers of the other age categories. 45.5% of the respondents are shown to be male, and 54.5% are female. Out of the 200 respondents, 27.5% have studied up to Ordinary Level. 34.5% has had their education up to Advanced Level. 26% of the respondents have a bachelor's degree and 12% are shown to be postgraduates.

## 4.3. Descriptive statistics

Table 2: Descriptive Statistics

		Use of Self-service Technology
N	Valid	200
	Missing	0
Mean		2.6656
Median		2.8750
Std. Deviation		.69297
Range		2.75

The use of self-service technologies was measured under four categories. According to the measurement, any mean value above 2 shows frequent use of self-service technologies. As per the mean value shown in the above table (2.6656), it can be understood that the consumers of banking services in Sri Lanka use self-service technologies quite frequently.

## 4.4. Correlation Analysis

In a typical marketing research, a value below 0.05 for Sig. (2-tailed) is considered significant (Moore, Notz, & Flinger, 2013). Since the table shows a sig. (2-tailed) value of .000 which is below the level of 0.05, it can be interpreted that there is a significant relationship between the variables of technology anxiety and consumer use of self-service technology. The relationship between two variables is generally considered strong when their correlation value is larger than 0.7 (Mindrila & Balentyne, 2017).

Table 3: Correlation between TA and Use of SST

		Use of SST
Technology Anxiety	Pearson Correlation	-.796
	Sig. (2-tailed)	.000
	N	200

Further, pearson correlation shows a value of  $-.796$ , representing a strong negative relationship. Accordingly in people who have high technology anxiety, there is more fear to use self service technologies.

Table 4: Correlation between Self-confidence and Use of SST

		Use of SST
Self-confidence	Pearson Correlation	.779
	Sig. (2-tailed)	.000
	N	200

Table 5: Correlation between Venturesomeness and Use of SST

		Use of SST
Venturesomeness	Pearson Correlation	.711
	Sig. (2-tailed)	.000
	N	200

Since the aim was to present the positive relationship of self-confidence and venturesomeness with consumer use of self-service technology, the self-confidence and venturesomeness dimensions were reverse coded. Self Confidence was measured with a six item scale, and according to table 4, the variable shows a significant relationship with the consumer use of self-service technology, as the sig. (2-tailed) value is shown to be  $.000$ . Pearson Correlation value, which is  $.779$ , suggests that self confidence and consumer use of self-service technologies have a strong positive relationship. According to the sig. (2-tailed) value presented in table 5, venturesomeness and consumer use of self-service technology are significantly related. The Pearson Correlation of  $.711$  shows a strong positive relationship between venturesomeness and consumer use of self-service technologies.

#### 4.5. Regression Analysis

Table 6: Impact of TA on Use of SST

Model	R	R Square
Technology Anxiety	.796 <sup>a</sup>	.634

Table 7: Significance of the impact

	Sig.
Regression	.000 <sup>b</sup>

The tables indicate that the independent variable predicts the dependent variable significantly well. This can be observed by the p value which shows a value below 0.05. According to the regression analysis, 63.4% of the variance in use of self-service technologies can be changed upon their anxiety level of new technologies.

#### 4.6. Moderator Analysis

Table 8: Moderating effect of the demographics

	R Square Change	Sig. F Change
Age	.010	.012
Gender	.018	.002
Education	.013	.003

The moderator effect on the impact that the independent variable has on the dependent variable is displayed in the above table. To measure the impact of the moderators, an interaction term was added into the regression process. According to the table, age changes the impact that technology anxiety has on consumer use of self-service technologies by 1%, gender changes the impact by 1.8%, and education level changes the impact by 1.3%. The significance of the moderator variables is higher since all of them represent a Sig. F change value of less than 0.05. Thereby, age and education level differences and differences between gender groups represent significant differences in the preference to use new technologies for banking activities.

#### 4.7. Hypotheses testing

As per the results generated from the analysis, the developed hypotheses can be tested.

Table 9: Hypotheses Testing (Regression)

	Coefficient	Sig	Results
H1: Technology anxiety significantly influences the use of self-service technologies in the banking sector	.634	.000	Supported

The moderating effect of the demographics were hypothesized and tested as follows.

Table 10: Hypothesis Testing (Moderating effect)

	R Square Change	Sig. F Change	Moderating Effect
H2a: Age has a moderating effect on the impact of technology anxiety on use of self-service technologies	.010	.012	Yes
H2b: Gender has a moderating effect on the impact of technology anxiety on use of self-service technologies	.018	.002	Yes
H2c: Education level has a moderating effect on the impact of technology anxiety on use of self-service technologies	.013	.003	Yes

The final hypothesis is tested using the figures derived from descriptive statistics.

Table 11: Hypothesis Testing (Descriptive Statistics)

	Mean	Result
H3: Customers use self-services in the banking industry frequently	2.6656	Supported

## 5. Conclusion

According to the data analysed, it can be observed that there is a significant impact of technology anxiety on consumer use of self-service technologies. Given the seeming importance of technology anxiety, it is crucial for the banking organizations to address technology anxiety of the existing and potential users. Thus, the banking organisations should consider the need to minimize the negative impact of technology anxiety to achieve the desired productivity and service quality levels, whilst reducing costs. Further, the findings of the research show that the demographic factors do have an effect on the impact that technology anxiety has on consumer use of self-service technology. According to the findings, bankers can identify different categories, while introduce the new technology base innovation; moreover, it can be used to identify their target customers according to the demographic characteristics such as age, gender and education level, and provide them with the necessary training to reduce the technology anxiety involved. The study was limited to 200 respondents from both regions due to the time limitation and cost constraints. Further, if the study was conducted with a larger sample to represent various customer groups focused on specific services, it would be more reliable.

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