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GEBZE TECHNICAL UNIVERSITY

GRADUATE SCHOOL OF SOCIAL SCIENCES

PERCEPTIONS OF SERVICE QUALITY: AN INVESTIGATION OF SELF-SERVICE TECHNOLOGIES IN BANKING AND ITS EFFECT ON CUSTOMER SATISFACTION

WALEED MANGO

A THESIS SUBMITTED FOR THE DEGREE OF

MASTER OF SCIENCE

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GEBZE

2017

YÜKSEK LİSANS TEZİ JÜRİ ONAY SAYFASI

GTÜ Sosyal Bilimler Enstitüsü Yönetim Kurulu'nun ..... tarih ve ..... sayılı kararıyla oluşturulan jüri tarafından ..... tarihinde tez savunma sınavı yapılan Waleed MANGO'nun tez çalışması İşletme Anabilim Dalında YÜKSEK LİSANS tezi olarak kabul edilmiştir.

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İMZA/MÜHÜR

ÖZET

Bu çalışmada, SSTQUAL ölçeğinin gelişmiş video teller makinesine (VTM) benzeyen Extreme Transaction Machine (XTM) gibi yeni teknolojiler kullanan Türkiye'deki katılım bankalarına uygulanabileceği tespit edilmiştir. Ölçekle alakalı bazı değişiklikler yapılması gerekse bile yine de farklı endüstriler ve farklı self servis teknolojileri (SST) için uyarlanabilir ve genelleştirilebilir bir ölçek olduğu görülmüştür. XTM'in hizmet kalitesi ile müşteri memnuniyeti ve müşteri sadakati arasında doğrudan olumlu bir ilişki tespit edilmiştir. Müşteri memnuniyetinin de müşteri sadakati üzerinde etkili olduğu bulunmuştur. Ayrıca, müşteri sadakati ile XTM hizmet kalitesi arasındaki ilişkide, müşteri memnuniyetinin ara değişken etkisi yaptığı anlaşılmıştır. Bu model, Türkiye'deki katılım bankalarındaki XTM veya XTM'e benzeyen SST hizmet kalitesiyle ilgili algıları, müşteri memnuniyetini ve müşteri sadakati düzeyini ölçmek için uygulanabilir. Bu çalışmanın amaçları için internet üzerinden toplanan 165 anket yanıtı kullanılmıştır. Anketler, XTM teknolojisini kullanan tek banka olan Kuveyt Türk Katılım Bankası'nın, cihazı kullanmış müşterilerine gönderilmiştir. Buna ek olarak, çalışma XTM'in bulunduğu tek konum olan İstanbul'da yapılmıştır.

Anahtar Kelimeler: Self Servis Teknolojisi, Self Servis, Hizmet Kalitesi, Müşteri Sadakati, Müşteri Memnuniyeti, XTM.

SUMMARY

In this study we found that the SSTQUAL scale can be applied to Participation Banks in Turkey and can be used for new technologies like the Extreme Transaction Machine (XTM) which is an advanced type of Video Teller Machine (VTM). Though the scale may need to be pruned, it is still considered a generalizable scale that can be replicated in different industries and for different self-service technologies (SSTs). A direct positive relationship does exist between service quality of XTM and the two dependent variables customer satisfaction and customer loyalty. Customer satisfaction also is found to have an effect on customer loyalty. Furthermore, customer satisfaction was found to have a mediating effect on the relationship between the service quality of XTM and customer loyalty. This model can be used again to measure the customer satisfaction and loyalty levels of customers along with their perceptions about service quality of the XTM at Participation Banks in Turkey or for XTM similar technologies. A total of 165 online survey responses were used for the purposes of this study. The surveys were sent to customers of the Kuveyt Turk Participation Bank which is the only bank to use the XTM technology. Additionally, the XTM is only located in Istanbul, Turkey which is where the study took place.

Key Words: Self-Service Technology, Self-Service, Service Quality, Customer Loyalty, Customer Satisfaction, XTM.

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ABBREVIATION LIST

Abbreviation	Explanation
SST	: Self Service Technology
XTM	: Extreme Transaction Machine
VTM	: Video Teller Machine
KTPB	: Kuveyt Turk Participation Bank

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1. INTRODUCTION

The importance of technology has risen significantly in the last decade. Formerly, the manufacturing sector was more affected by such changes; where achieving competitive advantage is becoming harder as highly-advanced manufacturing techniques and machines are being found. Nowadays, the technology wave is affecting the service sector. Advanced self-service technology is being applied in supermarkets, banks and hospitals. The concept of self-service technology (SST) is that the employee-customer interface is no longer needed. Instead, the customer can customize his or her own service with the help of specially designed technology.

The concept of self-service has been around since the 1990s, but with basic applications like Automated Teller Machines (ATM). The advent of the Internet led to the concept of Internet banking and online shopping which are other examples of self-service technology. As we entered the 21st century, computer software was integrated with smart technology in order to create more and more complex systems that help create the self-service. For example: self-checkout at supermarkets and self-check-in at airports.

SST has newly entered the banking sector in a different form, namely self-service bank branches. Hypothetically, in self-service branches there will be no employee-customer interaction, just a SST-customer interaction will exist. This is a very new application that has yet to be explored. There have been some attempts by a bank in the UK to make a movement towards such technology but the results are still not apparent. Turkey led by one of its major banks may as well be a pioneer in introducing such technology. It has been introduced and put into action but still has not become very widely known among the banking industry, let alone customers themselves.

Competition between banks has risen significantly in the last decade. This is due to difficult economic times and political unrest. In such times, financial institutions are working hard to prove their stability and increase their market share. Financial crises of our times led to the conception of a new type of financial institution i.e. Participation Banks or what is also known as Islamic Banking. Participation banks are financial institutions that adhere to Islamic jurisprudence that

defines certain laws and regulations that govern the transactions performed at the bank. Mainly this revolves around the prohibition of usury or interest.

Technology also is one of the most important drivers of change. This is due to the fact that companies that do not withhold the status quo and do not keep up to date with the newest of technologies will eventually fail.

With the advent of smartphones, banks started providing services through smartphones. Now it is almost impossible to find a reputable bank that does not provide banking through the Internet or mobile phone. Recently the release of the apple watch was followed immediately with banking through your apple watch. This shows how important keeping up with recent technology is for financial institutions.

The banking industry in Turkey is very competitive. Turkey is also a booming economy. Banks are always looking for the competitive edge that will help increase their market share.

Islamic banking in Turkey is known as Participation banking. Our study is related to one of these banks: Kuveyt Turk. The reason behind this is that Kuveyt Turk Participation Bank (KTPB) has recently developed a new form of SST. Using advanced technology they have developed what has been named by them as the eXtreme Transaction Machine (XTM). This SST can be described as an advanced ATM that provides video conferencing and aims at providing the best of traditional bank branches and ATMs (Can & Gündebahar, 2012). To the best of our knowledge this is currently not applied in any other bank in Turkey.

The XTM is actually a certain type of VTM. VTMs are basically ATMs that provide video and live conferencing with bank employees. More importantly, there is a need to measure the service quality of the XTM which is a new type of SST. Therefore, it was necessary that an appropriate model is found in order to measure the service quality of such a new type of SST. Hence, the aim of our study is to find such a model.

After reviewing the literature for an appropriate model, the most generalizable and recent model found was the SSTQUAL. Unlike other models that focus on a certain type of self-service or channel, the SSTQUAL addresses all types of SSTs in different industries and cultures. After the emergence of the SSTQUAL scale, there have been some attempts that aim at validating the SSTQUAL in different industries and different cultures. The writers themselves urge and recommend future research to focus on validating the scale in different countries and in different industries.

Research done on the SSTQUAL is still scarce and still has not covered all the different industries and different cultures. As for Turkey, there has been a study on self-checkout systems in supermarkets. However there is yet a study to be done in the banking industry in Turkey.

We also would like to point out that the technology we researched is one of a kind. It has not been implemented on a wide scale. Thus we aim at performing the first research of this kind on such a technology. This study helps contribute to the literature by being the first of its kind with regards to the technology researched and the niche that has been chosen. To the best our knowledge there is no research that validates the SSTQUAL for such an SST. Also, we aim to enrich the literature in the field of participation banking which is receiving growing interest in the world.

In addition, this type of validation has only been performed once within the Turkish culture but on a completely different type of SST. Previous research stresses the need to prove the validity of the SSTQUAL or any quality measurement model in different cultures because of the differences between cultures in defining quality.

The new surge in use of SSTs requires more research into how we can measure their service quality. Thus our study aims at answering the following questions; first which of the SSTQUAL dimensions (functionality, enjoyment, security/privacy, assurance, design, convenience, and customization) are applicable to measuring the service quality of the XTM within the participation banking industry in Turkey? Second, how do the applicable quality dimensions affect the satisfaction of customers with participation banks in Turkey? Third, how do the applicable quality dimensions affect the loyalty of customers towards participation banks in Turkey? And finally does the customer satisfaction with the XTM in the banking industry affect customer loyalty?

In this study we will first explain our review of the literature related to our research questions, and then as we go on we present details regarding our hypotheses development and the methodology that led to our findings. At the end we discuss the results, their validity and reliability. Finally we conclude with implications of this study and refer to future research that needs to be performed.

2. LITERATURE REVIEW

In this study we aim at determining if the SSTQUAL dimensions of quality are valid in the participation banking industry in Turkey for a new type of banking SST called XTM. We also aim at studying the relationships between customers' evaluation of the XTM's service quality, customer satisfaction and customer loyalty in Turkey's participation banking industry.

The scholars who developed SSTQUAL suggest testing its validity, reliability and generalizability in different industries, cultures, and for different types of SSTs (Lin & Hsieh, 2011). Thus we test the validity of the dimensions in the banking industry in Turkey with regard to the newly introduced technology known as XTM.

The seven dimensions of quality introduced by (Lin & Hsieh, 2011) are: functionality, enjoyment, security, assurance, design, convenience, and customization; these served as the main dimensions that were tested and studied.

The dependent variables were customer satisfaction and loyalty, while the independent variable was the XTM's service quality that was based on the dimensions of SSTQUAL. Therefore the study aimed at examining the relationship between these variables in the banking industry in Turkey, by distributing surveys to the customers of the KTPB which is the only known bank in Turkey known to use the XTM technology.

In Chapter 1, we discussed the importance of this study and how customer satisfaction and loyalty are of great importance to all businesses. Customer satisfaction can lead to increasing profitability, performance and even customer loyalty (E. W. Anderson, Fornell, & Lehmann, 1994; Fornell, 1992; Fornell, Johnson, & Anderson, 1996; Wendy W.N. Wan, Chung-Leung Luk, 2005). Therefore, in Chapter 2 we review the literature that explains theories related to service quality and self-service quality, customer satisfaction and loyalty.

In the coming section we have a brief description of the title search conducted. Then, the development and nature of services is explained. After that, we begin our review of service quality theories, self-service quality, customer satisfaction and customer loyalty.

2.1. Title Search

In order to conduct this study, a scan of literature regarding SSTQUAL was performed. The sources used were according to the Gebze Technical University databases. A mix of articles, books, reports and many other publications were examined in order to come up with the research at hand.

All papers that could be found containing the keywords “SSTQUAL” or “XTM” were studied. It is important to note that such sources are very scarce. Only a few papers have applied the SSTQUAL and conducted research about it. The XTM as explained before is a very new technology and thus only one paper could be found explaining the function of the XTM. As for research regarding VTMs, to the best of our knowledge there is no published research regarding the service quality of VTMs.

Also a general search was conducted regarding well-known terms such as: service quality, customer satisfaction, customer loyalty, SERVQUAL and more.

The coming literature review is divided into five main parts: the development and nature of services, service quality and self-service quality, customer satisfaction, and customer loyalty.

2.2. Development and Nature of Services

In this section we explain the history of services and how they were affected by technology. Also, we discuss self-service and how it evolved from traditional services along with its importance in the banking industry.

Researchers started to examine whether product and service marketing were two different concepts and thus the beginning of more research into services (Brown et al., 1994). Services have traits that make them different from products (Gronroos, 1978), this is why we should treat both as different concepts.

Some of the distinct properties of services that make them different from products are that services are intangible and cannot be handled by customers. While it is possible to inventory products, services cannot be stored. The service provider and the customer are both very important components of the service process (Gronroos, 1978).

Another very important aspect of services that is pointed out by Gronroos (1978) is that customers are part of the service process; on the other hand when it comes to produced goods, the customer only interacts with the process at the end when the produced goods are delivered. This is an important concept because it is the property by which we can differ between services and self-services. Self-services allow the customer, not just to interact with the service process, but be the main contributor and creator of the service process. This is the opposite of services, where the customer contributes to the service process but eventually it is the service provider that shapes the process.

In Figure 2.1 we can conclude very important relationships based on the triangle model developed by Kotler (1994). Though the model aims to help in understanding and improving service marketing, we can also deduct how the customers, employees and company interact. The most important relationship for this study is the one between the customer and the employee. This interaction is the main difference between services and self-services. In self-services there is generally no interaction between the employee and customer. It is important to note that some types of self-services provide the option of interacting with an employee when in need of assistance. This is very common on online retail websites, where you are usually provided with a link to contact a customer representative when in need of assistance.

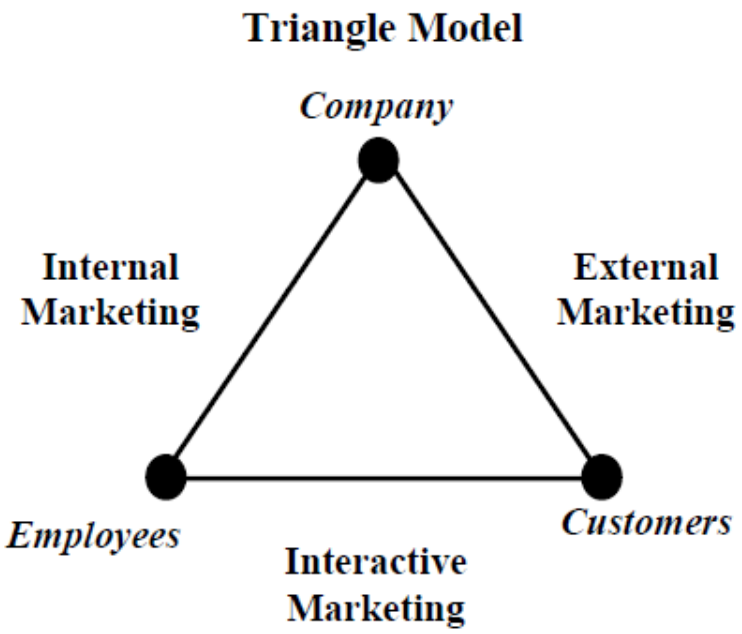

Figure 2.1: Triangle model of service marketing

As we mentioned before, the interaction of the customer with the service process is what differs it from products and their manufacturing process. This is also what differentiates services from self-services where customers do not engage directly with an employee but design the service process in a way that matches their personal wants and desires.

It is very important that businesses design their services according to their customers. When it comes to SSTs, firms can decrease the effect of technology anxiety by designing the SST with the customer in mind (Meuter, Ostrom, Bitner, & Roundtree, 2003).

2.2.1. Technology and Services

According to the studies of Eyadat and Kozak (2005), use of technology in the banking sector is positively related to profitability. Therefore, the introduction of technology into the banking sector is a must in order to have competitive advantage. It is also important to note that as labor costs increase, providing normal services where each customer must interact with a well-trained employee becomes a very costly endeavor, and according to Bitner, Booms, and Tetreault (1990) before technology was used in services, all encounters took place between a customer and an employee. Pratibha a. Dabholkar (1996) notes that the development of technology along with the increase in labor costs led to the shift to self-service.

According to Meuter, Ostrom, Roundtree, and Bitner (2000) services that are based on technology allow the customer to go through the service process without the need for an employee to intervene. Self-service technology is a technology that creates a system of interactions between the customer and specially-designed user interfaces that lead to satisfying the customer's needs and thus completing the service process.

Technology had a great effect on services and manufacturing are conceptualized. Kotler (1994) conceptualized services marketing as a 3 element model, after the advent of technology this model had to be reconceptualized. Thus A. Parasuraman (2000) redeveloped the model but while taking technology into consideration. As we see in Figure 2.2 technology has taken its place as a major element of interaction between the employee and customer. Now when considering services marketing, or any area related to services, we must study and analyze the

relationship between customers and technology. This is most obvious when it comes to self-service technology; where the entire service process relies on this customer-technology interaction.

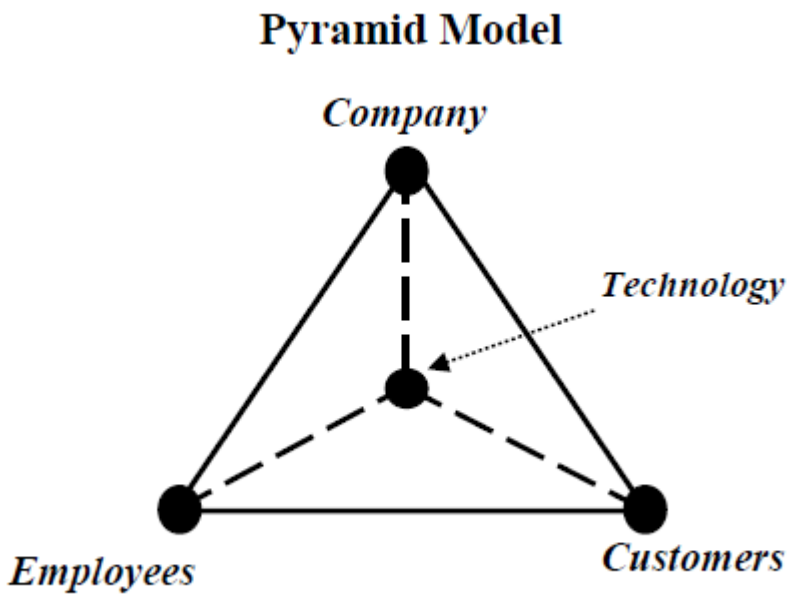

Figure 2.2: Pyramid model of services marketing

A. Parasuraman (2000) points out one of the most important benefits of using technology in services which is also a benefit of using SST; which is the ability to track and gather valuable statistics and information about customers during their interactions with SST. For example, when a customer uses an ATM the company can gather beneficial information about the type of transactions the customer usually performs. In the age of "Big Data" and "Internet of Things" this is a great competitive advantage.

2.2.2. SST in the Banking Industry

As for the banking industry, the advent of technology and information technology has led to a great revolution. The importance of technology can be seen in many facets of the relationship between technology, customer, company and employee as it is shown in the pyramid model above. Though it is not our main interest in this study, it is worth mentioning that the banking industry has thrived on the use of technology in its back-end processes and services that serve internal

customers. The banking industry is also one of the first industries to see the usage of SST i.e. the invention of ATMs. It is clear that the banking industry is at the frontier when it comes to applying technology to its internal and external interactions with customers.

It is argued that the reason behind the usage of technology within the banking industry is that there is great competition in the banking industry, which forces bank management to work on reducing as much costs as possible; this is mentioned by Meuter, Bitner, Ostrom, and Brown (2005) as one of the reasons for adopting technology within the banking industry.

Another underlying problem for banks is the increase in labor cost, which according to Pratibha A. Dabholkar (1996) is one of the reasons for switching over to SST. Most banks charge their customers a fee for performing certain transactions. The ability to reduce or eliminate such fees is a great competitive advantage. Directing customers to using SSTs like internet banking helps banks become more cost efficient and productive (Yusuf & Lee, 2015); or ATMs that help reduce operational costs (Tunay & Tunay, 2015).

As mentioned above, from an internal perspective introducing SSTs can be very lucrative for the bank and also help reduce costs. Though SSTs have internal organizational benefits and gains, the effects they have on customers are also important. For example, customers tend to prefer a mix of delivery channels over just a single one (Howcroft, Hamilton, & Hewer, 2002); which shows the need for firms to provide different types of SSTs along with traditional channels.

Other advantages that are gained by using the XTM or SSTs in general is that the customer has more control over the service process, which allows each customer to engineer the process and guide to whatever s/he expect from a banking service process. Pratibha A. Dabholkar (1996) mentions other benefits like enjoyment, many customers tend to find SST as enjoyable and fun to use. Customers are generally looking for service providers that help save their time and money, especially when it comes to financial services this is of great importance.

In this section we have seen how services have developed into self-services with the help of technology. Technology has a great influence on how customers view service providers and the way services are evaluated. Now we will look into the importance of the concept of service quality and what eventually led to the concept of SST quality.

2.3. Service Quality

Many theories like Vroom (1994) and other theories were the first research into the concept of service quality. The gap model developed by Parasuraman A, Zeithaml A, Valarie, and Berry (1988) is also one of the renowned theories about service quality and its definition. From it Parasuraman et al. (1988) developed the SERVQUAL model which one of the most commonly used service quality models. It was also used as a base for developing the SSTQUAL model and many others.

In the coming sections we will explain how the gap model lead to the development of SERVQUAL. Additionally how many researchers used SERVQUAL to develop their own models that are related to SST. We will also briefly compare the different SST models and why we chose the SSTQUAL model as a base for our study.

2.3.1. The Gap Model

The gap model is an important stepping stone for the development of SERVQUAL scale, where (Parasuraman A et al., 1988) employed the definition of service quality found in the gap model to develop the SERVQUAL measurement scale.

In this model, Anantharanthan Parasuraman, Zeithaml, and Berry (1985) define service quality as the outcome of difference between the customer's expectation and perception of the service quality. Anantharanthan Parasuraman et al. (1985) in Figure 2.3 shows us that this difference in the customer's expectation and perception of service quality is due to the existence of five gaps. These gaps are existed within the relationship between the customer and the firm, four of which are from the firm side and one of which is from the customer's side. According to Anantharanthan Parasuraman et al. (1985) these gaps lead to perceiving service quality as low or not sufficient. The gaps are:

(1) Consumer expectation and management perception gap: this occurs due to the inability of service provider management to understand the needs or dimensions of quality from the customer's perspective.

(2) Management perception and service quality specification gap: this is existent because customers require certain specification that for practical reasons cannot be supplied by the service provider, e.g.: lack of resources or existence of certain constraints.

(3) Service quality specifications and service delivery gap: the reasons this occurs is that no matter what specifications are put in place there is always an important role performed by the employee, thus even if quality standards exist there are sometimes where the employee's role leads to certain shortfalls.

(4) Service delivery and external communication gap: in advertising, certain service providers tend to promise customers more than they can fulfill which is one of the main reasons for the occurrence of this gap. In addition, customers are not aware of efforts made by management that aims at increasing the quality of the service, when this is not conveyed to customers this also helps increase this gap.

(5) Expected service and perceived service gap: this is due to the difference between what the customer expects of the service and what it turns out to be. When a customer expects how the outcome of the service will be and then not attain that outcome, this affects their perception of the service quality and thus leading to this gap.

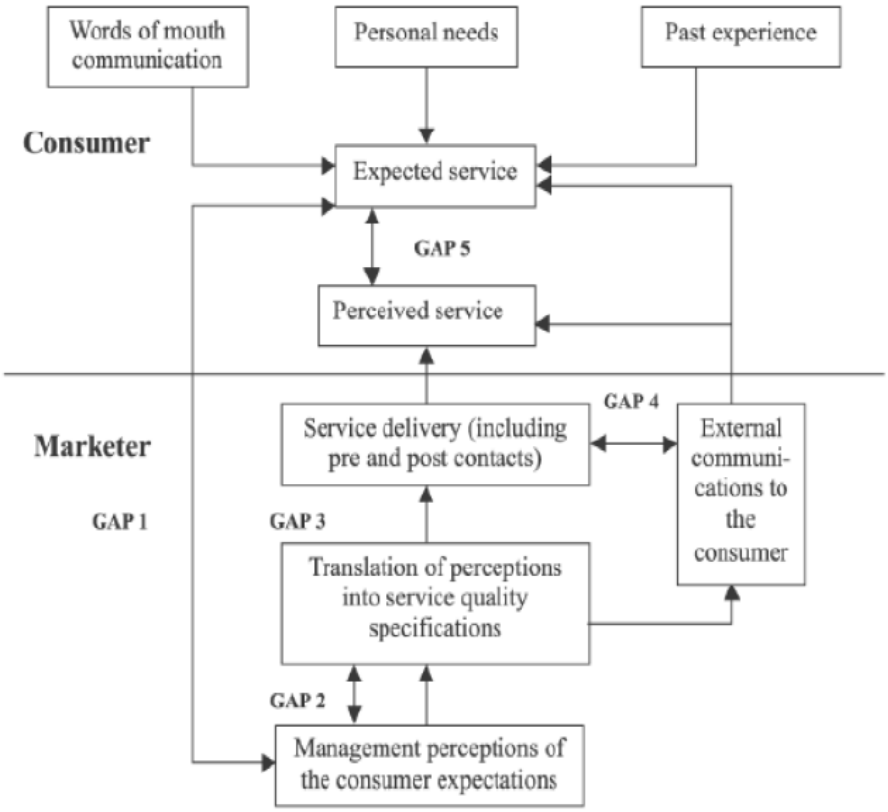

Figure 2.3: The Gap Model

Also we see from Figure 2.3 that according to Anantharanthan Parasuraman et al. (1985), the expectations of the customer are based on the following three factors: word of mouth, personal needs and past experience.

Anantharanthan Parasuraman et al. (1985) used focus groups and in-depth interviews to produce the gap model explained above. They also were able to conclude and deduce a group of dimensions or what they called determinants of service quality.

According to Anantharanthan Parasuraman et al. (1985) the determinants of service quality are:

1. Reliability: this includes consistency and continuously providing the service in a correct manner.
2. Responsiveness: has to do with the quickness in response of the employees when performing the service.
3. Competence: is related to skill and competencies that are needed to perform the service.
4. Access: the ability of the customers to easily reach the service.

5. Courtesy: politeness, kindness and manners when providing the service.
6. Communication: the ability of the service provider to communicate and contact the customer in a language that s/he understands.
7. Credibility: honesty and wanting what is best for the customer.
8. Security: this includes not feeling danger or risk when performing the service.
9. Understanding/Knowing the Customer: has to with wanting to know what the customer wants and making effort to understand it.
10. Tangibles: anything that has to do with aesthetics and physical aspects of the service.

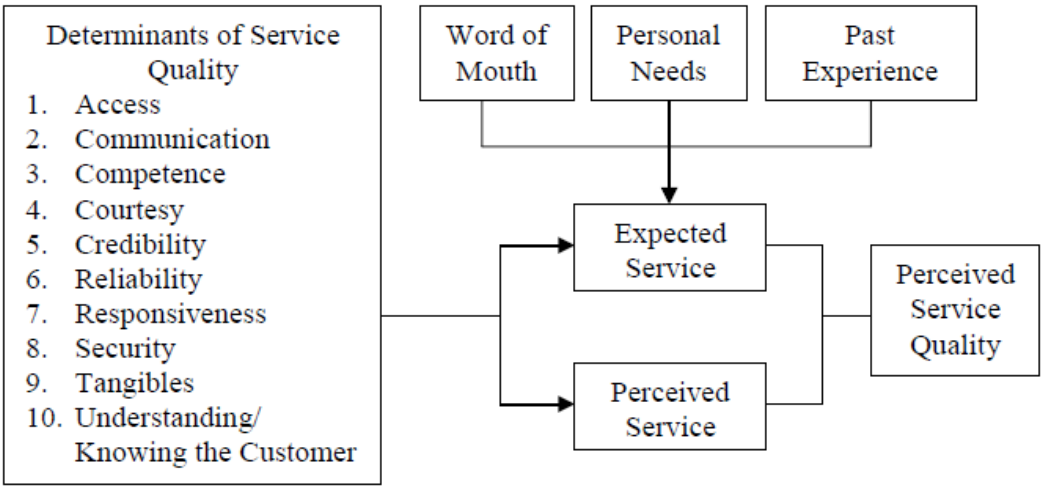

Figure 2.4: The Determinants of Service Quality

2.3.2. SERVQUAL Scale

Measurements are sometimes based on the thoughts of the researcher rather than being based on a sound conceptual statement or the studied variable (Jacoby, 1978). Before the development of SERVQUAL, the literature was in great need of a sound measurement scale that would give a sound estimation of the quality of services. This need lead to the development of SERVQUAL.

SERVQUAL was developed based on research that helped define the concept of service quality along with the qualitative research performed by Anantharanthan Parasuraman et al. (1985) that defined 10 dimensions of quality (Parasuraman A et al., 1988).

The measurement scale started out with a pool of 97 items that were generated from 10 dimensions of quality. Each of these items was phrased into two statements, one that measures the expectations of firms in a category and the second to measure the perceptions of quality of the service of the firm assessed. After scrutinizing, the scale was summarized in 22 items contained in 5 dimensions: tangibles, reliability, responsiveness, assurance, and empathy. The survey contains two parts, the first related to expectations of the sector and the second related to the perceptions of the service being assessed. Parasuraman A et al. (1988) also provide many applications of SERVQUAL all which aim at improving the quality of services by comparing the expectations and perceptions of customers using the SERVQUAL scale which can be modified according to the needs of the service provider or sector.

It is worth mentioning that in A Parasuraman, Berry, and Zeithaml (1991) the finders of the SERVQUAL scale reassessed the validity and reliability of their scale. They also mention a group of published papers that used the SERVQUAL in their studies. A Parasuraman et al. (1991) found that the two-part measurement approach may not be advisable though evidence is not enough to completely drop it. They call on further research that aims at measuring the expectation-perception values but by using different methods e.g. asking the customer to evaluate both an ideal service provider and the one being assessed at the same step.

2.3.2.1. Limitations of SERVQUAL

Although the SERVQUAL scale has received great acceptance in the literature, it also has been criticized (Babakus & Boller, 1992; Buttle, 1996; J. Joseph Cronin & Steven A. Taylor, 1992; Teas, 1993).

Mainly criticisms of the SERVQUAL scale stem from the difference between it and the SERVPERF scale proposed by (J. Joseph Cronin & Steven A. Taylor, 1992). In this study the authors state that SERVPERF explain more of the variation in service quality than SERVQUAL. Additionally, they believe that the SERVQUAL scale is flawed because it is based on a gap model rather than an attitudinal model. Later on this led to a great debate in the literature between those who support SERVQUAL and others who support SERVPERF.

Some of the main criticisms of SERVQUAL can be summarized as follows: it is based on a disconfirmation model rather than an attitudinal model, there is not enough evidence that customers assess service quality as a difference or gap between expectation and perception, it focuses on the service process itself and not the

outcome, and finally the five dimensions are not a standard or universal solution (Buttle, 1996). Other studies have also raised similar issues (Babakus & Boller, 1992; J. Joseph Cronin & Steven A. Taylor, 1992; Teas, 1993).

Despite being criticized by many scholars, SERVQUAL continues to be widely accepted in the literature as a good evaluator of service quality (Saravanan & Rao, 2007). Many have used SERVQUAL as a base for their studies and models. In addition, recent research has shown that there are slight differences between SERVQUAL and SERVPERF with regards to validity and reliability.

A meta-analysis aimed at comparing both SERVPERF and SERVQUAL in terms of predicting service quality found that both are valid and are assured to be good measures of service quality; however, the choice between the two should be based upon the purpose for which they will be used (Carrillat, Jaramillo, & Mulki, 2007). The study also explains that SERVPERF is a shorter instrument that does not require much modification based on context. However according to Carrillat et al. (2007), SERVQUAL which may require modification according to the context it is used in, is much more beneficial for practitioners who wish to infer detailed information about customers' perceptions of service quality.

2.3.2.2. SERVQUAL Applications

Other research has also found that SERVQUAL has higher diagnostic power and should be preferred by managers who wish to determine service quality shortfalls (Jain & Gupta, 2004).

SERVUQUAL has been adopted and used in many studies relating to measuring service quality; (Brown & Swartz, 1989; Carrillat et al., 2007; Chebat, Filiatrault, Gelinas-Chebat, & Vaninsky, 1995; Furrer, Liu, & Sudharshan, 2000; Jain & Gupta, 2004; Kettinger & Lee, 1994; Wilson, Zeithaml, Bitner, & Gremler, 2012).

It has also been used in studies related to self-service channels like online retail stores (Hou, 2005). More importantly, it has also been used in the Islamic banking industry in the United Arab Emirates (Jabnoun & Khalifa, 2005). Generally speaking, 33 out of 247 articles on the topic of e-banking used SERVQUAL to study customer beliefs regarding e-banking (Hoehle, Scornavacca, & Huff, 2012).

2.4. SST Service Quality

In the previous section we explained how SERVQUAL was a seminal model that was the base of many studies that aimed at measuring the service quality in different industries and countries. We also showed how recently SERVQUAL was used in even self-service quality related studies. However, more recent studies on the topic of self-service quality have shown that SERVQUAL is not adequate for measuring the service quality of SSTs.

2.4.1. SST Service Quality Models

Many researchers have tried to fill the gap that exists due to inadequacy of SERVQUAL in measuring the service quality of SSTs. Some researchers have chosen to use SERVQUAL but many others have also developed models to test service quality of specific SSTs. After a review of the literature, many scales were found that aimed at measuring service quality of certain types of SSTs; these scales were inspected in order to find the most appropriate scale for measuring the service quality of the XTM. As a result, Table 2.1 contains a list of some the more recent scales developed for measuring SST service quality; the table also contains dimensions of quality found to be of importance to customers in that particular study. It is important to note that many of these scales are related to specific online based services.

Table 2-1: Models testing service quality

Year	Authors	Scale and Application	Number of Dimensions	Dimensions	Number of Items
2001	Barnes, S.J. and Vidgen, R. (2001)	**WebQual** for an internet bookshop website	4	1. **Ease of use** 2. **Experience** 3. **Information** 4. **Communication and integration**	23

2001	Yoo, Boonghee and Naveen Donthu (2001)	**SiteQual** for an internet shopping site	4	1. **Ease of use** 2. **Aesthetic design** 3. **Processing speed** 4. **Security**	9
2003	Wolfinbarger,Mary and Mary C. Gilly (2003)	**eTailQual** for online shopping	4	1. **Website design** 2. **Fulfillment/reliability** 3. **Privacy/security** 4. **Customer service**	14
2004	Yang, Z., Jun, M., and Peterson, R.T. (2004)	**Online Service Quality Scale** for online banking services	6	1. **Reliability** 2. **Responsiveness** 3. **Competence** 4. **Ease of use** 5. **Security** 6. **Product portfolio**	20
2005	Parasuraman, Zeithaml, and Malhotra (2005)	**E-S-Qual** for online shopping websites	4	1. **Efficiency** 2. **Fulfillment** 3. **System availability** 4. **Privacy**	22
2006	. Bauer, H.H., Falk, T., Hammerschmidt, M., (2006)	**etransQual** for online shopping	5	1. **Functionality/design** 2. **Enjoyment** 3. **Process** 4. **Reliability** 5. **Responsiveness**	25
2007	Cristobal, Eduard, Carlos Flavián and Miquel Guinalíu (2007)	**PeSQ** for e-services	4	1. **Web design** 2. **Customer service** 3. **Assurance** 4. **Order management**	18
2011	Ding, D.X., Hu, P.J.H., Sheng, O.R.L., (2011)	**e-selfQual** for online retailing	4	1. **Perceived cognitive control** 2. **Service convenience** 3. **Customer service** 4. **Service fulfillment**	13

2011	Lin, J. S. C., & Hsieh, P. L. (2011)	**SSTQual** for self-service technologies	7	1. **Functionality** 2. **Enjoyment** 3. **Security/Privacy** 4. **Assurance** 5. **Design** 6. **Convenience** 7. **Customization**	20

2.4.2. SSTQUAL

The model developed by Lin and Hsieh (2011) is considered to be unique in that it can be used for different types of SSTs and has also been used in different types of industries. The scales discussed in the previous section all are either related to a certain industry or certain type SST. Lots of the models are only used for internet-based self-service. Because of this, SSTQUAL has been frequently used as a base model for studying different types of SSTs like self-service kiosks at supermarkets (Demirci Orel & Kara, 2014) and SSTs used in the banking industry (Radomir & Nistor, 2012).

Lin and Hsieh (2011) formed their scale based on a review of the literature related to service quality and characteristics that are valued by customers when using SSTs. Based on this literature review and in-depth interviews with customers they were able to generate a set of 75 items to be reviewed and scrutinized by expert judges. In turn, the judges refined the items and were reduced to 37. Then multiple questionnaires and statistical analyses were conducted until a final valid form of 20 items across 7 dimensions of quality was achieved, i.e. SSTQUAL (see Table 2.3).

Table 2-2: SSTQUAL Dimensions

Dimension		Item	
D1	Functionality	I can get my service done with the firm's SST in a short time.	FUN1
		The service process of the firm's SST is clear.	FUN2

		Using the firm's SST requires little effort.	FUN3
		I can get my service done smoothly with the firm's SSTs.	FUN4
		Each service item/function of the SST is error-free.	FUN5
D2	Enjoyment	The operation of the firm's SST is interesting.	ENJ1
		I feel good being able to use the SSTs	ENJ2
		The firm's SST has interesting additional functions	ENJ3
		The firm's SST provides me with all relevant information	ENJ4
D3	Security/Privacy	I feel safe in my transactions with the firm's SST.	SEC1
		A clear privacy policy is stated when I use the firm's SST	SEC2
D4	Assurance	The firm providing the SST is well-known	ASU1
		The firm providing the SST has a good reputation	ASU2
D5	Design	The layout of the firm's SST is aesthetically appealing.	DES1
		The firm's SST appears to use up-to-date technology	DES2
D6	Convenience	The SST has operating hours convenient to customers.	CON1
		It is easy and convenient to reach the firm's SST.	CON2
D7	Customization	The firm's SST understands my specific needs.	CUS1
		The firm's SST has my best interests at heart.	CUS2
		The firm's SST has features that are personalized for me.	CUS3

The authors themselves also distributed a final survey containing the SSTQUAL items and other items related to service outcome. The results showed that SSTQUAL is a generalizable model that can be used to measure the service quality

of different types of SSTs. In terms of replicability SSTQUAL can be compared with the seminal SERVQUAL scale.

The SSTQUAL's seven dimensions are:

1. Functionality: is related to how well the SST functions, its responsiveness and also how easy is it to use.
2. Design: has to do with the aesthetics, look and feel of the SST.
3. Customization: relates to how well the SST is personlized and meets the specific needs of each customer.
4. Enjoyment: represents the enjoyment felt when using the SST and when the service outcome is achieved.
5. Assurance: has to do with the reputation of the SST service provider.
6. Convenience: relates to the operating conditions of the SST and how easy it is to access it.
7. Security/Privacy: is related to how secure the customer feels when using the SST and how well their privacy is being protected.

2.4.2.1. Comparing SSTQUAL with Previous Self-Service Related Scales

When comparing the dimensions of SSTQUAL with previously developed scales, we notice there is a great deal of similarity between them. Actually, many of the dimensions of the other scales can be mapped into SSTQUAL's dimensions.

Other research has also found that the seven dimensions of SSTQUAL also have an effect on SAT (A. Parasuraman et al., 2005; Yen, 2005).

2.4.2.2. Different Versions of SSTQUAL

Despite the fact that the model is generalizable and is made up of seven dimensions, changing the sample or changing the sector may lead to different results (Radomir & Nistor, 2012). In their study, the authors also argue that decisions regarding the number of factors and their labels is mainly based on the researcher's judgement. Similar results can also be found in (Demirci Orel & Kara, 2014); where the authors argue that because of the different nature of self-chechout systems at markets and the different concerns of customers using such SSTs, it is possible that the dimension found are different than those in the original SSTQUAL.

These findings are of great importance to researchers who wish to use the SSTQUAL dimensions in their studies. This shows us that pruning certain items and labelling dimensions differently is acceptable.

For example, when applying the SSTQUAL to the banking industry in Romania the following five dimensions were found to be of importance to customers: Functionality (FUN1, FUN2, FUN3 and FUN4), Image (ASU1, ASU2, DES1 and DES2), Customization (CUS1, CUS2 and CON2), Enjoyment (ENJ1, ENJ2 and ENJ3), and Security/Privacy (SEC1, SEC2, ENJ4 and FUN5) (Radomir & Nistor, 2012). The authors also explain the reasoning behind the different labels and items. They argue that functionality, customization and enjoyment though slighlty different still represent the same dimensions in the orginial SSTQUAL. However, they name a new dimension called Image which contains items from the assurance and design dimensions of SSTUQL; according to them this dimension measures the perceptions of customers towards the image of the banking institution (Radomir & Nistor, 2012). Finally, the authors also argue that items ENJ4: “The bank's SST provides me with all relevant information” and FUN5: “Each service item/function of the SST is error-free” can be viewed by customers in terms of trust and condifence to be more related to Security/Privacy of the SST and accordingly should be under that dimension.

However when applying the same model to self-chekout systems at supermarkets in Turkey, it is found that only the following dimensions and items are of importance: Functionality (FUN1, FUN2, FUN3, FUN4 and FUN5), Design (DES1 and DES2), Enjoyment (ENJ1, ENJ2, ENJ3 and ENJ4), Assurance (ASU1 and ASU2), Convenience (CON1 and CON2) (Demirci Orel & Kara, 2014). In their study, the authors argue that Customization is not of concern to customers because self-checkout systems are not expected to be customized. Additionally they state that Security/Privacy dimension is not applicable because customers are not concerned with security like they are when doing purchases online.

In another study, the revised SSTQUAL scale improvised by Radomir and Nistor (2012) is compared with the original SSTQUAL developed by Lin and Hsieh (2011); both the scales are found to be inadequate in terms of validity and goodness of fit (Radomir & Nistor, 2014). The authors first refined the original SSTQUAL and found out that items FUN1, FUN5, ENJ4 and CUS3 should be removed and as a result the following dimensions and items are retained: Functionality (FUN2, FUN3 and FUN4), DESCONASU (ASU1, ASU2, DES1, DES2, CON1, and CON2),

Customization (CUS1, CUS2), Enjoyment (ENJ1, ENJ2 and ENJ3), and Security/Privacy (SEC1, SEC2). However their statitical analyses show that refining the scale revised by Radomir and Nistor (2012) leads to better fit and results. Thus, they argue that the dimensions and items that should be retained are based on their previosly obtained results in (Radomir & Nistor, 2012) that were refined again to give the following: Functionality (FUN2, FUN3 and FUN4), Image (ASU1, ASU2, DES1 and DES2), Customization (CUS1, CUS2), Enjoyment (ENJ1, ENJ2 and ENJ3), and Security/Privacy (SEC1, SEC2) (Radomir & Nistor, 2014).

We conclude that the previous studies set out to apply SSTQUAL in different industries and countries. They found that the SSTQUAL scale, though valid and generalizable, must still go through a refining process that leads to pruning of some items along with changing some of the dimensions. In all the studies conducting such procedures led to better validity and goodness of fit.

After reviewing the literature related to SSTs, we found that many previous models' dimensions can be found within the generizable scale of SSTQUAL. However, researh conducted using the SSTQUAL scale has also shown that the model despite being replicable in other industires and countries, it also must be pruned, validated and refined to fit the relevant SST, industry and country.

2.4.3. Effect of SST Service Quality on Other Factors

Reviewing the literature has also shown us that service quality has often been associated with its consequences. Most studies also study the effect of service quality on different factors like: cost (Crosby, 1979), customer satisfaction (J. Joseph Cronin & Steven A. Taylor, 1992), customer loyalty (Fornell, 1992), economic benefits (E. W. Anderson et al., 1994), and behavior of customers (Zeithaml, Berry, & Parasuraman, 1996).

Research related to SST service quality has also been associated with other factors that are consequence of service quality. Some of the outcome variables that were studied along with SST service quality are: perceived value (Bauer et al., 2006; A. Parasuraman et al., 2005), loyalty (Cristobal et al., 2007; Ding et al., 2011; A. Parasuraman et al., 2005), satisfaction (Cristobal et al., 2007; Ding et al., 2011). In addition, studies that have used the SSTQUAL scale in their studies also studied the relationship between SST service quality and outcome variables. Some of the

outcome variables that were studied are: behivoral intentions (Lin & Hsieh, 2011; Radomir & Nistor, 2012, 2014), satisfaction (Demirci Orel & Kara, 2014; Radomir & Nistor, 2012), and loyalty (Demirci Orel & Kara, 2014).

The previous evidence shows the importance of studying the effect of service quality of SSTs on other outcome variables. In this study, we focus on customer satisfaction and customer loyalty which are found to be directly related to customer retention and paying higher prices for products (Zeithaml et al., 1996). In the coming two sections we define customer satisfaction and loyalty, discuss how they are related to service quality, and also explain their importance in this study.

2.5. Customer Satisfaction

As explained in previous sections, customer satisfaction is of great importance to service providers. It also has very often been studied as an outcome of service quality. Recent studies in SST have also studied the effects of service quality of the SST on customer satisfaction. In the coming section we provide an explanation of the origin of customer satisfaction and its definition.

2.5.1. Origins of Customer Satisfaction

In order to understand what customer satisfaction is and how to achieve it, it is pertinent that we go back to the earliest of theories in explaining human needs. Maslow's hierarchy of needs theory can help us understand what motivates humans; thus helping us understand more about what may satisfy their needs and what they value as important when providing a certain service (Sharaf Mutahar Alkibsi, 2010). Quality is all about providing what the customer needs and wants, this is why starting with the basic needs of a human can help us understand where more complex needs stem from.

According to H. Maslow (1954) a human's needs are summarized in a an order where needs are fulfilled one after the other. When the first need is satisfied, humans look to satisfy the next need in the order. These needs are summarized as follows:

1. Physiological: anything a human need for survival.
2. Safety: this includes personal safety as well as financial.

3. Love: this includes social needs and the need to be loved and belong.
4. Esteem: this is related self-respect and acceptance.
5. Self-actualization: the need to reach one's maximum potential.

We can deduce very important dimensions of quality from these needs. As a matter of fact, many of the dimensions of scales discussed earlier can be fit or related indirectly to these needs. For example, the Functionality dimension in SSTQUAL represents how customers perceive the basic functions of the SST. This is analogous to the first need in Maslow's hierarchy which has to do with the basic needs of a human. Another example is the Safety/Privacy dimension in SSTQUAL which represents how safe customers feel when using the SST. This is similar to the Safety need in Maslow's hierarchy.

In other research conducted by Tafti and Shirani (1997) , users were found to have a hierarchy of needs when it comes to software and computing. We can deduce that customer also have certain expectations from SSTs that must be satisfied.

In the coming section we talk about the different definitions of customer satisfaction that are found in the literature.

2.5.2. Definition

Satisfaction has still not found consensus when it comes to defining it; one of those myriad of definitions could be that it is the result of customers achieving their goals (Molina, Martín-Consuegra, & Esteban, 2007). It can also be defined as the positive feeling a customer feels after receiving a service (Cronin, Brady, & Hult, 2000), or the result of the customer feeling an emotional bond to the service provider (Johnson, Sivadas, & Garbarino, 2008) .

When it comes to services where there is a customer-employee interaction, satisfaction is the outcome of the process that takes place between the customer and employee during the service delivery (Meuter et al., 2000). According to this definition, customers may not feel very satisfied if this interaction with the employee is absent. This is why some might tend to prefer traditional services over SSTs even when the benefits of the SSTs are obvious (Meuter et al., 2003)

More importantly, satisfaction according to the expectation-disconfirmation paradigm is the resultant of the difference between the customers' expectations about

the service and the actual outcomes of the service (Kotler & Armstrong, 1996; Rust & Oliver, 1994)

Though satisfaction by definition is similar to service quality, many studies showed that they are two different constructs (Parasuraman A et al., 1988). Additionally, managers must focus on improving customer satisfaction rather than just focusing on increasing service quality (J. Joseph Cronin & Steven A. Taylor, 1992)

Some of the important differences between the perception of service quality and satisfaction is that service quality has to do with a given service encounter while satisfaction is based on current, previous and even future encounters (E. W. Anderson et al., 1994). The same authors also explain that perceptions of quality can be sometimes before the service encounter even takes place, but satisfaction can only be a result of a service encounter.

2.5.3. Customer Satisfaction and SST Service Quality

Many studies have found that service quality directly affects customer satisfaction (Akbar & Parvez, 2009; Brady & Cronin, 2001; Sureshchandar, Rajendran, & Anantharaman, 2003). Additionally, recent studies show that the same effect exists when it comes to the service quality of SSTs and satisfaction with them. For example, a strong relationship between service quality in internet retailing and customer satisfaction was found by Wolfinbarger and Gilly (2003) and the same relationship exists when it comes to the satisfaction of customers in online consumer electronics (Wu, 2011). Also in the e-commerce industry similar results were found (Ribbink, Riel, Liljander, & Streukens, 2004).

There are some important factors that lead to satisfaction with SSTs. A study conducted explained that saving time and money, satisfy certain needs quickly and the possibility of avoiding employee contact were all important factors that led to satisfaction with SSTs (Meuter et al., 2000). In their study they also discuss that some of the main reasons that lead to dissatisfaction with technology are: incorrect functioning, SST unavailability, system errors and any type of SST failure.

In more recent studies, service quality of self-checkout systems in supermarkets was found to be directly related to customer satisfaction (Demirci Orel

& Kara, 2014). This shows us that service quality of SSTs that is evaluated using the SSTQUAL has an effect on customer satisfaction. This is of importance to this study because previous studies found results mainly relating to web-based SSTs or generally service quality.

As explained previously, research shows that satisfaction is a different construct but related to SST service quality. The importance of studying the relationship between SST service quality and customer satisfaction lies in the fact that satisfied customers based on their satisfaction with the service will probably come back for more in the future. Satisfaction is associated with future financial returns for the organization because a satisfied customer leads indirectly to more future purchases (E. W. Anderson et al., 1994).

Another important factor to be studied along with customer satisfaction is customer loyalty. Though customer satisfaction is found to affect customer loyalty, we would also like to study if a direct relationship exists between service quality of SSTs and customer loyalty.

2.6. Customer Loyalty

Customer loyalty is considered a very important factor for service providers because it increases the willingness of customers to buy products and recommend it to others. In this section we define customer loyalty and discuss its relationship with SST service quality and customer satisfaction.

2.6.1. Definition

Customer loyalty can be defined as an attitude that causes the customer to repeatedly buy products or services of the company and also recommend such products or services to others (Pearson, 1996). Others define it a word-of-mouth recommendation to others and a tendency buy more than once from the same company (J. Lee, Lee, & Feick, 2001). It also worth mentioning that some studies have made a distinction between repurchase intentions and willingness to recommend and treated them as different constructs when studying their relationship

with service quality (J. Joseph Cronin & Steven A. Taylor, 1992; Boulding, Kalra, Staelin, & Zeithaml, 1993)

Brand loyalty is also defined as “a deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future, thereby causing repetitive samebrand or same brandset purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior” (R L Oliver, 1999).

Sivadas and Baker-Prewitt (2000) state that customer loyalty is the main purpose of customer satisfaction measurement. In addition, non-loyal customers are more affected by negative information about the products or services than loyal customers (Donio’ et al., 2006)

2.6.2. Customer Loyalty and SST Service Quality

Customer loyalty defined as repurchase intentions was found to be not as affected by service quality as customer satisfaction; while still being affected indirectly through customer satisfaction which has a direct relationship with repurchase intentions (J. Joseph Cronin & Steven A. Taylor, 1992). On the other hand, service quality was found to have a direct relationship with repurchasing intentions and willingness to recommend (W.Boulding, A.Kalra, R.Staelin, 1993).

In a more recent study, SST service quality was found to directly affect customer satisfaction which in turn affect customer loyalty but no direct relationship was found between customer satisfaction and customer loyalty (Demirci Orel & Kara, 2014). Other studies that used SSTQUAL focused more on studying the relationship between SST service quality and behavioral intentions (Lin & Hsieh, 2011; Radomir & Nistor, 2012, 2014).

The previous discussion shows that there is a need to study the relationship between SST service quality and customer loyalty and whether a direct relationship exists or not. Because the relationship may not exist it also important to find out if there is indirect relationship due to the effect of customer satisfaction on customer loyalty.

3. CONCEPTUAL FRAMEWORK

3.1. Hypothesis Development

3.1.1. SSTQUAL Dimensions and SST Service Quality

Lin & Hsieh (2011) were able to develop a scale after a review of the service quality literature and the literature on characteristics that are valued by customers. They also performed in-depth interviews with customers. They generated a set of 75 items to be reviewed and judged by experts.

The items were refined and reduced to 37 and distributed in questionnaires. Followed by multiple statistical analyses these items were again reduced to 20. These 20 items were categorized into 7 dimensions of quality. A final valid form of 20 items and 7 dimensions was achieved i.e. SSTQUAL. After the authors distributed a final survey containing the SSTQUAL items and items related to service outcome, SSTQUAL proved to be a generalizable model applicable to test the service quality of different SSTs.

SSTQUAL has 7 dimensions; Functionality which is related to how well and easily the SST functions and its responsiveness. Design, is related to aesthetics and feel of the SST. Customization, related to the personalization of the SST and meeting specific needs of each customer. Enjoyment, related to the enjoyment felt during using the SST and after the service outcome is reached. Assurance, related to the reputation of the service providers. Convenience, related to the accessibility of the SST and its operating conditions. And finally, Security/Privacy which is how secure customers feel while using the SST and how protected their information is.

SSTQUAL has a lot of similarities with other scales when compared. Several dimensions in previous scales are very close and resemble those of SSTQUAL. It was also found that the 7 dimensions of SSTQUAL have an impact on customer satisfaction (A. Parasuraman et al., 2005; Yen, 2005).

As we mentioned, this model is generalizable. And despite the fact that it is generalizable and it contains 7 dimensions, changing the sector or sample may alter the results (Radomir & Nistor, 2012). The authors also argue that the number of factors and their labels is left to the researcher’s judgement. Demirci Orel and Kara

(2014) showed similar results in which the authors argue that because self-checkout systems in markets have a different nature and because of the difference in customer concerns when using such SSTs, it is possible that the dimensions be different than those in the original SSTQUAL. These results are of high value to researchers who choose to use the SSTQUAL dimensions in their studies and it shows that removing certain items and labelling dimensions differently may be necessary.

Based on the previous discussion in order to answer our first research question which is what dimensions of the SSTQUAL are relevant to the participation banking industry, the Turkish culture and the new type of SST called XTM (a more advanced form of the VTM); we perform a factor analysis to determine which dimensions will be used to study the relationship with customer satisfaction and customer loyalty.

The result of the analysis will help us determine if SSTQUAL is applicable, and if not then after pruning the dimensions we will use the modified version of SSTQUAL to study the hypotheses of coneptual model demarcated below.

3.1.2. SST Service Quality and Customer Satisfaction

As we mentioned before satisfaction can be defined as the positive feeling a customer feels after receiving a service (Cronin et al., 2000), or the result of the customer feeling an emotional bond to the service provider (Johnson et al., 2008). In practice, service quality and satisfaction are often used in each other's place, since both of them are evaluation variables of consumers' perceptions about a certain product/service (Chen, 2008). On the other hand Oliver among other authors suggested that there are some differences between service quality and customer satisfaction. (Richard L. Oliver, 1997) suggests that service quality judgments are more specific as opposed to customer satisfaction judgments. Also service quality is related to rational judgments and customer satisfaction is related to affective judgments (Chen, 2008).

As we mentioned in Chapter 2 many studies found that service quality directly affects customer satisfaction (Akbar & Parvez, 2009; Brady & Cronin, 2001; Sureshchandar et al., 2003). We also mentioned that recent studies show that the same effect exists when it comes to the service quality of SSTs. For example, a strong relationship between service quality in internet retailing and customer satisfaction was found by (Wolfinbarger & Gilly, 2003) and the same relationship

exists when it comes to the satisfaction of customers in online consumer electronics (Wu, 2011). Also in the e-commerce industry similar results were found (Ribbink et al., 2004).

Accordingly, to answer our second research question which questions if the service quality of XTM has a direct effect on customer satisfaction; we propose the following hypothesis:

H1: XTM service quality has a positive effect on customer satisfaction.

3.1.3. SST Service Quality and Customer Loyalty

Customer loyalty is defined by R L Oliver (1999) as "a deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior".

As we mentioned earlier customer loyalty was found to be not as affected by service quality as customer satisfaction. It is nonetheless affected indirectly through customer satisfaction which directly affects repurchase intentions (J. Joseph Cronin & Steven A. Taylor, 1992). Research also shows that service quality has a direct relationship with repurchasing intentions and intending to recommend (W.Boulding, A.Kalra, R.Staelin, 1993). A more recent study suggests that SST service quality has a direct effect on customer satisfaction which affects customer loyalty; while no direct relationship was found between self-service technology service quality and customer loyalty (Demirci Orel & Kara, 2014).

Different opinions about the relationship between service quality or SST service quality and customer loyalty shows that there is a need to conduct more studies about the relationship between SST service quality and customer loyalty and find out whether there is a direct relationship between them or not. The fact that a relationship between them may not exist makes it important to find out if there is an indirect relationship as a result of customer satisfaction's effect on customer loyalty.

In order to answer our third research question which questions whether a relationship exists between XTM service quality and customer loyalty in the participation banking industry in Turkey; we propose the following hypothesis:

H2: XTM service quality has a positive effect on customer loyalty.

3.1.4. Customer Satisfaction and Customer Loyalty

Customer satisfaction defined by Richard L. Oliver (1981) is “the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience” , and Liao, Palvia, and Chen (2009) suggests that it is an important determinant of repurchase intention. Customer satisfaction was also found to have a direct effect on customer loyalty when it comes to self-service checkout systems (Demirci Orel & Kara, 2014).

Customer loyalty is the main goal of customer satisfaction measurement (Sivadas & Baker-Prewitt, 2000). It is a core determinant of a brand's long-term attainability (Krishnamurthi & Raj, 1991).

If a customer is satisfied by a certain service provider more than its competitors, loyalty is more easily achieved (R L Oliver, 1999). It is also suggested that increased customer loyalty is primarily caused by increased customer satisfaction (Fornell, 1992).

Previous studies have proposed that perceptions of service quality affect feelings of satisfaction, which affect both loyalty and post-purchase behaviors (Fornell, 1992; J. Joseph Cronin & Steven A. Taylor, 1992; Richard L. Oliver, 1980).

As explained in the previous chapter, customer loyalty in some studies has been found to have a direct relationship with service quality (W.Boulding, A.Kalra, R.Staelin, 1993); however in other studies no direct relationship could be found between service quality or SST service quality and customer loyalty (Demirci Orel & Kara, 2014; J. Joseph Cronin & Steven A. Taylor, 1992). If a relationship between SST service quality and customer loyalty is not found, it is still important to study its indirect effect via customer satisfaction.

To answer our fourth research question which aims at finding whether a relationship exists between customer satisfaction and customer loyalty in the participation banking industry when it comes to the XTM; we test the following third hypothesis:

H3: Customer satisfaction has a positive effect on customer loyalty.

Furthermore, customer satisfaction was found to have a mediating effect on the relationship between service quality and customer loyalty (Akbar & Parvez,

2009). This may be the reason why many studies have failed to find a direct relationship between SST service quality and customer loyalty while customer satisfaction is present. Accordingly we also propose a fourth hypothesis as follows:

H4: Customer satisfaction has a mediating effect on the relationship between XTM service quality and customer loyalty.

The conceptual model with the hypotheses explained above can be summarized in Figure 3.1

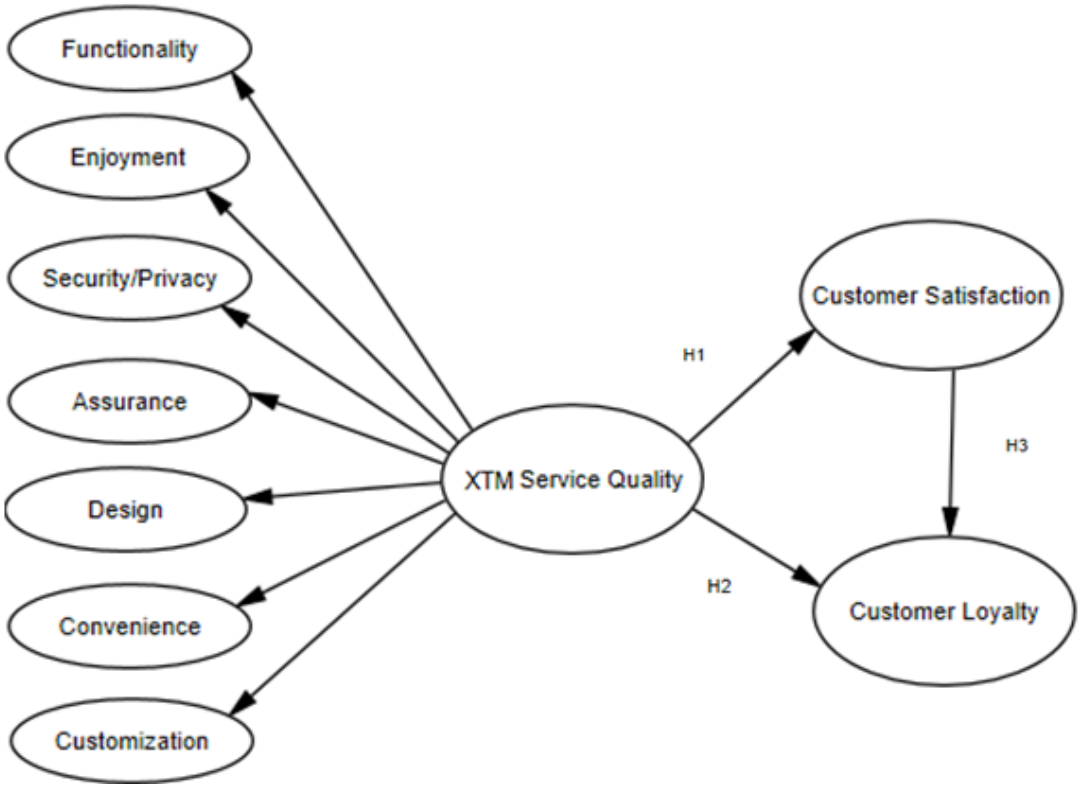

Figure 3.1: Conceptual Model

4. METHODOLOGY

In this study we use a quantitative research design to draw conclusions about theories and scales that are related to self-service quality, customer satisfaction, and loyalty. We aim at answering the research questions by testing hypotheses using statistical tests and analyses. This study is considered a correlational one, which according to Creswell (2013) is a type of design used for investigating the relationships between independent and dependent variables of the study.

Creswell (2013) also mentions that there are many quantitative approaches, one of which is survey design. In this study we use surveys to collect data from a sample and then draw conclusions that can be generalized over the entire population (Floyd J Fowler, 2009) . We use descriptive and inferential statistics to gain insight about the customers of SST.

In this chapter we restate our research questions into hypotheses to be tested. We also discuss in detail how this research was conducted and how the data was collected. We also talk about the validity, reliability and limitations of the study.

4.1. Research Design

The main purpose of this study is to generalize the results achieved by Lin and Hsieh (2011); which led to the development of SSTQUAL. Additionally, we extend the study by pruning the original scale into one that is more compliant to the XTM as a different type of SST and Turkey as a different culture.

Also, another goal of the study is to draw conclusions about the relationship between the validated SSTQUAL scale and their effect on customer satisfaction and loyalty.

Based on this, our study can be categorized as a quantitative correlational study (Vogt, 2007); where surveys are used as the data collection method which according to Neuman (2006) is best for studies that wish to learn more about the attitudes and behavior.

4.2. Hypotheses

Hypotheses are used to study a relationship between dependent and independent variables (Creswell, 2013). Therefore we use hypotheses in our study to verify the existence of a relationship between the evaluation of XTM service quality based on the dimensions of SSTQUAL, customer satisfaction and customer loyalty. Thus helping us find an answer to the research questions at hand.

The following sets of hypotheses are studied and are validated by performing statistical analyses using structural equation modeling (SEM) and path analyses. The proposed hypotheses are as follows:

H1: XTM service quality has a positive effect on customer satisfaction.

H2: XTM service quality has a positive effect on customer loyalty.

H3: Customer satisfaction has a positive effect on customer loyalty.

H4: Customer satisfaction has a mediating effect on the relationship between XTM service quality and customer loyalty.

It is important to note that the first and second hypotheses are also based on the results of confirmatory factor analysis (CFA) conducted in the coming chapter. After conducting CFA using AMOS 20 and validating the SSTQUAL dimensions and our general model, we proceed to test the hypotheses.

4.3. Sampling Frame

4.3.1. Geographic Location and Population

This study took place in Istanbul one of Turkey's largest populated cities. It is important to note that the XTM is only located in Istanbul and has not yet spread to other cities in Turkey. This is mainly because XTM is a newly developed technology and is still to a certain extent being tested and studied. Istanbul represents one of the largest technology hubs, not just in Turkey, but worldwide. One of the greatest challenges of this study was to find enough participants and access such a small population i.e. customers who use the XTM.

The survey was distributed to a sample of this population. Once again, to the extent of our knowledge, KTPB is one of the only banks to apply and use this

XTM technology widely across Istanbul; therefore, we could only study the customers of this bank whom are currently using the XTM. This is why the results attained in this study should be reevaluated in the future across different banks that use the same technology if possible.

4.3.2. Sample Requirements

As mentioned before, because the population under study is very small, there were no major constraints when applying the survey. The only requirement was that the customer had used the XTM before. Furthermore we assume that participants in the survey provided honest answers. We also assume that XTM users provided honest opinions about the service quality of the XTM and KTPB as a bank.

4.3.3. Sampling Technique

Only an online survey was used. This is because using a paper survey or calling customers on the phone is not approved by KTBP. According to their rules it is prohibited to directly solicit information from customers in any way. The only exception to this is online surveys which are also used by the bank itself as a means of measuring their customers' satisfaction. Additionally, allowing customers to fill out the survey at the time they choose and without the supervision of any person leads to better results. A non-probability convenience sample was used to conduct the study, because of lack of access to customer databases and also due to the fact that most studies in the literature on the topic of service quality tend to use convenience sampling.

Contacts at the KTPB agreed to send the survey link to XTM customers via email. More than 550 surveys were distributed by email and a total of 171 responses were obtained.

4.4. Sample Instruments

The survey instrument used by Lin and Hsieh (2011) was adopted and slightly modified to be more suitable for the industry and population under study. Such modifications did not affect the reliability and validity of the survey instrument (Demirci Orel & Kara, 2014; Radomir & Nistor, 2012). In this section we explain how the survey instrument was adapted to fit the banking industry in Turkey.

4.4.1. Existing survey

As in all replication studies we conducted our studies based on an existing scale, i.e. SSTQUAL which was developed in (Lin & Hsieh, 2011). Based on the recommendations of many scholars (Demirci Orel & Kara, 2014; Lin & Hsieh, 2011; Radomir & Nistor, 2012), we studied the validity of the results obtained by (Lin & Hsieh, 2011). However, we applied the scale to the banking industry on a newly developed technology called the XTM.

Thus the first section of the distributed survey was made up of 20 questions for measuring XTM quality. The second section contained questions measuring customer satisfaction and loyalty. The third and final section contained general demographic questions.

The first section and second section were made up of 7-level Likert-type scales from 1 (strongly disagree) to 7 (strongly agree). The questions related to SSTQUAL were a total of 20 items or questions that were broken up into 7 quality dimensions: functionality, enjoyment, security, assurance, design, convenience, and customization.

The second set of customer satisfaction and loyalty questions were a total of 9 questions (4 and 5 respectively.) The questions for measuring customer satisfaction were adapted from (Bloemer, Ruyter, & Peeters, 1998); while the customer loyalty questions were adapted from (Cronin et al., 2000).

As for the third demographics section, it contained questions about: age, gender, education, frequency of banking, frequency of using XTM and monthly income. These questions were found to be useful in previous studies of this kind

which is why we decided to include them. Also, these questions helped us learn more about the survey participants and the users of XTM; thus helping us inspect other relationships that could exist between certain demographic factors and the perception of quality regarding SST that may be used in future research. For example, age may have a negative impact on the preference of SST over normal services (Simon & Usunier, 2007).

4.5. Adaptation

Demirci Orel and Kara (2014) translated the SSTQUAL questions into Turkish; and used back translation as a method to verify the correctness of the translation. Similarly, for the purposes of this study the survey was translated into Turkish and then was checked by a Turkish specialist to ensure the meaningfulness of the questions. After that, the questions were back translated by an English language expert who is a Turkish Native speaker and thus we validated the correctness of the questions and what they aim at measuring. The English and Turkish surveys were also compared by bilingual people in the banking industry and were found to be similar.

4.5.1. Pilot study

After translating the survey into Turkish, a focus group was conducted with experts in the field of User Experience in the banking industry. The objective of this focus group was to make sure that these questions will be understood correctly by users (customers) of the XTM. Based on this focus group some minor changes were made to the wording of some of the questions in the survey.

Finally we distributed the survey to 5 XTM users and asked them to share their thoughts and comments about the questions and what they understood from them. After this field test, it was concluded that the questions will be easily understood by the customers and are ready to be distributed. However both the participants in the field test and the focus group noted that the second security item (SEC2) which asks about the XTM's privacy policy is not completely

understandable. Nonetheless it was used in the survey and this feedback was taken into consideration in data analysis.

After making the necessary modifications to the survey, it was ready to be distributed for purposes of data collection.

4.6. Ethics

The survey was distributed online. It was sent by email to a large pool of XTM users via the KTPB mailing system. This was important in receiving real and genuine data about the service quality of the XTM and customer satisfaction. XTM users received an email that explained the aim of the survey as gaining insight into customers' perceptions about the XTM's service quality. Also, it was mentioned that this survey was part of an academic study where all information will be kept confidential and will only be used for academic purposes. This of course was all within the knowledge of KTBP and their support.

It is also worth noting that the survey results were stored on a secure surveying website which only the researcher had access to. Each participant was given a unique code to prevent duplicates and therefore no names were requested.

4.7. Data Collection

Many online survey tools were evaluated to choose the most appropriate one for distributing the survey. Typeform.com was chosen as the survey tool because of user friendly design and many other functions that were necessary in assuring the quality of the data collected.

The final survey was uploaded to typeform.com and the survey's link was given to the bank to be sent to XTM customers. Because the population under study is very small, all questions in the survey were marked as required to ensure that participants complete the entire survey before submitting it. This helped obtain 171 complete responses with no missing values. (See Appendix A for the online Turkish survey and Appendix B for the English one).

4.8. Data Analysis

After obtaining the final responses leading to a total of 171 responses, the data was downloaded from Typeform as a Microsoft Excel sheet. The data was then entered and coded into IBM SPSS Statistics 20. The AMOS 20 software was also used in order to conduct model fit tests and path analysis using SEM.

Before conducting any analyses, we inspected the responses to look for unengaged participants. We found out that 6 of the 171 survey responses obtained may have been filled out by unengaged participants. Each of these 6 participants has repeated the same answer for the entire 29 model related questions. Thus, we conclude that they were not engaged when filling out the survey and that removing the data obtained from these responses will lead to more accurate statistical analyses. For the purposes of this study we used a total of 165 full and valid responses.

After inspecting the data and removing invalid responses, we use descriptive statistics to learn more about the sample at hand and the responses of the customers. The demographics of the sample were studied to analyze the customers of the XTM. Frequency tables were used to look for trends and patterns. Then the responses to each dimension were also analyzed separately to look for trends that may give some insight into how the customers evaluate the XTM.

Second, we modeled the data in AMOS 20 and used the model to perform CFA and inspect the necessary model fit indices. After pruning necessary items, the final model was tested for reliability and validity. It also important to note that exploratory factor analysis (EFA) was not conducted because the SSTQUAL model has already been validated, developed, and proven to be reliable.

Finally, we use the validated model to perform the necessary path analyses in order to answer our research questions and test our hypotheses.

4.9. Reliability

Reliability is achieved when the results obtained by the researcher can be repeated if the same conditions are supplied (Gibbs, 2008).

Researchers can ensure or improve reliability with the following methods: pilot tests, precise level of measurement, multiple indicators, and clear conceptualization of constructs (Neuman, 2006). Our study included the following techniques:

1. Pilot test: We conducted a pilot test along with focus groups in order to make sure the survey instrument is understood and reliable.
2. Precise measurement: 7-point Likert scale type questions were used throughout the survey, which according to the literature is the optimal number of points. Also, the original SSTQUAL scale used 7-point Likert scales (Lin & Hsieh, 2011).
3. Multiple indicators: Each of the dimensions of SSTQUAL contained more than one item and all dimensions were tested for internal consistency.
4. Clear construct conceptualization: All dimensions were found in the literature to be used and have proven to be reliable.

The items of the dimensions of quality used in the study were based on SSTQUAL which was validated in different studies (Demirci Orel & Kara, 2014; Lin & Hsieh, 2011; Radomir & Nistor, 2012, 2014). Also, the items for the customer satisfaction construct were from Bloemer et al. (1998); and customer loyalty items were used in Cronin et al. (2000).

After showing that this study was based on previous reliable scales and research, we would also like to draw attention to the validity of this study.

4.10. Validity

The validity of the study involves internal and external validity (Creswell, 2012) .The primary concern of internal and external validity is experimental designs (Neuman, 2006). The following two sections include a discussion of internal and external validity issues related to study method and design.

4.10.1. External validity

Especially in quantitative studies, it is important that the conclusions and results of the study can be generalized to the population. Threats to external validity are threats that may prevent generalization; for example: selection bias, methods,

and real world vs experimental world differences. We strived to eliminate such threats by choosing the most possible and appropriate general sample. This is also evident from the demographics of the sample taken. Also, it was clearly stated that the survey is anonymous and only for evaluating the quality of the XTM self-service and measuring customer satisfaction.

4.10.2. Internal validity

It is important to establish that our instrument and conclusions truly measure what we set out to study. There are many threats to internal validity; some were more likely to affect the study.

For example, maturation effects and mortality were reduced by using a simple and fun survey design along with decreasing the length of the survey as much as possible. Instrumental biases were taken into consideration when preparing the survey and since the survey was distributed online there was no present effect from the researcher. Selection biases were also taken into consideration as explained above.

4.10.3. Construct validity

According to Schriesheim and Cogliser (2009), historically validity has been divided into three subdivisions: content, criterion-related and construct validity. Construct validity has to do with the ability of the instrument in measuring the constructs of the scale; it a term that incorporates other types of validity such as content, convergent and criterion validity (Messick, 1979). To prove and assess construct validity multiple and different types of studies must be conducted (Ghiselli, Campbell, & Zedeck, 1981). Lin and Hsieh (2011) stated that SSTQUAL has proved to have good construct validity and also performed rigorous multiple studies and research in order to obtain the final SSTQUAL scale.

In spite the fact that demonstrating construct validity requires multiple studies, we aimed at establishing as much construct validity as possible by addressing content, convergent, discriminant and predictive validity according to the guidelines found in Bagozzi and Phillips (1982).

As for content validity, the scale items that were used in this study already have been used in the literature (Demirci Orel & Kara, 2014; Lin & Hsieh, 2011). Additionally, when developing the original SSTQUAL scale, items were reviewed by experts judges in order to assure content validity and also conducted thorough literature review (Lin & Hsieh, 2011). These are good indicators of content validity which according to Li, Rao, Ragu-Nathan and Ragu-Nathan (2005) requires a good review of the literature and interviews with experts and academicians.

In Chapter 5 we use different statistical measures in order to address issues of convergent and discriminant validity. Finally, we study relationships of the XTM service quality construct with other variables and show that they in accordance with the literature; this according to Li et al. (2005) is what predictive validity seeks to find.

Throughout the study, while preparing the survey and during the data collection phase the researchers kept in mind the different threats to reliability and validity; and accordingly worked on reducing the effect of such threats. Additionally, the SSTQUAL scale was applied to different industries and cultures by many other researchers who also stated the validity and reliability of this scale (Demirci Orel & Kara, 2014; Lin & Hsieh, 2011; Radomir & Nistor, 2012, 2014).

5. RESULTS

In previous chapters, we took a look at the latest research in SST and how its service quality is being measured. Also, we studied the basic theories that explained service quality, customer satisfaction and loyalty. Additionally, we explained the methodology used to prepare the survey instrument, collect the data and then analyze it.

This study aims at validating SSTQUAL scale developed by Lin and Hsieh (2011) in Turkey's participation banking industry for a new type of SST known as XTM along with applying the SSTQUAL to measure the service quality of the XTM. Then based on this scale find answers to the research questions which aim at testing for relationships between the evaluation of service quality of the XTM, customer satisfaction and customer loyalty.

In Chapter 5, we discuss the results of the statistical analyses conducted according to the methodology laid out in Chapter 4.

5.1. Data Preparation

In this section we explain all procedures that were necessary for obtaining the data and preparing it for statistical analyses that will be conducted in the coming Findings section. We first summarize how the survey was prepared and distributed. Then we explain how the data was transferred to SPSS 20 and coded. Finally, we show the results of using AMOS 20 to perform CFA and path analysis.

5.1.1. Data Collection

The survey instrument was adapted from SSTQUAL (Lin & Hsieh, 2011). The survey was translated into Turkish with the help of language experts. Then a focus group was used to assess the questions and how well they will be understood by the customers. After some modifications to the translation of the questions we set out to perform a pilot test. We gave the survey to 5 XTM users and asked for feedback on the survey.

The survey was found to be clear and understandable by the 5 XTM users. The only negative feedback was related to the security-related item “A clear privacy policy is stated when I use the XTM.” It was thought to be irrelevant with regard to the XTM. This was taken into consideration during the data analysis.

The next step was distributing the survey. As explained in the previous chapter, the XTM is relatively a new SST and has yet to become very common and available. Because of this, the population of XTM users is very small compared to the number of customers of KTPB. Additionally, KTPB has very strict policies regarding soliciting information from customers and distributing surveys.

Therefore, only an online survey was permissible and was sent to XTM users who accept receiving emails. More than 550 emails were sent out containing a link to the survey that is found on Typeform. After opening the link, a short description of the survey was provided. To prevent missing values and because the sample is very small, all the survey’s questions were marked as required. Afterwards, a total of 171 full responses were obtained; which were enough for the purposes of our study.

5.1.2. Data Entry

The data was downloaded from the website as an Excel sheet and was then transferred into IBM SPSS Statistics 20 for conducting the necessary statistical analyses. There were no missing values and therefore a total of 171 full responses were obtained. However, after scrutinizing the responses we found that there are 6 possible unengaged responses. Those 6 responses are not used in the analyses to prevent inaccurate results, hence a total of 165 responses are used in the study. We explain this in more detail in the next section.

The data was entered into SPSS and the relevant variables were defined for each item. It is important to note that in SPSS each item is defined as a variable, but throughout the study we use variable as a group of items. For example, the customer satisfaction variable contains many items or questions. Only in this section we use the word variable to describe an item in SPSS.

The data was coded according to the coding used in SSTQUAL (Lin & Hsieh, 2011), where each variable (dimension of quality) was abbreviated by three

letters along with a number to indicate the item or question number. For example, the enjoyment variable (ENJ) was measured by 4 items (questions): ENJ1 “The operation of the XTM is interesting”, ENJ2 “I feel good being able to use the XTM”, ENJ3 “The XTM has interesting additional functions”, ENJ4 “The XTM provides me with all relevant information”. (See Appendix C for the detailed coding used for each item and variable). The variables measured by the survey and that are of relevance to the study are the following:

- Independent variables:
    1. Functionality (FUN): measured by FUN1, FUN2, FUN3, FUN4 and FUN5.
    2. Enjoyment (ENJ): measured by: ENJ1, ENJ2, ENJ3 and ENJ4.
    3. Security/Privacy (SEC): measured by: SEC1, and SEC2.
    4. Assurance (ASU): measured by: ASU1, and ASU2.
    5. Design (DES): measured by: DES1, and DES2.
    6. Convenience (CON): measured by: CON1, and CON2.
    7. Customization (CUS): measured by: CUS1, CUS2, and CUS3.

- Dependent variables:
    1. Customer satisfaction (SAT): measured by: SAT1, SAT2, SAT3, and SAT4.
    2. Loyalty (LOY): measured by: LOY1, LOY2, LOY3, LOY4, and LOY5.

- Demographics:
    1. Age.
    2. Gender.
    3. Education.
    4. Frequency of banking transactions.
    5. Frequency of using XTM.
    6. Monthly income.

Even though we used the same dimension and items as SSTQUAL at the beginning, later on in the study some of the items may need to be pruned in order to achieve a better model fit.

5.2. Data Reliability and Validity

Before conducting any statistical test or analyses, it is important that the data used is reliable and valid. Invalid or unreliable data can lead to incorrect conclusions and findings. In the previous chapter we explained the steps that were taken during the preparation of the survey instrument and during the collection of the data in order to increase the reliability and validity of the study.

To ensure the collected data is reliable, before the statistical analyses were performed we conducted a general inspection of the data and looked for unengaged responses. We found that 6 of the 171 responses were possibly filled out by unengaged participants, because the answers to all the questions, excluding the demographics section, were the exact same answer. In order to ensure the accuracy of the results obtained by the analyses, we decided to remove these 6 possibly unengaged responses and ended up with a total of 165 full and valid survey responses which were used for the purposes of this study.

As for the reliability and validity of the scale, the scale used in this study SSTQUAL was proven to be valid and reliable (Lin & Hsieh, 2011). The authors also discussed the importance of revalidating the scale in different countries and within other industries. Other studies applied the scale in different countries and industries and found that the SSTQUAL scale is also valid and reliable in other contexts with some minor modifications to the number of dimensions and items (Demirci Orel & Kara, 2014; Radomir & Nistor, 2012, 2014). Based on these studies we can conclude that the SSTQUAL is a relatively reliable and valid scale.

Nonetheless we calculate the reliability scores of the dimensions of SSTQUAL and make sure that construct reliabilities are acceptable; see Table 5-1.

Table 5-1: Construct Reliability of SSTQUAL

Dimension	Cronbach Alpha
Functionality	0.918
Enjoyment	0.865
Security/Privacy	0.738
Assurance	0.834
Design	0.635
Convenience	0.666
Customization	0.901
Satisfaction	0.917
Loyalty	0.947

The Cronbach alpha for all the dimensions is above the 0.7 threshold used in the literature, with an exception of Design and Convenience which also received a score that is not very far from the accepted 0.7. Additionally, when dimensions contain less than 10 items it is common to attain reliability coefficients that are below 0.7 which is the case for the design and convenience dimensions (Pallant, 2007). Also, low alphas can be a result of sample homogeneity (Bernardi, 1994). The scale we are using has already been proved to be reliable and valid, which is why the attained alphas can be accepted.

In this section we provided a brief description of how the survey instrument was prepared, how the data was collected, and construct reliability of the dimensions is within the acceptable limits found in the literature. Also, we explained how the data was coded into SPSS 20 in preparation for performing the statistical analyses in the next section and discussing the results obtained.

5.3. Findings

In this section we delve into the details of the analyses that have been performed in order to find an answer to the research question. Firstly, we conduct a descriptive analysis of the results of the survey and take a general look at the responses of the customers. Secondly, we perform confirmatory factor analysis (CFA) using structural equation modeling (SEM) in AMOS 20. Thirdly, we conduct a path analysis to test our hypotheses.

5.3.1. Nonparametric Tests and Ordinal Data

Many researchers have debated whether Likert scale date can be analyzed with parametric statistical tests or not. On one hand, many have conducted studies proving that conclusions based on parametric tests will almost always give reliable results with the exception of very extreme cases. Additionally, a general look at the literature reveals that many scholars use parametric tests without even explaining why they made such assumptions and based on what information.

On the other hand scholars who opposed using parametric tests when analyzing Likert scale data continue to publish papers that urge the scientific community to be more wary of the fact that conclusions may be incorrectly used because of such carelessness when conducting statistical tests and analyses. This issue has been called upon especially in medical journals, where falsely deducted conclusions may lead to risks and danger on human life.

In order to avoid incorrect conclusions and to stay on the safe side, when applicable and possible we preferred nonparametric and stronger statistical tests to calculate results and find conclusions.

5.3.2. Demographics and statistical information

After assuring customers that the information will only be used for statistical analyses, participants were asked for: age, gender, education level,

how often they performed banking transactions, how often they used the XTM, and monthly income.

We used this information to learn more about the profile of customers who use the XTM. Also, gathering this information helps us better analyze the results and could be used to deduce certain conclusions. Many researchers have tried to find relationships between technology usage and certain demographic variables like age, gender and wealth class (Castillo-Manzano & López-Valpuesta, 2013; Chang & Yang, 2008; Simon & Usunier, 2007).

The descriptive statistics for all variables were calculated. The median and mode were used as central tendency measures and the interquartile range (IQR) as a measure of spread or variability. This is because the data at hand is ordinal and has been found by using Likert scale type questions. As mentioned earlier many have considered using the mean and standard deviation with this type of data as unacceptable and that it may lead to unsound conclusions. In addition to the above measures, frequency tables were also analyzed.

5.3.2.1. Age

Many have tried to study the effect of age on tendency to use technology and SSTs. On one hand, there are some who believe that age should not be used as a variable for studying its effect on technology usage (P. a. Dabholkar & Bagozzi, 2002). On the other hand in recent studies, there are some who tried to study the effect of age on cognitive thinking and how that may lead to preferring traditional services over SSTs (Simon & Usunier, 2007).

The median and mode of the sample is the interval 26-35 years. This is expected because many of the customers of KTPB are middle-aged working women and men. According to officials at the bank, this is KTBP's main customer segment because the tendency of such people to prefer participation banks over others due to religious beliefs. This is very noticeable because 61.2% of the sample is within this range; see Table 5-2.

We notice that the sample contains no customers who are 56 years old or above. This may be an indication that customers who are 56 years old and above do not prefer using the XTM because it is a new type of technology. However, we cannot make definite conclusions because this sample may not be representative.

This information would be more beneficial if it was compared with the number of customers in this range limit that use other types of banking channel e.g. mobile banking, internet banking, etc.

We believe that this should be investigated by KTBP because this age group may be avoiding even trying the XTM because of certain perceptions against SSTs.

Table 5-2: Age

	Frequency	Percent	Valid Percent	Cumulative Percent
18-25	38	23.0	23.0	23.0
26-35	101	61.2	61.2	84.2
36-45	20	12.1	12.1	96.4
46-55	6	3.6	3.6	100.0
Total	165	100.0	100.0	

5.3.2.2. Gender

In Table 5-3 we can see that 68.5% of the sample were males and 31.5% were females. This is expected because the workforce mainly consists of males and even though females are a good percentage of the workforce in Turkey, many families use joint accounts instead of opening different accounts.

Some studies found that females and males may differ with regard to their expectations of SSTs (Chang & Yang, 2008). Therefore, it is imperative that we take into consideration the differences between males and females when it comes to expectations of quality; especially that almost one third of the sample is females. It is also worth mentioning that other research found that females prefer self-service kiosks at airports (Castillo-Manzano & López-Valpuesta, 2013).

Table 5-3: Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	113	68.5	68.5	68.5
Female	52	31.5	31.5	100.0
Total	165	100.0	100.0	

5.3.2.3. Education

Based on the median and mode, most of the participants have a bachelor's degree. Also, 93.9% of the participants have at least one university degree; see Table 5-4. This is an important indication about the type of people who use the XTM. Previous research shows that customers with a university degree had an 11.5% more chance of preferring online check-in rather than traditional check-in at the airport (Castillo-Manzano & López-Valpuesta, 2013).

Table 5-4: Education

	Frequency	Percent	Valid Percent	Cumulative Percent
High school graduate	2	1.2	1.2	1.2
Bachelor's degree student	8	4.8	4.8	6.1
Bachelor's degree	89	53.9	53.9	60.0
Master's or PhD student	41	24.8	24.8	84.8
Master's or PhD degree	25	15.2	15.2	100.0
Total	165	100.0	100.0	

5.3.2.4. Frequency of Banking Transactions

We asked participants how often they performed banking transactions. It turns out that most of them perform them 2-3 times a week. More importantly, 83.6% of participants perform banking transactions 2-3 times a week or more; see Table 5-5. This however does not reflect how often they use the XTM as we will see in the coming section.

Table 5-5: Frequency of Banking Transactions

	Frequency	Percent	Valid Percent	Cumulative Percent
Daily	50	30.3	30.3	30.3
2-3 times a week	88	53.3	53.3	83.6
Once a week	18	10.9	10.9	94.5
Less than once a week	9	5.5	5.5	100.0
Total	165	100.0	100.0	

5.3.2.5. Frequency of using XTM

Despite the fact that most participants use the XTM sometimes (44.2%), many also rarely do (42.4%); see Table 5-6. Along with the responses of the previous question about the frequency of banking, we can conclude that a large number of participants prefer other banking channels over the XTM.

Table 5-6: Frequency of using XTM

	Frequency	Percent	Valid Percent	Cumulative Percent
Always	1	0.6	0.6	0.6
Often	12	7.3	7.3	7.9
Sometimes	73	44.2	44.2	52.1
Rarely	70	42.4	42.4	94.5
First time	9	5.5	5.5	100.0
Total	165	100.0	100.0	

5.3.2.6. Monthly Income

The monthly income of 31.5% of the participants is between 3,001 TL and 4,500 TL; see Table 5-7. Though some have found that income does affect the use of SSTs (Meuter et al., 2003), some also have found that people who are anxious about technology tend to have lower incomes (H. J. Lee & Yang, 2013).

This sample contains people with relatively low, medium and high income. Thus we cannot make any conclusion about the effect of income on the use of SSTs. But it seems that people who have a medium income are common users of the XTM.

Table 5-7: Monthly income

	Frequency	Percent	Valid Percent	Cumulative Percent
1,000 TL and lower	4	2.4	2.4	2.4
1,001 TL - 2,000 TL	11	6.7	6.7	9.1
2,001 TL - 3,000 TL	40	24.2	24.2	33.3
3,001 TL - 4,500 TL	52	31.5	31.5	64.8
4,501 TL - 6,000 TL	26	15.8	15.8	80.6
6,001 TL - 7,500 TL	13	7.9	7.9	88.5
7,501 TL - 9,000 TL	11	6.7	6.7	95.2
9,001 TL and above	8	4.8	4.8	100.0
Total	165	100.0	100.0	

5.4. Quality, Satisfaction and Loyalty Dimensions Descriptive Analysis

In the previous section, we analyzed the demographic data that was collected from 165 participants. We were also able to come to important conclusions about the sample at hand. In this section we will take a look at the participants' responses to the SSTQUAL, satisfaction and loyalty questions. The responses were collapsed into three categories: disagreement includes responses 1, 2, and 3), undecided (includes response 4), and agreement (includes responses 5, 6, and 7).

5.4.1. Functionality

5 questions regarding the functionality dimension were asked. We can see that 75.8% of the participants agree that the XTM provides for FUN1, FUN2, FUN3 and FUN4. The agreement and disagreement percentages for these four questions are very similar. However, we note that FUN5 "Each service item/function of the XTM is error-free" has the lowest percentage of agreement. Actually, about half of the participants either disagrees or is undecided about whether the XTM is error-free or not. It is important that managers consider the reasons why customers believe that the XTM is considered to have errors.

Table 5-8: Functionality

	Disagree	Undecided	Agree
FUN1: I can get my service done with the XTM in a short time.	9.1%	13.9%	77.0%
FUN2: The service process of the XTM is clear.	7.9%	10.3%	81.8%
FUN3: Using the XTM requires little effort.	9.7%	14.5%	75.8%
FUN4: I can get my service done smoothly with the XTM.	10.3%	12.7%	77.0%
FUN5: Each service item/function of the XTM is error-free.	20.0%	29.1%	50.9%

5.4.2. Enjoyment

From the 4 questions asked about the enjoyment dimensions, ENJ1 and ENJ2 received the highest percentage of agreement. They were followed closely by ENJ3. ENJ4 “The XTM provides me with all relevant information” received the lowest percentage of agreement compared to the rest. This may be an indication that when it comes to providing the information customers want the XTM is not as effective as it should be.

Table 5-9: Enjoyment

	Disagree	Undecided	Agree
ENJ1: The operation of the XTM is interesting.	5.5%	9.7%	84.8%
ENJ2: I feel good being able to use the XTM.	7.9%	10.9%	81.2%
ENJ3: The XTM has interesting additional functions.	6.7%	16.4%	77.0%
ENJ4: The XTM provides me with all relevant information.	13.9%	18.2%	67.9%

5.4.3. Security

Two questions were asked regarding the security dimension of SSTQUAL. Though 74.5% seem to agree that while using the XTM they feel safe (SEC1), only 62.4% agree that it states a clear privacy policy (SEC2). We also notice that the undecided are about 23.0%. During expert interviews and the pilot study many had commented that this question is not very clear and may not be applicable to the XTM.

Table 5-10: Security

	Disagree	Undecided	Agree
SEC1: I feel safe in my transactions with the XTM.	10.9%	14.5%	74.5%
SEC2: A clear privacy policy is stated when I use the XTM.	14.5%	23.0%	62.4%

5.4.4. Assurance

84.2% of participants believe that KTPB is a well-known bank and has a good reputation. Overall this percentage is one of the highest with regard to agreement between all the dimensions of SSTQUAL.

Table 5-11: Assurance

	Disagree	Undecided	Agree
ASU1: Kuveyt Turk Participation Bank is well-known.	7.3%	8.5%	84.2%
ASU2: Kuveyt Turk Participation Bank has a good reputation.	3.6%	5.5%	90.9%

5.4.5. Design

Two questions were asked about the design of the XTM. 81.8% agree that "The layout of the XTM is aesthetically appealing" and 72.1% agree that "The XTM appears to use up-to-date technology". It is worth investigating why approximately 28% of participants are either undecided or disagree with DES2 since the XTM is state of the art technology and is not found in any other bank in Istanbul.

Table 5-12: Design

	Disagree	Undecided	Agree
DES1: The layout of the XTM is aesthetically appealing.	7.9%	10.3%	81.8%
DES2: The XTM appears to use up-to-date technology.	9.7%	18.2%	72.1%

5.4.6. Convenience

Regarding convenience, 85.5% of the participants believe that the operating hours are convenient. However, 37.5% of participants are either undecided or

disagree with CON2 “It is easy and convenient to reach the XTM”. This is expected because XTMs are not as common as traditional branches and ATMs. Therefore, customers may feel that the XTM is not very reachable. Improving the geographical distribution of the XTMs should be considered in order to improve this item.

Table 5-13: Convenience

	Disagree	Undecided	Agree
CON1: The XTM has operating hours convenient to customers.	4.2%	10.3%	85.5%
CON2: It is easy and convenient to reach the XTM.	13.3%	24.2%	62.4%

5.4.7. Customization

This dimension seems to receive the least percentage of agreement overall. There are about 35.7% of the participants that are either undecided or disagree with CUS1, CUS2 and CUS3. Only 57.0% agree that “The XTM has features that are personalized for me”. This is very important especially when it comes to SSTs, because one of the main advantages or differences between traditional services and SSTs are a customer’s ability to personalize and shape the service process as s/he wishes. Thus it is of great importance that managers consider why customers did not agree with these items.

Table 5-14: Customization

	Disagree	Undecided	Agree
CUS1: The XTM understands my specific needs.	11.5%	24.2%	64.2%
CUS2: The XTM has my best interests at heart.	11.5%	26.1%	62.4%
CUS3: The XTM has features that are personalized for me.	18.2%	24.8%	57.0%

5.4.8. Customer satisfaction

4 questions were asked in order to measure the degree of satisfaction of customers. 91.2% of the participants agreed with items SAT1, SAT2, and SAT3. However, fewer participants seem to agree with SAT4 “I am extremely pleased with the quality of service provided by the XTM”. This may be an indication that satisfaction of customers with KTBP in general is higher than their satisfaction with the services provided by the XTM.

Table 5-15: Customer Satisfaction

	Disagree	Undecided	Agree
SAT1: Generally I am very happy with this bank.	3.0%	4.8%	92.1%
SAT2: I am extremely pleased with the quality of service provided by this bank.	3.6%	4.2%	92.1%
SAT3: This bank meets my expectations.	5.5%	3.6%	90.9%
SAT4: I am extremely pleased with the quality of service provided by the XTM.	7.9%	14.5%	77.6%

5.4.9. Customer Loyalty

Participants were asked 5 questions to measure their loyalty towards KTBP. Based on the responses to LOY1, LOY2, LOY3, and LOY4 more than 90% of the participants would recommend KTBP to others and also they themselves bank at KTBP. In spite of the also relatively high percentage regarding LOY5 “This bank is my preferred bank”, it seems that when it comes to preference approximately 15% of the participants are hesitant or do not prefer KTBP. The reasons behind this should definitely be investigated especially that many customers also seem to agree that they would recommend KTBP to others and they themselves would bank again at it.

Table 5-16: Customer Loyalty

	Disagree	Undecided	Agree
LOY1: I would deal with this bank again.	4.2%	3.0%	92.7%
LOY2: I would recommend this bank to any of my friends.	4.2%	3.6%	92.1%
LOY3: If I need to bank again, I would come to this bank.	3.6%	2.4%	93.9%
LOY4: I would speak positively about this bank to others.	2.4%	3.0%	94.5%
LOY5: This bank is my preferred bank.	7.3%	9.1%	83.6%

5.5. Confirmatory Factor Analysis (CFA)

In the previous sections we analyzed and studied the responses to the survey. First we studied the general profile of the sample by studying their demographics. Second we analyzed the agreement and disagreement percentages of each item in the survey.

One of the main objectives of the research was to validate the previous SSTQUAL model or modify it so that it is reliable and valid for using in the banking industry and especially for a new type of SST i.e. the XTM. Now we will perform CFA to deduce model parameters and the factor structure using AMOS 20. After that we will find an answer to the research questions by testing our hypotheses using path analysis.

CFA is performed in order to validate the results obtained by previously conducted research with regard to the SSTQUAL scale (Demirci Orel & Kara, 2014; Lin & Hsieh, 2011; Radomir & Nistor, 2012).

Before performing the CFA we test for sampling adequacy by checking the Kaiser-Meyer-Olkin (KMO) measure, which is an index showing whether there are linear relationships between the variables and accordingly if it is appropriate for factor analysis. The closer KMO is to 1 the better. The overall KMO is 0.908 which according to (Kaiser, 1974) is marvelous. With the exception of ASU1 which has a KMO measure that is meritorious, all the variables have a KMO

measure which is above 0.9 and according to Kaiser (1974) is marvelous. We conclude that our sample is adequate for performing CFA.

We also examine the results of Bartlett's test of spherecity which has a null hypothesis that states that the correlation matrix is an identity matrix i.e. there are no correlation between the variables. The significance of the test is below 0.005.Based on the previous discussion our data is found to be suitable for factor analysis.

To test the validity of the model, we used AMOS 20 to perform confirmatory factor analysis and evaluated the necessary model fit indices. During CFA, two variables were found to be nonconforming with our model and thus were removed in order to improve the general model fit. These items are ENJ4 from the Enjoyment factor and SAT4 from the Customer Satisfaction factor. After the process of pruning, the resulting fit indices can be found in Table 5-17.

Table 5-17: Model Fit

Model Fit Index	$\chi 2$	$\chi 2/df$	CFI	IFI	TLI	RMSEA	PNFI
Value	669.368	2.139	.910	.911	.900	.083	.754

All the fit indices are within the acceptable limits of the literature. The $\chi 2/df$ is below 3 which is a reasonable fit (Marsh & Hocevar, 1985).The comparative fit index also shows good fit (Bentler & Stein, 1992). The incremental fit index (IFI=0.911) and the Tucker-Lewis index (TLI=0.900) also show good fit. Finally the root mean square error of approximation (RMSEA=0.083) is within the acceptable limit (Browne & Cudeck, 1992). The parsimonious normed fit index (PNFI=0.754) is also above 0.7.

In addition, the standardized factor loadings were estimated and validity was checked. The standardized factor loadings can be found in Table 5-18. All factor loadings are significant and above 0.7 with the exception of DES2 that has a loading of 0.662 which also acceptable. In turn, this indicates convergent validity (J. C. Anderson & Gerbing, 1988).

Table 5-18: Factor Loadings

Variable	Coding	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9
Functionality										
I can get my service done with the firm's SST in a short time.	FUN1	0.87								
The service process of the firm's SST is clear.	FUN2	0.829								
Using the firm's SST requires little effort.	FUN3	0.818								
I can get my service done smoothly with the firm's SSTs.	FUN4	0.889								
Each service item/function of the SST is error-free.	FUN5	0.726								
Enjoyment										
The operation of the firm's SST is interesting.	ENJ1		0.809							
I feel good being able to use the SSTs	ENJ2		0.878							
The firm's SST has interesting additional functions	ENJ3		0.8							
Security/Privacy										
I feel safe in my transactions with the firm's SST.	SEC1			0.76						

A clear privacy policy is stated when I use the firm's SST	SEC2			0.77						
Assurance										
The firm providing the SST is well-known	ASU1				0.832					
The firm providing the SST has a good reputation	ASU2				0.869					
Design										
The layout of the firm's SST is aesthetically appealing.	DES1					0.707				
The firm's SST appears to use up-to-date technology	DES2					0.661				
Convenience										
The SST has operating hours convenient to customers.	CON1						0.789			
It is easy and convenient to reach the firm's SST.	CON2						0.64			
Customization										
The firm's SST understands my specific needs.	CUS1							0.84		
The firm's SST has my best interests at heart.	CUS2							0.931		
The firm's SST has features that are personalized for me	CUS3							0.85		
Satisfaction										

Generally I am very happy with this bank.	SAT1								0.877	
I am extremely pleased with the quality of service provided by this bank.	SAT2								0.907	
This bank meets my expectations.	SAT3								0.88	
Loyalty										
I would deal with this bank again.	LOY1									0.9
I would recommend this bank to any of my friends.	LOY2									0.929
If I need to bank again, I would come to this bank.	LOY3									0.963
I would speak positively about this bank to others.	LOY4									0.886
This bank is my preferred bank.	LOY5									0.801

We also calculated the coefficient alphas, average variance extracted (AVE) and the composite reliability (CR) for all the variables, see Table 5-19.

Table 5-19: Correlation Validity and Reliability Coefficients

Variables		1	2	3	4	5	6	7	8	9
Functionality	1	(.83)								
Enjoyment	2	0.57**	(.83)							
Security/Privacy	3	0.69**	0.54**	(.77)						
Assurance	4	0.51**	0.37**	0.49**	(.85)					
Design	5	0.49**	0.47**	0.59**	0.49**	(.68)				
Convenience	6	0.52**	0.46**	0.6**	0.45**	0.66**	(.72)			

Customization	7	0.57**	0.43**	0.69**	0.43**	0.57**	0.73**	(.87)		
Satisfaction	8	0.43**	0.33**	0.45**	0.69**	0.45**	0.5**	0.42**	(.89)	
Loyalty	9	0.43**	0.38**	0.42**	0.58**	0.37**	0.4**	0.34**	0.68**	(.90)
Mean		5.36	5.82	5.15	5.86	5.46	5.39	4.96	5.97	6.18
Standard Deviation		1.27	1.24	1.31	1.13	1.21	1.16	1.40	1.09	1.07
AVE		0.69	0.69	0.59	0.72	0.47	0.52	0.76	0.79	0.81
Composite Reliability		0.92	0.87	0.74	0.84	0.64	0.68	0.91	0.92	0.95
Cronbach Alpha		0.92	0.87	0.74	0.83	0.64	0.67	0.90	0.92	0.95

**p<0.01

Note: Numbers on diagonals represent the square root of AVE.

All the measures are either above or very close to the limitations provided by the literature (Fornell & Larcker, 1981). All AVEs are above the recommended 0.5 level suggested by Bagozzi, Yi and Singh (1991); except for Design (AVE=0.47) which also very close to the limit. The AVEs also show acceptable levels of discriminant validity (Demirci Orel & Kara, 2014). However, we also notice that all correlations of the Design factor are below the square root of AVE. As for the correlations, they are all below the corresponding square root of AVE except for the correlation of Customization and Convenience (0.73) which is very close to the square root of AVE (0.72). Also, the results show us that all the dimensions have a Cronbach's alpha that is greater than 0.7 which is the recommended threshold in the literature (Kline, 2005); however Design and Convenience are a bit lower than the threshold but are still very close to the minimum requirement. In addition, it is common to see lower than 0.7 reliability coefficients for dimensions with less than 10 items (Pallant, 2007).

According to the discussion above and the measures of validity and reliability, we conclude that our model is fit, reliable and valid. Thus, we use it to test of our hypotheses in the coming section.

5.6. Hypothesis Testing

In this section we test the hypotheses of this study in order to answer the research questions. This study aims at answering the question: Are the dimensions of quality of SSTQUAL significantly related to SAT and LOY in Turkey? In the previous section, reliability and validity analyses help us conclude that our model is reliable and valid in the participation banking industry in Turkey for the XTM. Accordingly, we use structural equation modeling (SEM) in AMOS 20 to test the following hypotheses that were explained and developed in the literature review; see Table 5-20.

- H1: XTM service quality has a positive effect on customer satisfaction.
- H2: XTM service quality has a positive effect on customer loyalty.
- H3: Customer satisfaction has a positive effect on customer loyalty.
- H4: Customer satisfaction has a mediating effect on the relationship between XTM service quality and customer loyalty.

Table 5-20: Path Model

Hypotheses	Path	Path Value	Result
H1	XTM Service Quality -> Customer Satisfaction	0.878***	Supported
H2	XTM Service Quality -> Customer Loyalty	0.894***	Supported
H3	Customer Satisfaction -> Customer Loyalty	1.048***	Supported
H4	XTM Service Quality -> Customer Satisfaction	0.902***	Supported
	XTM Service Quality -> Customer Loyalty	-0.102	
	Customer Satisfaction -> Customer Loyalty	1.111***	

***p<0.01

As seen in Table 5-20 all the hypotheses of the model are supported. The first hypothesis which states that there is a positive effect of XTM service quality on customer satisfaction is supported with ($\beta = .878$ $p < .01$). This shows us that customers who are satisfied with the SST are also more likely to have evaluated the XTM service quality as high. This is important for managers because any increase in the XTM service quality directly leads in an increase in customer satisfaction.

As for the second hypothesis we hypothesize that XTM service quality has a positive effect on customer loyalty which is also supported with ($\beta = .894$ $p < .01$). This means that in order to increase customer loyalty, firms must work to increase the service quality of the XTM or SST.

The third hypothesis which states that customer satisfaction has a direct effect on customer loyalty is also supported with ($\beta = 1.048$ $p < .01$). Thus we find that similar to the literature, there is a direct effect of customer satisfaction on customer loyalty. Additionally, this also helps support the fourth hypothesis which states that customer satisfaction has a mediator effect on the relationship between XTM service quality and customer loyalty.

Finally, the fourth hypothesis which states that customer satisfaction is a mediator in the relationship between XTM service quality and customer loyalty is also supported. First, we showed that the independent variable i.e. XTM service quality directly affects the mediator which is customer satisfaction; this was supported in the first hypothesis. Second, we show that the independent variable (XTM service quality) directly impacts the dependent variable i.e. customer loyalty; this was supported in the second hypothesis. Third, we show that the mediator (customer satisfaction) directly impacts the dependent variable (customer loyalty) and that when the mediator is kept in the path analysis, the relationship between the independent variable (XTM service quality) and the dependent variable (customer loyalty) no longer is supported. Accordingly, we have proved that the fourth hypothesis is also supported because of the effects explained above which were based upon the model for testing mediator effects (Baron & Kenny, 1986).

As we saw above, XTM service quality was found to have a direct impact on both customer loyalty and satisfaction. These results are in accordance with

previous literature and theory; thus indicating that the model also has good predictive validity (Bagozzi, Yi, & Phillips, 1991). Additionally, customer satisfaction was found to affect customer loyalty and mediate the effect between it and XTM service quality. This is very important for any service provider because retaining customers and increasing their loyalty is one of the most important goals of any service provider. The cost of gaining a new customer is much higher than retaining a customer who has already been satisfied by your service (Reichheld & Schefter, 2000). Also, because all the dimensions of SSTQUAL were found to be valid and strongly affect XTM service quality, service providers should also take special care in providing for the 7 dimensions of quality found in SSTQUAL.

6. CONCLUSION AND FURTHER RESEARCH

The aim of this study was to first test whether the SSTQUAL model developed by Lin and Hsieh (2011) is replicable and valid in the participation banking industry in Turkey when applied to a new type of technology called XTM (an advanced type of VTM). Also, it aimed at testing whether a relationship exists between the evaluation of customers of the XTM service quality and customer satisfaction and loyalty. In addition, it aimed at studying the nature of the relationships between these three variables.

The model was first validated using structural equation modeling and was found to be sound, valid and reliable. Therefore, we concluded that the model that consists of SSTQUAL quality dimensions, customer satisfaction and customer loyalty is a valid model that was replicated in a different industry (i.e. participation banking), a different culture (i.e. Turkey) and a different type of SST i.e. XTM. This was an important step because to the best of our knowledge this has not been performed before in the same conditions. Thus we added to the very scarce literature about applying SSTQUAL to different cultures, industries and SSTs. Our results also were congruent with the literature in terms that the SSTQUAL was found to be replicable but with some minor pruning and modifications.

Furthermore, we supported literature that studies the relationships between SST service quality, customer satisfaction, and customer loyalty. We found that the XTM service quality does have a direct impact on customer satisfaction and customer loyalty. This is of great important to companies who own any type of SST and wish to increase their customers' satisfaction and loyalty. We also went a step further and showed that the relationship between these three variables includes a mediation effect. Customer satisfaction was found to have mediator effect on the relationship between XTM service quality and customer loyalty.

In conclusion, we contributed to the literature by showing that the SSTQUAL model is a generalizable model and can be replicated in the participation banking industry and in a different culture i.e. the Turkish culture. We also showed that the SSTQUAL provides a general good fit when studying the service quality of new types of technology or SSTs. We also contributed in showing that customers'

evaluation of SST service quality directly impact customer loyalty and customer satisfaction. Also, that when it comes to SSTs, customer satisfaction was found to have a mediating effect in the relationship between SST service quality and customer loyalty.

As for practical implications, companies who use SSTs can benefit from applying the SSTQUAL model to evaluate customers' perceptions of the quality of the SST. Also, they can use the same model used in this study to also evaluate customer satisfaction and customer loyalty. These two measures are very important for companies who wish to gain a competitive advantage over other companies who provide the same services. This study also showed that generally speaking many people are getting used to using SSTs in daily life and are overall satisfied with such technology and accordingly satisfied with the companies who provide the SST.

In addition, we believe that managers should focus on measuring the service quality of SSTs that they own and thoroughly study the dimensions of quality that the customers perceive as important. Customers should be constantly asked for their perceptions about the performance of the SST in each of the dimensions of quality and accordingly modifications should be made in order to improve the performance and service quality of the SST. Managers should also make sure that the dimensions that exist in the model are capable of addressing all the different needs and expectations of customers regarding the SST being used.

This study also showed that the service quality of the SST has a direct positive effect on customer satisfaction and loyalty which are necessary for organizations to survive in competitive markets. Thus, firms that do not use SSTs are advised to consider using such technologies. However, such managers should be aware of the effect the service quality of the SST has on their customers' satisfaction and therefore should invest in constantly measuring their customers' perceptions of the SST's service quality.

Our suggestion for further research is that this scale should be expanded item-wise and should contain a list of different variables and dimensions. The results of our study along with those of previous studies that aimed at applying the SSTQUAL in a different environment or with a different type of SST (Demirci Orel & Kara, 2014; Radomir & Nistor, 2012); show us that a single scale that applies to all cultures and all different technologies is not possible to achieve. With the expanding

of technology and the immergence of new types of SSTs, using a single model or scale to measure service quality of SSTs is not very wise or applicable. Further studies should try to create a new expanded scale with a larger number of items and dimensions. Then when a service provider or practitioner wishes to study an SST, they would apply the scale in a pilot study and validate the items and dimensions. They would then prune any items that do not fit or that decrease the scale consistency.

Finally, the main limitation of this study was the population and sample at hand. The XTM is a very new type of SST and state-of-the-art technology which is only used by KTPB. To the best of our knowledge, there are no banks in Turkey that use the same technology. Thus, surveys were only distributed to users of the XTM that is used by KTPB. This led to having a small sample size and prevented us from applying this survey and model across different banks in Turkey.

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BIOGRAPHY

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