

Customer Perceptions of Technology-Based Banking Service Quality Provided by Banks
Operating in Yemen

by

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of the Requirements for the Degree
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CUSTOMER PERCEPTIONS OF TECHNOLOGY-BASED BANKING SERVICE
QUALITY PROVIDED BY BANKS OPERATING IN YEMEN

by

Sharaf Mutahar Alkibsi

November 2010

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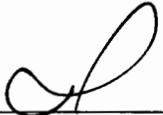
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Abstract

Technology-based banking services (TBBS) are quickly expanding and provide cost reductions per transaction, given increasing labor costs. However, TBBS can be very costly if not introduced correctly. It is critical to have a clear understanding regarding how to best implement, manage, and promote TBBS for success. The purpose of this quantitative correlational descriptive research study was to determine if a set of technology-based banking service quality dimensions had an association with customer satisfaction and behavioral intentions toward TBBS in Yemen. Findings revealed evidence that seven service quality dimensions—functionality, enjoyment, security, assurance, design, convenience, and customization—suggested by Lin and Hsieh (2006) were significantly associated with customer satisfaction and behavioral intentions toward TBBS in Yemen ($N = 465, p < .05$). The findings contained descriptive and inferential statistical analysis to describe service quality dimensions and customer perceptions of TBBS. The study includes a recommendation that bank leaders focus on service enjoyment and customization to enhance customers' experience using TBBS. Additional research venues were discussed to improve self-service technologies within the banking industry in Yemen.

Dedication

I dedicate this dissertation to those who have contributed to my education and assisted me in every way. My parents, wife, daughter, sisters, nephews, nieces, in-laws, uncles, cousins, friends, sponsors, employers, employees, students, and teachers—thank you all for your help and your inspiration.

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that enables people like me to access world-class education and gain from a distinguished pool of instructors, administrators, and resources.

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Chapter 1: Introduction

In light of the recent financial crisis and global economic recession, leaders of financial institutions are under additional pressure not only to maintain customer satisfaction (SAT) while sustaining lower costs, but also to maintain market leadership. To lower costs and maintain market leadership, bank leaders in Yemen have capitalized on superior service quality and technological infrastructure (Willems, 2004). Research on these strategies has indicated that SAT correlates with profitability (Anderson, Fornell, & Lehmann, 1994; Wan, Luk, & Chow, 2004), loyalty (Fornell, 1992), and positive customer behavioral intentions (BI; Zeithaml, Berry, & Parasuraman, 1996).

Service quality assessment within the banking industry requires further investigation. The current study involved examining the relationship between the perceived quality dimensions of technology-based banking services (TBBS) and SAT and BI toward TBBS. This chapter includes the background of the problem, statement of the problem, purpose of the study, significance of the study, and significance of the study to leadership. The chapter also includes the nature of the study, research question, hypotheses, theoretical framework, and definitions. The chapter also includes assumptions, limitations, delimitations, and a summary of the chapter.

Background of the Problem

This section contains an explanation of the motivation for the study through a thorough examination into the background of the problem. The section includes a discussion on social concerns and theoretical interests for the study to reveal how the study contributes to the theoretical knowledge base. A discussion regarding the Yemen

banking industry and research conducted on TBBS helps to inform the reader by providing a historical context.

Yemen banking industry. The economics of banking services in Yemen involve managing limited resources to generate economic welfare and growth. Globalization has affected how goods and services transfer from one country to another as well as within a country (Keegan & Green, 2008). Policy makers and regulators continue to encourage businesses for public benefit by stimulating the supply and demand for banking services in Yemen.

Supply of banking services. The supply of banking services is increasing in Yemen because of the deregulations of the banking industry (Central Bank of Yemen, 2008) and the government of Yemen's decision to join the World Trade Organization in 2000 (World Trade Organization, 2008). Although banking deregulations triggered industry change and intensive competition, joining the World Trade Organization enabled international banks to enter into the local market. The focus of banks in Yemen has been introducing TBBS to compete and offer customers a wide range of service options (Credit Agriculture Cooperative Bank, 2006; International Bank of Yemen, 2008; National Bank of Yemen, 2008; Yemen Bank of Reconstruction and Development, 2008; Yemen Gulf Bank, 2008).

Analysts at the National Bank of Yemen (2008) reported a strategic focus on organizational restructuring to meet technological implementation and automation plans in 2008 and offering a range of service options. Bank spending on TBBS yields approximately 7.3% of bank revenues based on an industry standard of 3-year asset depreciation (National Bank of Yemen, 2008). Compared with the industry average of

6.6%, Harris, Herron, and Iwanichi (2008) considered the ratio to be “very aggressive” (p. 47). The enormity of the investments in TBBS complements investments in organizational development and capacity building to ensure returns on investment and to meet stakeholders’ demands.

Demand for banking services. Regulators in Yemen are focusing on the increasing number of banking consumers because of the important role of banking to the economy (Central Bank of Yemen, 2008). Analysts at the Central Bank of Yemen reported an association between an increase in the number of banking customers and the introduction of TBBS. Yemen has a population of approximately 25 million (Central Statistics Organization [CSO], 2008). The Central Bank of Yemen analysts also noted the existence of approximately 1 million bank accounts in Yemen, indicating four bank accounts exist for every 100 people in Yemen, which is very low when compared with the international average of 187 bank accounts for every 100 people (Bank for International Settlements, 2009). One strategy to increase the number of bank accounts is to encourage banks to offer TBBS.

Research on technology-based banking services. A review of the literature revealed extensive research regarding the nature of services, service quality dimensions influencing customer perceptions, SAT, and BI (Parasuraman, Zeithaml, & Berry, 1988; Seth, Deshmukh, & Vrat, 2005), although limited research exists on understanding customer perceptions of TBBS (Shamdasani, Mukherjee, & Malhotra, 2008). The development of technology-based services (TBS) has triggered further research on what constitutes better service quality in TBS (Dabholkar, 1994; Meuter, Bitner, Ostrom, & Brown, 2005; Parasuraman, Zeithaml, & Malhotra, 2005; Zhu, Wymer, & Chen, 2002).

Lin and Hsieh (2006) provided a model and a survey instrument to examine service quality within TBS and indicated that functionality, enjoyment, security, assurance, design, convenience, and customization constitute service quality dimensions within self-service technologies (SSTQUAL) associated with SAT and BI. While these dimensions are general to TBS across industries, no research has included an evaluation of the service quality of TBS in the banking industry. Lin and Hsieh called for further research in the area of service quality of TBS in the banking industry. Abuhatem (2004) reported a lack of research in assessing service quality within banking services in Yemen.

Statement of the Problem

The general problem is that some customers report a feeling of dissatisfaction with technology-based banking service quality (MarebPress, 2009), which presents a challenge to bank leaders who have invested in the technologies to gain SAT and favorable BI. Service quality assessment is an important leadership task needed to achieve organizational success (Glaveli, Petridou, Liassides & Spathis, 2006). Lin and Hsieh (2006) described seven dimensions (functionality, enjoyment, security, assurance, design, convenience, and customization) that constitute customer expectations of service quality within self-service technologies. The specific problem is the quality of technology-based retail banking services in Yemen need improvement to increase SAT and behavioral retention (MarebPress, 2009).

The current quantitative correlational research design involved an examination into whether a relationship exists between perceived service quality as employed in TBBS within Yemen banks and SAT and BI as a response to TBBS. The population of the study was retail banking customers in Yemen. The findings might help to inform

bank leaders how to improve service quality and also provide a framework to understand TBBS.

Purpose of the Study

The purpose of the quantitative correlational study was to determine if a set of technology-based banking service quality (TBBSQUAL) dimensions have an association with SAT and BI toward TBBS in Yemen. The study involved testing the seven dimensions suggested by Lin and Hsieh (2006) in a specific industry (banking) and population (Yemen). Dimensions of TBBSQUAL consisted of functionality, enjoyment, security, assurance, design, convenience, and customization (Lin & Hsieh, 2006). The predictor variables (independent variables) were TBBSQUAL dimensions. The criterion variables (dependent variables) were SAT and BI. The study involved an examination into perceptions of current retail banking customers who used TBBS in Yemen banks to determine the relationship between TBBSQUAL dimensions and SAT and BI.

A quantitative research method with a correlational design that made use of a survey was appropriate for the study. A quantitative method was appropriate because the primary objective of the study was to describe possible relationships and correlations between variables (Creswell, 2008). The qualitative method involved an attempt to explore a central phenomenon. Correlational research, unlike experimental research, does not need to have a control group and an experimental group to find causes and effects. Correlational methods can help to determine if, and to what extent, a relationship exists between two variables (Vogt, 2007). A survey instrument that uses a 7-point Likert-type format was designed to collect participant perceptions to conduct statistical comparison (see Appendix A for survey instrument).

Significance of the Study

The research study provided original contributions to fill two main knowledge gaps. First, the study contributed to current and future research by comparing and contrasting related literature. Second, the study provided a practical application to measure service quality within TBBS in Yemen.

Contribution to current and future research. The present study involved identifying constituencies that construct the service quality of TBBS in Yemen. Findings of the study provided evidence supporting the results in previous literature such as Lin and Hsieh (2006). Lin and Hsieh recommended future research of TBS in the banking industry. TBBSQUAL was a continuation of the service quality (SERVQUAL) model developed in 1988 to conceptualize and operationalize service quality. The findings reported the association between service quality and technology with SAT and BI in the Yemeni banking industry where limited research on the subject previously existed.

Practical application. The current study included an assessment model that might help bankers and researchers investigate customer perceptions of TBBS. Previously researchers have operationalized service quality by developing assessment scales such as SERVQUAL (Parasuraman et al., 1988), WebQual (Loiacono, Watson, & Goodhue, 2002), eTailQ (Wolfenbarger & Gilly, 2003), SITEQUAL (Yoo & Donthu, 2001), and E-S-QUAL (Parasuraman et al., 2005). The current study confirmed a TBBSQUAL model to help bankers in Yemen to monitor and assess TBBS. The research findings from the study made it feasible for bankers in Yemen to be able to identify shortfalls of service quality and allocate resources to prevent and improve customer perceptions and behaviors toward TBBS.

Significance of the Study to Leadership

The findings of the research study might help two main leadership groups: bank leaders and technology leaders. The research study involved identifying service quality dimensions associated with TBBS to capture SAT and BI. Deming (1982) highlighted the role of leadership in the success of quality initiatives to foster a chain reaction: quality, productivity, lower costs, and capturing the market. The information indicated service quality dimensions that organization leaders need to adopt within the organization vision and culture to meet the demand for technological advancement (Diamante & London, 2002).

Bank leaders invest in TBBS to offer customers multiple service options with the support of technology providers (Willems, 2004). Creating a framework to empower both bank leaders and technology providers would maximize the returns on investment in TBBS and motivate customers to consume more TBBS. The study added valuable information to the body of knowledge on how to lead a successful implementation of TBBS. Results from the study provided the body of leadership with knowledge of a consistent approach to employ successful banking services in Yemen to ensure SAT and positive customer reactions.

Nature of the Study

The current study involved the use of a quantitative, correlational, descriptive research methodology to examine a relationship between service quality dimensions (independent variables) and SAT (dependent variable) and BI (dependent variable). The selected research method was appropriate because the primary objective of the study was

to describe possible relationships and correlations between variables (Creswell, 2008). In contrast, qualitative methods involve exploring a central phenomenon.

Correlational researchers, unlike experimental researchers, do not need to have a control group and an experimental group to find causes and effects. Correlational methods helped to determine if, and to what extent, a relationship exists between two variables. The correlational method provided an analysis of variance (ANOVA) for hypotheses tests and evaluations such as a *t* test, an *F* test, and Pearson's *r* (Lind, Marchal, & Wathen, 2008).

The current study included an adaptation of an existing survey instrument to gather data from a sample of the population. Using a Likert-type survey to measure customer perceptions quantitatively facilitated a statistical data set to measure and correlate TBBSQUAL, SAT, and BI. The basis of the survey instrument was the valid and reliable SSTQUAL survey instrument (Lin & Hsieh, 2006), which was adapted and validated further by a pilot study for the purpose of the study. Unlike the use of any other survey instrument, using the SSTQUAL survey instrument enabled comparing and contrasting the findings of the study with the findings by Lin and Hsieh (2006).

Participants were recruited from current retail banking customers from 10 banks in Yemen. Participants were recruited to complete the survey during their visit to bank branches and automated teller machine (ATM) locations. The study included the use of both quota sampling and convenience sampling procedures to collect data from over 300 participants to achieve a significant sample size to remain at a 3% sampling error rate and a power criterion of .80 for effect size of .20 at an alpha level of 5% (Creswell, 2008).

Research Question

Because retail-banking customers reported dissatisfaction with TBBS in Yemen (MarebPress, 2009), the research question investigated service quality dimensions suggested by Lin and Hsieh (2006) and associated with SAT and BI within TBBS in Yemen. The research question was as follows:

Research Question: Which combinations of functionality, enjoyment, security/privacy, assurance, design, convenience, and customization, which are service quality dimensions in TBBS, have an association with SAT and BI toward TBBS in Yemen?

Hypotheses

A set of hypotheses was tested to answer the research question based on the study problem and purpose. The hypotheses were a guide to the research process. Each involved a prediction that the data might or might not support. Two-sided statistical tests were performed at an alpha level of 5% to either reject or accept the hypotheses. H_0 represents a null hypothesis and H_a represents an alternative hypothesis.

The set of hypotheses related to the study's research question. The hypotheses addressed each of the service quality dimensions: functionality, enjoyment, security/privacy, assurance, design, convenience, and customization in relationship with SAT and BI. Researchers have used the same pattern of hypotheses in several quantitative research studies in the domain of service quality dimensions, SAT, and BI (Cronin, Brady, & Hult, 2000; Yen, 2005). The hypotheses were as follows.

H_{10} : No correlation exists between customer evaluation of technology-based banking service functionality and SAT and BI toward TBBS in Yemen.

H1_a: A significant correlation exists between customer evaluation of technology-based banking service functionality and SAT and BI toward TBBS in Yemen.

H2₀: No correlation exists between customer evaluation of technology-based banking service enjoyment and SAT and BI toward TBBS in Yemen.

H2_a: A significant correlation exists between customer evaluation of technology-based banking service enjoyment and SAT and BI toward TBBS in Yemen.

H3₀: No correlation exists between customer evaluation of technology-based banking service security and SAT and BI toward TBBS in Yemen.

H3_a: A significant correlation exists between customer evaluation of technology-based banking service security and SAT and BI toward TBBS in Yemen.

H4₀: No correlation exists between customer evaluation of technology-based banking service assurance and SAT and BI toward TBBS in Yemen.

H4_a: A significant correlation exists between customer evaluation of technology-based banking service assurance and SAT and BI toward TBBS in Yemen.

H5₀: No correlation exists between customer evaluation of technology-based banking service design and SAT and BI toward TBBS in Yemen.

H5_a: A significant correlation exists between customer evaluation of technology-based banking service design and SAT and BI toward TBBS in Yemen.

H6₀: No correlation exists between customer evaluation of technology-based banking service convenience and SAT and BI toward TBBS in Yemen.

H6_a: A significant correlation exists between customer evaluation of technology-based banking service convenience and SAT and BI toward TBBS in Yemen.

H7₀: No correlation exists between customer evaluation of technology-based banking service customization and SAT and BI toward TBBS in Yemen.

H7_a: A significant correlation exists between customer evaluation of technology-based banking service customization and SAT and BI toward TBBS in Yemen.

Theoretical Framework

The basis of the theoretical framework of the study was the expectancy theory (Vroom, 1964), the hierarchy of needs theory (Maslow, 1954), the expectation-disconfirmation theory (Oliver, 1980), and the SERVQUAL conceptual model (Parasuraman et al., 1988). Researchers have associated service quality with SAT and BI (Cronin et al., 2000; Hackl & Westlund, 2000; Jain & Gupta, 2004). Customer satisfaction includes cognitive and emotional attitudes that translate into intentions (Oliver, 1980). Based on the theory of planned behavior, intentions are valid predictors of an individual's actual behavior (Ajzen, 1991). These theories provide a theoretical framework that identifies service quality perceptions in relation to SAT and BI.

Vroom's (1964) expectancy theory indicates that humans feel motivated to perform a task based on three factors: (a) perception that one can do the task, (b) perceptions that the task will reach to results, and (c) perceptions that the results are desirable. Based on the expectancy theory, customers might feel motivated to use TBBS only if they perceive that TBBS will perform as expected; customers might not feel motivated to use TBBS if they do not perceive technology is operating properly.

Maslow's (1954) hierarchy of needs provides a germinal foundation to issues such as safety and self-actualization to form SAT. The theory indicates five basic human needs that need to be satisfied: physiological, safety, belonging, esteem, and self-

actualization. Maslow indicated that when a lower need is satisfied, humans seek a higher level. According to the theory, when customers already feel safe, their motivations are based on a higher level of needs and not on safety.

Oliver (1980) theorized the expectation-disconfirmation theory and indicated that customers perceive service quality to be low if it does not meet their expectations, and customers perceive service quality to be high if it does meet their expectations. Customers will perceive service quality to be high only if the service performance meets or exceeds initial customer expectation. According to Oliver, service quality theory “predicts that clients will judge that quality is low if performance does not meet their expectations and quality increases as performance exceeds expectations” (p. 62).

Based on an extensive review of research in service quality, Parasuraman, Zeithaml, and Berry (1985) developed the gap model based on the expectation-disconfirmation theory, which identified five gaps in service delivery that need to be closed for service quality perceptions to meet expectations. Parasuraman et al. (1988) developed the SERVQUAL model, which indicates that service quality includes five main dimensions. The dimensions are tangibility, reliability, responsiveness, assurance, and empathy. The SERVQUAL dimensions related to SAT and BI.

Based on the SERVQUAL and self-service technologies research, Lin and Hsieh (2006) proposed a model that empirically constructed seven dimensions of SSTQUAL. SSTQUAL included functionality, enjoyment, security, assurance, design, convenience, and customization. Lin and Hsieh found SSTQUAL correlated with SAT and BI.

Although Parasuraman et al. (1988) indicated SERVQUAL is a global service quality model, Lin and Hsieh (2006) provided a conceptual model of self-service

technology service quality called SSTQUAL. The theoretical premise for this research study was the idea that perceptions and expectations of service quality dimensions are different when services are delivered through technology. Additional investigation is necessary to determine whether SSTQUAL is significant within the banking industry based on a different population in relation to SAT and BI.

Customer attitudes and perceptions are antecedents of human behaviors. The theory of planned behavior (Ajzen, 1991) provides a framework that indicates that perceptions and attitudes form intentions, and BI predicts actual behaviors. The current research study involved predicting service quality dimensions associated with BI to predict customer behavior. The prediction might help organizational leaders improve their services to gain favorable customer behaviors such as willingness to remain loyal, pay a premium, increase spending, and refer other customers (Zeithaml et al., 1996).

Definitions

Assurance: Assurance refers to a bank's reputation and good image or a service provider's ability to inspire trust and confidence. Assurance is a dimension of service quality both in traditional services (Parasuraman et al., 1988) and in TBS (Zeithaml, Parasuraman, & Malhotra, 2002).

Behavioral intentions (BI): Behavioral intentions occur when a customer feels motivated and convinced to make a future action such as provide positive word of mouth, recommend a service, or remain loyal (Zeithaml et al., 1996). Adopting TBBS was a positive BI.

Convenience: Technology-based banking services are easy to use, have convenient operating hours, and are in reachable locations (Meuter, Ostrom, Roundtree, & Bitner, 2000).

Customer satisfaction (SAT): Customer satisfaction is the degree to which a customer believes that the use of a service evokes positive feelings (Rust & Oliver, 1994).

Customization: Customization refers to the ability of TBBS to provide tailored and personalized services to meet the individual needs and interests of customers such as preferences and service options (Lin & Hsieh, 2006).

Design: Design includes the technology layout, the degree to which something is visually appealing, and the use of up-to-date equipment (Lin & Hsieh, 2006). Although design could sound similar to the tangibility dimension, based on the tangibility definition, design also includes the system or service design.

Empathy: Empathy occurs when a service provider demonstrates concern and care for the individual needs and interests of customers, including convenient hours of operation and effective communication channels to customers (Parasuraman et al., 1988).

Enjoyment: Technology-based banking services operations are interesting, delightful, or joyful with features and capabilities that make customers feel good when using them. Enjoyment comes from “arising intrinsically from interacting with [technology-based service] options” (Dabholkar, 1996, p. 35). Meuter et al. (2005) included enjoyment in their instrument when examining service quality perceptions based on the expectancy theory.

Functionality: Functionality is the ability to perform a required TBBS task effectively and efficiently with error-free performance. Functionality presents the reliability dimension in traditional services (Parasuraman et al., 1988), the reliability dimension in technology-based self-services (Dabholkar, 1996), the reliability dimension in websites (Zeithaml et al., 2002), the performance dimension in Internet services (Yen, 2005), and the system availability in electronic services (E-S-QUAL; Parasuraman et al., 2005). The synthesis is “accuracy of outcomes” (Dabholkar, 1996, p. 34).

Reliability: Reliability is the fulfillment of the service provider’s promises to customers such as maintaining TBBS 24 hours a day, providing defect-free and malfunction-free solutions, and providing the appropriate service dependably and accurately (Parasuraman et al., 1988).

Responsiveness: Responsiveness is the service provider’s prompt reaction to customer needs (Parasuraman et al., 1988).

Security: Security refers to the safety and security of customer transactions with the banks’ TBBS, including a privacy policy. Dabholkar (1996) recommended adding this dimension to future service quality research. Security is the degree to which the service is safe and protects customer information (Parasuraman et al., 2005; Zeithaml et al., 2002).

Service quality: Service quality is the “global judgment, or attitude, relating to the superiority of the service” (Parasuraman et al., 1988, p. 16).

Tangibility: Tangibility is the visual appearance of the facility, equipment, and personnel of the service provider (Parasuraman et al., 1988).

Technology-based banking services (TBBS): Technology-based banking services are banking services that need computer systems or machines to operate. The services can include ATMs, telephone banking, mobile banking, Internet banking, or merchant points of sale for processing payment transactions (Dimitriadis & Kyrezis, 2008; Lin & Hsieh, 2006; Zhu et al., 2002).

Assumptions

The current research study involved participants who were assumed to provide honest and thoughtful answers to the survey questions. Participants in the study were expected not to manipulate the survey questions to reflect any unique or unrelated positive or negative attitudes toward banks. The goal was for participants to focus on TBBS and not other bank services.

Scope

The scope of the present study was to investigate seven service quality dimensions within TBBS in Yemen in relation to SAT and BI. The quantitative correlational descriptive research included an examination into a sample of bank customers who use TBBS in Yemen banks. A survey instrument was used to gather the data. Analysis of the data provided an understanding of the relationship between the variables. The study findings were generalizable to retail banking customers in Yemen who use TBBS.

Limitations

The current research study was limited to retail banking participants in Yemen who agreed to participate voluntarily within the time available to conduct the study. The examination included customer perceptions of TBBSQUAL, SAT, and BI. The validity

of the current research study was limited to the reliability and validity of the administrated survey instrument both online and offline. The results of the study were dependent on particular participants of Yemeni culture who self-reported the findings of the study.

The use of nonprobability sampling was a limitation. Because of the inability to access customer databases to perform a probability sampling, a convenience sampling technique was necessary. The population for the current study represented approximately 2% of the entire population in Yemen (Central Bank of Yemen, 2008), so using a directory or other means to select random participants could have generated a very low response rate. Data collected through both online and offline survey versions helped to ensure a higher level of representation of the population in the sample. The sampling procedure included the application of a quota sampling technique to add an element of control to the generalizability of the findings over the population. According to Neuman (2006), quota sampling is an enhanced form of convenience sampling. Convenience sampling helped to ensure that qualified participants were among the target population who fit the sampling frame. Many researchers have used convenience sampling when measuring service quality and SAT (Kaynak, 2005; W. F. Lewis, 2007; Liu, 2008; Mayard, 2007; Tso, 2007).

Delimitations

The confines of the research study included surveying a sample of 465 customers from 10 different banks operating in Yemen: Arab Bank, CAC Bank, International Bank of Yemen, National Bank of Yemen, Saba Islamic Bank, Shamel Bank of Yemen and Bahrain, Tadamoun International Islamic Bank, Yemen Commercial Bank, Yemen Gulf

Bank, and Yemen Kuwait Bank. The sample yielded a 95% confidence interval (95 out of 100 times, the sample value fell within the range of the population mean) with a sampling error rate of 3% (Creswell, 2008). Study results were generalizable to identify service quality dimensions that could explain SAT and BI within TBBS in Yemen. The study involved implementing a convenience sampling procedure based on random respondents who walked into a branch. Collecting data near bank branches and ATM machines helped reach the target customer group. Customers of the participating 10 banks comprised over 95% of the total target population of customers involved with TBBS in Yemen (Central Bank of Yemen, 2008).

Summary

Technology-based banking services are becoming critical components of service delivery in the banking industry (Dabholkar, 1996; Meuter et al., 2000). Financial institutions compete with each other based on technology infrastructures, and customer demands increase as a result. Research indicated that service quality dimensions could be associated with SAT, retention, and loyalty (Cronin et al., 2000; Lin & Hsieh, 2006). The purpose of the quantitative correlational study was to determine if a set of technology-based banking service quality (TBBSQUAL) dimensions have an association with SAT and BI toward TBBS in Yemen.

The study results provided a further understanding of the seven service quality dimensions of self-service technologies (functionality, enjoyment, security, assurance, design, convenience, and customization) and their generalizability to explain SAT and BI in Yemen. The study results might help bank leaders to inspire a culture that adopts service quality for enhanced business performance. Technology providers might benefit

from understanding end-user perceptions of technology. Findings might support researchers in the field of service quality, technology, and banking research. The study involved answering the research question, testing hypotheses, and determining whether the relationships are statistically significant or not.

Chapter 2 will include a comprehensive review of the literature regarding the study variables and a review of the nature of services. A discussion of the conceptualization of service quality research will provide a basis for the study. A comparison and contrast of service quality dimensions within TBS will result in a description of how the study evolved from current literature. A review of SAT and BI will be investigated within the service quality research.

Chapter 2: Review of Literature

The purpose of the quantitative correlational study was to determine if a set of technology-based banking service quality (TBBSQUAL) dimensions have an association with SAT and BI toward TBBS in Yemen. The study involved testing the seven dimensions suggested by Lin and Hsieh (2006) in a specific industry (banking) and population (Yemen). Dimensions of TBBSQUAL are functionality, enjoyment, security, assurance, design, convenience, and customization (Lin & Hsieh, 2006). The predictor variables (independent variables) were the TBBSQUAL dimensions. The criterion variables (dependent variables) were SAT and BI. The study involved examining perceptions of current retail banking customers of 10 banks in Yemen who were using TBBS to determine the relationship between TBBSQUAL dimensions and SAT and BI in a specific industry (banking) and population (Yemen).

Chapter 1 indicated the need for leaders to understand which service quality dimensions affect SAT within TBBS. Customer satisfaction has positive consequences such as business performance and profitability (Anderson et al., 1994; Wan et al., 2004), loyalty (Fornell, 1992), and customer BI (Zeithaml et al., 1996). The purpose of chapter 2 is to review the literature on four main topics related to the objectives of the study: nature of services, service quality, SAT, and BI.

The literature review includes four primary topics. Nature of services includes the historical overview of service marketing research and the current development of services through technology innovation. Service quality includes early conceptual frameworks of service quality and its development to meet current requirements of technology-based service quality. Customer satisfaction illustrates customer needs of

personal and social interactions and its development to require self-control and actualization via service customization and a 24-hour-a-day service option. The discussion on BI describes how customer intentions translate into behaviors such as retention and adoption. The following section includes a description of the title search process for examining the literature.

Title Search

The literature review includes an overview of previous findings related to the topic of this research study. Sources included reports, research documents, peer-reviewed articles, and research available through University of Phoenix online databases and online library collections. The databases included ProQuest, EBSCOhost, Emerald, Sage, and IT Knowledgebase. The reports included market reports, industry reports, governmental reports, and international organizations' reports. Books, e-books, and related publications were also used as references. Table 1 includes a list of key words used during the search process along with the number of results found.

The research process involved articles related to SAT, BI, service quality, technology, and measurement tools in the retail banking industry. A trail of references led to historical and current research related to the topic. The review of literature includes a theoretical framework containing four major categories of literature: (a) the nature of services, (b) service quality, (c) SAT, and (d) BI.

Table 1

Key Words Used During Searches

	1980- 1990	1990- 2000	2000- 2005	2005- 2010
"service quality" AND "banking"	20	999	1,046	1,626
"service quality" AND "technology" AND "banking"	8	639	755	1,269
"service quality" AND ("banking" OR "technology")	68	3,344	3,647	4,998
"service quality" AND ("banking" OR "self-service banking")	20	999	1,046	1,626
"service quality" AND "technology" AND "banking" AND NOT ("online")	8	581	528	598
"service quality" AND (("technology" W/5 "banking") OR "banking")	20	999	1,046	1,626
"customer satisfaction" AND (("technology" W/5 "banking") OR "banking")	11	1,041	1,205	1,627
"quality" AND (("technology" W/5 "banking") OR "banking")	930	9,100	11,115	13,306
"behavioral intentions"	146	1,234	1,638	2,552

Theories

The expectancy theory (Vroom, 1964), the hierarchy of needs theory (Maslow, 1954), the expectation-disconfirmation theory (Oliver, 1980), and the SERVQUAL

conceptual model (Parasuraman et al., 1988) contain the main theories that guided the study. Vroom's (1964) expectancy theory indicated that humans feel motivated to perform a task based on three factors: (a) perception that one can do the task, (b) perceptions that the task will reach to the results, and (c) perceptions that the results are desirable. Maslow's (1954) hierarchy of needs theory provided five basic human needs that need to be satisfied. According to the theory, an individual fulfills lower levels of needs before moving to higher levels of needs (Newstrom, 2011). Oliver (1980) applied Vroom's (1964) theory to services and theorized the expectation-disconfirmation theory. According to Oliver, customers would perceive service quality to be low if service quality did not meet their expectations, and customers would perceive service quality to be high if service quality did meet their expectations. Based on an extensive review of research on service quality, Parasuraman et al. (1985) developed the SERVQUAL model, which indicates that service quality can relate to service quality dimensions. The following discussion includes four major categories of literature: (a) the nature of services, (b) service quality, (c) SAT, and (d) BI.

Nature of Services

The nature of services is a service concept that is different from goods. This section includes an overview of the service marketing research. The following discussion contains the historical overview and current findings related to the nature of services.

Historical overview. The service literature started in the 1970s following a debate between researchers whether service marketing is the same as or different from product marketing (Brown, Fisk, & Bitner, 1994). Gronroos (1978) discussed the relationship between product and service marketing research and described service traits

that make services different. Booms and Bitner (1981) described the uniqueness of services that required an expansion of the marketing mix concept. Berry (1981) described internal marketing, with a focus on employees in the service delivery process. Kotler (1994) discussed the interactive marketing concept to link customers, employees, and leaders to market services.

Gronroos (1978) described service as intangible, inseparable, variable, and perishable. Unlike products, services are intangible and cannot be seen, tasted, felt, heard, or smelled before customers buy them. Services are typically produced and consumed simultaneously and are, therefore, inseparable. In many cases, the customer is part of the service process. Services vary depending on who provides the service to whom and when and where the delivery of the service takes place. Services cannot be stored or inventoried and are perishable.

Gronroos (1978) reported that product-marketing research had negatively influenced services-marketing research. Although customers were viewed as an “unnecessary restriction to the development of marketing” (Gronroos, 1978, p. 596) in the product-marketing research, customer behavior and involvement was a critical dimension in the service-marketing research (Gronroos, 1978, p. 596). Although producers send goods to customers after production and quality control, services are performed interactively with customers. Gronroos (1984) distinguished services from products in terms of consumption. Products are outcome consumption while services are process consumption that occurs during the buyer–seller interaction or production–consumption interaction.

Another influence of product-marketing research over service-marketing research is the marketing mix. Traditional marketing literature included the four Ps of marketing: product (or service), promotion, price, and place or distribution (McCarthy, 1964). Booms and Bitner (1981) criticized the four Ps and suggested three additional Ps to reflect the unique service traits of intangibility, inseparability, variability, and perishability: process, physical evidence, and participants. Booms and Bitner focused on marketing strategies within service organizations and the findings indicated that service providers needed to focus on the three additional Ps to achieve sound performance. Service traits led researchers to rethink services marketing to meet a different array of challenges.

In response to the challenges, Kotler (1994) developed the triangle model of service marketing to explain the interactive marketing concept (see Figure 1). According to Kotler, the model helps business leaders to achieve service marketing more effectively. The model included three main parties: company, employee, and customers (Kotler, 1994, p. 470).

The three parties generate three different relationships. The first relationship is the company–customer relationship that represents external marketing and concurs with an early product marketing mix and the four Ps of marketing that companies need to manage pricing, advertising, and distribution. The second relationship is the company–employee relationship, which represents internal marketing and concurs with Berry’s (1981) ideas of internal marketing to employees that companies need to manage training, motivation, and rewards. The third relationship is employee–customer relationships, which represent the service delivery process or the actual interaction between an

employee and a customer while consuming the service. The employee–customer relationship also concurs with Booms and Bitner’s (1981) concepts of the seven Ps of the marketing mix and Gronroos’s (1984) production–consumption interaction.

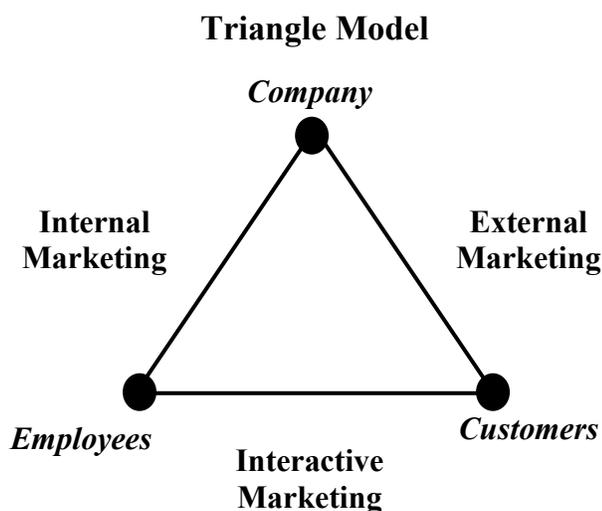


Figure 1. Triangle model of service marketing.

Note. From *Marketing Management: Analysis, Planning, Implementation, and Control* (8th ed., p. 470), by P. Kotler, 1994, Englewood Cliffs, NJ: Prentice Hall. Copyright 1994 by Prentice Hall. Adapted with permission (see Appendix B).

Current findings. The current findings in the nature of services included current concepts in service development. A brief discussion of the literature on service classifications follows. Then the role of productivity and customization illustrates the theory of swift and even flow in optimizing services. Subsequently, the role of technology in changing the service landscape leads into a discussion of the pyramid model that illustrates how technology changed service encounters.

Service development. According to Ojasalo (2009), the focus of current service development is aligning business goals with service design. Business leaders need to identify business goals such as increasing productivity and cutting costs and link them to

service design to remain competitive. Service design involves understanding service processes and delivery channels that meet customer needs and requirements (Ojasalo, 2009).

Organizational leaders and researchers started to look into service operations and service marketing to classify different services. The service operation looked into the productivity component of the service, whereas the marketing component looked into the customer interaction with the services. Schmenner (2004) developed a model to classify services based on the two dimensions.

Classification. Schmenner (2004) classified the service landscape into four quadrants based on relative throughput time and degree of variation (see Table 2 for examples). The relative throughput time is how quickly a service encounter can be rendered relative to others in the industry (service productivity). The degree of variation is how much customization is necessary for the service provision (service interaction). A high relative throughput time requires intense labor per transaction to provide a high degree of variation such as professional services (law firms and accountants) or a low degree of variation such as mass services (retail banking and wholesaling). According to Schmenner, a low relative throughput time requires less labor per transaction to provide a high degree of variation such as a service shop (hospitals and repair shops) or a low degree of variation such as a service factory (airlines and hotels).

The retail banking industry, the focus of the research study, is a mass service that requires a high relative throughput time and a low degree of variation. According to Schmenner (2004), mass services require a low degree of variation in the service delivery. Bank leaders might provide low service customization for each customer. In

contrast, service providers are required to pay attention to employee capacity to service and handle customer needs.

Table 2

Services Landscape Based on Throughput Time and Degree of Variation

Degree of variation	Throughput time	
	Low	High
Low	Service factory (Airline, hotel)	Mass services (Retail banking, wholesaling)
High	Service shop (Hospital, repair shop)	Professional services (Law firm, accountant firm)

Note. Based on Schmenner's (2004) classification of services.

Optimization. Schmenner (2004) posited the theory of swift and even flow and noted that service providers strive to increase service productivity by minimizing the relative throughput time (labor) and degree of variation (customization) to reach the service factory level of operations. Just as in product manufacturing, service providers need to reach a service factory level of operations to achieve productivity. In the scenario of retail banking services where throughput time is high, organizational leaders might focus on reducing bottlenecks and removing service process wastes, such as counting and recounting cash during deposits and withdrawals or verifying customer identity. Leaders must take into consideration the degree of variation, such as charging different customers different rates based on service types, and provide an even flow of the service delivery process. This scenario of service delivery provides the optimal service operations (high

productivity) and service interaction (high customization) that organizational leaders might seek to reach to enhance overall services (Schmenner, 2004).

The role of technology. To achieve higher productivity and customization of service delivery, bank leaders were historically required to open branches with many trained service desk employees to handle customer-specific services. All service encounters traditionally took place in the presence of an employee and a customer (Bitner, Booms, & Tetreault, 1990). With the increase of labor costs and innovations in technology, more service providers shifted to self-service technologies (Dabholkar, 1996). The use of technology allowed service providers to use technology to overcome operational expenses and address customer-specific needs. Eyadat and Kozak (2005) found the use of technology correlated positively with profitability in the banking sector.

Technology-based services are technological interfaces that enable end-users to take advantage of a service without any direct employee intervention (Meuter et al., 2000). A service encounter is an interaction between a customer and a machine such as an ATM machine, Internet site, or interactive voice response system, and service providers focus on systems rather than employees and system functionality rather than employee interactions. Organizational leaders have a new array of challenges to address in the new paradigm.

The pyramid model. The use of technology in service delivery has transformed service-marketing research. Technology was expected to grow alongside the growth of technology innovation (Meuter et al., 2000). The transformation of service delivery from employee–customer interactions to employee–technology and technology–customer interactions added a new dimension in service delivery. Parasuraman (2000) developed

the pyramid model of services marketing (see Figure 2), which is an extension of the triangle model by Kotler (1994) discussed earlier. The model captured the added complexity of marketing services with the introduction of technology.

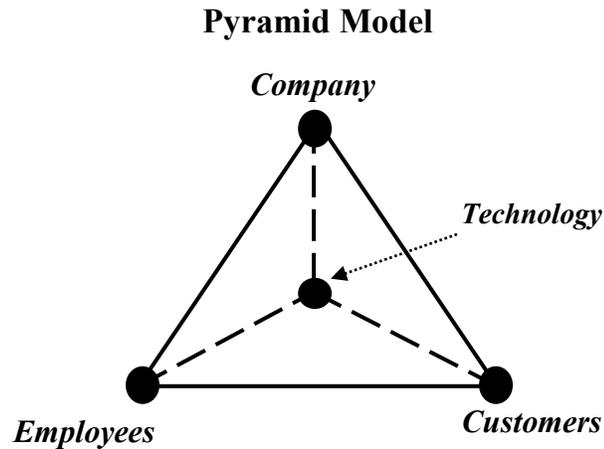


Figure 2. Pyramid model of services marketing.

Note. From “Technology Readiness Index (TRI): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies,” by A. Parasuraman, 2000, *Journal of Service Research*, 2, p. 308. Copyright 2000 by Sage. Adapted with permission (see Appendix B).

The model presented technology as a new dimension into the two-dimensional triangle model. In product marketing, one dimension of marketing was the company–external customer dimension based on a traditional marketing mix and the four Ps of marketing. In service marketing, two dimensions of marketing were added as discussed earlier: the company–employee and the customer–employee relationships. In TBS, three links were added to the triangle model. These links present a technology medium between the company, the customer, and the employee (Parasuraman, 2000, p. 308).

The use of technology provides business leaders with three main benefits (Parasuraman, 2000). First, leaders can communicate more efficiently, develop new products and services, and analyze customer behaviors with the support of computing technologies. Second, business managers can interact with employees via an intranet and a knowledge-based database despite geographic locations or time barriers. Third, the use of technology allows an employee to interact with a customer via technological interfaces such as ATMs and e-services.

The use of technology within the banking industry has led to a transformation within relationships between banks and customers from a direct interpersonal relationship to an indirect relationship via technology (Parasuraman, 2000). Bank leaders view technology-based service options as a means to reduce cost (Meuter et al., 2005), as customers are becoming more technologically sophisticated (Dabholkar, 1996). Both bank leaders and customers have compelling incentives for using technology as the medium of banking services.

Bank leaders have three main incentives to invest in TBBS. First, bank leaders can gain an economy of scale by increasing fixed cost in the technology infrastructure to minimize variable cost per transaction (Willems, 2004). According to Dabholkar (1996), more service providers shifted to self-service technologies because of the increased labor costs associated with in-person banking. Innovations in technology have made TBBS feasible.

Second, banking customers differentiate between banks based on the banks' technological capabilities (Furey, 1991; Sureshchandar, Rajendran, & Anantharaman, 2003). A study carried out by personnel at the Opinion Research Corporation indicated

that 43% of retail banking customers were more likely to choose a financial institution that offered multichannel TBBS (Nutti, 2009). According to Kitten (2007), “The majority of consumers base their decisions on the number and accessibility of ATMs a financial institution has in its network” (p. 30). Such technological capabilities influence a customer’s decision regarding where to bank.

From a bank’s perspective, the third incentive for using TBBS is an enhanced competitive position. The effective use of technology creates barriers to entry, enhances productivity and efficiency, and increases customers’ switching cost (Dimitriadis & Kyrezi, 2008; Zhu et al., 2002). By using TBBS, bank leaders might collect customer information for effective use by management (Furey, 1991). Banks can then gain market share and knowledge ahead of the competition.

Customers might benefit from TBBS because of control, speed, convenience, ease of use, and enjoyment (Dabholkar, 1996). Technology-based banking services provide customers with more control over banking needs in terms of when, where, and how to produce the service. Customers might be attracted to services that save them time, money, or effort. Customers might save bank trips and waiting time in teller queues. Some customers expect better service quality when using TBS (Dabholkar, 1996; Dabholkar & Bagozzi, 2002).

Organizational leaders can leverage technology to develop and innovate services (Dabholkar, 1996; Ojasalo, 2009). The use of technology can increase productivity and customize services to meet customer requirements. Service marketing literature indicated that service providers should focus on service quality (Gronroos, 1984; Lin & Hsieh,

2006; Parasuraman et al., 1985). The following section provides an overview of service quality literature.

Service Quality

Service quality has become an important factor in enabling service productivity and customization in the service delivery process and in affecting SAT and profitability. Many researchers have conceptualized service quality (Gronroos, 1982; Parasuraman et al., 1985). Other researchers have examined and operationalized factors that constitute service quality perceptions (Brady & Cronin, 2001; Lin & Hsieh, 2006; Parasuraman, 2000; Zeithaml et al., 1996; Zhu et al., 2002). Researchers then compared service quality to key performance indicators such as productivity, SAT, and profitability (Anderson et al., 1994; Schmenner, 2004). The following discussion includes the historical overview and current findings related to service quality. A review of the literature of the consequences of service quality will be discussed.

Historical overview. This section includes an illustration of the development of service quality concepts and scales. The development starts with the expectancy theory (Vroom, 1964), which provides germinal foundations that derived the expectation-disconfirmation theory. The expectation-disconfirmation theory (Oliver, 1980) provides a basis for the service quality theory. Based on the service quality theory, Parasuraman et al. (1985) developed the gap model that conceptualized service quality. The model was operationalized to measure service quality and resulted in the SERVQUAL scale (Parasuraman et al., 1988). The following sections include a discussion on the application of historical frameworks for the purpose of the present study, including

expectancy theory, service quality theory, the gap model, and the SERVQUAL scale. A focused discussion about service quality within TBBS follows.

Expectancy theory. The germinal framework of Vroom's (1964) expectancy theory provides a basis for understanding service quality perceptions and evaluation. Vroom supported the notion that customers would be motivated to use a service only if they perceive it to be rewarding, reachable, and reliable. Newstrom (2011) noted,

Motivation is a product of three factors: how much one wants a reward or service outcome (valence), one's estimate of the probability that effort will result in successful performance (expectancy), and one's estimate that performance will result in receiving the reward (instrumentality). (p. 124)

Based on the theory, customers might be motivated to use a service depending on (a) how rewarding they found the service, (b) how far using the service would result in a successful performance, and (c) how sure using the service would result in receiving the expected reward. Customers have to be confident and interested in using the service. The service should be rewarding, be easy to use, and fulfill customer needs. Customers should be assured that the service would generate the expected positive results. If these conditions are met, customers might feel motivated to use the service.

Although the expectancy theory appears in the literature as a motivational theory heavily applied to employee motivation and satisfaction within the internal organizational structure (Newstrom, 2011), some researchers have applied the concept to customers in service marketing (S. Lee, 2007; Smith, 2004). Parasuraman et al. (1985) stressed the role of service quality expectations in understanding service quality. Brady and Cronin (2001) considered valence as a determinant of service quality outcome. The expectancy

theory provided the basis for the expectation-disconfirmation theory that emerged into the service quality theory.

Service quality theory (Expectation-disconfirmation theory). Based on expectancy theory, Oliver (1980) illustrated the expectation-disconfirmation theory, which indicated that customers would perceive service quality as low if the service did not meet their expectation. Customers would perceive service quality as high if the service met their expectations. According to Oliver, service quality “predicts that clients will judge that quality is low if performance does not meet their expectations and quality increases as performance exceeds expectations” (p. 62). The theory posits that service quality develops based on service perceptions and expectations.

Researchers published additional historical research about service quality in the 1980s. Gronroos, who is from Finland, pioneered service quality research and established a service quality research agenda (Rust & Oliver, 1994). Gronroos (1984) described a service quality model as one that achieves a proper buyer–seller interaction or a production–consumption interaction. Brown et al. (1994) indicated that service quality was the most researched topic in the service literature.

The service quality model indicated that total quality of a service is a function of technical quality and functional quality and shaped by corporate image (Gronroos, 1984; see Figure 3). Because service is intangible, the corporate image presents the tangible component of service that customers judge when evaluating the overall service.

Corporate image gives the customer an indication of the success or failure of the service delivery process. Services need to be technically acceptable, meaning that a service is doing its basic purpose. A money transfer service, for example, has a technical feature

when the agent sends money and the beneficiary receives the money safely. A functional feature is the proper handling of the money, delivery speed, and how the interaction occurs during the transfer process.

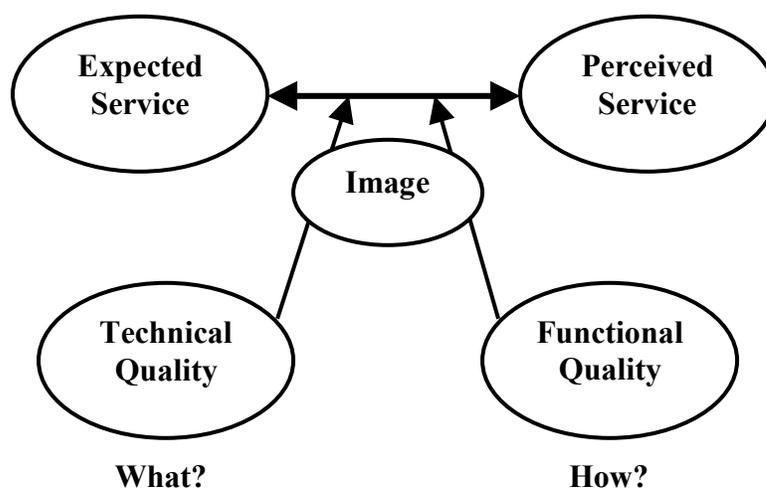


Figure 3. Service quality model.

Note. From “A Service Quality Model and Its Marketing Implications,” by C. Gronroos, 1984, *European Journal of Marketing*, 18, p. 40. Copyright 2007 by Emerald Group. Adapted with permission (see Appendix B).

Gronroos (1984) indicated that organizational leaders needed to focus on service quality to remain competitive. Leaders can remain competitive by (a) managing realistic promises to ensure customers’ perceptions of the service match their expectations, (b) understanding technical and functional quality and how customers perceived them, and (c) improving functional quality during the buyer–seller interaction. While these were theoretical recommendations to organizational leaders to improve service quality, researchers continued to investigate the concept of service quality.

Parasuraman et al. (1988) indicated that service quality is “an abstract and elusive construct because of three features unique to services: intangibility, heterogeneity, and

inseparability of production and consumption” (p. 13). Parasuraman et al. indicated service quality is the customer’s judgment of, or attitude toward, the superiority of the service that is related, but not equivalent to, satisfaction. Bitner et al. (1990) defined service quality as the relative feeling of a customer toward an organization and its services. Oliver (1997) described service quality perceptions as cognitive reactions and evaluations of service attributes. Researchers noted that service quality stems from the comparison between what customers feel the service provider should offer and what the service provider delivers (Gronroos, 1982; R. C. Lewis & Booms, 1983; Oliver, 1980; Parasuraman et al., 1985).

The gap model. Parasuraman et al. (1985) developed the gap model, which is a conceptual model that referred to service quality as the discrepancy between customer expectation and perception of service. Parasuraman et al. (1985) conducted and analyzed focus groups and executive interviews, finding that service quality shortfalls arise from five main gaps. Four gaps arose from the marketer’s side and the fifth arose from the customer side (see Figure 4). The gaps represent factors affecting service quality shortfalls. The gaps included (a) consumer expectations–management perception gap, which was a lack of knowledge of customer expectations; (b) management perception–service quality specification gap, which was a deficiency in the service quality standard; (c) service quality specifications–service delivery gap, which involved a poor performance leading to service quality shortfalls; (d) service delivery–external communication gap, which included promises undelivered to consumers leading to service quality shortfalls; and (e) an expected service–perceived service gap, which was

the discrepancy between customer expectations of the service and the perception of the delivered service.

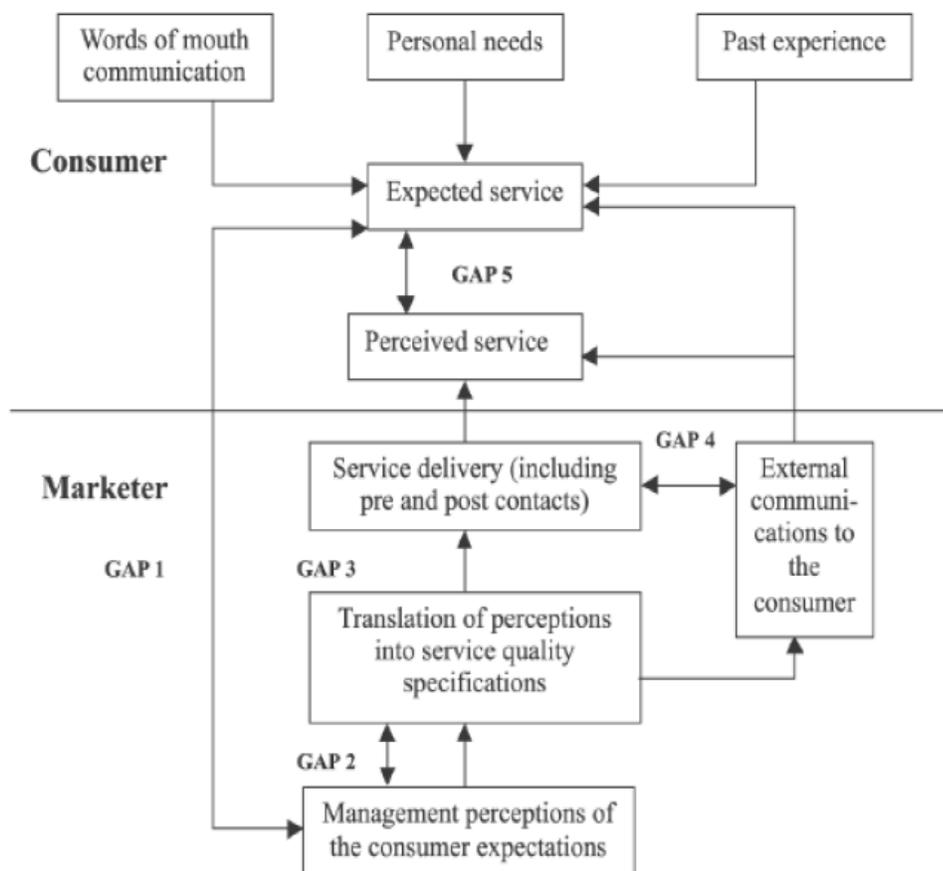


Figure 4. The gap analysis model.

Note. From “A Conceptual Model of Service Quality and Its Implications for Future Research,” by A. Parasuraman, V. Zeithaml, and L. Berry, 1985, *Journal of Marketing*, 49, p. 44. Copyright 1985 by the American Marketing Association. Adapted with permission (see Appendix B).

Based on the gap model and the focus group analysis, Parasuraman et al. (1985) provided a model of what determined service quality (see Figure 5). Customers build their expectation of service based on word-of-mouth, external communication, personal needs, and experience. Customers evaluate the delivered service based on a number of

service dimensions that include “tangibles, reliability, responsiveness, communication, credibility, security, competence, courtesy, understanding/knowing the customer, and access” (Parasuraman et al., 1985, p. 47).

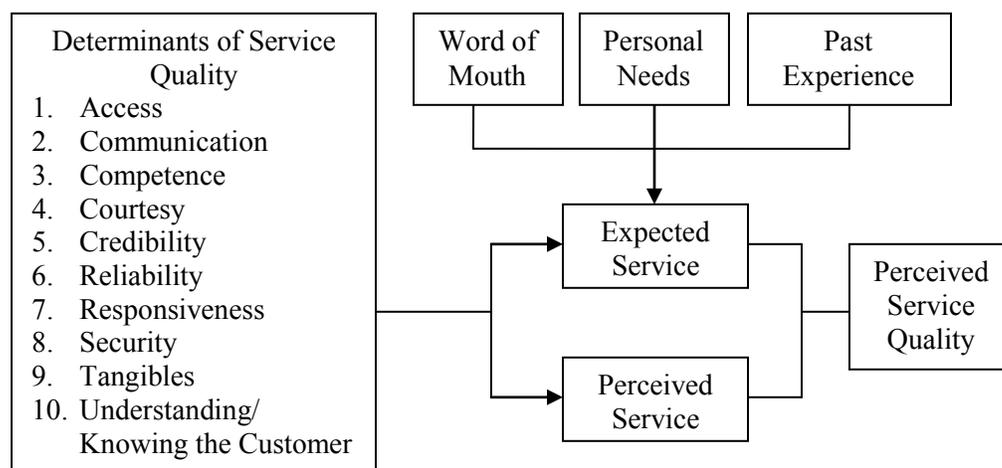


Figure 5. Determinants of perceived service quality.

Note. From “A Conceptual Model of Service Quality and Its Implications for Future Research,” by A. Parasuraman, V. Zeithaml, and L. Berry, 1985, *Journal of Marketing*, 49, p. 48. Copyright 1985 by the American Marketing Association. Adapted with permission (see Appendix B).

SERVQUAL scale. Parasuraman et al. (1988) developed the SERVQUAL multidimensional scale to conceptualize and operationalize service quality based on the expectation-disconfirmation theory and the gap model. The SERVQUAL scale provides organizational leaders with an applicable tool or scale to quantify customer perceptions of the overall service quality, which is a global evaluation rather than a service-encounter incident. Using focus groups, data were derived from five service industries: appliance repair and maintenance, retail banking, long-distance telephone service, securities brokerages, and credit card companies. The data included 100 questions that asked

participants to rate a service in terms of expectations and perceptions on specific attributes thought to reflect service quality. The scale was refined to 22 questions.

The SERVQUAL is a 22-item survey instrument that includes five main dimensions of service quality: tangibility, reliability, responsiveness, assurance, and empathy. Each item measured customer perceptions and customer expectations on a 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale operationalized service quality as a gap score of the difference between the customer expectations score and the customer perceptions score. Parasuraman et al. (1988) noted that organizational leaders should minimize the gap to maintain overall service quality and SAT. The higher the gap was, the lower the service quality would be, and vice versa.

Parasuraman, Berry, and Zeithaml (1991) refined and reassessed the SERVQUAL scale. The refinement reflected survey reliability and validity in a multisector study. The refinement provided empirical analysis with data from a telecommunications company, two banks, and two insurance companies. The five dimensions explained 57 to 71% of the service quality variance. Appendix C contains a summary of service quality dimensions with a brief description and the number of items in each dimension. Just like any other scale, critics have questioned the SERVQUAL instrument (Buttle, 1996).

Critics of SERVQUAL. Buttle (1996) summarized a review and critique of the SERVQUAL instrument. The findings indicated four major theoretical criticisms: conceptualization framework, literature support, focus on process versus outcome, and dimensionality. Buttle also discussed operational weaknesses of the execution and methodology of the survey. The weaknesses included survey length (with the two administrations of expectations and perceptions), scale points, and item composition to

capture customer assessment of variables (Buttle, 1996; Morrison, 2004). According to Buttle, operational criticism is less significant than theoretical criticism. Therefore, an additional discussion follows on the four major theoretical concerns associated with the SERVQUAL instrument.

Buttle (1996) and Teas (1993) supported the attitudinal diagram discussed by Cronin and Taylor (1992) rather than the disconfirmation diagram for the first two major criticisms regarding conceptualization and literature support. Cronin and Taylor conceptualized service quality as an attitude explaining perceptions of performance as opposed to the difference (or gap) between customer expectations and perceptions illustrated by Parasuraman et al. (1988). Empirical evidence with literature support indicated that service performance only (SERVPERF) outperformed the disconfirmation-based SERVQUAL scale as the SERVPERF explained more variation of the service quality (Cronin & Taylor, 1992).

As a result of the conceptual differences, SERVPERF differed from SERVQUAL in operationalizing service quality. SERVPERF considered customers' perception of the service quality and took into consideration the expected and perceived performance automatically when respondents rated service quality items. Therefore, the performance-only measurement dropped the expectations component of SERVQUAL. SERVPERF questioned each survey item only once, as opposed to asking each question twice, once for expectations and once for perceptions. The conceptualization of SERVPERF provided enhanced operational remedies to the SERVQUAL model, which in turn improved survey reliability and validity (Cronin & Taylor, 1992).

The third major criticism illustrated by Buttle (1996) was that SERVQUAL was concerned with service process rather than service outcome. SERVQUAL assessed delivery of the service rather than what the service delivered. Compared with Gronroos (1984), the five dimensions of SERVQUAL qualify for the functional features of the service delivery process. Hence, technical quality and corporate image are not addressed in the SERVQUAL model.

Fourth, many researchers questioned the dimensionality of SERVQUAL. Buttle (1996) indicated, “The most serious [concerns about dimensionality] are concerned with the number of dimensions, and their stability from context to context” (p. 15). Cronin and Taylor (1992) suggested a weighted score to measure the importance of dimensions in the SERVPERF scale to adjust for different industries. For example, customers might weight tangibility higher in a hotel service, whereas tangibles might be less important in a remote service delivery where customers might not see service tangibles. Other researchers suggested additional dimensions such as customization (Fornell, Johnson, Anderson, Jaesung, & Bryant, 1996), security (Carman, 1990), and convenience (Szymanski & Hise, 2000). Szymanski and Hise (2000) emphasized issues of convenience, design, and security as dominant factors of service quality to attain SAT in TBS such as Internet services.

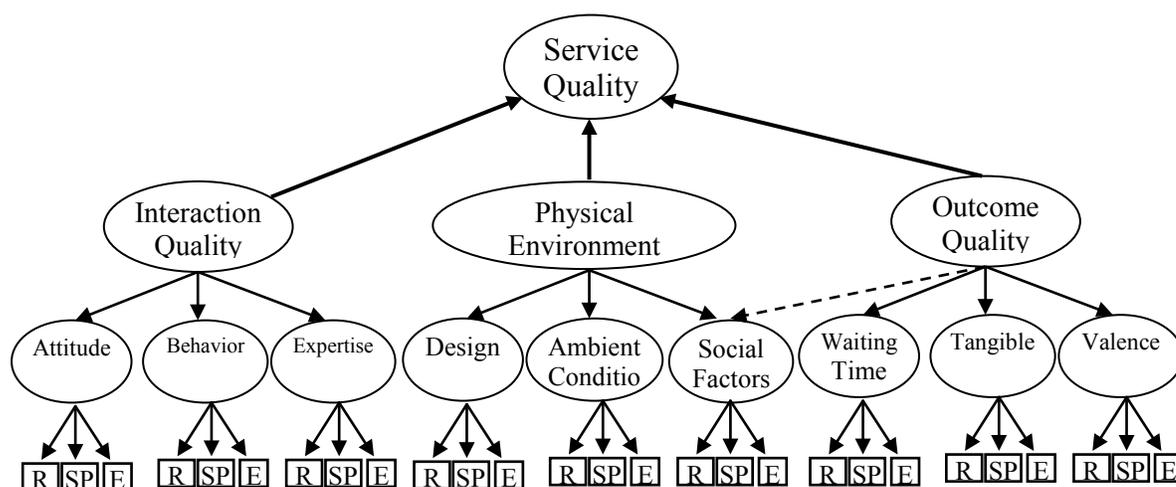
Technology-based services in banking. Service quality research within TBBS revealed unique service quality dimensions. In principle, individuals can perceive the use of technology as a source of service quality (Dabholkar, 1996). Arend (1992) posited that the use of technology provided operational efficiency with additional functionality and convenience. Although Arend questioned whether technology is convenient or

impersonal, findings showed that technology has helped bank personnel to improve customer service and employee–customer relationships. Arend supported the notion that the effective use of technology indicated enhanced service reliability and responsiveness. Other service quality factors within TBBS are convenience, safety, and accessibility (Zeithaml & Gilly, 1987) that predict customer acceptance and use of a service. Zhu et al. (2002) and Gefen (2002) combined dimensions of reliability, responsiveness, and assurance into one dimension in measuring service quality in TBBS using the SERVQUAL model.

Current findings. Current findings in the service quality literature include two main parts for the purpose of the current study. The first part includes general service quality research. The second part includes service quality literature within TBS. The first part includes the following two main topics: (a) recent conceptualization model of service quality and (b) recent findings on the SERVQUAL versus SERVPERF model.

Service quality conceptualization. The conceptualization and measurement of service quality perceptions have been the most debated and controversial topics in the services marketing literature to date according to Brady and Cronin (2001). Brady and Cronin posited a multi-hierarchical model where service quality consists of dimensions and sub-dimensions (see Figure 6). Brady and Cronin’s suggested model combined previous models in service quality including SERVQUAL (Parasuraman et al., 1988), the Nordic model (functional, technical, and image) by Gronroos (1984), the three component model (Rust & Oliver, 1994), and the multilevel model (Dabholkar, Thorpe, & Rentz, 1996). Cronin was also a coauthor of the SERVPERF with Taylor (Cronin & Taylor, 1992). According to Brady and Cronin (2001), the importance of different

dimensions depended on industry characteristics. Leaders of industries with low levels of customer–employee interactions might concentrate only on a subset of the dimensions. The final hierarchical model included many aspects of service quality to cover a wide range of service industries and contexts. Hence, the original SERVQUAL remained a relevant research domain (Saravanan & Rao, 2007) and many researchers continued to use it (Chang, 2007).



Note: R = a reliability item, SP = a responsiveness item, E = an empathy item. The broken line indicates that the path was added as part of the model respecification.

Figure 6. A hierarchical approach on conceptualizing perceived service quality.

Note. From “Some New Thoughts on Conceptualizing Perceived Service Quality: A Hierarchical Approach,” by M. Brady and J. Cronin, 2001, *Journal of Marketing*, 65, p. 37. Copyright 2001 by the American Marketing Association. Adapted with permission (see Appendix B).

SERVQUAL versus SERVPERF. Whereas Brady, Cronin, and Brand (2002) continued to reassess and replicate the SERVPERF model to support previous findings by Cronin and Taylor (1992), Zeithaml and Parasuraman (2004) enhanced and further explained the SERVQUAL model. Saravanan and Rao (2007) noted,

Even though SERVQUAL, developed by Parasuraman et al. (1988), had widespread impact on business and academic circles, it has also been subjected to widespread criticisms. However, researchers and practitioners generally agree that the 22 items in SERVQUAL are good predictors of the overall evaluation of service quality by the customers. (p. 437)

Carrillat, Jaramillo, and Mulki (2007) conducted a meta-analysis to investigate both performance-only SERVPERF and expectations/performance SERVQUAL scales. Findings indicated both are equally valid predictors of overall service quality. According to Carrillat et al., the purpose of the instrument should dictate the choice between SERVQUAL and SERVPERF. Carrillat et al. suggested that SERVQUAL would fit a diagnostic purpose especially for practitioners, whereas SERVPERF would fit a shorter instrument for establishing theoretically sound models. Carrillat et al. found both scales provided higher predictive validity when used in non-English-speaking countries, low individualistic countries, and industries with a low degree of variation such as banks. SERVQUAL required further adaptation to the context of the study to enhance validity (Carrillat et al., 2007; Parasuraman, Zeithaml, & Berry, 1994).

Many researchers have adapted the SERVQUAL model to meet context requirements. Researchers adapted SERVQUAL to measure service quality performance on a Chinese website (Hsu & Hsu, 2008), online retail stores (Hou, 2005), and Chinese mobile communications (Lai, Hutchinson, Li, & Bai, 2007). Researchers have used the SERVQUAL model in the Middle East to measure service quality within banking services in the United Arab Emirates (Jabnoun & Khalifa, 2005).

Current findings of service quality within technology-based services.

Although many researchers have acknowledged a need for greater understanding of the role of technology in service quality (Brown et al., 1994; Dabholkar, 1994; Meuter et al., 2000; Parasuraman et al., 2005), current literature provides three main topics that influence customer perceptions of service quality within TBS. First, customer perception of TBS depends on a customer's unique traits and attitudes toward technology (Meuter et al., 2005; Parasuraman, 2000). Second, the level of interactions between customers and technology influences customer perceptions of service quality within TBS (Theotokis, Vlachos, & Pramataris, 2008). Third, customers expect specific service quality dimensions based on the context of TBS (Lin & Hsieh, 2006; Yen, 2005). The following sections contain a discussion on each of these three main topics.

Customer traits. Customer traits shape perceptions and views of TBS.

Parasuraman (2000) classified customers into technology-oriented customers and technology-challenged customers to understand customer perceptions of TBS. Technology-oriented customers embrace technology and find it beneficial and advantageous. Such customers are more likely to have a positive perception of the overall quality of TBS. Technology-challenged customers think of technology as a drawback and a source of frustration. Such customers are more likely to have a negative perception of the overall quality of TBS. Parasuraman suggested a technology readiness construct to assess people's readiness to adopt technology. The technology readiness construct included four main factors: optimism, innovativeness, discomfort, and insecurity (Parasuraman, 2000). Customers might be optimistic and have internal desires to use TBS. In contrast, customers might exhibit anxiety or technophobia when faced

with TBS operations (Meuter, Ostrom, Bitner, & Roundtree, 2003; Meuter et al., 2005; Yen, 2005). Attitudes influence customer perceptions of the overall performance of TBS, regardless of the level of interaction or the type of TBS.

Level of interactions. Customer perceptions of TBS service quality are dependent on the perceived level and complexity of the interaction with TBS. Customers are willing to adopt TBS depending on their perceived competence, superiority, and mastery over the TBS (J. Lee & Allaway, 2002). According to J. Lee and Allaway (2002), perceptions of TBS are dependent on a “complex composite of predictability, controllability and outcome desirability” (p. 573). Based on experimental research, J. Lee and Allaway (2002) found that those with high personal control over technology would perceive lower risk and enhanced value, which induce a greater intent toward adoption. In contrast, customers who perceive TBS to be complicated, unpredictable, or beyond their control would probably perceive a low service quality and would be unwilling to adopt the TBS (J. Lee & Allaway, 2002).

Theotokis et al. (2008) indicated that individuals should not consider TBS as a homogeneous group of services and noted that TBS differs in terms of the level of customer-technology interaction. Customer-technology contact (CTC) illustrates how different levels of contact between customers and technology can influence customer perceptions of service delivery. Low CTC within TBS (such as liquid crystal display screens that provide information services) should not be compared with high CTC within TBS (such as self-checkout services or stock trading) that require a high level of interaction between the customer and technology. Customer perceptions of the service

delivery are dependent on the CTC (Theotokis et al., 2008). As a result, different TBS had different service quality dimensions to assess overall service quality.

Service quality dimensions within TBS. Many researchers investigated service quality dimensions within TBS and developed models to assess service quality within particular TBS such as SITEQUAL (Yoo & Donthu, 2001), WebQual (Loiacono et al., 2002), eTailQ (Wolfenbarger & Gilly, 2003), E-S-QUAL (Parasuraman et al., 2005), and SSTQUAL (Lin & Hsieh, 2006). Each assessment model provided a list of dimensions to measure service quality. Dabholkar (1996) proposed five attributes of TBS influence customers' perception of service quality: speed of delivery, ease of use, reliability, enjoyment, and control. Based on Dabholkar's work, Yen (2005) proposed five attributes of Internet TBS: efficiency, ease of use, performance, convenience, and control. Zhu et al. (2002) posited service quality has an association with "ease of use, conservation of time, convenience, privacy, accuracy, multifunctional capabilities, and the use of advanced technology" (p. 72). Lin and Hsieh (2006), who investigated service quality of self-service technologies, also supported many of the factors.

Self-service technologies service quality model (SSTQUAL). Lin and Hsieh (2006) investigated factors that influence customers' perception of service quality within self-service technologies. The suggested dimensions were functionality, enjoyment, security, assurance, design, convenience, and customization based on the performance-only measurement. The following analysis includes a discussion on each of the seven dimensions in comparison with related literature.

Functionality. The technology-based service is able to perform the required task effectively and efficiently with error-free performance. Functionality presents the

reliability dimension in traditional services (Parasuraman et al., 1988), the reliability dimension in technology-based self-services (Dabholkar, 1996), the reliability dimension in websites (Zeithaml et al., 2000), the performance dimension in Internet services (Yen, 2005), and the system availability in electronic services (E-S-QUAL; Parasuraman et al., 2005). The synthesis is “accuracy of outcomes” (Dabholkar, 1996, p. 34). The functionality dimension is similar to the technical quality defined by Gronroos (1982, 1984) and Oliver and Rust (1994). Gronroos (1984) defined the technical quality factor of service quality as “what the customer is left with when the production process is finished” (p. 38).

Enjoyment. Technology-based service operations are interesting, delightful, or joyful with features and capabilities that make customers feel good when using them (Dabholkar, 1996). Enjoyment comes from “arising intrinsically from interacting with the technology-based service” (Dabholkar, 1996, p. 35). Meuter et al. (2005) included enjoyment in the instrumentality component when examining service quality perceptions based on the expectancy theory by Vroom (1964). Customer traits and readiness also influence enjoyment (Parasuraman, 2000).

Security. Security refers to the safety and security of customer transactions with the banks’ TBBS, including a privacy policy. Dabholkar (1996) recommended adding the security dimension to future service quality research. Security is the degree to which the service is safe and protects customer information (Parasuraman et al., 2005; Zeithaml et al., 2002).

Assurance. Assurance is the firm’s reputation and good image (Lin & Hsieh, 2006). A service is assuring when the service provider has the ability to inspire trust and

confidence (Parasuraman et al., 1988). Assurance is a dimension of service quality in both traditional services (Parasuraman et al., 1988) and in TBS (Zeithaml et al., 2002). Truthful information presented through TBS inspires assurance (Parasuraman et al., 2005).

Design. Design includes the technology layout, the degree to which something is visually appealing, and the use of up-to-date equipment (Lin & Hsieh, 2006). Although design could sound similar to the tangibility dimension, the tangibility definition includes physical material. The design includes system design and service processes, in addition to physical material and equipment. Zhu et al. (2002) referred to system design as the IT policy that governs the design of the service from a process perspective. System design influences the level of CTC (Theotokis et al., 2008).

Convenience. Technology-based services are easy to use, have convenient operating hours, and have reachable locations (Meuter et al., 2000). The convenience component includes accessibility to the service such as availability of Internet service for website access, mobile handsets for mobile banking services, and nearby service locations for ATM services. Convenient services can be perceived as low CTC (Theotokis et al., 2008).

Customization. The bank's TBBS show concern and care for the individual needs and preferences of customers with service options (Lin & Hsieh, 2006). Technology-based banking services are customizable, indicating that the service is capable of providing tailored and personalized services. A customer can customize TBBS to send an automated short messages service to the customer's mobile after each ATM transaction. Schmenner (2004) supported the notion that customization can enhance

service productivity as the service variation requested by customers would be transferred from the service provider's employee to the end customer with the support of technology. Dabholkar (1996) and Yen (2005) used customization as the control component used in their studies to explain service quality in TBS.

Each of the seven dimensions, functionality, enjoyment, security, assurance, design, convenience, and customization, presents a service quality dimension that many researchers have supported as relating to SAT within TBS (Dabholkar, 1996; Parasuraman et al., 2005; Yen, 2005). The following discussion compares and contrasts the original service quality dimensions (tangibility, reliability, assurance, responsiveness, and empathy) proposed by Parasuraman et al. (1988) with the seven dimensions of TBS (functionality, enjoyment, security, assurance, design, convenience, and customization) proposed by Lin and Hsieh (2006).

Although service assurance stayed the same in traditional services (Parasuraman et al., 2005) and TBS (Lin & Hsieh, 2006), other dimensions reflected an adaptation of original service quality dimensions to suit the nature of TBS. The original tangibility dimension of service quality included a concern for appearance and facilities (Parasuraman et al., 1988). Within TBS, personal appearance is not applicable, although a process design was added under the design dimensions (Lin & Hsieh, 2006).

Another example is empathy. In the original service quality literature, the empathy dimension presented service providers' attention to customers' individual needs and interests (Parasuraman et al., 1988). In contrast, Lin and Hsieh (2006) supported the notion that customization is a service quality dimension within TBS that allows customers to manage the service process according to their individual needs and interests.

A third example is responsiveness. In the original service quality literature, responsiveness reflected customer service personnel's willingness and promptness to respond to customer requests and orders (Parasuraman et al., 1988). In contrast, TBS operates automatically without any human intervention. In a related matter, the enjoyment dimension includes interesting functions and in-depth information that moves the dimension of responsiveness to a higher level. Lin and Hsieh (2006) posited that TBS is expected not only to respond promptly and clearly but also to "offer engaging functions" (p. 508). In traditional services, a responsive human teller would promptly give a customer a statement of account upon request. Within TBS, a system will provide a statement of account based on formulas that are more complex, and customers can download and view data in attractive tables and charts, which might make TBS more enjoyable.

Lin and Hsieh's (2006) SSTQUAL introduced four dimensions: security, convenience, enjoyment, and customization. Although some of the dimensions compare with the original service quality dimensions as discussed above, each has an added explanation of the uniqueness of TBS. The security dimension reflects the unique security threat associated with technology. Therefore, the security dimension was added to reflect the concern with technology (Parasuraman et al., 2005). According to Lin and Hsieh, service providers should not only enhance the safety of the transaction with TBS, but also supply clear guarantees. In contrast, the convenience dimension reflects the accessibility of the service 24 hours per day, which is a unique attribute of TBS that is not available in traditional services. Service providers can increase customer convenience

and choice regarding place and time of service consumption through TBS (Lin & Hsieh, 2006).

Another issue includes enjoyment with TBS, including the fun and delight experienced with the use of technology. Enjoyment reflects additional features that traditional service providers cannot provide easily. Customers' ability to inquire about a bank transaction from home at midnight might not be applicable to traditional human tellers. In TBS, customers anticipate easy and understandable service functions (Lin & Hsieh, 2006). Shamdasani et al. (2008) found the dimension of enjoyment to correlate directly with SAT within TBS.

The fourth issue is customization. Customization is comparable with the empathy dimension in the original service quality dimensions. Although empathy is concerned with the attention provided to customers during the service encounter and the care provided to customers by service personnel (Parasuraman et al., 1988), customization provides the technology-based capabilities of care and attention to customer needs and unique requirements (Lin & Hsieh, 2006). Technology-based services cannot be compassionate, but rather adapting and customizable.

Based on the comparison and contrast of the SSTQUAL dimensions and the original SERVQUAL dimensions, one might conclude that the SSTQUAL can be a valid and reliable extension to apply to TBS service quality. Researchers supported the notion (Dabholkar, 1996, 2000; Yen, 2005). Parasuraman and Zeithaml, who coauthored E-S-QUAL (Parasuraman et al., 2005), also coauthored SERVQUAL (Parasuraman et al., 1988). One might conclude the significance of service quality assessment and conceptualization with the introduction of technology. A review of the literature

indicated a need for further investigation of service quality within different industries (Brady & Cronin, 2001). Lin and Hsieh (2006) called for further investigation of service quality within TBS in the banking industry. A common theme in these studies is the association between customer perception of service quality and SAT and BI.

Consequences of service quality. Research about service quality has always had an association with consequences such as satisfaction (Cronin & Taylor, 1992; Cronin et al., 2000) and BI (Zeithaml et al., 1996). Researchers have also examined the relationship between service quality and cost (Crosby, 1979), business performance and profitability (Anderson et al., 1994), and loyalty (Fornell, 1992). Such consequences reveal the significance of the problem described within the present study, which was an attempt to understand service quality in relation to SAT and BI within TBBS for researchers and practitioners. The focus of the current research study was on service quality as an antecedent of SAT and BI (Cronin & Taylor, 1992; Lin & Hsieh, 2006; Parasuraman et al., 1988).

Customer Satisfaction

Customer satisfaction can be a goal that organizational leaders strive to reach. The following sections include a historical overview and current findings associated with SAT. The historical overview includes an explanation of SAT definitions and consequences. Current findings include a discussion on recent reflections on SAT and a discussion on SAT within TBS. A discussion of customer perceptions of service quality versus satisfaction will include a review on how the two concepts present two distinct constructs within the service marketing literature.

Historical overview. This historical overview includes a foundational framework, definitions of SAT, and the potential consequences of SAT on customer behavior. The following three sections include literature related to SAT. The sections include foundational framework, definitions, and consequences.

Foundational framework. Maslow's (1954) hierarchy of needs theory provided an understanding of the order of human needs that have to be satisfied. The model may be used to understand customer needs from a service. Service providers have to ensure that a service is delivering its main purpose, which is to fulfill customer needs (Gronroos, 1982). In examining customer perceptions of TBBS, understanding customer needs is important.

Maslow (1954) claimed that humans looked to satisfy five basic needs in the following sequential order: physiological needs such as food, drink, and shelter; safety; social acceptance or belonging; self-esteem or prestige; and self-actualization or self-fulfillment. A customer would be satisfied with a service if the customer were in need of the service out of physiological need such as hunger or thirst. A customer who perceives a service to be unsafe would probably be unwilling to use the service. Customers who prefer human interactions and find face-to-face services satisfy their social acceptance needs might not find non-face-to-face services to be satisfying.

Customers who have reached the self-actualization stage, the highest level on Maslow's hierarchy of needs, might find high customizable services good to fulfill their needs. At the same time, the safety needs may not be relevant to these customers as they already have fulfilled these lower-level needs.

An empirical investigation by Tafti and Shirani (1997) revealed a hierarchy of end-user computing needs similar to Maslow's (1954) hierarchy of needs. Technology end-users needed to fulfill their information needs (such as reliable software operations). Tafti and Shirani believed that once this need is fulfilled, end-users will need to have system features such as the ability to receive reports in multiple channels. Then, end-users need to fulfill technical needs such as customizing reports or self-control systems.

Based on Maslow's theory, Herzberg's two-factor model specified hygiene factors and motivational factors of satisfaction. Hygiene factors are the maintenance factors that cannot be ignored to maintain a foundation, which was being a customer in the context of the current study. Motivational factors, on the other hand, are the satisfiers. The absence of these satisfiers does not lead to dissatisfaction (Newstrom, 2011).

Understanding human needs and motivations is important for understanding what satisfies individuals, which helped answer the research question of the present study. The hierarchy of needs theory provided an understanding of human motivation and explains a hierarchy of these needs. Herzberg's two-factor model separated satisfiers and hygiene factors. The hygiene factor has explained similar studies when service quality dimensions did not explain SAT within TBS (Zhu et al., 2002). The following discussion will discuss the definition of SAT.

Definition. Rust and Oliver (1994) noted the word satisfaction is “derived from the Latin word *satis* (enough) and *facere* (to do or make)” (p. 3). The definition indicated that satisfaction could be a fulfillment of customer needs. Researchers have indicated that satisfaction can be cognitive based on the expectation-disconfirmation paradigm

(Oliver, 1980) or affective based on an emotional response to consumption experience (Liljander & Strandvik, 1997).

Researchers have viewed SAT as cognitive. According to Rust and Oliver (1994), the process of satisfaction under the expectation-disconfirmation paradigm included two processes: (a) forming an expectation about the service based on internal cues and (b) a subsequent comparison of expectations against outcomes. The comparison is a cognitive evaluation that is the prime determinant of satisfaction or dissatisfaction (Rust & Oliver, 1994).

In contrast, reviewers have viewed SAT as affective. Liljander and Strandvik (1997) indicated that satisfaction is not understandable without the study of its affective dimensions or emotional responses. Satisfaction relates to reinforcement and arousal (Rust & Oliver, 1994). A pain reliever could fulfill a negative reinforcement causing satisfaction. Entertainment could provide a positive reinforcement causing satisfaction. High arousal such as a surprise can be a fulfillment and a source of satisfaction. Low arousal such as the state of no shocks or no surprises can also be a fulfillment and a source of satisfaction.

Satisfaction can be a fulfillment to customer needs as well as organization objectives. Rust and Oliver (1994) referred to SAT as a transaction-specific indicator, whereas Anderson et al. (1994) indicated that SAT could be applied as a fundamental indicator of the firm's overall performance. Customer satisfaction has an association with economic consequences that are beneficial to a firm (Anderson et al., 1994).

Consequences. Fornell (1992) illustrated the Swedish experience in SAT monitoring on a macro level. Sweden was the first country to establish an annual SAT

biometer that measured SAT across 30 industries and over 100 corporations. The measurement of SAT on a country level allowed Fornell to relate SAT to productivity and market share on a macro level. Anderson et al. (1994) concluded that organizations with high SAT enjoyed superior economic returns. The returns occurred in the long term as SAT affected future purchasing behavior.

Current findings. Molina, Martín-Consuegra, and Esteban (2007) indicated that researchers have not agreed upon one definition of SAT. Molina et al. implied that satisfaction resulted when customers achieved their goal. According to Cronin et al. (2000), satisfaction reflected a customer's positive feelings from a service. Anderson, Fornell, and Mazvancheryl (2004) and Matzler, Hinterhuber, Daxer, and Huber (2005) found a positive association between SAT and shareholder value. Johnson, Sivadas, and Garbarino (2008) found SAT to be the result of customers' affected commitment. Affective commitment refers to customers' sense of belonging and emotional bonding to a firm.

In traditional services, SAT is the result of the customer–employee relationship during the service delivery, recovery, and personalization of the service (Meuter et al., 2000). Customer relationship might have pleasurable fulfillment to customers such as special treatment or social interaction with employees. In contrast, customers who feel uncomfortable using TBS might avoid the use of technology, even when benefits are obvious (Meuter et al., 2003). Haytko and Simmers (2009) found that the convenience of TBS has displaced the importance of human interactions in relation to SAT. Customers might belong to the firm through nonsocial attributes such as frequent rewards (Johnson et al., 2008).

In an investigation of factors associated with SAT within TBS in the banking industry, Zhu et al. (2002) examined customer experience, perceived service quality, service policies and procedures, and preference toward traditional services in relation to SAT and found a significant relationship. Research findings indicated a significant association between perceived service quality dimensions within TBS and SAT.

Meuter et al. (2000) researched sources of satisfaction and dissatisfaction rising from TBS in a qualitative manner. According to Meuter et al. (2000), SAT was the result of TBS's ability to solve intensive needs immediately, save time and money, and avoid service personnel interaction. In contrast, customer dissatisfaction came from technology failure, which comes from service unavailability, inaccurate functions or billing, or system errors. Customer-driven failures such as customer misuse of technology were also sources of dissatisfaction (Meuter et al., 2000).

According to Lin and Hsieh (2006), SAT within TBS comes from the ability of TBS to function correctly; the extent to which service is perceived as enjoyable, secure, and convenient; and the level of security and customization TBS provides customers. Lin and Hsieh supported the notion that the ability of TBS to inspire trust and confidence will increase customers' satisfaction with the service. Lin and Hsieh expected perceived service quality to correlate with SAT.

Customers' perceptions of service quality versus satisfaction. The relationship between SAT and BI has been widely discussed in the literature (Cronin et al., 2000; Dabholkar, 1994). Cronin et al. (2000) listed 31 research studies in which the researchers linked service quality perception, SAT, and BI. H. Lee, Lee, and Yoo (2000) found a perception of service quality is the result of SAT.

Ekinci (2003) found that “service quality and customer satisfaction are strongly related but are, nevertheless, different constructs” (p. 72). In Ekinci’s study, SAT did not correlate with customer perception of service quality. A significant correlation occurred when customers took into consideration the price they paid.

Customer satisfaction might result from price, product variety, and availability. In TBBS, products such as bill payment, money transfers, and online transaction execution might become a major SAT factor. High service fees such as high charges for using an ATM can hinder SAT of the service.

Anderson et al. (1994) supported the notion that, generally speaking, SAT is distinct from service quality for three main reasons. First, SAT comes from actual service encounter experience, whereas someone can perceive quality without consumption. Second, quality is independent of price, whereas SAT is dependent on perceived value, which is perceived quality relative to price paid. Third, quality pertains to the current perception of a service, whereas SAT pertains to all past and current experiences, as well as future anticipated experiences.

Although service quality is an important factor of SAT, Parasuraman et al. (1988) found empirical support for the notion that perceived service quality is an independent construct to measure SAT. Cronin and Taylor (1992) supported such a notion and indicated that managers need to “emphasize total customer satisfaction programs over strategies centering solely on service quality” (p. 65). Lin and Hsieh indicated that service providers should examine service quality dimensions to improve SAT and BI.

Behavioral Intentions

Behavioral intentions is a method organizational leaders use to ensure customer retentions and repurchase. The following sections include a discussion on the historical overview and current findings associated with BI. The historical overview provides an understanding of the BI construct and the theory of planned behavior that explains the relationship between human intentions and actual behaviors. Current findings include a discussion on BI within the service quality research.

Historical overview. Behavioral intentions are “the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior” (Ajzen, 1991, p. 181). The motivational factors include situation, perceptions, and attitudes toward a particular action. In the context of the current research study, a BI can be favorable or unfavorable toward the consumption of a service. This definition is consistent with the definitions of other researchers in service quality research such as Parasuraman et al. (1988), Cronin et al. (2000), and Lin and Hsieh (2006) that have simplified the measurement of BI to understand relationships within service quality research. Behavioral intentions can be viewed as “indicators that signal whether customers will remain with or defect from the company” (Zeithaml et al., 1996, p. 33).

The theory of planned behavior includes evidence of the significance of customer perceptions and attitudes to predict customer actual behavior (Ajzen, 1991). The theory indicates that intentions are antecedents of human behaviors. According to Ajzen (1985), predictions of human behaviors can occur based on human intentions or plans to engage in a behavior. Ajzen (1991) provided three main factors to determine customer

intentions: (a) attitudes toward a behavior, (b) subjective norms, and (c) perceived behavioral control.

The first factor indicates that the basis of predicting a behavior is specific attitudes toward the behavior in question (Ajzen, 1991). In the context of relating service quality with BI, only specific service quality dimensions can be expected to predict customer behavior. In contrast, subjective norms refer to people's beliefs about how others will view the behavior in question (Ajzen, 1991). The first factor is similar to the idea discussed by Parasuraman et al. (1985), which indicates service quality gaps can come from word-of-mouth communication, as discussed earlier. Perceived behavioral control, which is the third factor, refers to one's perceptions of his or her ability to perform a given behavior, which is similar to the concepts of the expectancy theory discussed earlier. According to Ajzen (1991), "The stronger the intention to engage in a behavior, the more likely should be its performance" (p. 181).

Current findings. Both researchers and practitioners have researched the BI construct to help predict customer behavior (Cronin & Taylor, 1992; Dabholkar, 2000; Lin & Hsieh, 2006; Parasuraman et al., 1988). The researchers noted primarily studied SAT and BI in the service quality literature because customer behaviors are very complex to predict from a psychological perspective (Ajzen, 1991). Such a study would require a complicated experimental research methodology that would allow a researcher to control service quality dimensions over time with longitudinal data. Behavioral intentions presented an acceptable presentment of customer actual behavior based on the theory of planned behaviors. The importance of the BI concept appeared in the need for organizations to retain customers (Zeithaml et al., 1996).

Zeithaml et al. (1996) provided a model of customer behavioral consequences of service quality (see Figure 7). Zeithaml et al. indicated that based on customer perception of service quality, customers would find the service quality either superior or inferior. If service were perceived as superior, customers would have favorable BI. Favorable BI would help to retain the customer, provide ongoing revenues, increase customer spending, elicit a customer's willingness to pay premium prices, and attract other customers. If service was perceived to be inferior, a customer would have unfavorable BI. Unfavorable BI would deter the customer, provide decreasing revenues, decrease customer spending, dampen a customer's willingness to pay premium prices, and deter other customers.

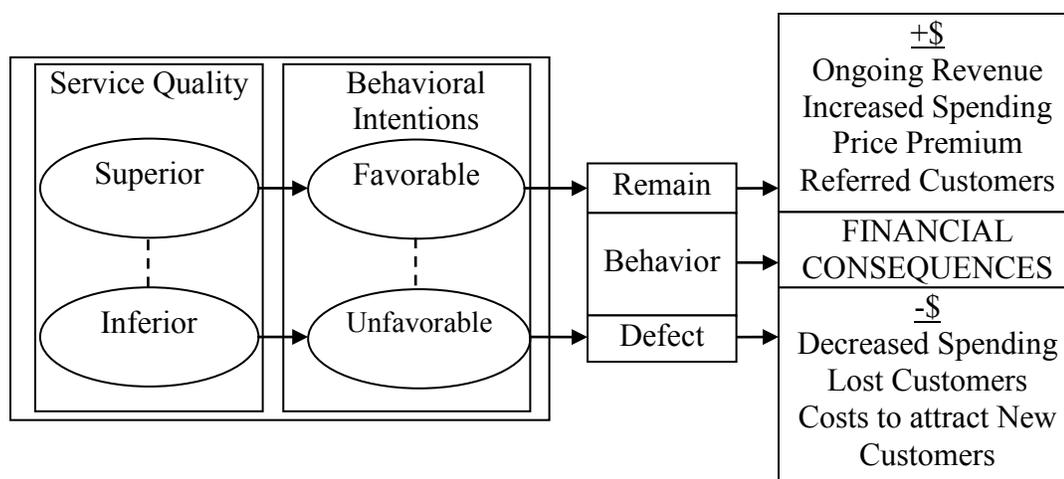


Figure 7. The behavioral and financial consequences of service quality.

Note. From "The Behavioral Consequences of Service Quality," by V. Zeithaml, L., Berry, and A. Parasuraman, 1996, *Journal of Marketing*, 60, p. 33. Copyright 1996 by the American Marketing Association. Adapted with permission (see Appendix B).

Customer behavior has changed dramatically since the introduction of innovated technologies. Customer preferences have shifted from the traditional brick-and-mortar

banks toward virtual banks and TBBS. With the introduction of online banking services in an information-technology-based global economy, leaders of financial institutions need to enhance service quality to meet customer expectations (Ziqi & Tow-Cheung, 2008).

The importance of TBBS has evolved as the environment has changed.

Based on a meta-analysis conducted by Carrillat, Jaramillo, and Mulki (2009), service quality plays a vital role in a firm's quest for building long-term relationships with customers. The findings of the meta-analysis provided support from 86 articles whose authors examined the impact of service quality on SAT, attitudinal loyalty, and BI. Within TBS, Lin and Hsieh (2006) indicated that perceived service quality had a significant positive influence on SAT and BI.

Conclusion

Chapter 2 included a thorough review of the body of knowledge related to the nature of services, service quality, SAT, and BI. The development of technology influenced the nature of services and shifted the relationship between a customer, an employee, and a company with an added technology dimension (Parasuraman, 2000). The service quality conceptualization provided the impetus for the gap model, which indicated the existence of five major gaps in service delivery that can cause a service quality gap between customer expectations and perceptions of the service process (Parasuraman et al., 1988). Cronin and Taylor (1992) and Parasuraman et al. (1988) found that closing the gap between customer expectations and perceptions of service quality enhanced SAT and BI.

Many researchers have investigated factors that influence service quality.

Parasuraman et al. (1998) provided a SERVQUAL model that included five dimensions

of service quality to influence customer perception of service quality. The dimensions include tangibility, reliability, responsiveness, assurance, and empathy. Further research of service quality within TBS provided different arrays of service quality measurements based on customer attitudes, levels of interaction, and service contexts. Lin and Hsieh (2006) noted seven dimensions of service quality that determine service quality within TBS: functionality, enjoyment, security, assurance, design, convenience, and customization.

Summary

Chapter 2 included an overview of the literature in which researchers examined the relationships between service quality and SAT. The literature findings of Parasuraman et al. (1988) provided a conceptual framework that concluded service quality is an antecedent of SAT and BI. Lin and Hsieh (2006) provided a conceptual model to examine service quality within the context of TBS. The model included seven dimensions of service quality within TBS that need further assessment in the banking industry to determine if a set of these dimensions relates to SAT and BI. Chapter 3 contains a discussion on the methodology used to conduct the research study.

Chapter 3: Methodology

The purpose of the quantitative correlational study was to determine if a set of TBBSQUAL dimensions have an association with SAT and BI toward TBBS in Yemen. The study involved testing the seven dimensions suggested by Lin and Hsieh (2006) in a specific industry (banking) and population (Yemen). Dimensions of TBBSQUAL consist of functionality, enjoyment, security, assurance, design, convenience, and customization (Lin & Hsieh, 2006). The predictor variables (independent variables) for this investigation were the aforementioned TBBSQUAL dimensions. The criterion variables (dependent variables) were SAT and BI. The study involved an examination into perceptions of current retail banking customers who used TBBS in 10 banks in Yemen to determine the relationship between TBBSQUAL dimensions and SAT and BI in a specific industry (banking) and population (Yemen). The study might help bank and technology leaders understand which factors influence customer perceptions associated with TBBS in Yemen.

Chapter 3 includes a description of the research method and its appropriateness to the purpose, research question, hypotheses, geographic location, population, informed consent, confidentiality, sampling frame, survey instrument, data collection, and data analysis. The chapter also includes evidence of the reliability and validity of the research design to achieve the research objectives. The chapter concludes with a summary.

Research Method and Appropriateness of Design

The following two sections include a discussion on the research method and design selected to achieve the goal of this study. A section on the research methodology

includes a description of the selected method. The second section includes a discussion on the appropriateness of the design to achieve the goal of the study.

Research method. The objective of the research study was to examine a relationship and test an existing model. Quantitative research methods can help a researcher explain a relationship, test a theory, describe a pattern, and measure a behavior (Cooper & Schindler, 2008). The aim of the current research study was to reach a generalization based on the quantitative measurement of patterns of behavior, in contrast to a qualitative method, which involves exploring a central phenomenon (Creswell, 2008). Quantitative methods tend to answer specific and narrow questions by collecting and analyzing quantifiable data, whereas qualitative methods tend to answer general and broad questions by collecting and analyzing views and themes (Creswell, 2008). This study has specific and narrow relationships that need testing; correlating quantifiable data can provide statistical significance to support or reject the hypotheses regarding SAT and BI.

Appropriateness of the study design. The design of the study was to determine whether TBBSQUAL dimensions have an association with SAT and BI. Basic, correlational, descriptive, and cross-sectional designs are necessary. The rationale used to select such designs as opposed to other approaches follows. Subsequent sections are as follows: Basic Research, Correlational, Descriptive, Survey, and Cross-sectional Sampling.

Basic research. The research study involved basic research rather than applied research. The focus of basic research is supporting or refuting theories that explain behavior (Neuman, 2006). In contrast, the focus of applied research is on solving a

specific practical concern to an employer (Neuman, 2006). The research findings might be of significance to practitioners and business leaders, particularly to bank leaders and technologies innovators, although the primary concern for the research study was to contribute to a current conceptual framework suggested by Lin and Hsieh (2006) related to customer perceptions and behaviors toward TBBS in Yemen through a quantitative research method.

Correlational. The primary purpose of the research study was to determine the degree to which relationships exist between a set of service quality dimensions of TBBS, SAT, and BI. The principle advantage of the correlational design is the ability to explain the relationship between two variables. Correlational methods can help to determine if, and to what extent, a relationship exists between two variables (Vogt, 2007).

Correlational research, unlike experimental research, does not require a control group and experimental group to see the cause and effects. The complexity of the variables and the inability to control or manipulate the variables makes an experimental design inappropriate. Neuman (2006) noted, “Experiments are best for topics where the researcher controls a situation and manipulates an independent variable” (p. 331). The present study involved a search for any significance in relationships and involved describing the relationships between variables.

Descriptive. The study mainly involved describing quantitative data. Outcomes of qualitative studies describe “a picture of the specific details of a situation, social settings, or relationship” (Neuman, 2006, p. 35). In contrast to exploratory or explanatory research, descriptive research only involves clarifying and documenting the relationship between the specified variables. Neuman (2006) indicated that exploratory

research involves an attempt to explore and generate new ideas and themes that need further research. Explanatory research will involve an explanation regarding “why things are the way they are” (Neuman, 2006, p. 35). Descriptive analysis does not involve exploring or generating any new ideas or explaining or extending to a current issue. However, the study findings appeared to provide reasonable grounds for future exploratory or explanatory research.

Survey. Because existing data were not available, a data collection method was necessary. Researchers can use a survey to ask certain questions to many people in a short period; summarize answers into percentages, tables, and figures; and generalize results from a sample of respondents (Neuman, 2006). Neuman (2006) noted, “Survey research is best for topics where the researcher asks questions and learns about reported attitudes or behavior” (p. 331). A survey design was the measurement tool used to collect quantifiable data at one point in time.

Cross-sectional. Methods in the study involved collecting, describing, and assessing quantitative data at one point in time. Creswell (2008) noted cross-sectional survey design is appropriate when “the researcher collects data at one point in time” (p. 389). In contrast to a cross-sectional design, a longitudinal design is appropriate for examining attitudes, beliefs, opinions, or practices over time (Creswell, 2008). Although monitoring customer perceptions of TBBS over time might help bank and technology leaders to achieve market leadership, future research can describe patterns of relationships over time. The focus of the study was to describe the relationship between TBBSQUAL, SAT, and BI. Quantitative data collected through a survey taken at one point in time were necessary to achieve the goal of the study appropriately.

Because customers in Yemen were reporting dissatisfaction with TBBS (MarebPress, 2009), the current study involved examining whether dissatisfaction comes from shortfalls in certain service quality dimensions within TBBS. Service quality is an antecedent of SAT and BI (Cronin & Taylor, 1992; Parasuraman et al., 1988). Lin and Hsieh (2006) posited that seven dimensions (functionality, enjoyment, security, assurance, design, convenience, and customization) determine service quality in SSTQUAL.

The SSTQUAL served as the foundation of the survey instrument to examine the problem of customer dissatisfaction. The survey assessed current bank customers' perceptions of each dimension. The current study involved statistically analyzing the collected quantitative data to reject or fail to reject established hypotheses. The research was a continuation of previous researchers' investigations into the relationships among service quality, SAT, and BI that have used quantitative, correlational methods (Cronin et al., 2000; Yen, 2005). A quantitative method with a basic correlational design that includes the implementation of a cross-sectional survey was appropriate and optimal to achieve the purpose of the study and answer the research question (Creswell, 2008).

Research Question

Because retail-banking customers reported dissatisfaction with TBBS in Yemen (MarebPress, 2009), the research question served to investigate service quality dimensions suggested by Lin and Hsieh (2006) and associated with SAT and BI within TBBS in Yemen. The research question was as follows:

Research Question: Which combinations of functionality, enjoyment, security, assurance, design, convenience, and customization, which are service quality dimensions in TBBS, have an association with SAT and BI toward TBBS in Yemen?

Hypotheses

A set of hypotheses was tested to answer the research question based on the study problem and purpose. The hypotheses are a guide to the research process. Each involves a prediction that the data might or might not support. Statistical two-sided tests were performed at an alpha level of 5% to either reject or accept the hypotheses. H_0 represents a null hypothesis and H_a represents an alternative hypothesis.

A set of seven hypotheses addressed the study's research question. The hypotheses address each service quality dimension: functionality, enjoyment, security/privacy, assurance, design, convenience, and customization in relationship with SAT and BI. Researchers have used the same pattern of hypotheses in several quantitative research studies in the domain of service quality dimensions, SAT, and BI (Cronin et al., 2000; Yen, 2005). The hypotheses were as follows.

H_{10} : No correlation exists between customer evaluation of technology-based banking service functionality and SAT and BI toward TBBS in Yemen.

H_{1a} : A significant correlation exists between customer evaluation of technology-based banking service functionality and SAT and BI intentions toward TBBS in Yemen.

H_{20} : No correlation exists between customer evaluation of technology-based banking service enjoyment and SAT and BI toward TBBS in Yemen.

H_{2a} : A significant correlation exists between customer evaluation of technology-based banking service enjoyment and SAT and BI toward TBBS in Yemen.

H3₀: No correlation exists between customer evaluation of technology-based banking service security and SAT and BI toward TBBS in Yemen.

H3_a: A significant correlation exists between customer evaluation of technology-based banking service security and SAT and BI toward TBBS in Yemen.

H4₀: No correlation exists between customer evaluation of technology-based banking service assurance and SAT and BI toward TBBS in Yemen.

H4_a: A significant correlation exists between customer evaluation of technology-based banking service assurance and SAT and BI toward TBBS in Yemen.

H5₀: No correlation exists between customer evaluation of technology-based banking service design and SAT and BI toward TBBS in Yemen.

H5_a: A significant correlation exists between customer evaluation of technology-based banking service design and SAT and BI toward TBBS in Yemen.

H6₀: No correlation exists between customer evaluation of technology-based banking service convenience and SAT and BI toward TBBS in Yemen.

H6_a: A significant correlation exists between customer evaluation of technology-based banking service convenience and SAT and BI toward TBBS in Yemen.

H7₀: No correlation exists between customer evaluation of technology-based banking service customization and SAT and BI toward TBBS in Yemen.

H7_a: A significant correlation exists between customer evaluation of technology-based banking service customization and SAT and BI toward TBBS in Yemen.

Geographic Location and Population

The current study involved surveying banking customers who use TBBS in Sana'a City, the capital and largest city in Yemen. The population under investigation

was approximately 400,000 customers who use TBBS from 10 banks operating in Yemen (Central Bank of Yemen, 2008). The customers use TBBS such as ATMs, credit and debit cards, interactive voice responders, mobile banking, and Internet banking services. ATM cards are the most popular TBBS in local banks (R. Alkhateeb, personal communication, May 16, 2008). Although banks allow minors to open bank accounts, a guardian must have an association with the bank accounts. Some TBBS such as credit cards and Internet banking require a minimum age of 18 years old. Therefore, the population consisted of adult customers who benefit from TBBS in Yemen. Participants of the study signed an informed consent and confidentiality form and the basis for participant selection was a sampling frame.

Informed Consent and Confidentiality

Participation in the research study was voluntary. Bank customers were selected during their visits to bank branches and ATM locations and invited to participate in an online version of the survey. Permission to conduct the study on the premises of organizations was obtained prior to the collection of any data (see Appendix D for permissions for using resources). Each participant who agreed to participate in the study signed the informed consent and confidentiality form prior to participation (see Appendix E for consent and confidentiality form). The form indicated the time needed to complete the survey, the purpose of the study, and a confirmation of the participant's protection of privacy rights. The form also indicated that all responses were strictly confidential and anonymous, and no association or link would occur between the responses and any individual or any bank in any report.

The study involved following the standard confidentiality measures in accordance with university and local policies. The study also involved taking every effort to protect the confidentiality of research participants. Appointed assistants during the data collection process received 2 hours of training in data collection procedures and in the protection of human subjects and signed a confidentiality agreement (see Appendix F). Collected data were secure and confidential at all times during and after the study. All data will remain in the researcher's locked file cabinet for 3 years, after which all data will be shredded. Electronic data generated during the analysis will remain password-protected on the researcher's personal computer for 3 years, after which time electronic copies will be deleted.

Sampling Frame

The aim of the study was to collect data involving customer perceptions and intentions toward using TBBS. The target sample included current customers at 10 banks providing TBBS. The following sections include a discussion on sample characteristics and sampling techniques used to achieve the purpose of the study.

Sample characteristics. In this study, qualified participants had to meet two conditions: (a) have an ATM, credit, or debit card and (b) have used any TBBS in the past month. The two criteria helped to achieve a good representation of the sample to examine TBBSQUAL in accordance with the definition of TBBS. Participants were 18 years old, which is the minimum age to be a cardholder. Participants who met the mentioned characteristics provided a reasonable sample to study.

Sample technique. The study included a nonprobability, convenience-sampling technique. Because of the inability to access customer databases to perform a probability

sampling, a convenience sampling technique was necessary. The population for the study represented approximately 2% of the population of Yemen, so using a directory or another means to select random participants could have generated a very low response rate. The study included an online and an offline version of the survey to ensure better representation of the population given the technology focus of the study. The following discussion addresses the sampling procedures for each version.

Online survey. Online participants were reached via e-mail. Contacts at a few banks agreed to send the survey invitation to their e-mail databases, which contained over 5,000 e-mails of current retail banking customers. Online participants were invited upon survey completion to refer their friends to the survey by entering the e-mail addresses of their friends or sharing the survey with their social networks such as Facebook. The method was an example of a snowball sampling technique in which participants invite more participants (Neuman, 2006). This sampling strategy was implemented to increase the number of participants at a reasonable cost and within available time to conduct the study. At the same time, the method allowed for a better representation of the sample.

Offline sampling. Potential participants were recruited to participate in the survey during their visits to bank branches or ATM locations. According to Creswell (2008), convenience sampling is appropriate when “the researcher selects participants because they are willing and available to be studied” (p. 155). Unlike probability sampling that eliminates sampling bias, convenience sampling has “no controls to ensure precision” (Cooper & Schindler, 2008, p. 397) to reduce or eliminate sampling bias. Many researchers have used convenience sampling when measuring service quality and SAT (Kaynak, 2005; W. F. Lewis, 2007; Liu, 2008; Mayard, 2007; Tso, 2007).

Neuman (2006) indicated that quota sampling is an enhanced form of convenience sampling. The study involved an application of a quota sampling technique in the sampling procedure to add an element of control. Quota sampling provides a number of participants who represent different groups within a population. Because the population of the study consisted of customers of 10 banks who use TBBS, every bank was represented in the sample. The objective was to ensure sample diversity and the representation of all retail banking customers who qualify to participate in the study.

The aim was to collect surveys from a minimum of 300 participants from the 10 banks to achieve ample data. The sampling process involved recruiting participants until the minimum number of 300 participants was obtained. Creswell (2008) recommended 30 participants for correlational research in general. Creswell noted that 300 participants responding to survey questions would yield a 95% confidence interval, such that 95 out of 100 times, the sample value would fall within the range of the population mean, with only a 3% sampling error rate. According to Creswell, a power criterion of .80 with an effect size of .20 can be achieved with a sample size of 395 at an alpha of .05. Therefore, 465 qualified participants selected on the basis of quota sampling and convenience sampling were an acceptable sample for the purpose of the study.

Survey Instrument

The survey instrument used to collect variables of the study included existing scales and measurement instruments that proved reliable and valid in Lin and Hsieh (2006). Adaptation was necessary to reflect the target population in the banking industry in Yemen. Therefore, a pilot study was conducted to establish reliability and validity.

The following sections contain a discussion of the existing survey, reason for adaptation, and the pilot study.

Existing survey. The study instrument included an adaption of the SSTQUAL scale used in Lin and Hsieh (2006; see Appendix G for permission to use an existing survey). The scale was appropriate for several reasons. First, Lin and Hsieh developed the scale recently (in 2006), and the basis of the scale is a well-developed service quality conceptual framework (see Chapter 2). Second, the scale involves service quality in TBS, which fit the definition of TBBS. Third, Lin and Hsieh, the developers of the survey, called for further assessment of the reliability and validity of the scale in the banking industry.

Although researchers have developed many other survey tools from solid conceptual frameworks such as SERVQUAL (Parasuraman et al., 1988), SITEQUAL (Yoo & Donthu, 2001), WebQual (Loiacono et al., 2002), eTailQ (Wolfenbarger & Gilly, 2003), and E-S-QUAL (Parasuraman et al., 2005), the survey tools did not fully reflect TBBSQUAL as defined in this study. Zhu et al. (2002) used SERVQUAL to assess service quality in TBBS, but had to incorporate many adaptations to reflect the uniqueness of technology rather than traditional banking services, which SERVQUAL originally measured.

The survey for the present investigation was a self-administered questionnaire that served to collect data for the study. The survey includes five main sections: (a) demographics, (b) perceptions of TBBSQUAL, (c) SAT, (d) BI, and (e) open-ended remarks (see Appendix A for the survey instrument). Although quantitative data collection involves gathering numeric data, the open-ended remarks section is to “identify

any comments people might have that are beyond the responses to the closed-ended questions [in quantitative research]” (Creswell, 2008, p. 228). The open-ended remarks contributed to the descriptive nature of the study.

The demographics section described the sample, including age, gender, income, education level, years of experience with technology, and years with current bank. The inclusion of additional control questions served to ensure participant qualification to represent the population based on the sampling procedure. All items provided respondents with a list of options from which to select.

Sections 2, 3, and 4 made use of Likert-type scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The TBBSQUAL section includes 20 items measuring seven dimensions of functionality, enjoyment, security, assurance, design, convenience, and customization. See Appendix H for a mapping of the survey items to the seven dimensions of TBBSQUAL. The satisfaction section consists of three items adapted from the American Customer Satisfaction Index scale (Anderson et al., 2004; Fornell et al., 1996). The BI section consists of three items used throughout service-marketing literature (Cronin et al., 2000).

Items in the SAT and BI sections are the same items used in Lin and Hsieh (2006). Using these items facilitated a comparison between the data gathered in this study and the data gathered by Lin and Hsieh to provide a comparison of the study findings and the findings discussed in the literature. The only difference was the required adaptation of the survey to meet the specific needs of the current study.

Adaptation. SSTQUAL was developed in English for general TBS. For the purpose of the current study, the survey was translated into Arabic because some

participants might not have been conversant in English. The survey needed to reflect the uniqueness of the banking industry in Yemen. A pilot study followed the adaptation that confirmed face validity and reliability of the final survey instrument.

Pilot study. A pilot study was conducted upon the approval of the proposal to ensure survey validity and reliability after the adaptation. Neuman (2006) indicated that pilot tests could improve the reliability and validity of survey instruments. The pilot study consisted of two phases.

Phase 1. The first phase included a panel of experts based on a suggestion by Creswell (2008). The panel selected for the study included bank professionals selected for their business and for their academic expertise and mastery of the Arabic and English languages. After signing the informed consent and confidentiality form, the panel members received a draft of the survey in Arabic and English during a focus group meeting, and an overview of the study with the members of the panel ensued.

The discussion covered the overall language and interpretations, instructions, survey items, and presentation. The objective was to ensure survey reliability and validity in measuring customer perceptions and intentions within the context of TBBS in Yemen. The process included reviewing the items one-by-one and recording final wording when consensus occurred. If disagreement occurred, a majority vote prevailed. The researcher took notes and made comments for further analysis.

Phase 2. The second phase of the pilot study consisted of 10 individual field-test interviews with bank customers. Creswell (2008) suggested conducting field-test interviews to ensure that participants would be able to understand and complete the survey. Each participant was asked to sign the informed consent and confidentiality form

prior to taking the survey. Participants were asked to indicate any comments or questions regarding the survey instructions and content. The researcher recorded the comments and discussed the comments with the participants.

The above two steps were not audio or video recorded or transcribed as suggested in qualitative research (Creswell, 2008) because the pilot test and focus group would not involve exploring a phenomenon or providing in-depth analysis of the instrument that requires transcription. Taking field notes during a pilot study is an appropriate method of data collection (Creswell, 2008). The pilot study was to confirm or disconfirm the translation of the developed SST-QAUL scale, provide improvements, and check validity and reliability within the context of banking services in Yemen. After the survey was adapted, localized, and revisited to meet the industry and population, it was used for data collection.

Data Collection

As discussed, data collection involved a cross-sectional survey instrument (see Appendix A for the survey instrument). The survey instrument includes a 7-point Likert-type format to collect participant perceptions. Likert-type answers can be in a numerical format, which is appropriate to a quantitative correlational study.

Data collection took place in bank branches and ATM locations (see Appendix D for a permission to use premises form). The locations enabled contact with the target sample to investigate the study problem and achieve the purpose. A research assistant coordinated with location supervisors to recruit participants. Recruiting assistants signed a confidentiality agreement (see Appendix F). The recruiters discuss informed consent with the potential participants. Participants who agreed to participate in the study signed

the form prior to taking the survey. In the event that participants could not finish the survey immediately, they had the option to take the survey with them and mail the survey to the researcher by the deadline date. E-mail invitations to bank customers were arranged with a few banks. These e-mails directed participants to an online version of the survey that only allowed participants to view the survey after accepting the consent form. Based on the sampling frame, 465 offline and online versions of the survey were completed and collected. Offline survey collection took place at three different branch and ATM locations for each bank. Completed surveys were stored safely in a locked filed cabinet and an electronic database was secured in a personal computer throughout the data analysis phase of the research study.

Data Analysis

Survey data were collected and entered into a Microsoft Excel spreadsheet. The data were then copied into a SPSS Version 18 for Windows worksheet. The analysis included descriptive analysis of the raw data as well as inferential statistical analysis.

Descriptive analysis provided a description of the study variables. The analysis began with sample characteristics based on the demographic categories. Next was an item-level analysis of each of the survey items followed by a variable-level analysis of the average of each of the survey variables. The analysis provided a description and documentation of the sample responses to the survey. A Cronbach's alpha was measured to assess the in-trait consistency of the scales for reliability (Vogt, 2007), which was accepted at the 70% level.

Inferential statistics was used to compare mean measurements of different participants at a 5% alpha level. The ANOVA provided an understanding of how

participants differed in their responses based on their demographic categories such as age, gender, technology experience, banking experience, and current bank. An independent sample *t* test helped to determine whether responses differed among respondents who were required to bank with a particular bank or not, as well as whether respondents completed the online or offline versions of the survey.

A correlational analysis tested the hypotheses by correlating each of the independent variables with each of the dependent variables. If relationships emerged, directions and strengths of relationships were examined. All analyses were two-sided at a 5% alpha level.

The study also involved further analysis. Confidence intervals, histograms, box plots, and correlation matrices are displayed to understand variable distributions. Figures and tables provide visual representations of the results (Lind et al., 2008).

A regression analysis predicted each of the dependent variables (SAT and BI) in terms of the independent variables of functionality, enjoyment, security, assurance, design, convenience, and customization. Multiple regression analysis provided the coefficient of determination, R^2 , which is the strength of independent variables in explaining dependent variables. Regression analysis was important to answer the research question and identify the combination of service quality dimensions that operate together in explaining dependent variables. The analysis also included a structural equation modeling (SEM) analysis to provide a direct comparison between the present findings and those found in Lin and Hsieh (2006). Lin and Hsieh utilized SEM analysis to measure how the data fit their model.

Reliability

The focus of reliability is the correctness and exactness of the research method and design (Cooper & Schindler, 2008). Reliable research occurs when the study results would be the same if replicated under similar conditions (Neuman, 2006). According to Neuman (2006), instrument reliability in quantitative research could increase by four techniques: pilot tests, precise level of measurement, multiple indicators, and clear conceptualization of constructs. The study included the following techniques:

1. A pilot test was conducted as discussed above. A panel of experts confirmed and contributed to the instrument reliability.
2. The Likert-type scale had a 7-point range that provided the optimal level for reliability. Based on research on Likert-type scales, Neuman (2006) reported that reliability increases as the number of points increase and it levels off at seven points. Many SERVQUAL researchers have used the 7-point range (Cronin & Taylor, 1992; Lin & Hsieh, 2006; Parasuraman et al., 1988; Zhu et al., 2002).
3. Each variable consisted of multiple items. A Cronbach's alpha was calculated to assess the in-trait consistency of the scales (Vogt, 2007).
4. The conceptualization of the construct was expected to be clear based on the literature review. Each measure indicated one and only one concept. Concepts are clearly defined. Previous research showed measurement scales provided reliable and valid outcomes (Lin & Hsieh, 2006).

The study included three main scales. Based on the literature review, researchers have used SAT (Anderson et al., 2004; Fornell et al., 1996) and BI (Cronin et al., 2000) scales extensively in the service-marketing literature as valid and reliable scales (Cronin

et al., 2000; Lin & Hsieh, 2006). SSTQUAL is relatively recent and does not have the same literature support. Nevertheless, Lin and Hsieh claimed item reliability as well as validity.

Although a reliable study infers correctness of the research method, the focus of validity is how well a study evaluates what a researcher intends to assess. A reliable design is necessary for validity (Vogt, 2007). The validity and reliability of a study determine the scientific worth of any research (Creswell, 2008).

Validity

Study validity involves internal and external validity (Creswell, 2008). 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.

External validity. External validity reflects the extent to which the research findings are generalizable across persons, settings, and times (Creswell, 2008; Neuman, 2006). The study achieved external validity by eliminating possible external forces that might hinder study generalizability in Yemen. For example, participants were asked for their honest and objective responses. The survey was distributed to qualified customers in normal settings. The sample was large enough to attain statistical representation of all banking customers in Yemen. Demographics confirmed sample distribution. Therefore, a replication of the data collection procedure should provide consistent outcomes (Neuman, 2006).

Internal validity. Internal validity reflects a limited amount of error in the research design (Neuman, 2006). As long as no internal misrepresentation or disruption

occurs, internal validity is established. Issues of selection bias such as mortality (when a participant refuses to finish all parts of the survey), maturation (when a participant becomes bored), instrumentation (when a problem occurs to the instrument, such as unclear survey copies or data entry problems), and contamination (when participants influence each other) present threats to internal validity (Neuman). The recruiters kept these issues in mind during the data collection process and took every measure to eliminate them. Participants were encouraged to complete the survey, assistance in filling out the survey was offered if participants showed signs of boredom, all survey papers were checked for clear photocopying, and participants were not allowed to discuss the survey while filling out their perceptions.

In the context of this correlational survey design study, the survey instrument was a major concern regarding internal validity. Measurement validity is the extent to which survey instrument items capture the desired variables. Measurement validity consists of face, content, criterion, and construct validity (Cooper & Schindler, 2008; Neuman, 2006).

Face validity. Face validity is the judgment of others that the measure is valid. As discussed in the survey instrument section, adaptation of the survey instrument included translation and localization of the instrument to ensure that retail customers in Yemen would understand the survey properly. One objective of the two-phase pilot study, as discussed earlier, was to ensure face validity. The panel of experts judged and contributed to the survey validity in capturing the objective of the study.

Content validity. Content validity is the extent to which measurement content captures the entire meaning. As illustrated in the literature review, the basis for the

development of the scale was the global service quality scale (SERVQUAL). The scale evolved based on previous research related to TBS in service delivery (Dabholkar, 1996; Meuter et al., 2005; Parasuraman et al., 1998; Zhu et al., 2002). The evolution of the SSTQUAL scale indicates that the construct has tapped all parts of the subject, which supports survey content validity (Neuman, 2006).

Criterion validity. Criterion validity is the extent to which the measure agrees with external sources such as preexisting measures (concurrent validity) or future behavior (predictive validity). The study was comparable to Lin and Hsieh's (2006) study that used the SSTQUAL scale. Criterion validity was achieved when current findings agreed with those reported by Lin and Hsieh as discussed in Chapter 4. Findings indicated agreement with the findings reported by MarebPress (2009) in which some customers were dissatisfied with TBBS in Yemen (concurrent validity). Future research on customer actual behavior toward TBBS might assess the predictive validity of the study.

Construct validity. Construct validity is the extent to which multiple indicators are consistent; that is, similar indicators correlate positively (convergent validity) and dissimilar indicators do not correlate or correlate negatively (discriminant validity). Lin and Hsieh (2006) confirmed the construct validity. SSTQUAL is a multiple-item scale that was "conceptualized, constructed, refined, and tested" (p. 499). According to Lin and Hsieh, the scale has gone through "substantive and empirical considerations" (p. 500). Lin and Hsieh conducted confirmatory factor analysis and found a good fit of the items in the scale, which indicated construct validity. Factor loadings revealed convergent validity, which indicated that multiple measures of the same construct stay

together or behave in similar ways. Constraint analysis revealed discriminant validity, which indicated that dissimilar variables were negatively associated or diverged.

Summary

Chapter 3 included a detailed description of the methodology for the current research study. The study involved a quantitative, descriptive, correlational research method. The study design was appropriate because the study involved determining if a relationship exists between TBBSQUAL, SAT, and BI. A cross-sectional survey that collects quantitative data on customer attitudes and beliefs is appropriate to conduct correlational analysis (Creswell, 2008). The chapter included a discussion on the research question and hypotheses; the study population and geographical settings; and the sampling, data collection, and data analysis. The survey instrument was expected to be a reliable and valid tool to measure customer perceptions of service quality, SAT, and BI associated with TBS in the banking industry (Lin & Hsieh, 2006). Conducting a pilot study served to confirm reliability and validity of the translated and adapted scales (Neuman, 2006). Chapter 4 will contain an analysis of the gathered data.

Chapter 4: Results

The previous chapters contained the background, a review of the relevant literature, and a description of the method of the study. The quantitative correlational descriptive research study involved determining if a set of TBBSQUAL dimensions have an association with SAT and BI toward TBBS in Yemen. The study involved testing the seven dimensions suggested by Lin and Hsieh (2006) in a specific industry (banking) and population (Yemen). Chapter 4 contains the findings obtained through following the methodology outlined in Chapter 3. This chapter includes data reporting, findings, and a summary.

Data Reporting

This section begins with a brief description of the pilot study procedures, and the survey adaptations and translations that resulted from the pilot study. The section continues with a discussion of data collection procedures, the methods used to conduct the survey, the sample size, and the return rate to build an understanding of the sample used in the study. Next is a description of the procedures used to prepare the data for analysis. The section ends with a discussion of the procedures used to analyze the data, presenting evidence of the data reliability and validity in measuring the study constructs, preparing to report the findings.

Pilot Study

The pilot study helped to tailor the study to the banking industry in Yemen. The pilot study consisted of two procedures. The first procedure was a focus group that looked at the survey translation and adaptation to suit Yemen's banking industry. The

second procedure was a pilot test of the survey. The following two sections include a description and analysis of the results.

Focus group. The focus group consisted of seven panel experts who assisted in validating the survey instrument in addition to the translation and adaptation of the survey instrument. The focus group was important to ensure survey face validity and reliability in answering the research question. The following two sections include a description of the focus group and a brief analysis of the results.

Description. The seven members of the focus group included three banking experts, two technology users, a customer service supervisor in a local financial institution, and a service quality expert. Everyone in the focus group was fluent in Arabic and English. The banking experts included current and previous employees in local banks including a card center manager, an information technology manager, and a delivery channels supervisor. Technology users were specialized individuals in technology services with extensive experience in technology infrastructures and equipment used for communications and payment channels such as mobile phones and ATMs.

The focus group discussed the contents of the survey, the survey translation, and data collection methodology. The following three sections contain discussions on each of these areas. The objective of the focus group was to ensure that the survey would achieve its purpose.

Survey contents. After a brief explanation of the study, the researcher asked the focus group to provide an evaluation of the survey instrument's ability to answer the study's research question. The focus group agreed that the survey items would

effectively measure the study variables. The focus group did suggest adding an item to measure service recovery, which is the bank's ability to resolve TBBS difficulties.

Survey translation. Even though the survey was translated into Arabic and back-translated into English prior to the focus group discussion, the focus group critiqued the language and presentation of the survey in light of the group's experiences in the local market. The critiques included modifying the structure of certain sentences and changing words to more clearly focus the statements, as well as suggesting changes in the survey instructions, organization, and formatting. The group's discussion led to an agreement regarding the prefinal survey items to be used in the pilot study.

Data collection methodology. The focus group suggested using two versions of the survey—online and offline—to ensure better representation of the population given the technology focus of the study. Specifically, the focus group pointed out that an online version of the survey could be more effective in reaching retail banking customers who use Internet banking services. A few members of the focus group also confirmed that the online version was suitable for achieving the purpose of the study.

Analysis. The focus group thoroughly discussed the contents of the survey. The group found the literature by Lin and Hsieh (2006) indicated the survey instrument was generally acceptable, believing that it would measure what it was supposed to measure and answer the research question of the present study. The focus group did not think that any of the questions were weak or lacked context within the banking industry in Yemen. The survey was modified to include a new item suggested by the focus group to measure service recovery: “When I face a difficulty using TBBS, the bank solves it effectively and efficiently.” Meuter et al. (2000) did not find service recovery as a source of satisfaction;

rather, a service failure was a source of dissatisfaction. While such findings were discussed with the focus group, the group continued to agreed that because service recovery is a critical service quality measure, it was important to be included in the study for possible different findings.

The focus group thoroughly discussed the translation of the survey. The discussion revealed that the translation needed to emphasize the item questions to ensure that the respondents would understand the focus of the item. For example, in the Arabic version, items referring to the respondent's bank needed to include the phrase *my bank*. That is, the focus group agreed that an item that read, "The bank's TBBS have interesting additional functions" needed instead to read "*My bank's* TBBS have interesting additional functions" because in the Arabic language, the possessive *s* might confuse the phrase with the general, "TBBS have interesting additional functions."

The focus group also suggested underlining examined concepts. For example, the focus group suggested underlining the words *additional functions* in the item "The bank's TBBS have interesting additional functions" to ensure that respondents evaluate "additional functions" rather than "interesting" (see Appendix I).

The focus group's suggestions were included in the study. The survey was developed in two versions, online and offline pen-and-paper, in the two languages Arabic and English. The survey had 21 items, including the additional item to measure service recovery. After the survey was approved by the focus group, a pilot test was needed before distribution to the sample respondents and to confirm the focus group findings.

Pilot test. The prefinal draft of the survey was field-tested to ensure clarity, usability, and reliability of the study instrument. The survey was distributed to 10 bank

customers who responded to it and provided additional comments on features such as its formatting, style, and meanings. The pilot test included both the online and offline versions in both languages. These comments led to further refinement of the survey instrument to ensure that the survey would be effective for data collection. The researcher discussed the respondents' answers to the pilot survey with the respondents to ensure that the survey questions measured the study variables and could answer the study's research question.

Data Collection

The data collection process included both the offline pen-and-paper version and an online version of the survey. Both versions included the same content: an informed consent and confidentiality form to be completed prior to filling out the survey and the survey instrument in Arabic and English (see Appendix I for consent form, confidentiality form, and final survey). The following sections contain a description of the data collection process for each version.

Pen-and-paper survey. The pen-and-paper version of the survey consisted of 700 copies of the survey handed to potential respondents in 20 different locations by 12 research assistants. Selected locations included bank branches, malls, and near ATM locations. The researcher trained the research assistants on how to recruit participants and collect the data. The training included three main issues: (a) how to ensure data confidentiality (assistants signed a confidentiality agreement—see Appendix I); (b) who the target respondents were, in order to meet the minimum qualifications set in Chapter 3 (sample characteristics were explained with examples); and (c) what participants had to do after they agreed to fill out the survey (e.g., participants had to sign an informed

consent and confidentiality form prior to filling out the survey). The training included an overview of the risks and challenges associated with the data collection process as well as logistics, access to premises, and handling respondent questions. Using research assistants served to reduce researcher bias in the study in addition to helping speed the collection of surveys from multiple locations.

The offline version of the survey returned 588 (84%) completed surveys. Given that 300 completed surveys was the necessary minimum as discussed in the methodology section above, this return rate was acceptable. The researcher coded the surveys and entered the results into SPSS Version 18 for data analysis. The researcher then reviewed the data again to ensure that the data entry process did not include any typographical errors or other mistakes.

Online survey. The researcher set up the online version of the survey using LimeSurvey, an open source online survey application, and customized the survey to meet the requirements of the study. The survey included the same survey content as the paper-and-pen survey in both Arabic and English versions. Respondents could use a language drop-down menu to flip between the two languages whenever they needed to. The online survey started with the informed consent and confidentiality form. Respondents had to acknowledge the form prior to starting the survey. The survey was divided into groups of questions, and respondents had to click *next* before the next of group of questions appeared. The researcher managed the database that stored all the data.

Three local banks agreed to send the Web link for the survey to their customer mailing lists, which totaled approximately 5,000 e-mail addresses. Respondents had the

option to refer the survey to their friends and colleagues. Respondents were also offered the option to share the survey with their social media friends. The online survey returned 627 (13%) completed surveys that were saved into the database for further preparation and analysis. The return rate of the online portion of the study was also acceptable as it exceeded the study's required minimum of approximately 300 surveys.

The return rates varied between the online and offline surveys due to the amount of effort required for each. The online survey was easier to collect because it was delivered through banks' e-mail databases, which reached 5,000 respondents. The offline survey required research assistants to recruit participants into the study. Research assistants indicated that approximately 1 out of 10 potential participants agreed to take the time to fill out the survey. Among those who agreed to take the survey, only 84% actually completed it.

Data Preparation

The data collection procedure ended with the preparation of data for analysis. The preparation of data included merging the pen-and-paper survey results and the online survey results into one SPSS file database with 1,216 cases. The data included many missing values and incomplete cases. All incomplete cases or cases with missing values of the main dependent and independent variables were excluded. Missing values in the demographics sections were acceptable. Respondents who did not meet the sample characteristics as described in Chapter 3 were excluded.

The results included 465 valid respondents or cases to be used in the sample analysis. The sample size was higher than the expected 300 participants (discussed in the sampling technique section in Chapter 3). The valid responses included 318 (68.4% of

the total) cases from the pen-and-paper surveys and 147 (31.6% of the total) cases from the online survey (see Figure 8). These percentages indicate that offline respondents were more willing to take the time to answer every question whereas the online respondents might have started the first few questions and decided to quit. This observation emphasizes the importance of the research assistants in recruiting participants. The following section contains a description of the data analysis procedures.

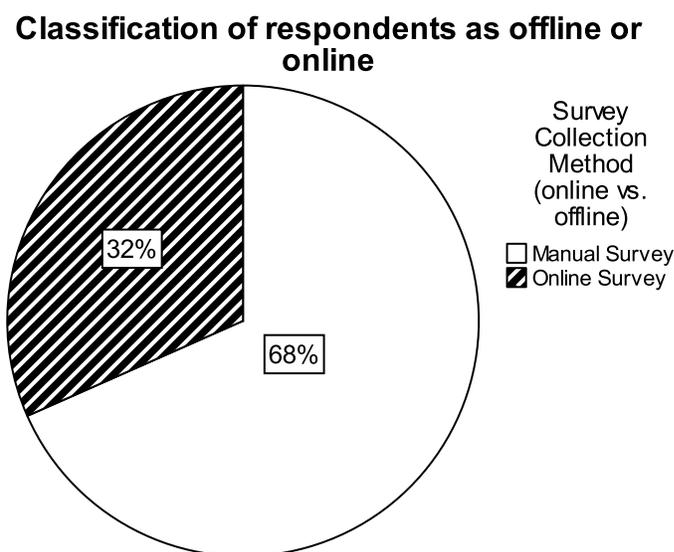


Figure 8. Distribution of sample as online and offline in the final sample set.

Data Analysis Procedure

Before reporting the findings, it is important to understand the procedures used to review the collected data and ensure its reliability and validity to analyze the findings.

The study included the use of SPSS Version 18 to conduct the data analysis. The analysis included seven service quality dimensions within TBBS (independent variables): functionality, enjoyment, security, assurance, design, convenience, and customization.

The study included two dependent variables: SAT and BI. The following three sections include a description of how the data were coded to establish quantitative analysis and

provide evidence of data reliability and validity in measuring different constructs of the study.

Data coding. The survey instrument was based on the findings of Lin and Hsieh (2006), who suggested using more than one survey question to measure each variable. Appendix J shows coded survey items within each variable, along with the mean score and standard deviation. Each survey item was coded into the dimension code with the item number under the dimension. For example, five survey items measured the functionality dimension of TBBS quality, so these were coded FUN1, FUN2, FUN3, FUN4, and FUN5. Appendix J lists the 26 scale items that measured the seven independent variables (TBBSQUAL) and two dependent variables (SAT and BI) in the study. One item measured service recovery as suggested by the focus group.

Reliability. The focus of reliability in a study is the correctness and exactness of the research method and design (Cooper & Schindler, 2008). Reliable research occurs when the study results would be the same if replicated under similar conditions (Neuman, 2006). Cronbach's alpha coefficient was used to assess the in-trait consistency of the scale. The coefficient is a value between 0 (very low) and 1 (very high) that indicates the internal consistency of the items in the scale to measure a latent variable. Appendix K includes reliability tests including Cronbach's alpha for the entire scale and for each variable.

Creswell (2008) considered a Cronbach's alpha of .60 or higher to be acceptable. Vogt (2007) considered any value of Cronbach's alpha of less than .70 to be unacceptable. The overall scale in the study was thus reliable, with a Cronbach's alpha coefficient of .964 indicating that the survey items fit together. The Cronbach's alpha

coefficients for the study variables ranged between .78 and .89 (see Appendix K). These high Cronbach's alpha coefficients indicate that each construct has a high internal consistency among the items measuring the constructs. The data appeared to be reliable in answering the research question.

Validity. Validity is concerned with how well the survey questions measure what they are intended to measure. The scale validity in measuring customer perception of TBS was observed in Lin and Hsieh (2006) and was discussed in Chapter 3. The pilot study also confirmed the face validity of the survey questions to measure customer perceptions of TBBS in Yemen, as discussed above.

The previous discussion provided an overview of the research process used to arrive at the study data. The process started with a focus group and pilot test that confirmed the survey instrument. The survey instrument captured both online and offline respondents' perceptions. The researcher coded the findings for further analysis using SPSS Version 18. The data reporting process concluded with a confirmation of the reliability and validity of the data to measure the study variables and answer the study research question. The following section contains the study findings.

Findings

The purpose of the study was to determine if a set of TBBSQUAL dimensions (measured as functionality, enjoyment, security, assurance, design, convenience, and customization) have an association with SAT and BI toward TBBS in Yemen. The findings utilized parametric statistical analysis as all variables are treated as numeric. The following sections include a description of the sample demographics, a descriptive analysis of the study variables, mean comparisons of the study variables across

categorical demographic variables, the correlations among the study's independent and dependent variables, a multiple regression analysis to describe the behavior of dependent variables in relation to independent variables, and a structural equation model to test the degree to which data fit the relationship model.

Sample demographics. The survey asked the respondents about their demographics such as age, gender, years of experience with technology, years of experience with their current bank, and information about their current bank. This information helped describe and explain the sample under examination and provided a foundation for the findings and conclusions of the study. The following sections include a description and analysis of each demographic.

Age. Because different age groups may have different service needs and perceptions of service quality, an understanding of the sample's age contributes to the explanation of the findings.

Description. The mean age of the sample was approximately 29 years ($SD = 6.3$). Over 70% of the sample was under the age of 35 years, and only 7% of the sample was over the age of 45 years. Table 3 shows each age group with the count and percentage of the total sample.

Table 3

Age Distribution

Age	Count	%
Valid values		
18-25 years	122	26
26-30 years	132	28
31-35 years	85	18
36-45 years	62	13
Over 45 years	34	7
Missing values	30	6

Retail banking customers in Yemen are relatively young. According to the Central Bank of Yemen (2008), banks in Yemen started offering retail banking services with credit cards and other TBBS in 1990 after the unification of Yemen. The services were limited to major cities, offered by one bank, and offered only to premium customers. After the deregulation of the banking industry in the late 1990s, banks in Yemen aggressively started offering TBBS (Willems, 2004) and experienced a high growth in usage between 2004 and 2008 (Central Bank of Yemen, 2008).

The recent introduction of TBBS seems to have attracted a younger population as presented in the sample. Figure 9 shows the age distribution of the sample relative to Yemen's economically active population as presented by the Central Statistics Organization (CSO, 2005). The economically active population, as defined by the CSO is the Yemen population that participates in the labor market as employed or self-employed, but does not include the population that has never been employed.

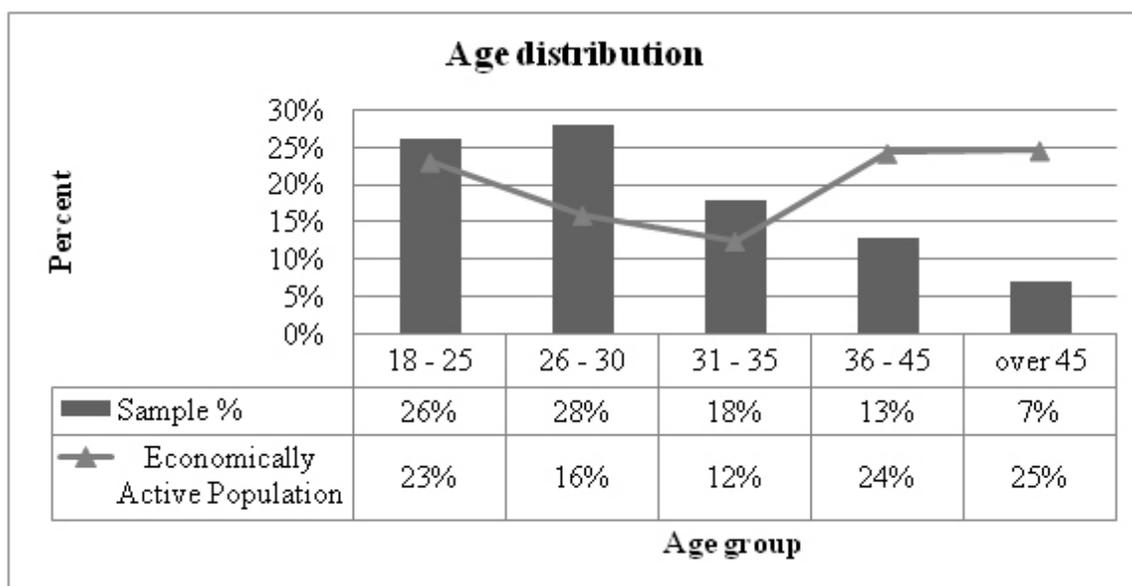


Figure 9. Age distribution of the sample relative to Yemen's economically active population. Economically active population as presented in CSO (2005).

Analysis. The sample overrepresented the age group between 18 and 35 years old and underrepresented the over-35 age group. The overrepresentation could be because the first age group included individuals who joined the labor market during the introduction of TBBS. This age group might have found that TBBS matched their lifestyle. The overrepresentation might also indicate that bank leaders need to consider attracting the older population through a proper orientation to those services.

Gender. The sample included 81 (18%) females and 374 (82%) males. According to CSO (2005), females represent 23% of the population involved in the economy whereas males represent 77%. These ratios reflect the masculine Arabic society (Robertson, Al-Khatib, & Al-Habib, 2002), where males go to work while females primarily stay at home. The CSO (2005) indicated that the literacy rate among females was only 33% in Yemen, whereas it was 73% among males. The ratios in the

sample thus were close to what would be expected in the population in Yemen. The ratios also indicated a need to encourage or train more females to use TBBS.

Technology usage. Participants were asked to provide the number of years they had been working with technologies such as ATM machines, personal computers, and mobile phones. These data were collected to examine whether technology usage had an influence over customer perceptions of TBBS. Parasuraman (2000) indicated that technology is an important service dimension in TBBS, as discussed in Chapter 2.

According to Parasuraman (2000), the use of technology has changed the way services are provided to customers and therefore has changed the relationships between business leaders, employees, and customers. Service delivery is provided to customers through technology. As a result, an assumption existed that customers' experience with technology influenced how they perceived service quality associated with TBBS in Yemen.

Description. The mean amount of technology usage reported was between 5 and 10 years. Table 4 shows the distribution of the number of years participants had been working with technology. The sample distribution indicated 20% of the respondents were new to technology, with 5 years' experience or less; 35% had a medium level of experience with between 5 and 10 years of technology usage; and 42% had extensive experience and had used technology for over 10 years.

Table 4

Sample Distribution Based on Technology Experience

Technology experience	Count	%
Valid values		
Below 5 years ^a	97	20
Between 5 and 10 years ^b	161	35
Over 10 years ^c	193	42
Missing values	14	3

Note. Working with technology includes experience with mobiles, ATMs, or personal computers.

^a New to technology. ^b Medium experience with technology. ^c Extensive experience.

Analysis. The sample was a reasonable representation of the population because TBBS expanded in 2004 in Yemen (Willems, 2004), mobile phones expanded in 2001 when the first mobile company launched (Sabafon, 2010), personal computers expanded in the early 1990s (CSO, 2005), and the average respondent age was 29 years. This observation might indicate that bank leaders might need to provide additional training and orientation to users with less technology exposure. The high percentage of respondents might also indicate the importance of technology experience in adopting TBBS.

Participants by bank. Participants were asked to indicate their current bank. These data were important to ensure that participants were not influenced by a particular service provider. The following two sections describe and analyze the sample based on their current banks.

Description. The sample included customers of 10 banks operating in Yemen.

Figure 10 indicates the percentage of participants in the top six banks based on the size of their customer base. The highest percentage was the International Bank of Yemen, with 38% of the sample. The lowest were National Bank of Yemen, Yemen Gulf Bank, and Yemen Kuwait Bank with 1% each. Figure 10 also includes the distribution of all retail banking customers in Yemen as described by Central Bank of Yemen (2008).

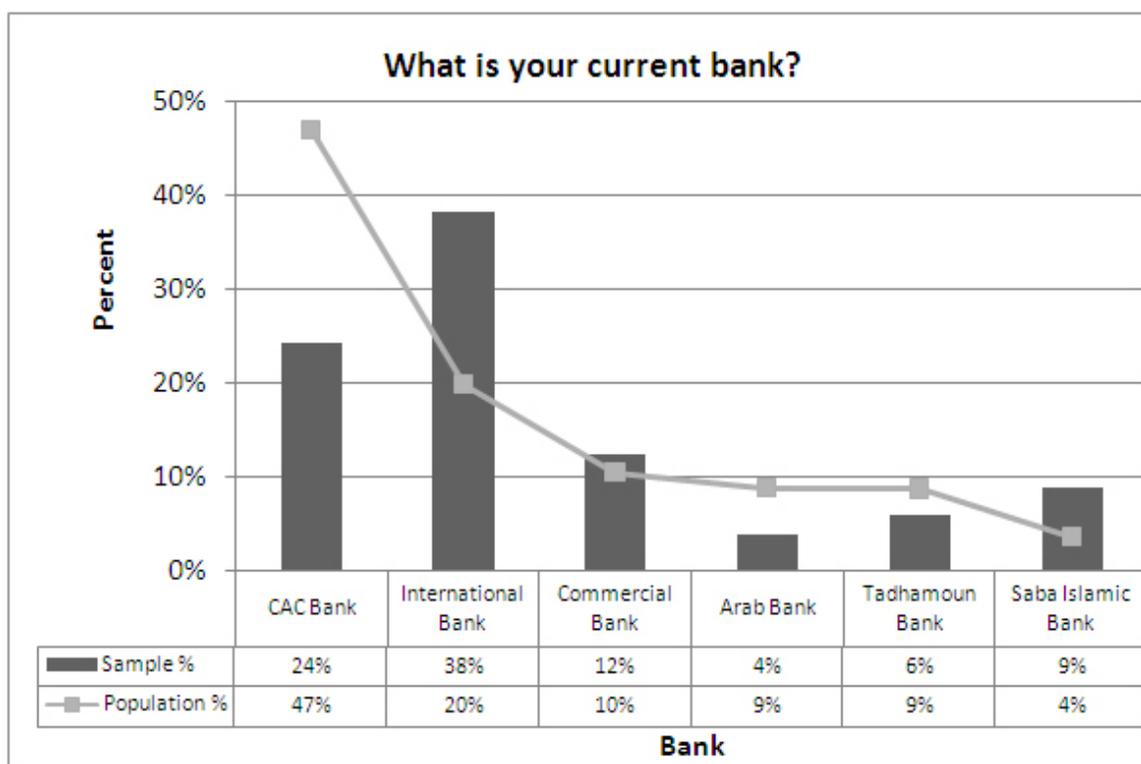


Figure 10. Sample distribution compared with population distribution by bank.

Population percentages based on data obtained from Central Bank of Yemen (2008).

Analysis. The data provided an uneven distribution of customers among banks in Yemen. Approximately 60% of the sample came from the top two banks, namely, CAC Bank and International Bank of Yemen. According to Central Bank of Yemen (2008), 65% of cardholders belonged to those two banks. These data seem to indicate that customers are attracted to some banks and not others.

The sample data also showed a discrepancy in representing customers based on their current bank. The main discrepancies in the representation of banks in the sample included (a) underrepresentations of CAC bank and Arab Bank and (b) overrepresentation of International Bank of Yemen and Saba Islamic Bank. Banks varied in their cooperation with facilitating access to customer databases to participate in the study, which might have influenced the representation.

Banking services usage. Participants were also asked to provide the number of years they had been banking with their current bank. These data were important for describing participants based on their experience of TBBS with their current bank. Customer satisfaction with a bank's TBBS can be attributable to a long relationship with a bank, including with non-TBBS such as loans. The following two sections indicate a description and analysis of the sample's distribution based on how many years participants had been banking with their current bank.

Description. The mean number of years respondents had used their current bank was 5.77 ($SD = 4.55$; Figure 11). The sample represented a normal distribution of participants skewed to the left, with the highest frequency of participants having 2 to 3 years' experience with their current bank.

Analysis. Reviewing the data revealed three main groups of participants. Members in the first group, who had been customers of their banks for 3 years or less, comprised approximately 36% of the sample. The group included participants who had recently joined their banks and were probably still at the stage of evaluating their bank's services. The second group consisted of approximately 43% of the sample and included participants with medium experience, between 3 and 7 years, with their banks. Members

of the second group might have reached the conclusion to remain with their current bank because they enjoyed the services offered. The third group consisted of participants who had been banking with their current bank for 7 years or more. This group of participants who had established long-term relationships with their banks represented approximately 20% of the sample. Table 5 shows the sample distribution based on years of experience with participant's current bank, which might suggest that banks need to provide additional orientation to current customers instead of seeking to attract new customers.

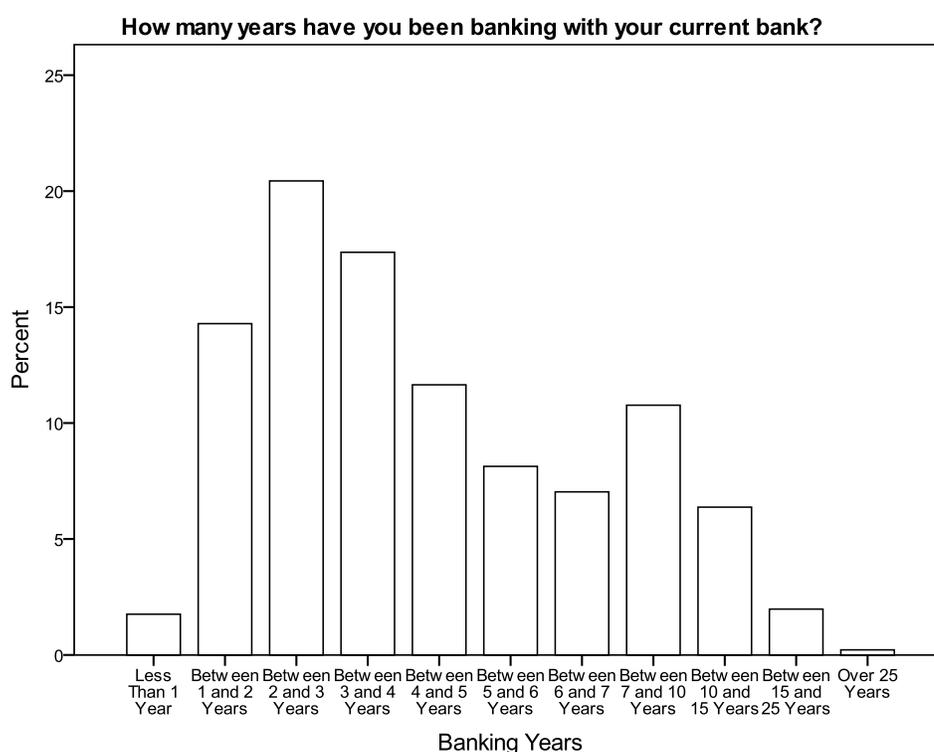


Figure 11. Sample distribution based on banking experience.

Table 5

Sample Distribution Based on Banking Experience

Years with current bank	Count	%
Valid values		
Less than 3 years ^a	166	36
Between 3 and 7 years ^b	201	43
7 years or above ^c	88	19
Missing values	10	2

^a Evaluation stage. ^b Medium experience. ^c Long-term relationship.

Description and analysis. Descriptive analysis was used to summarize the collected data and provide an understanding of respondents' answers to each survey item as well as the central tendency of the variables of the study. The following sections include a description of each of the nine dimensions at the item level to obtain a general understanding of customer perceptions of TBBS service quality dimensions, SAT, and BI. The item-level analysis includes the percentages of agreement, neutrality, and disagreement of the survey item results. Percentages of agreement were found by collapsing Likert-type scale answers of 5, 6, or 7. Similarly, percentages of disagreement were found by collapsing answers of 3, 2, or 1. The percentages of neutral responses reflect answers of 4 on the Likert-type scale.

Functionality. Respondents were asked five questions pertaining to the functionality dimension of TBBS. As shown in Table 6, the survey results reflected that at least 70% of respondents were in agreement with functionality factors including FUN1, "I can get my service done with the bank's TBBS in a short time"; FUN4, "I can

get my service done smoothly with the bank's TBBS"; and FUN2, "The service process of the bank's TBBS is clear." Although 63.9% of respondents were in agreement with FUN3, "Using the bank's TBBS requires little effort," only 48.8% of respondents were in agreement with FUN5, "Each service item/function of the TBBS is error-free."

Table 6

Measured Perceptions of Functionality Items by Agreement, Neutrality, and Disagreement

Functionality items (N = 465)	Agree	Neutral	Disagree
FUN1: I can get my service done with the bank's TBBS in a short time.	73.1	14.2	12.7
FUN2: The service process of the bank's TBBS is clear.	78.5	12.3	9.2
FUN3: Using the bank's TBBS requires little effort.	63.9	23.4	12.7
FUN4: I can get my service done smoothly with the bank's TBBS.	75.9	12.3	11.8
FUN5: Each service item/function of the TBBS is error-free.	48.8	31.4	19.8

Note. Collapsed percentages of agree, neutral, and disagree with service functionality.

Approximately 31.4% of respondents were neutral to FUN5, "Each service item/function of the TBBS is error-free," and 19.8% disagreed. The data appeared to indicate that customers find TBBS to include errors and they cannot assert TBBS is error-free. The data seemed to have agreed with the present study problem statement and indicated that TBBS needs a great deal of improvement to reach a level where services are offered error-free.

Enjoyment. Respondents were asked four questions pertaining to service enjoyment concerning TBBS. As shown in Table 7, the survey results reflected that at least 70% of respondents were in agreement with ENJ2, “I feel good being able to use the TBBS.” A little over half of the respondents were in agreement with ENJ1, “The operation of the bank’s TBBS is interesting”; ENJ3, “The bank’s TBBS have interesting additional functions”; and ENJ4, “The bank’s TBBS provide me with all relevant information.”

Table 7

Measured Perceptions of Enjoyment Items by Agreement, Neutrality, and Disagreement

Enjoyment items (<i>N</i> =465)	Agree	Neutral	Disagree
ENJ1: The operation of the bank’s TBBS is interesting.	59.4	22.8	17.8
ENJ2: I feel good being able to use the TBBS.	78.3	11.8	9.9
ENJ3: The bank’s TBBS have interesting additional functions.	54.0	26.2	19.8
ENJ4: The bank’s TBBS provide me with all relevant information.	63.9	21.1	15.1

Note. Collapsed percentages of agree, neutral, and disagree with service enjoyment.

The findings seemed to indicate that over 40% of respondents could not agree that TBBS was interesting or had additional functions. This finding indicated that current TBBS might either lack interesting functions or respondents are not aware of all relevant information. Additional investigation might help provide greater understanding of these findings.

Security. Respondents were asked two questions pertaining to the service security dimension of TBBS. As shown in Table 8, the survey results reflected that at

least 70% of respondents were in agreement with SEC1, “I feel safe in my transactions with the bank’s TBBS,” and SEC2, “A clear privacy policy is stated when I use the bank’s TBBS.” Less than 10% of respondents did not feel safe or did not know of the privacy policies provided by their banks.

Table 8

Measured Perceptions of Security Items by Agreement, Neutrality, and Disagreement

Security items (N = 465)	Agree	Neutral	Disagree
SEC1: I feel safe in my transactions with the bank’s TBBS.	81.9	10.5	7.5
SEC2: A clear privacy policy is stated when I use the bank’s TBBS.	82.2	8.2	9.7

Note. Collapsed percentages of agree, neutral, and disagree with service security.

The findings seemed to indicate that TBBS provides adequate security to its current retail banking customers. Respondents perceived transactions with their banks to be safe and observed a clear privacy policy. This finding might indicate that customers would not continue using a bank unless such security measures are in place.

Assurance. Respondents were asked two questions pertaining to the service enjoyment dimension of TBBS. As shown in Table 9, the survey results reflected that at least 70% of respondents were in agreement with ASS1, “The bank providing the TBBS is well-known,” and ASS2, “The bank providing the TBBS has a good reputation.”

Table 9

Measured Perceptions of Assurance Items by Agreement, Neutrality, and Disagreement

Assurance items ($N = 465$)	Agree	Neutral	Disagree
ASS1: The bank providing the TBBS is well-known.	81.3	10.8	8.0
ASS2: The bank providing the TBBS has a good reputation.	78.3	11.0	10.8

Note. Collapsed percentages of agree, neutral, and disagree with service assurance.

The findings appeared to indicate that respondents perceived their banks to be well-known and to have a good reputation. This conclusion confirmed respondents' beliefs that they have made a good decision to go with a bank that is popular and well respected by others.

Design. Respondents were asked two questions pertaining to the service design dimension of TBBS. As shown in Table 10, the survey results reflected that at least 50% of respondents were in agreement with DES1, "The layout of the bank's TBBS is aesthetically appealing," and DES2, "The bank's TBBS appear to use up-to-date technology."

Table 10

Measured Perceptions of Design Items by Agreement, Neutrality, and Disagreement

Design items ($N = 465$)	Agree	Neutral	Disagree
DES1: The layout of the bank's TBBS is aesthetically appealing.	61.5	19.1	19.4
DES2: The bank's TBBS appear to use up-to-date technology.	50.1	33.8	16.1

Note. Collapsed percentages of agree, neutral, and disagree with service design.

The low percentage of respondents who agreed with the two items indicates that TBBS might not be appealing or appear up to date. The low percentage indicated that customers have higher expectations toward the service design of TBBS. The data suggested that bank leaders might need to improve service layouts and implement more modern technologies to meet customer expectations.

Convenience. Respondents were asked two questions pertaining to the service convenience dimension of TBBS. As shown in Table 11, the survey results reflected that at least 70% of respondents were in agreement with CON1, “The TBBS have operating hours convenient to customers,” and CON2, “It is easy and convenient to reach the bank’s TBBS.”

Table 11

Measured Perceptions of Convenience Items by Agreement, Neutrality, and Disagreement

Convenience items ($N = 465$)	Agree	Neutral	Disagree
CON1: The TBBS have operating hours convenient to customers.	78.3	10.3	11.4
CON2: It is easy and convenient to reach the bank’s TBBS.	72.5	16.3	11.2

Note. Collapsed percentages of agree, neutral, and disagree with service convenience.

The service recovery question suggested by the prestudy focus group was found to relate closely to the service convenience quality dimension as discussed later in the chapter. The survey results reflected that 59.6% of respondents agreed with REC1, “When I face difficulty using TBBS, the bank solves it effectively and efficiently.”

Twenty-three percent of respondents were neutral to the survey item and 17.4% disagreed.

The findings appeared to indicate an overall agreement that TBBS was convenient to use with good operating hours and was easy to reach. Forty percent of respondents had an issue with service recovery. The data indicated that bank leaders might need to put in place contingency plans to solve TBBS problems as they appear and resolve these issues more effectively.

Customization. Respondents were asked three questions pertaining to service enjoyment dimension concerning TBBS. As shown in Table 12, the survey results reflected that at least 70% of respondents were in agreement with CUS1, “The bank’s TBBS understand my specific needs,” and CUS2, “The bank’s TBBS have my best interests at heart.” Item CUS3, “The bank’s TBBS have features that are personalized for me,” fell below the 70% threshold.

Table 12

Measured Perceptions of Customization Items by Agreement, Neutrality, and Disagreement

Customization items (<i>N</i> =465)	Agree	Neutral	Disagree
CUS1: The bank’s TBBS understand my specific needs.	72.9	15.7	11.4
CUS2: The bank’s TBBS have my best interests at heart.	70.8	18.1	11.2
CUS3: The bank’s TBBS have features that are personalized for me.	57.8	27.7	14.4

Note. Collapsed percentages of agree, neutral, and disagree with service customization.

The findings suggest that respondents found TBBS understand their needs and have the respondents' best interests at heart. Approximately half the respondents were not positive that TBBS had features that were personalized for them, which suggests that bank leaders and technology developers might need to provide additional service features that can enable respondents to personalize TBBS to their individual needs.

Customer satisfaction. Respondents were asked three questions pertaining to the SAT dimension of TBBS. As shown in Table 13, the survey results reflected that at least 50% of respondents were in agreement with SAT1, "Overall, I am satisfied with the TBBS offered by the bank," and SAT3, "The TBBS offered by the bank are close to my ideal TBBS." Only 48.8% agreed with item SAT2, "The TBBS offered by the bank exceed my expectations," while 32% were neutral and 19.1% disagreed.

Table 13

Measured Perceptions of Customer Satisfaction Items by Agreement, Neutrality, and Disagreement

Customer satisfaction items ($N = 465$)	Agree	Neutral	Disagree
SAT1: Overall, I am satisfied with the TBBS offered by the bank.	69.7	14.4	15.9
SAT2: The TBBS offered by the bank exceed my expectations.	48.8	32.0	19.1
SAT3: The TBBS offered by the bank are close to my ideal TBBS.	57.8	25.8	16.3

Note. Collapsed percentages of agree, neutral, and disagree with customer satisfaction.

The findings seemed to indicate that respondents were somewhat satisfied with the TBBS, but the majority could not agree that the services exceeded their expectations.

The findings were in agreement with the study problem statement that some customers reported dissatisfaction with TBBS and that the services need improvement to meet customer expectations (MarebPress, 2009).

Behavioral intentions. Respondents were asked three questions pertaining to the behavior intentions dimension of TBBS. As shown in Table 14, the survey results reflected that at least 70% of respondents were in agreement with item BIN1, “I will probably use the TBBS offered by the bank again,” and item BIN2, “I would probably recommend the TBBS offered by the bank to a friend.” Item BIN3, “I will continue to use the TBBS offered by the bank even if competing banks offered similar services for lower prices,” fell below 50% in agreement; 35% were neutral and 15.7% disagreed.

Table 14

Measured Perceptions of Behavioral Intentions Items by Agreement, Neutrality, and Disagreement

Behavioral intentions items (N=465)	Agree	Neutral	Disagree
BIN1: I will probably use the TBBS offered by the bank again.	81.3	9.9	8.8
BIN2: I would probably recommend the TBBS offered by the bank to a friend.	71.0	17.8	11.2
BIN3: I will continue to use the TBBS offered by the bank even if competing banks offered similar services for lower prices.	49.0	35.3	15.7

Note. Collapsed percentages of agree, neutral, and disagree with behavioral intentions.

The previous discussion provided collapsed percentages of respondents' perceptions of agreement, neutrality, and disagreement with survey items. Because each

study variable included more than one item to measure the variable, items in each dimension were averaged to obtain a score for that dimension to understand the central tendencies of the study variables. SPSS Version 18 computed the new variables. The average scores were used to analyze the relationships and test the hypotheses. Appendix L shows the descriptive analysis of the average scores for the nine variables along with box plots and histograms. The descriptive analysis shows the mean, standard deviation, variance, skewness, and kurtosis. The following discussion provides a brief analysis of the central tendencies of the study variables.

Analysis. The study employed a 7-point Likert type scale for gathering responses, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In reviewing the findings, it was evident that overall and on average customers rated service quality dimensions, SAT, and BI an average of 4.55 or higher. That is, customers were overall and on average satisfied with TBBS offered by banks operating in Yemen ($M = 4.72$, $SD = 1.59$) and had positive BI toward TBBS ($M = 5.09$, $SD = 1.56$). The basis for the findings was a sample of 465 responses.

The data were considered normal distribution with limited extreme cases. Even though slight skewness and kurtosis were detected, participants' choices were limited to an answer from 1 to 7. None of the variables had a kurtosis coefficient higher than 4. A visual check of histograms and box plots (see Appendix L) showed roughly normal distributions. This conclusion is important because the following findings assume normality.

The data showed that the security and assurance dimensions of service quality within TBBS have the highest relative means of 5.77 and 5.61, respectively, and a

relatively medium standard deviation of 1.4 for both. The data indicate that at least 82% of the participants agreed that their current banks provided acceptable levels (at least 4.2 points out of the 7-point Likert-type scale) of security and assurance, which might also indicate that customers consider security and assurance to be important factors in their decisions about where to bank in the first place.

The TBBS design ranked the lowest mean and highest standard deviation ($M = 4.55$, $SD = 1.6$). The data indicated that banks might need to pay more attention to service design. The data suggested that participants on average found the degree to which TBBS is visually appealing and the use of up-to-date equipment to be at the lowest level compared with other service quality dimensions.

Mean Comparison

The mean comparison or inferential statistics analyzed the mean differences among sample groups' demographics such as age, gender, years of experience with technology, years of experience with their current bank, and their current bank. Creswell (2008) indicated that inferential statistics is used to "compare two or more groups on independent variables in terms of the dependent variable (i.e., how do boys and girls compare in their self-esteem?)" (p. 190). The study used one-way ANOVA to infer the significance of difference of all variables in terms of the demographic variables. One-way ANOVA is utilized to "estimate and compare the effects of the different treatments on the response variable" (Bowerman, O'Connell, & Murphree, 2009, p. 444).

Independent sample t tests were examined between participants who reported that they were required to bank with a particular bank and between participants who filled out the survey online and offline. Independent sample t tests were used to compare two

independent samples by using a confidence interval of 95%. Appendix M includes the ANOVA and independent t test result tables. The following sections compare the means among the groups to report any significant differences.

Age. Comparing means among different age groups results in a significant difference ($p < .05$, two-tailed) among different age groups based on functionality, security, customization, and SAT. The data did not provide any significant difference among the other variables in the study.

The data appeared to show that young and elderly participants had a significantly higher level of satisfaction than the middle-aged group between 26 and 45 years old. Figure 12 presents average SAT means with 95% confidence intervals across age groups. This finding seemed to indicate middle-aged participants had higher expectations and therefore had lower average satisfaction of TBBS.

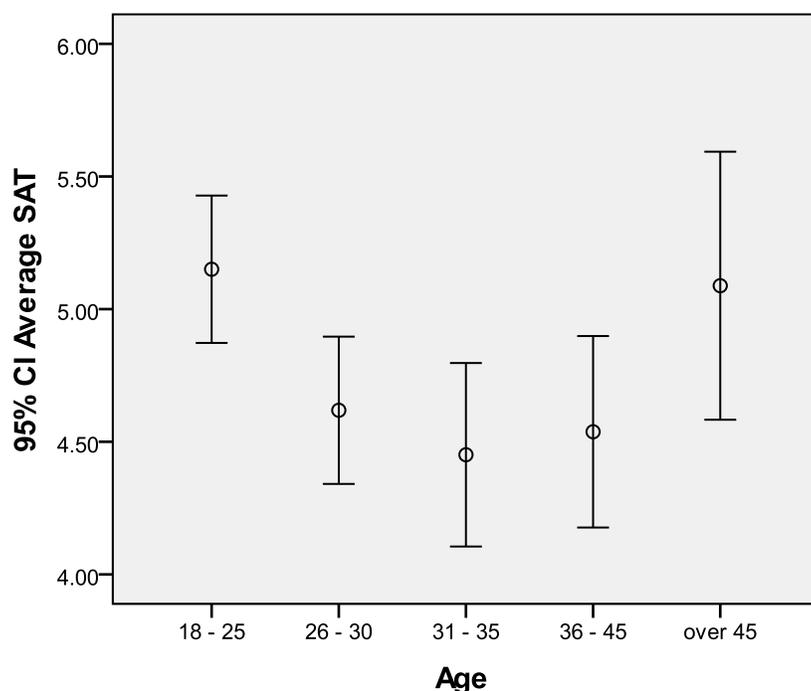


Figure 12. Average customer satisfaction 95% confidence intervals across age categories.

CI = confidence intervals.

Gender. The data did not indicate any significant difference among variables based on gender. Figure 13 shows average SAT and average BI toward TBBS with 95% confidence intervals. The figure shows visual indifference among the means among males and females, which indicates that bank leaders do not have to take any special measures toward service quality associated with TBBS for males or females.

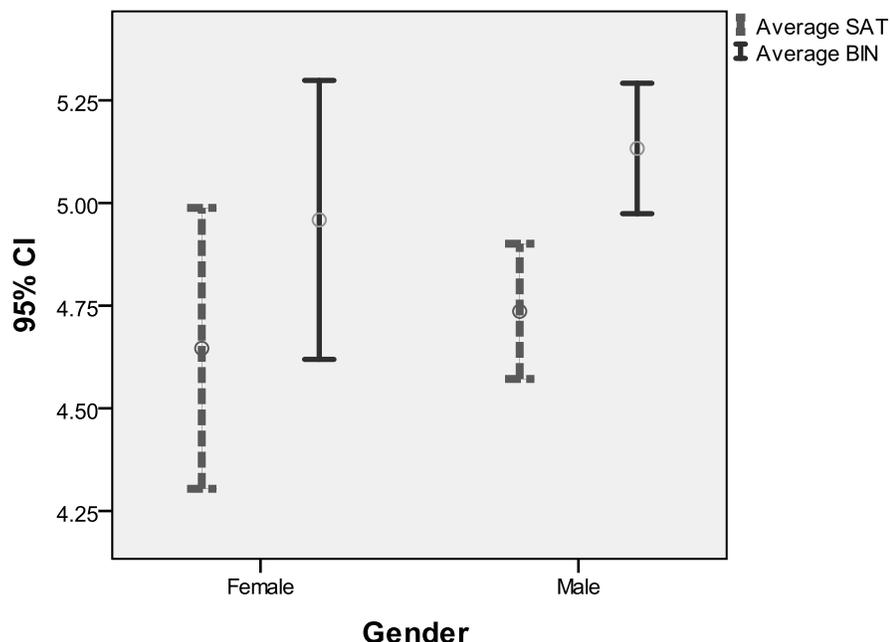


Figure 13. Average customer satisfaction and average behavioral intentions 95% confidence intervals across males and females. CI = confidence intervals.

Years of experience with technology. The data showed significant differences ($p < .05$) between the mean measurements of the study variables across respondent groups based on experience with technology. Respondent BI toward TBBS were the only exception. Figure 14 presents average means of the variables across technology experience groups.

The data suggested that respondents with extensive experience with technology had overall lower perceptions of TBBS service quality dimensions as well as lower

satisfaction levels. The data appeared to indicate that there was no significant difference among customers' BI toward such services.

Figure 14 shows a negative relationship between service quality dimensions and the technology experience of respondents. For example, respondents with extensive technology experience perceived TBBS to be more time-consuming, to be more unclear, and to require more effort than less technology-experienced respondents, which indicates that bank leaders might have to make additional efforts to meet service quality requirements to meet the expectations of experienced customers. As another example, respondents with little technology experience perceived TBBS to have higher level of security, assurance, and customization than did more experienced respondents.

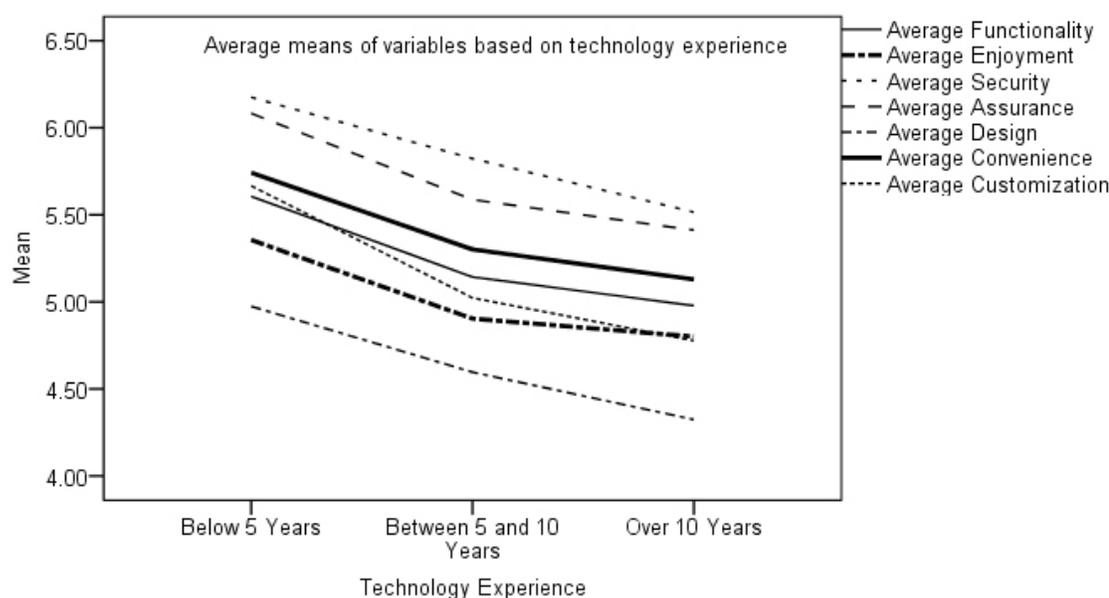


Figure 14. Average means of study variables in terms of technology experience ($p < .05$).

The data seemed to indicate no significant difference exists between more and less technologically experienced customers toward their BI. Regardless of customers' experience with technology, respondents' willingness to use TBBS offered by their

current bank or to recommend such services to their friends varied indifferently. Respondents' satisfaction differed significantly ($p < .05$), which might suggest to bank leaders that SAT does not necessarily lead to positive BI toward TBBS within the context of customer experience with technology.

Years of experience with current bank. The data seemed to indicate a significant difference among all variables based on the number of years customers had been with their current banks. No exception was detected for this demographic variable and no relationship was observed from the generated graphic presentation. These findings suggested bank leaders should further investigate how the perceptions of newly acquired customers toward TBBS might differ from the perceptions of long-time customers.

Current bank. Initial ANOVA among respondents based on their current bank revealed that customer perceptions of service quality dimensions associated with TBBS were not significantly different ($p > .05$) except for enjoyment and customization. An examination of the number of cases per bank revealed that some banks provided fewer than 20 cases. Such a low number of cases per bank could be a limitation of these findings because of the possibility of a Type I error. Type I errors occur when the null hypothesis is rejected although it is actually true. Creswell (2008) noted that a power analysis is a rigorous, systematic approach to identify an appropriate sample size for group comparisons. In the current study, a power analysis indicates that approximately 25 participants were the minimum acceptable number of participants per analyzed group to obtain a power criterion of .90 for an effect size of 1.0 and an alpha level of .05 (Creswell, 2008, p. 632). The five banks with less than 25 respondents were excluded

from the analysis. As a result, the researcher repeated the mean comparison to reflect the eliminated cases.

The data showed that all service quality dimensions were significant ($p < .05$) except for service functionality, assurance, and design. The measured mean of all other dimensions was significantly different, indicating that customers' ranking of these service dimensions was significantly different between respondents from different banks.

The data indicated that respondents from different banks did not rank service functionality, assurance, and design differently, which suggested that respondents from different banks did not perceive these dimensions as differentiation qualities of TBBS. Respondents from different banks perceived different service quality levels in the four dimensions of enjoyment, security, convenience, and customization. These findings seemed to indicate that banks in Yemen have different levels of service qualities that customers perceive differently. This conclusion is important to bank leaders and technology developers who are seeking service differentiation and competitive positions.

Service accessibility was part of the service convenience. The findings appeared to indicate that respondents perceived different banks to have different levels of service accessibility. This finding supports bank leaders' additional efforts to increase service accessibility and reachability to provide service convenience to customers and remain competitive.

Customers of different banks did not perceive technology used, which was measured as service design, differently. This insignificant difference might indicate that customers do not perceive differences between banks' infrastructures. This finding

indicated that banks might not compete on infrastructures but rather compete on other service quality dimensions such as convenience, security, customization, and enjoyment.

The above findings trigger a need for additional investigations on bank characteristics that might be associated with customers' perceptions of service convenience, security, customization, and enjoyment that bank leaders might focus on to increase customer perceptions of these quality dimensions. Bank leaders might be interested to check which technologies might be associated with customer perceptions such as online banking, mobile banking, or ATMs. Additional research might also provide bank leaders with more specific directions into how to expand TBBS to meet customer expectations.

The data indicated that measurements of both SAT and BI were significantly different ($p < .05$) among customers of the different banks used in the analysis. The different measurements also indicated that SAT and BI are key performance indicators on which bank leaders need to focus when benchmarking or conducting competitive analysis.

Bank selection requirement. In addition to the above findings, the survey asked participants to indicate whether they were required to bank with their current bank. This question was important for examining whether a significant difference existed among respondents based on such obligation by employers or business partners. Respondents required to bank with a particular bank were required so by their employers to facilitate salary payments or by business partners to receive monetary benefits. Respondents who were not required to bank with a particular bank had decided to bank with their current

bank using their own free will. Conducting an independent sample t test measured whether the two groups were significantly different.

The independent sample t test indicated that all variables were significantly different between respondents who were required to bank with their current bank and those who were not required to bank with their current bank. The only exceptions were convenience and customization. Respondents' perceptions of banks' service quality dimensions of convenience and customization apparently did not differ significantly ($p > .05$), which suggests that employees or business partners did not significantly perceive service convenience or customization to be different whether or not their banking arrangement was required.

Customer perceptions of service functionality, enjoyment, security, assurance, and design were significantly different ($p < .05$) when respondents were required to bank with a particular bank, which indicates that employers who require their employees to bank with a particular bank need to continuously monitor these service quality dimensions when making such decisions. Both SAT and BI were significantly different ($p < .05$) when such requirements were in place.

These findings indicate a need for further research on how these decisions are made and an investigation into whether employers or business partners look for non-TBBS requirements to facilitate retail banking services to their employees and business partners. An association might exist between employee job satisfaction and employee satisfaction with TBBS.

Online versus offline surveys. Because the study utilized both online and offline surveys, an independent sample t test was conducted to examine if a significant

difference occurred between the mean measurements across the variables on the two survey types. The independent sample *t* test indicated that no significant difference existed among the two independent samples ($p > .05$) across service enjoyment, assurance, design, and convenience. The average means of customer perceptions of service functionality, security, and customization appeared significantly different between the online and the offline respondent groups.

Online respondents showed overall lower SAT and BI than offline respondents, as well as lower perceptions of service functionality, security, and customization. Figure 15 presents the 95% confidence intervals of the measurement of the variables across the two groups. The figure shows an obvious and significant difference between online and offline survey respondents. Participants of the online survey appeared to have overall lower perceptions of service quality dimensions, SAT, and BI. This finding might indicate that respondents who used the online survey system were more frequent users of online banking services and therefore more worried about some of the service quality dimensions. Online respondents might have had more exposure to online services that made their expectations higher.

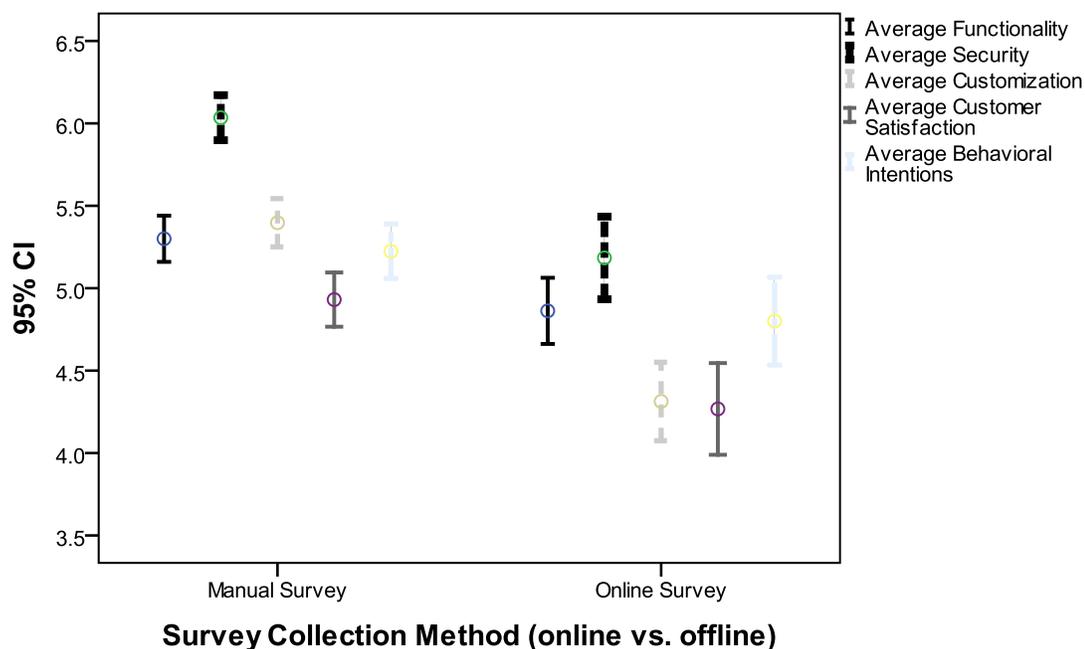


Figure 15. Average means of study variables at 95% confidence intervals across offline surveys and online surveys. CI = confidence interval.

The findings presented in this section included reports and analyses of the mean difference and variation of the study variables in terms of demographic categories of the study participants. The ANOVA indicated significant differences appeared to exist among different groups and inferential statistics for study variables. The following section continues the description of inferential statistics by looking into the correlations among study variables. The previous findings included a comparison of continuous variables against categorical independent variables while the following analysis involves comparing and relating continuous variables such as service quality dimensions, SAT, and the BI of respondents toward TBBS. These findings are important to attempt to answer the study's research question about the association between service quality dimensions toward TBBS and SAT and BI toward these services in Yemen.

Correlation Analysis

The purpose of inferential statistical analysis is to provide evidence for accepting or rejecting a hypothesis (Vogt, 2007). The current study included null and alternative hypotheses to test the association between independent variables and dependent variables. Correlation coefficients were used to describe and measure the association between two variables. Pearson correlations were used to test the study's hypotheses.

The following three sections include an examination of the relationships among the study variables. The first section contains a discussion on the interrelationships among service quality dimensions (independent variables). The second section contains a discussion on the relationship between service quality dimensions (independent variables) and SAT and BI (dependent variables), as well as provides the hypotheses testing to answer the study research question. The third section contains a discussion on the relationship between SAT and BI toward TBBS in Yemen (dependent variables).

Interrelationships among service quality dimensions. Table 15 shows the Pearson's correlation coefficients between the study variables. All correlations were found to be statistically significant ($p < .001$; two tailed) with positive linear associations among the seven independent variables. The inter-item correlations ranged between .77 (functionality and enjoyment) and .43 (security and design). Such high interitem correlation indicated a moderate multicollinearity as discussed under the regression analysis.

The data seemed to indicate that respondents' perceptions of different service quality dimensions were correlated ($p < .001$). The strongest relationship occurred between functionality and enjoyment. As respondents perceived TBBS to be done in a

short time with a clear process that required little effort and involved smooth operations, they also perceived these services to be interesting and enjoyable.

Table 15

Correlation Coefficients Among Independent Variables

Pearson's correlations	1	2	3	4	5	6	7
1. Functionality	1						
2. Enjoyment	.771	1					
3. Security	.653	.574	1				
4. Assurance	.664	.652	.663	1			
5. Design	.617	.682	.430	.577	1		
6. Convenience	.709	.734	.608	.657	.604	1	
7. Customization	.726	.703	.666	.610	.639	.728	1

Note. All correlations are significant ($p < .001$; two-tailed; $N = 465$).

The weakest relationship occurred between security and design. Respondents perceived TBBS to be aesthetically appealing and appearing up-to-date technologically; they also felt safe with these services. The relationship was modest, with a correlation coefficient of .43. This correlation was the weakest among the correlations of the study variables. Creswell (2008) considered a correlation value between .35 and .65 to be “useful for a limited prediction” (p. 365) or a moderate relationship.

Twenty-one interrelationships existed between the seven independent variables. The relationships included 13 strong relationships with correlation coefficient $r > 0.65$ and eight relationships with correlation coefficient $r < .65$. The range of correlation coefficients was between .43 and .77.

These findings seemed to indicate that service quality dimensions are correlated. When respondents perceived TBBS to be convenient, they also perceived it to be enjoyable and customizable with high functionality. Respondents' perceptions of low customization were associated with low perceptions of functionality, enjoyment, security, and convenience.

Interrelationships among service quality, customer satisfaction, and behavioral intentions. The data seemed to indicate a positive significant relationship between each of the seven service quality dimensions and SAT and BI. Figure 16 displays the correlation coefficients between each of the service quality dimensions and the two dependent variables of SAT and BI. The findings seemed to indicate that customers who perceived service quality dimensions of TBBS to be high were also satisfied with these services and had positive BI toward these services.

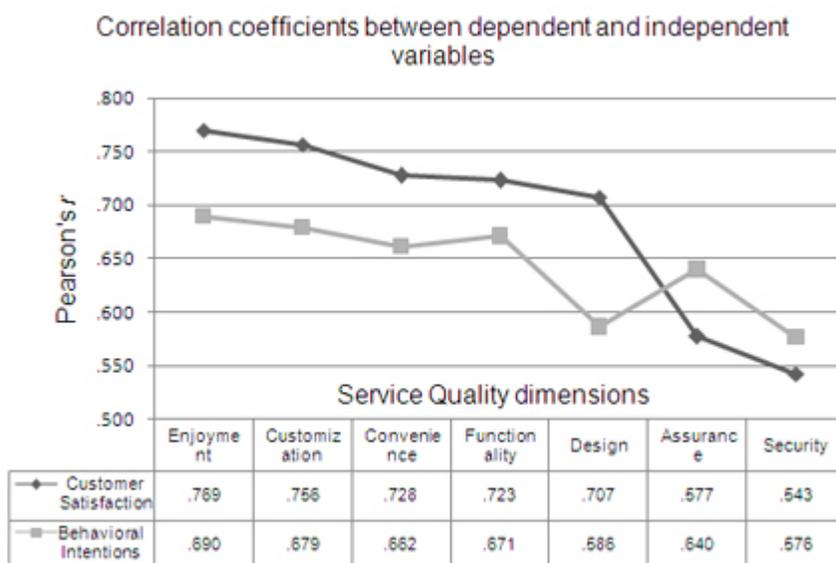


Figure 16. Correlation coefficients between dependent and independent variables. All correlations were significant at the $p < .001$ level.

These findings were important for answering the study's research question and testing its hypotheses. The study's research question was as follows: Which combinations of functionality, enjoyment, security, assurance, design, convenience, and customization, which are service quality dimensions in TBBS, have an association with SAT and BI toward TBBS in Yemen? The findings of the study indicated that all service quality dimensions have an association with SAT and BI toward TBBS in Yemen.

A set of seven hypotheses accompanied the study research question. Each hypothesis addressed one service quality dimension and noted that a significant correlation exists between customer evaluation of a technology-based banking service dimension and SAT and BI toward TBBS in Yemen. The findings provided support for the seven hypotheses. Consequently, the null hypotheses were rejected.

While service enjoyment and customization are highly correlated as discussed in an earlier section, they are also highly correlated with SAT and BI, which indicates that customers who enjoyed TBBS and found it highly customizable were highly satisfied with these services and had positive BI, such as recommending the services to their friends and continuing to use these services. Unsatisfied customers who had negative BI did not find TBBS to offer personalized services, pleasure, or excitement. The correlation coefficient of customization and enjoyment with SAT and BI was higher than $r > .70$, indicating a strong relationship. Looking at the coefficient of determination r^2 , which assesses the proportion of variability in one variable that can be determined or explained by a second variable, 60% of the variability in SAT can be determined or explained by service enjoyment.

Service security appeared to have the weakest correlation with SAT and BI toward TBBS, with correlation coefficients of 0.54 and 0.58, respectively ($p < .001$). Customer perceptions of security were significantly yet weakly related to SAT and BI toward TBBS. Looking at the coefficient of determination r^2 , service security could determine or explain 30% of the variability in SAT. Such a ratio of variability is moderate. Creswell (2008) considered a correlation value between .35 and .65 to be “useful for a limited prediction” (p. 365).

Relationship between customer satisfaction and behavioral intentions. The data provided a strong, positive, significant relationship between SAT with TBBS and BI toward TBBS (Pearson’s $r = 76\%$; $p < .001$, two-tailed). Looking at the coefficient of determination r^2 , SAT could determine or explain 58% of the variability in customer BI toward TBBS. Such a ratio of variability is moderate. The findings seemed to indicate that improved SAT with TBBS will increase customers’ intentions to continue using TBBS, recommend these services to their friends, and become less price-sensitive.

The previous sections included a discussion on correlations among study variables. Correlations measure the linear association between two variables and explain the direction of the relationship and strength of association. Correlation analysis helps explain and predict the behavior of one variable based on another variable. For example, the correlation analysis explained SAT based on perceptions of service enjoyment. Correlation analysis did not take into consideration the impact of multiple variables on an outcome. The following section contains a discussion on the multiple regression analysis.

Multiple Regression Analysis

The study included the use of a multiple regression analysis to identify a line of “best fit” (Creswell, 2008, p. 367) for more than one independent variable in predicting or explaining a dependent variable. This analysis was important for attempting to answer the study’s research question. The previous analysis indicated that all independent variables had strong relationships with the dependent variables, but did not explain how they interact to predict dependent variables. Multiple regression analysis was used in an attempt to demonstrate the impact of all service quality dimensions in explaining SAT and BI.

A multiple regression is a statistical procedure that examines the combined impact of several variables to predict or explain a dependent variable. A multiple regression equation is illustrated below.

$$Y(\text{predicted}) = \beta_1 x_1 + \beta_2 x_2 + a + \varepsilon,$$

where Y = the predicted scores, β_1 = a constant for the slope of x_1 (β_2 for x_2), a = the intercept, and ε = error.

The following two sections include a discussion on the regression analysis for SAT and BI. The researcher used SPSS Version 18 to assess the calculation. Specifically, a linear multiple regression analysis with a stepwise method was used. The stepwise method was used because it uses the best predictors in estimating the regression model. The following sections report an analysis of the findings of the multiple regressions.

Customer satisfaction regression model. The multiple regression analysis indicated that the service quality dimensions of enjoyment, customization, design,

convenience, functionality, and assurance (independent variables) combined together appear to explain SAT with $r = .853$, $r^2 = .728$, and adjusted $r^2 = .724$. The regression model fit the data with an F test = 204 that was significant at the $p < .001$ level. The service security dimension did not contribute to the fitness of the model so it was not included in the regression results. Table 16 includes the beta weights (slopes) of each variable and a constant (intercept) of the service quality dimensions associated with TBBS. The table includes both unstandardized and standardized coefficients along with t value and significance level. The independent variables in combination can predict SAT of TBBS offered by banks in Yemen.

Table 16

Multiple Regression Analysis Predicting SAT in Terms of TBBSQUAL Dimensions

	Unstandardized		Standardized		Collinearity			Observed power ^a	
	coefficients		coefficients		t	statistics			
	Beta	SE	Beta			Tolerance	VIF		
(Constant)	-.547	.178			-3.069	.002			
Enjoyment	.296	.051	.260		5.772	.000	.292	3.425	1.00
Customization	.283	.045	.260		6.318	.000	.352	2.844	1.00
Design	.228	.036	.229		6.426	.000	.469	2.132	1.00
Convenience	.198	.047	.175		4.201	.000	.341	2.931	.99
Functionality	.150	.055	.120		2.745	.006	.311	3.212	.78
Assurance	-.089	.041	-.078		-2.164	.031	.462	2.164	.60

Note. Dependent variable: Average customer satisfaction. VIF = variance inflation factor.

^a Alpha = .05.

The results of the regression model indicated a moderate multicollinearity. Collinearity occurs when interrelationships exist between independent variables that might influence the results of the multiple regression model (Mann, 2007). Collinearity statistics in Table 16 provide a variance inflation factor (*VIF*). Orris (2007) suggested that *VIF* should not be higher than 10; a *VIF* value higher than 5 would indicate a severe collinearity, and a *VIF* value higher than 3.33 would indicate a moderate collinearity. Service enjoyment was the only moderate collinearity variable with $VIF > 3.33$.

The regression analysis results indicated that when combining service quality dimensions, six dimensions can operate together to predict SAT of TBBS in Yemen with acceptable power estimates. These dimensions account for 72% of the variability in SAT. Bank leaders might use the following formula to estimate SAT:

$$\text{SAT} = -0.55 + 0.30 \text{ ENJ} + 0.28 \text{ CUS} + 0.23 \text{ DES} + 0.20 \text{ CON} + 0.15 \text{ FUN} - 0.09 \text{ ASS} + \text{error},$$

where ENJ = enjoyment, CUS = customization, DES = design, CON = convenience, FUN = functionality, and ASS = assurance. The findings seemed to indicate that service assurance is negatively associated with SAT in contributing to the regression model, and service security did not appear to contribute to the model. These findings were questionable because Lin and Hsieh (2006) suggested a positive significant relationship of all variables to the combined model, which necessitated a conceptual investigation of the results based on the literature. The following two sections contain an analysis of service assurance and service security in association with SAT within the scope of the study. Service assurance was examined because of its negative regression weight. Service security was examined because it was not significant as an independent variable.

Assurance is a service quality dimension that refers to a bank's reputation and good image or a service provider's ability to inspire trust and confidence. When predicting SAT, this factor might not add to the combined model; rather, it might reduce SAT or not affect it significantly because a service provider's higher reputation might increase customers' expectations of the service provider, making the gap between service expectations and service perception very high. Expectation-disconfirmation theory indicates that a large gap between perceptions and expectations might lead to a decrease in SAT (Oliver, 1980).

Service security refers to the safety and security of customer transactions with the banks' TBBS, including a privacy policy. Service security might not add to the regression model in predicting SAT based on Maslow's hierarchy of needs. According to Maslow's theory, an individual fulfills lower levels of needs before moving to higher levels of needs (Newstrom, 2011). As the lower level needs are met, they no longer affect behavior. As customers feel safe with their transaction and are able to fulfill their safety needs, they move up the hierarchy pyramid to reach higher order needs such as social needs, self-esteem needs, or self-actualization needs (Schiffman & Kanuk, 2010). When customers already feel safe, the security dimensions would have no effect on predicting SAT.

Maslow's hierarchy of needs can also explain why service customization seemed to rank as the highest contributing dimension in the regression model. Customization refers to the ability of TBBS to provide tailored and personalized services to meet the individual needs and interests of customers that can satisfy their self-actualization needs

that Maslow placed at the top of the needs hierarchy. That is, customers feel actualized when they can shape their TBBS to match their preferences.

Another explanation toward understanding why service assurance appeared to be negatively associated with SAT and service security did not significantly contribute to the model is Herzberg's motivator-hygiene theory, which employs Maslow's needs hierarchy. These two service quality dimensions might be hygiene factors, and the other five dimensions may be motivator factors. Hygiene factors are those that can prevent dissatisfaction but do not in themselves satisfy, while motivator factors are those factors that produce satisfaction (Bowditch & Buono, 2005). The hygiene factor theory has explained similar studies when service quality dimensions did not explain SAT (Zhu et al., 2002).

Behavioral intentions regression model. Similar to SAT analysis, a regression analysis was conducted to predict customer BI toward TBBS in terms of service quality dimensions. The multiple regression analysis seemed to indicate that service quality dimensions of enjoyment, customization, assurance, convenience, and functionality combined together significantly explained customer BI toward TBBS with $r = .770$, $r^2 = .593$, and adjusted $r^2 = .583$. The regression model and each of the independent variables mentioned appeared to be significant at the $p < .05$ level. The regression model fit the data with an F test = 133 that was significant at the $p < .001$ level. Service security and service design dimensions did not seem to contribute to the fitness of the model so they were not included in the regression results. Table 17 includes the beta weights (slopes) of each variable and a constant (intercept) of service quality dimensions associated with TBBS. The table includes both unstandardized and standardized

coefficients along with t value and significance level. The independent variables in combination seem to be able to predict customer BI toward TBBS offered by banks in Yemen.

Table 17

Multiple Regression Analysis Predicting BI in Terms of TBBSQUAL Dimensions

	Unstandardized		Standardized		Collinearity			Observed power ^a	
	coefficients		coefficients		t	Sig.	statistics		
	Beta	SE	Beta				Tolerance		VIF
(Constant)	-.049	.213			-.231	.818			
Enjoyment	.247	.059	.222		4.191	.000	.317	3.155	.99
Customization	.247	.052	.232		4.723	.000	.367	2.725	1.00
Assurance	.224	.048	.200		4.621	.000	.471	2.122	1.00
Convenience	.128	.056	.116		2.283	.023	.342	2.926	.63
Functionality	.142	.065	.116		2.176	.030	.312	3.208	.58

Note. Dependent variable: Average behavioral intentions. *VIF* = variance inflation factor.

^a Alpha = .05.

The results of the regression model indicated a low multicollinearity. Similar to the discussion in the previous section with SAT, collinearity statistics in Table 17 provide a *VIF*. The BI regression model did not include any moderate collinearity as all the *VIF*s were below 3.33, indicating a low collinearity.

The regression analysis results indicated that when combining service quality dimensions, five dimensions might operate positively together to predict customer BI toward TBBS in Yemen with acceptable power estimates. These dimensions accounted

for only 59% of the variability in customer BI. Bank leaders in Yemen might use the following formula to estimate customer BI toward TBBS:

$$\text{Customer BI} = -0.05 + 0.25 \text{ ENJ} + 0.25 \text{ CUS} + 0.22 \text{ ASS} + 0.13 \text{ CON} + 0.14 \text{ FUN} + \text{error},$$

where ENJ = enjoyment, CUS = customization, DES = design, CON = convenience, FUN = functionality, and ASS = assurance. Service security and design, although significantly correlated with customer BI ($r = 0.576$ and $.586$, respectively; see Figure 16), were not found to be significantly associated with BI after allowing for the effects of all other service quality predictors. The findings indicated that service security and service design did not seem to contribute to the regression model to predict customer BI toward TBBS. These findings indicated a need for further analysis toward understanding the reasons behind customer BI. The following discussion includes an analysis of concepts associated with service security and design in relation to customer BI within the scope of the study.

Behavioral intentions refer to customer feelings toward TBBS. Ajzen (2005) indicated a customer's attitude toward a behavior determined customer intentions. Because a customer has a positive attitude toward a service, the customer's intentions would be positive. For this reason, the regression model was conducted to address BI as a function of SAT and TBBSQUAL dimensions. The results generated a better fit model that explained customer BI with $r = .806$, $r^2 = .649$, adjusted $r^2 = .646$, and F test = 212 at $p < .001$. The model included only SAT, service assurance, customization, and enjoyment. All other service quality dimensions were not significant in the generated model. Table 18 includes the coefficients of the model.

Table 18

Multiple Regression Analysis Predicting BI in Terms of SAT and TBBSQUAL Dimensions

	Unstandardized		Standardized			Collinearity		Observed power ^a
	coefficients		coefficients		statistics			
	Beta	SE	Beta	<i>t</i>	Sig.	Tolerance	<i>VIF</i>	
(Constant)	.301	.189		1.594	.112			
Satisfaction	.446	.048	.456	9.286	.000	.316	3.164	1.00
Assurance	.267	.042	.239	6.301	.000	.529	1.889	1.00
Customization	.125	.048	.117	2.582	.010	.370	2.702	.73
Enjoyment	.112	.053	.101	2.098	.036	.332	3.014	.55

Note. Dependent variable: Average behavioral intentions. $N = 465$. *VIF* = variance

inflation factor.

^a Alpha = .05.

These analyses respond to how the findings of the research differed from those of Lin and Hsieh (2006). Although Lin and Hsieh did not use multiple regression analysis, the analysis presented so far appeared to indicate that fewer factors effectively predict SAT and BI. The analysis below continues to address these issues.

These findings seemed to agree with the literature that service quality is an antecedent of SAT and BI. When SAT was added to the regression model of predicting BI in terms of TBBSQUAL, SAT counted for .45 while the next predictor was approximately .24 in standardized terms. The model indicates that SAT and service quality dimensions are able to explain 65% of variability of BI (strong relationship),

whereas service quality dimensions alone are only able to explain 58% of BI variability (medium relationship; Creswell, 2008).

These findings indicate that SAT, service assurance, service customization, and service enjoyment explain BI better with acceptable power estimates. Customer satisfaction shapes customers' attitudes, which determine BI. Service assurance, which represents the bank's reputation, shapes the subjective norms that determine BI. Service customization and enjoyment could have shaped customers' perceived behavioral control, which determines BI. Ajzen (2005) supported these findings and asserted that the three main factors that determine customer intentions are (a) attitudes toward a behavior, (b) subjective norms, and (c) perceived behavioral control. Bank leaders in Yemen might use the following formula to estimate customer BI in terms of SAT and some service quality dimensions associated with TBBS:

$$\text{Customer BI} = 0.3 + 0.45 \text{ SAT} + 0.27 \text{ ASS} + 0.13 \text{ CUS} + 0.11 \text{ ENJ} + \text{error}.$$

The findings indicated that a customer's perception of service quality dimensions such as design, convenience, and functionality seems to predict SAT but does not seem to predict the customer's BI to switch banks, reuse the bank's services, or recommend a bank to third parties. Customer satisfaction seems to be the major determinate of customers' BI. This finding seemed to confirm a path relationship similar to the original research on the relationship between service quality, SAT, and BI discussed in the literature (Cronin & Taylor, 1992; Lin & Hsieh, 2006; Parasuraman et al., 1988).

The previous sections were an attempt to help to answer the study's research question and to understand the combination of service quality dimensions in explaining SAT and BI toward TBBS offered by banks in Yemen. The regression analysis provided

insight into service quality dimensions combined in a regression model. The following section contains an examination of the data in a structural equation model.

Structural Equation Model Analysis

Although correlations from the present study provided support for the majority of the hypotheses developed, a more complete test of the hypothesized relationships could be the structural equation model. Structural equation modeling (SEM) is a statistical method to measure how closely a proposed model matches empirical data gathered in a sample (Vogt, 2007). According to Vogt (2007), SEM analysis is powerful because it can integrate “elementary techniques into an advanced whole . . . [and is] the most advanced analytical method studied [in Vogt’s 2007 book]” (p. 247). According to Vogt (2007), SEM operated as a confirmatory method that integrated regression analysis, path analysis, factor analysis, and causal modeling.

The SEM statistical procedure provided several benefits to the current study. First, SEM provided better measurement of latent variables. Service quality dimensions (latent variables) were measured by several observed survey items that were averaged to enable regression analysis. Second, the procedure took into consideration the measurement errors of observed variables when explaining the relationships between latent variables. Third, the procedure enabled path analysis for more than one independent variable and more than one dependent variable simultaneously. Fourth, SEM helped to analyze and model multicollinearity that regression analysis did not handle.

The SEM analysis could enable a direct comparison between the present findings and the findings of Lin and Hsieh (2006). Lin and Hsieh utilized SEM analysis to

measure how the data fit their model. The SEM analysis of the present study data is compared and discussed below.

The researcher used SPSS Version 18 and AMOS Version 18 to develop the model and test how the data fit it. AMOS is an easy-to-use graphical interface with an advanced computing engine for SEM that provided SEM with a maximum likelihood estimation method for the current study. The AMOS report provided the SEM results presented in Appendix N.

Appendix N includes a model diagram, model fit, and estimates. The SEM results were used to confirm and determine to what degree the proposed model of service quality dimensions was associated with SAT and BI. The following three sections contain a description and analysis of these findings.

Diagram and model fit. The diagram appears on Appendix N and includes observed variables, which are the coded survey items in rectangles. The oval shapes are the unobserved variables or latent variables, which are the seven service quality dimensions and the two dependent variables of the study. Error variables are attached to each survey item to indicate it is an observed variable that is subject to error. The diagram also includes the paths between the variables with standardized covariance between latent variables on each double-headed arrow, standardized regression weights on each one-headed arrow, and squared multiple correlations on each observable variable.

Model fit. The model fit summary appeared to reveal a good overall fit. The results indicate chi-square (χ^2) = 725.18, $df = 260$, $p < .0001$, which seemed to indicate a significant difference between the model and the data. The root mean square error of

approximation (RMSEA) was 0.062 with a confidence interval (CI_{.90}) = .057, .067.

Table 19 includes additional fit indices, a description of the index, recommended values, results from Lin and Hsieh (2006), and the current study's results. All modification indices were low except for three variables, and squared multiple correlations ranged from 0.50 to 0.96 except another three variables as discussed below. The following sections contain a discussion of each of the findings.

Table 19

Model Fit Indices Results

Fit index	Description ^a	Recommended value ^a	Lin & Hsieh (2006) (N = 189) ^b	Current study (N = 465)
χ^2/df	Estimate of how many times larger the obtained χ^2 value is than the expected value of a χ^2 variate with a given number of <i>df</i> .	Less than 3	2.42	2.79
RMSEA	Measure of the closeness of fit, a value representing the difference between error in sample data and expected error in model data.	< .05 = good fit .05-.08 = average fit .08-.1 = mediocre fit	0.087	0.062
CFI	Incremental fit index, measure of the proportionate improvement in fit as one moves from the baseline to the target model, per <i>df</i> .	Approaches 1	0.95	0.947

Table 19 (continued)

Fit index	Description ^a	Recommended value ^a	Lin & Hsieh (2006) (N = 189) ^b	Current study (N = 465)
NFI	Measure of the proportionate improvement in fit (defined in terms of f or χ^2) as one moves from the baseline to the target model.	Approaches 1	0.92	0.920
GFI	The goodness-of-fit index deals with error in reproducing the variance-covariance matrix. Values range from 0 to 1 with 1 being a perfect fit.	Approaches 1	0.86	0.881

Note. RMSEA = root mean square error of approximation, CFI = comparative fit index, NFI = normed fit index, and GFI = goodness-of-fit index.

^a As suggested by Byrne (2001). ^b Values based on the financial services technology-based services (Lin & Hsieh, 2006).

Chi-squared. Chi-squared is statistically significant, $p < .0001$, indicating that the model does not perfectly fit the data. Joreskog (1969) indicated that most models do not perfectly fit the population, and this is generally acceptable because models are approximations. The usefulness of chi-square analysis is sometimes limited because it is sensitive to the sample size (Byrne, 2001).

Chi-squared per degrees of freedom. The fit index χ^2/df adjusts chi-squared for the degrees of freedom. Byrne (2001) suggested a value below 3; the data indicated a value of 2.79. The index indicated that the data varied 2.79 from the tested model. The findings of Lin and Hsieh (2006) in the financial services were also below 3 at 2.79. This fit index presented support for the model fit to the data.

RMSEA. RMSEA is a value representing the difference between the error in the sample data and the expected error in the data of the model. A value of .062 represents an average fit of the data error compared with the expected error in the model. The confidence interval (CI_{.90}) = .057, .067. Therefore, the range is still at the average fit suggested by Byrne (2001). Lin and Hsieh (2006) indicated a value of .086, which was in the mediocre fit in the financial services and in the overall value of .77 in the general self-services technologies. This index also supported an average model fit to the data.

Comparative fit index (CFI). The CFI is an incremental fit index that measures the proportionate improvement in fit as one moves from the baseline to the target model. Byrne (2001) described the index as an index not affected by model complexity. The index has a maximum value of 1, which is a perfect fit. The data in the present study indicated a value of .947, which is a positive indicator of fit based on the index (Byrne, 2001). The index also supported the model fit to the data.

Normed fit index (NFI). The other indices described in Table 19 included a normed fit index (NFI), which is an incremental fit index similar to CFI that measures the proportionate improvement in fit as one moves from the baseline to the target model. The difference between NFI and CFI is that NFI defines improvement in terms of χ^2 , whereas CFI defines improvement in terms of χ^2 per degree of freedom. The value of .92

is also within the acceptable range of fit as described by Byrne (2001). This index also supports the model fit to the data.

Goodness-of-fit index (GFI). The goodness-of-fit index deals with error in reproducing the variance-covariance matrix. Byrne (2001) indicated a value of 1 is a perfect fit and a value higher than .90 is good. A value of .881 would be average fit. The findings of Lin and Hsieh (2006) were .86 on this index. This index indicates a less-than-good model fit to the data.

Based on the discussed fit indices, one can conclude that the model in the current study fits the data with reasonable limitations. The findings are limited because SEM analysis requires a large sample size. The results are close to those found by Lin and Hsieh (2006). The model would better fit the data with further analysis of the estimate values and cases that are furthest from the fitted model.

Estimates. The SEM results included additional estimates to help address the model details. The results included regression weights, covariance, and squared multiple correlations. The estimates were important for identifying data confirming or deviating from the suggested model. The findings indicated a significant path existed from service quality dimensions to SAT to BI. Customer BI had a significant regression weight of .79 of SAT. The estimates included modified indices that detect model change with parameter modifications and squared multiple correlations to identify survey items' contributions to the model. The following two sections include a discussion on modified indices and squared multiple correlation results.

Modified indices. The modified indices in AMOS provide a powerful tool for detecting the model's parameters, which if set free would improve the fitness of the

model (Arbuckle, 2007) if this could be justified conceptually. Three paths were added to the model that had underlying theory as shown in Appendix N. The paths were between FUN5 and FUN1, ENJ1 and ENJ3, and ENJ2 and ENJ4.

The underlying theory was the fact that these items were measuring the same latent variables and the verbiage of these items might have led them to mean the same thing. For example, ENJ1, “The operation of the bank’s TBBS is interesting,” and ENJ3, “The bank’s TBBS have interesting additional functions,” could be referring to the same meaning. These two variables were set free in the model by adding a double-headed curve between them to indicate they can be correlated with each other. As a result, the model fit the data better. This finding also supported the comments provided by the focus group members when they suggested underlining some words on the survey to reflect emphasis.

Squared multiple correlations. The SEM reports also include squared multiple correlations, which indicate each item in the survey that is part of the model and how much it contributes to the model in fitting the data. The lowest estimates were FUN3, which was “Using the bank’s TBBS requires little effort”; FUN5, which was “Each service item/function of the TBBS is error-free”; BIN3, which was “I will continue to use the TBBS offered by the bank even if competing banks offered similar services for lower prices”; and CUS3, which was “The bank’s TBBS have features that are personalized for me.” The estimated squared multiple correlations were .163, .383, .399, and .450, respectively. All other estimates were between .511 and .879. The findings indicated that these four survey items were data that do not fit the suggested model.

The results of the SEM analysis generated by AMOS Version 18 assisted in providing an explanation of how the data deviated from the suggested model. The SEM reports specified the cases that were furthest from the fitted model. The answers to the open-ended questions of these cases were analyzed qualitatively to find any emerging themes that could explain the association between service quality dimensions, SAT, and BI in responding to the research question of the study.

Open-ended remarks analysis. Three main themes were indicated by the open-ended questions based on cases found furthest from the fitted model. Respondents were asked to provide open-ended remarks about service issues they would like to see enhanced in the quality of TBBS offered by their banks. Appendix O includes the main themes and their count. The main apparent themes were error-free services, service accessibility, and service assurance.

The first theme was error-free services. Respondents complained about errors associated with ATMs, especially when the machines ran out of cash. This theme was measured by the survey in item FUN3. Although this item was among the least presented items in the SEM analysis, it seemed to be a very important concern to customers. This is no surprise because TBBS is useless if it is full of errors.

The second theme was accessibility, specifically to ATMs and merchant points of sale. Accessibility was among the 10 service quality dimensions listed by Parasuraman et al. (1985). In the present study, accessibility was part of service convenience.

The third apparent theme was service assurance. The open-ended remarks by respondents included low confidence in a bank's ability to maintain effective operations of TBBS. Remarks addressed the importance of following recent regulations, especially

in the aftermath of the financial crisis. Other remarks indicated the importance of assuring customers when systems fail to operate. It seems that banks do not have clear procedures to provide to customers regarding what to do in case of a system error.

Several comments indicated the importance of training employees to do their jobs properly. Customers did not seem to trust employee actions. The lack of trust is probably a result of previous employee–customer interaction where an employee did not demonstrate self-confidence in solving customer problems.

Summary

Chapter 4 involved an attempt to include detailed reporting and analysis of the findings of the study. The findings included a pilot study that indicated the attempt to confirm the validity of the survey instrument to measure service quality dimensions associated with TBBS provided by banks operating in Yemen and its adaptation. The chapter contained a description of the study’s data collection and preparation. The chapter also contained a description of the sample and a report of the study’s data analysis procedures. Internal consistency of the scale items seemed to confirm survey reliability.

Also reported in the study was a descriptive and inferential statistical analysis. The findings of the study appeared to indicate significant correlations among the study variables. The study hypotheses were tested and the results rejected the null hypotheses and accepted the alternative hypotheses. The findings appeared to indicate that all service quality dimensions are significantly correlated with SAT and BI toward TBBS provided by banks in Yemen.

The data provided additional findings after allowing for the effects of all other predictors in a combined model. Service security appeared to be insignificant in predicting SAT in a regression model. Customer BI was best predicted in terms of SAT, service assurance, service customization, and service enjoyment. Examining a structural equation model helped to determine if the data fit the proposed model. The data appeared to have an average fit to the model with few limitations. Chapter 5 will contain the conclusions, implications, and recommendations of the study.

Chapter 5: Conclusions

Financial institutions in Yemen have been actively competing with each other on the basis of TBBS (Willems, 2004) because these services have been a critical component of service delivery in the banking industry (Dabholkar, 1996; Meuter et al., 2000). Leaders of financial institutions have been under additional pressure not only to maintain SAT while sustaining lower costs, but also to maintain market leadership through the implementation of effective TBBS that can lower transaction costs and increase customer demand for financial services.

The current study involved an attempt to provide important findings to business leaders as they develop their business strategies. As customers had complained about service quality associated with TBBS (MarebPress, 2009), this research study provides important information about customers' perceptions of TBBS that can enable bank leaders to improve their service quality, attain SAT, and predict customer reactions to improvements in service quality. At the same time, the study communicates customer concerns to business leaders in Yemen so that they might better service their customers.

The purpose of the quantitative correlational descriptive research study was to determine if a set of TBBSQUAL dimensions had an association with SAT and BI toward TBBS in Yemen. The study involved testing the seven dimensions suggested by Lin and Hsieh (2006) in a specific industry (banking) and population (Yemen). Dimensions of TBBSQUAL consisted of functionality, enjoyment, security, assurance, design, convenience, and customization (Lin & Hsieh, 2006). The predictor variables (independent variables) for the study were the aforementioned TBBSQUAL dimensions. The criterion variables (dependent variables) were SAT and BI.

The study included a survey research design. The survey was designed to capture the current perceptions of the service quality, SAT, and BI of the customers of Yemen's banks in a quantitative manner. To ensure the reliability and validity of the survey instrument, the researcher conducted a pilot study. Four hundred sixty-five survey respondents participated either online or offline; analysis of the participants' responses contributes to knowledge and might help scholars, leaders, and practitioners to improve SAT and predict favorable BI toward TBBS in Yemen. The study findings helped to answer the research question by testing the study hypotheses.

This chapter contains the conclusions of the study findings presented in Chapter 4; the implications of the findings, and recommendations to business leaders; practitioners, and scholars. The discussion includes a response to the problem and purpose of the study outlined in Chapter 1, in light of the literature review in Chapter 2, and based on the study methodology presented in Chapter 3. The chapter concludes with a summary of findings.

Conclusions, Implications, and Recommendations

The current study contains empirical evidence to support a significant positive linear relationship between service quality dimensions associated with TBBS and SAT and BI toward TBBS. The results of the study confirm previous research by Lin and Hsieh (2006) that service quality is associated with SAT and BI.

The following sections will include conclusions, interpretations, and recommendations to business leaders, policy makers, and scholars. The sections are organized in the following order: SAT and BI toward TBBS, demographic considerations, service quality dimensions associated with TBBS, open-ended remarks,

and the overall model. The conclusions are supported by the study data and compared with the literature.

Customer satisfaction. Customer satisfaction is the degree to which a customer believes that the use of a service evokes positive feelings (Rust & Oliver, 1994). The following discussion includes conclusions, implications, and recommendations about SAT with TBBS in Yemen.

Conclusions and implications. The present study appeared to indicate low SAT among respondents toward TBBS offered by banks in Yemen. This finding supports the study problem statement that retail banking customers are reporting dissatisfaction with TBBS in Yemen (MarebPress, 2009) and contributes to the significance of the study in contributing to the current literature. The current study indicated that 51% of respondents did not agree with the survey item, “The TBBS offered by the bank exceed my expectations.” Approximately 30% of respondents did not agree with survey item, “Overall, I am satisfied with the TBBS offered by the bank.” These findings seemed to confirm the need for the study and added significance to the conclusions.

The study findings appeared to indicate a significant relationship exists between SAT and all service quality dimensions covered in the study. Each of the seven service quality dimensions had a significant positive bivariate correlation in the study. The study involved evaluating a multiple regression model in an attempt to predict SAT in terms of service quality dimensions in a combined model. The findings seemed to confirm a significant model that explained 72% of the variance in SAT in terms of service enjoyment, customization, design, convenience, and functionality. The remaining 28% remained unexplained by the study and can be studied in future research.

According to Oliver (1980), SAT is a cognitive situation based on an expectation-disconfirmation paradigm. The expectation-disconfirmation paradigm begins with forming an expectation about a service based on its internal cues and ends with a comparison between expectations against outcomes as discussed in Chapter 2. Customers in Yemen found that TBBS does not exceed their expectations, indicating that expectations are higher than perceptions. This finding appeared to indicate that TBBS is not up to the requirements of customers. According to Parasuraman et al. (1988), a service quality gap can arise from the difference between customer expectations and perceptions. Additional analysis was necessary to understand the different factors associated with SAT toward TBBS offered by banks in Yemen.

Lin and Hsieh (2006) noted that customer perceptions of service quality associated with financial self-services such as ATMs might have been highly standardized to the point that customers are not able to differentiate service quality to predict SAT. A conclusion in the present study was that SAT is associated with financial self-services such as ATMs. The difference may be explained by the different level of TBBS standardization between the two markets studied. Lin and Hsieh (2006) conducted their study based on a sample in Taiwan, whereas the present study included a sample in Yemen. The conclusion was that TBBS is less standardized in Yemen than in Taiwan in 2006. Therefore, a replication of the current study in Yemen in the future might provide evidence regarding whether the difference in SAT is based on how much standardization has occurred in TBBS or some other reason, such as cultural preferences or market situation.

As labor costs continue to increase, TBBS offer obvious cost benefits to the banking industry in Yemen. Literature indicated a high correlation between SAT and profitability (Anderson et al., 1994; Wan et al., 2004), loyalty (Fornell, 1992), and positive customer BI (Zeithaml et al., 1996).

Recommendations. Research indicated that SAT correlates with profitability (Anderson et al., 1994; Wan et al., 2004). Bank leaders need to leverage factors associated with SAT to increase profitability. The use of TBS offers cost benefits that can also contribute to banks' profitability. For bank leaders to effectively achieve profitability, they need to continuously improve all service quality dimensions discussed in the present study, namely, functionality, enjoyment, security, assurance, design, convenience, and customization. More specifically, bank leaders can predict SAT based on service enjoyment, customization, design, convenience, and functionality as these dimensions together explained 72% of SAT.

Bank leaders might need to manage customer expectations of TBBS. In addition, bank leaders might need to communicate accurate information to customers. Bank leaders might also need to manage customer perceptions of TBBS by providing differentiated service quality that meets customer needs and wants.

Service quality dimensions explained 72% of SAT based on the study data. Additional research using qualitative data might provide an explanation of the remaining 28% unexplained variation. Qualitative research might provide other factors that explain SAT with TBBS.

Behavioral intentions. Behavioral intentions occur when a customer feels motivated and convinced to make a future action, such as provide positive word of

mouth, recommend a service, or remain loyal (Zeithaml et al., 1996). The following discussion includes conclusions, implications, and recommendations toward SAT with TBBS in Yemen.

Conclusions and implications. The present study indicates overall positive customer BI toward using and recommending TBBS offered by banks in Yemen. Seventy percent of respondents in the study agreed they would recommend TBBS offered by their banks to their friends and 81% would continue to use them. This finding provides a positive indication of the current intentions of banking customers in Yemen.

The study findings appeared to indicate a significant relationship exists between customer BI and all service quality dimensions covered in the study. Each of the seven service quality dimensions seemed to have a significant positive bivariate correlation. The study involved evaluating a multiple regression model to predict customer BI in terms of service quality dimensions in a combined model. The findings seemed to confirm a significant model that explained 58% of the variance in customer BI toward TBBS in terms of service enjoyment, customization, design, convenience, and functionality. Based on the findings, customer BI toward TBBS can be predicted in Yemen based on customers' evaluations of their ability to control services (customization), to use and operate TBBS (functionality), the look and feel of TBBS (design), and how easy and convenient it is to reach and access TBBS (convenience).

The present study also involved evaluating another multiple regression model to predict customer BI in terms of service quality dimensions and SAT. The other multiple regression model was performed because previous studies (Cronin & Taylor, 1992; Lin & Hsieh, 2006; Parasuraman et al., 1988) indicated that SAT is an antecedent of BI. Ajzen

(2005) indicated that customers' attitudes determined customers' BI and actions. In the present study, SAT represented customers' attitude toward the current service provided by their bank. The regression model appeared to be able to explain 65% of the variance in BI in terms of SAT, service assurance, customization, and enjoyment.

The findings of the present study appeared to confirm previous research that SAT is an antecedent of customer BI. The findings also seemed to agree with Ajzen's (2005) model of determinates of behavioral intentions and actions, which included attitude, social norms, and behavioral control. In the application of TBBS, customer behavioral intentions would be based on customers' attitudes, represented in this study as satisfaction, social norms in terms of assurance (i.e., reputation), and behavioral control (i.e., service customization).

Recommendations. Bank leaders might focus on SAT as it seems to shape customers' attitudes toward TBBS. Additional research in terms of how customer traits play a role in forming customer attitudes might be an important area for better classification and segmenting of customers. Customer satisfaction can be explained by the service quality perceived by customers.

As discussed previously, a recommendation is that bank leaders manage service assurance carefully to ensure that customers are assured of a bank's ability to deliver services; at the same time, banks must not exaggerate in their advertising and marketing plans so that customers' expectations remain within the bank's ability to deliver.

Accurate and truthful communications seem to be associated with positive BI.

Bank leaders might continue to improve service enjoyment and customization to ensure customers' behavioral control over TBBS. The findings of the current study

appeared to indicate that as customers perceive their ability to personalize services gives them control over TBBS and produces excitement and joy, customers' BI will be favorable to bank leaders in terms of positive word-of-mouth and increased usage of TBBS.

Demographic considerations. In addition to evaluating customer perceptions of TBBS, the current study involved gathering customer demographics. The following sections will provide conclusions inferred from the study results with interpretations and recommendations.

Age. The ANOVA among age groups seemed to indicate a significant difference exists among the groups. The difference indicates that as bank leaders segment customers based on their age, service quality issues needs to be addressed. Bank leaders might consider how different age groups reach service enjoyment, which is a critical factor in determining SAT and BI.

The over-45 age group seemed to have a higher standard deviation of SAT than other groups (see Figure 12), which might indicate instability for this group because of different needs and requirements. Service functionality, security, and customization were also significantly different among age groups. Bank leaders might consider providing additional training and orientation to the over-45 age group in areas such as how to use TBBS (functionality), how to secure TBBS (security), and how to control TBBS (customization).

Gender. Banks in Yemen have developed unique services for females to attract this segment, such as special branches for females only and feminine credit cards. Although the segmentation strategy might be effective from a marketing perspective, it

did not seem to result in a significant effect regarding how males and females perceive service quality dimensions, SAT, or BI. Females, however, were underrepresented in the present study.

Years of experience with technology. The present study provided some evidence that customer perceptions of service quality dimensions and SAT are significantly different among customers based on their experience with technology. Overall, customers experienced with technology perceived service quality dimensions to be lower and were less satisfied, which seems to indicate a deficiency between what customers expect TBBS to offer and how they perceive them. The recommendation to bank leaders would be additional orientation and communication of their strategies and policies to customers. Experienced customers might not understand why bank leaders offer services they way they do. At the same time, bank leaders need to stay up to date with the latest technologies to meet the demands of TBBS users with extensive experience, especially because they represented over 42% of the sample.

Years of experience with current bank. The study showed no significant difference among respondents' perceptions, satisfaction, and BI toward TBBS based on how long they have been banking with the same bank, which indicates that no matter whether customers have been banking for a long or short time, they have similar attitudes toward TBBS. This finding seemed to confirm the importance of service quality measures for predicting SAT and BI. This finding confirmed that customers are able to identify service quality measures and evaluate them accurately.

Bank leaders, as a result, might need to conduct further investigation into how views about TBBS might differ between newly acquired customers and long-term

customers. The findings did not appear to indicate the existence of a customer learning curve. This finding also might be an unfavorable indication that customers are not building loyalty with their banks.

Participants by bank. The analysis revealed that customers of different banks do not differ significantly in terms of their perceptions of service functionality, assurance, and design. The findings of the study supported the importance of service enjoyment, security, convenience, and customization dimensions in determining SAT and BI. One might conclude that service functionality, assurance, and design are core traits of TBBS, regardless of how banks offer these services. Banks have more space to differentiate their services through the other dimensions as customers have evaluated them differently across banks. In this discussion, it is important to note that the study sample was not a good representation of the population (see Chapter 4).

Bank selection requirement. Some companies in Yemen require their employees and business partners to bank with a particular bank to receive their salaries or payments. The findings of the present study indicated that such business decisions might have an influence on how users of TBBS perceive these services. Overall, customers seemed to perceive service quality dimensions to be lower when they were required to bank with a particular bank specified by their employers or business partners. Similarly, SAT and BI toward TBBS were lower, which seemed to reflect the human nature of freedom and self-determination.

The findings seemed to provide significant conclusions for policy makers, employers, businesses, and bank leaders for handling the needs of consumers of retail

banking services. The present study included a recommendation to give customers the freedom of selecting their banks.

Additional research can provide more insight into the reasons employers and business partners require some stakeholders to bank with a particular bank. Such research might reveal other advantages or opportunities associated with such policies. The findings of the current study might contribute to such research from the perspective of customers' perceptions of the quality of the retail banking service.

When the best interests of bank leaders align with employers' best interests, customers should not be made to suffer. The findings of the present study indicated that while customer perceptions are lower when employees are forced to bank with a particular bank, there appeared to be no significant difference among customers in terms of service convenience and customization. Therefore, bank leaders might leverage their strategic alignment with employers by focusing on two dimensions in presenting their TBBS. Bank leaders might focus on providing more control and personalization to employees and increasing their office hours and ATM network coverage to capture customer interests in their offerings.

The previous discussion involved an attempt to cover SAT and BI toward TBBS along with demographic considerations to improve service quality dimensions associated with TBBS. The study research question was as follows: Which combinations of functionality, enjoyment, security, assurance, design, convenience, and customization, which are service quality dimensions in TBBS, have an association with SAT and BI toward TBBS in Yemen? The findings of this study provided insights with which to

answer the research question. The following sections will involve an attempt to answer the research question by addressing each of the service quality dimensions.

Service Quality Dimensions

The current study was able to include an attempt to confirm a service quality model applicable to TBBS offered by banks in Yemen. The present model included seven service quality dimensions associated with TBBS: functionality, enjoyment, security, assurance, design, convenience, and customization. Each of these is discussed below.

Functionality. Functionality concerns how TBS is able to perform the required task effectively and efficiently with error-free performance. Functionality represents the reliability dimension in traditional services (Parasuraman et al., 1988). The following sections contain a review of customer evaluation of service functionality, its association with SAT and BI, its implications, and recommendations to interested leaders.

Conclusions and implications. Study respondents evaluated service functionality to be above average. Respondents seemed to be able to get their services in a short time, the service process was clear and smooth, and they found TBBS to require little effort.

The relationship between service functionality, SAT, and BI was positive, significant, and strong. As customers evaluated service functionality high, they also seemed to report high SAT and positive BI toward TBBS. Similarly, as customers evaluated service functionality low, they also seemed to report low SAT and possibly negative BI toward TBBS. This finding seemed to be supported in the literature (Lin & Hsieh, 2006).

In predicting SAT, service functionality appeared to operate among the lower weighted service dimensions with a significant contribution to the model ($\beta = .15$). Service functionality ranked fifth among the seven service dimensions in the regression model. The conclusion was that SAT is dependent on service functionality in a combined regression model. Bank leaders might need to consider service functionality when setting up development plans for TBBS.

Service functionality seemed to have a weak contribution to the regression model in predicting customer BI toward TBBS in the combined model. Bank leaders might need to consider service functionality as a means to achieve SAT. In turn, SAT seemed to be able to predict customers' BI toward TBBS in Yemen as discussed later in this chapter. Research showed ease-of-use and usefulness are important service quality factors in predicting customers' attitudes toward general TBBS (Curran & Meuter, 2005) and Internet banking (Ho & Ko, 2008).

The main functionality concern was having an error-free service. Approximately 50% of the respondents thought that TBBS was not error-free. Some of the errors included malfunctions, the ATM running out of cash, and being temporarily out of service. The service functionality issue appeared to be the highest reported issue on the open-ended question part of the survey conducted in the study. It was also among the lowest survey items reported in this study. Respondents seemed to have high expectations of service performance with no errors.

The data appeared to indicate that TBBS was not easy to use. Users expect technology to operate in a manner that is useful and easy to use, as indicated by Davis's (1989) technology acceptance model. The functionality dimensions of service quality

include the reliability of technology as smooth and clear to operate, useful in terms of requiring little effort to perform its core functions, and error-free. Experiencing service errors would be a major service dissatisfaction that might create unfavorable customer reactions such as reporting to a third party, which is evident in the study problem statement as described by MarebPress (2009).

Recommendations. Bank leaders should focus on delivering error-free services to their customers. Error-free service represents the technical aspect of service quality. Gronroos (1984) defined this technical quality factor as “what the customer is left with when the production process is finished” (p. 38).

Bank leaders might need to set up control measures to prevent or react immediately to service failures and errors. Technology-based banking services are highly automated services that require customers’ self-service. Therefore, a bank’s role would be to ensure that no service errors occur and that the systems or bank employees can prevent such failures.

Bank leaders also need to improve service functionality continuously to meet customer demands of improvement in technology. Technology has been rapidly developing within the past two decades and bank leaders need to keep up with these technologies to make sure that service functions are meeting customer demands. Bank leaders can also improve service functionality by developing policies and procedures that enable customers to obtain TBBS with little effort. The data in the current study seemed to provide evidence that customers not only perceive TBBS to include errors but also found TBBS to require significant effort.

Technology-based banking services need to be easy to operate and more intuitive to use. Bank leaders might focus on TBBS design to achieve ease of use and facilitate training on how to operate TBBS equipment. For example, bank leaders might develop training videos to guide customers. Multimedia instructions can be provided to customers on ATM screen savers and through Internet banking websites. These training guides can be useful to all customers, especially the older age groups because they showed significant concerns in this area. Additional training for customers might also minimize user errors, especially for those who are less technology literate.

Possible suggestions would be to investigate customer requirements in terms of what specific services need to be easier to use, should be clearer to operate, or can be executed smoothly. Investigating sources of service errors might also assist bank leaders to identify causes of service errors such as technology failures, user errors, and operation ineffectiveness to provide recommendations for minimizing these errors. Additional research at the bank level might provide specific insight into certain service functions that customers could obtain faster and easier.

Enjoyment. Enjoyment includes how technology-based service operations are interesting, delightful, or joyful with features and capabilities that make customers feel good when using them (Dabholkar, 1996). Enjoyment “aris[es] intrinsically from interacting with the technology-based service” (Dabholkar, 1996, p. 35). The following sections include an interpretation of customers’ evaluation of service enjoyment, its association with SAT and BI, its implications, and recommendations to interested leaders.

Conclusions and implications. Study respondents evaluated service enjoyment to be above average overall, which seemed to indicate that customers found TBBS to be

interesting and delightful in three main parts. First, customers felt good about being able to use TBBS. Second, TBBS provided all needed information to manage customer finances. Third, the operation of TBBS such as ATMs, Internet banking, and mobile banking were interesting and fun to use.

Customers' main enjoyment concern was with additional features. Customers seemed to have the impression that TBBS could do much more, as evident in customer responses to the survey's open-ended question. Customers indicated that TBBS could be much more interesting with additional services and features that would make financial management more interesting and rewarding. This item about additional features was among the lowest service dimension items reported in the study. Approximately 48% of the respondents answered 4 or less on this item on a 7-point Likert-type scale.

The relationship between service enjoyment, SAT, and BI seemed to be positive, significant, and strong. As customers evaluated TBBS as interesting and delightful, they were satisfied and had favorable BI toward TBBS ($\beta = .30$). The relationship between service enjoyment and SAT was the strongest relationship among service quality dimensions toward SAT. The study findings indicated a strong association existed between customers' interest in TBBS and SAT. The data seemed to indicate that customers' perception of the ideal TBBS was to be enjoyable.

Service enjoyment also appeared to contribute to the regression model in predicting customer BI toward TBBS. The analysis indicated that customer BI appeared to depend mainly on SAT along with service enjoyment, assurance, and customization. The data seemed to indicate that as customers enjoyed TBBS, they were willing to

recommend TBBS to their friends, willing to continue to use these services, and willing to bear higher fees.

Customers seem to expect TBBS to be interesting to use with mobile phones, the Internet, and ATMs. Customers expect the technologies might provide additional services and technologies that are enjoyable. Parasuraman (2000) indicated that customer traits and readiness to use technology have an influence on service enjoyment. Therefore, customer traits such as optimism and innovativeness would influence customers' perceptions of what technology can provide for them. Innovative and optimistic customers would expect TBBS to provide more services than traditional banking services. Additional research into customer traits in regard to service enjoyment might provide further understanding of how customers perceive enjoyment within the context of TBBS in Yemen.

The current study suggested that when customers feel good about being able to use TBBS, they are willing to continue using TBBS and to recommend TBBS to their friends. This finding is supported by Ajzen (2005), who indicated that customers' BI are based on their attitudes toward an action. Curran and Meuter (2007) found empirical evidence that service enjoyment is a critical factor in motivating customers to adopt and continue to use TBS in the banking industry. According to Curran and Meuter, TBBS should not be treated as a tool, but instead as a mechanism with which to enjoy doing meaningful transactions.

The present study results indicated that retail banking customers in Yemen are satisfied with TBBS as they enjoy using TBBS. Customers considered TBBS to be satisfactory when they perceive the services to be interesting, to contain additional

functions, and to provide all relevant information. Customers who feel good using TBBS tend to be more satisfied with TBBS and more willing to have positive intentions toward these services.

Recommendations. Bank leaders may need to ensure that TBBS are positioned as highly enjoyable, fun, delightful, and interesting, which also needs to be reflected in customer interactions with TBBS. Bank leaders should not spare any additional service or interaction that can make customers feel delighted using TBBS. Bank leaders might consider sending promotional messages associated with fun and enjoyment through TBBS. New payment mechanisms such as mini ATM cards and contactless cards might also increase customers' delight with these services. According to Theotokis et al. (2008), the level of interaction between customers and technology influences customer perceptions of service quality within TBS. More interactive services such as bill payments over multiple channels such as mobile phone, Internet, telephone, and ATMs might provide customers with the level of interaction that can increase customer perceptions of service enjoyment.

Ho and Ko (2008) suggested instituting incentive programs to generate customer excitement about Internet banking because service enjoyment increases the emotional value of the product for customers. The findings of the present study indicated a strong relationship between service enjoyment, SAT, and BI. Therefore, bank leaders might stress and leverage service enjoyment as part of their customer acquisition plans through trial offers and live demonstrations.

The literature seemed to indicate that customers' perceptions of service quality are associated with customer traits and readiness to use TBBS. The current study called

for additional research along this avenue because of the high association between service enjoyment and SAT and BI toward TBBS in Yemen. Further research might also focus on particular service interactions that can explain service enjoyment in order to provide more detailed and specific directions to bank leaders regarding any additional interesting services customers are looking for. Additional research might also provide concrete examples of how banks in Yemen might make TBBS more enjoyable. This is very important because service enjoyment appeared to have the strongest relationship among service quality dimensions with SAT and BI.

Security. Security refers to the safety and security of customer transactions with the banks' TBBS, including the banks' privacy policy. Security was the degree to which the service was safe and customer information was protected (Parasuraman et al., 2005; Zeithaml et al., 2002). The following sections involve an attempt to discuss customers' evaluation of service security, its association with SAT and BI, its implications, and recommendations to interested leaders.

Conclusions and implications. Study participants provided the highest evaluation of service quality dimensions to service security, which seemed to indicate that most customers felt safe in their transactions with their bank's TBBS and found a clear privacy policy offered by their bank. The service quality dimension appeared to indicate that banks operating in Yemen have been able to meet customers' safety needs, which might also indicate that customers who had already been using these services had accepted the services' safety level before continuing to use them.

Service security, although significantly correlated with customer BI, was not found to be significantly associated with SAT nor BI after allowing for the effects of all

other service quality predictors in combined regression models. This finding was not surprising in light of Maslow's hierarchy of needs. As discussed in the literature review, according to Maslow's theory, an individual fulfills lower levels of needs before moving to higher levels of needs (Newstrom, 2011). As the lower level needs are met, they no longer affect behavior. Therefore, as customers are able to fulfill their safety needs by feeling safe with their transactions, they turn their attention toward trying to fulfill higher order needs such as social needs, self-esteem needs, or self-actualization needs (Schiffman & Kanuk, 2010). When customers already feel safe, the security dimension would have no effect in predicting SAT. Service security could be considered a hygiene factor, which is a factor that can prevent dissatisfaction but cannot satisfy (Bowditch & Buono, 2005). The hygiene factor theory has explained similar studies when service quality dimensions did not explain SAT in combined models as found in Zhu et al. (2002).

Maslow's hierarchy of needs indicated that individuals fulfilled lower levels of needs before seeking to satisfy higher levels of needs (Newstrom, 2011). Thus, it would be surprising to expect customers to use TBBS while they perceived TBBS to be unsafe or missing clear privacy policies. While limited empirical support was found for Maslow's theory (Soper, Milford, & Rosenthal, 1998), the application of the theory within the context of customer motivation to using TBBS seems to be logical.

Recommendations. The present study involved examining service quality dimensions associated with SAT and BI of current retail banking customers. However, the study did not examine dimensions associated with customer acquisition. Customer acquisition is concerned with increasing market share and recruiting new customers,

which is a subject beyond the scope of the study. Additional research into customer acquisition would probably find service security to be a major service quality dimension.

Bank leaders are recommended to consider service security a service requirement rather than a service quality improvement factor. As service security increases, then customers will be able to access TBBS. If service security is compromised, then TBBS will not be considered regardless of how other service quality dimensions play into the quality equation.

Assurance. Assurance is a firm's reputation and good image (Lin & Hsieh, 2006). A service is assuring to customers when the service provider has the ability to inspire trust and confidence (Parasuraman et al., 1988). The following sections will include a discussion on customers' evaluation of service assurance, the association of assurance with SAT and BI, its implications, and recommendations to interested leaders.

Conclusions and implications. Service assurance appeared to be second to service security in terms of customer evaluation. Customers found their banks to be well-known and had good reputations. Similar to service security, service assurance would be expected to be a service prerequisite. Being well-known and having a good reputation are important for banks' customer acquisition.

Service assurance was significantly positively associated with other service quality dimensions, SAT, and BI. However, in a regression model where all service quality dimensions were combined, service assurance appeared to be negatively associated with SAT and positively associated with BI as follows:

Customer satisfaction is a cognitive situation based on the expectation-disconfirmation paradigm (Oliver, 1980) or an affective situation based on an emotional

response to a consumption experience (Liljander & Strandvik, 1997). Customer satisfaction occurs in a comparison of expectations against outcomes (Rust & Oliver, 1994). According to Parasuraman et al. (1988), customer perception of service quality decreases as the gap between customer expectations and perceptions increase. As customers perceive a bank to be well-known and have a good reputation, customer expectations increase; as a result, customer dissatisfaction might occur.

Behavioral intentions are “the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior” (Ajzen, 1991, p. 181). Motivational factors include situations, perceptions, and attitudes toward a particular action. Ajzen (2005) identified three main factors that determine customer intentions: (a) attitudes toward a behavior, (b) subjective norms, and (c) perceived behavioral control, which lead to customers’ actual behavior.

Service assurance was the lowest predictor of SAT ($\beta = -0.09, p < .05$), which seemed to indicate that customers who perceived service assurance to be low had relatively higher SAT. Thus, as customers perceive their bank to be well-known or highly reputable, they were slightly dissatisfied with the TBBS offered.

Parasuraman et al. (2005) noted that a survey item that measures whether customers perceive TBBS providers to be truthful in their customer assurance would provide a better assessment of this service dimension. Bank leaders might be substantially investing in advertising to raise their popularity, but they may need to make sure that their communication is accurate and truthful to maintain customer expectations of service assurance.

Service assurance positively related to customer BI. When matching service assurance to the three factors suggested by Ajzen (2005) to determine customer intentions, subjective norms can best describe service assurance. Subjective norms refer to people's beliefs about how others will view a behavior in question (Ajzen, 1991). When a customer perceives a service provider to be well-known and highly reputable, the customer believes others will view the customer's positive BI to be an acceptable norm, which will lead to the customer having positive BI, and as customers view a service provider to be unknown by others, the customers generate negative BI and actions toward the service provider (Ajzen, 2005).

Recommendations. Bank leaders may need to manage service assurance carefully. Customer assurance through advertising or market dominance can generate a subjective norm, leading to customers having positive BI and actions toward their banks. Communications to customers that reinforce service assurance may need to be accurate and truthful so that customer expectations do not exceed reasonable perceptions and thus lead to dissatisfaction.

Design. Service design includes the technology layout, the degree to which something is visually appealing, and the use of up-to-date equipment (Lin & Hsieh, 2006). Although design sounds similar to the tangibility dimension, design includes system design and service processes as well as physical material and equipment. The following sections include a discussion of customer evaluation of TBBS service design, its association with SAT and BI, its implications, and recommendations to interested leaders.

Conclusions and implications. Service design had the lowest respondent evaluations in the present study. Approximately 50% of the respondents considered TBBS offered by banks in Yemen to be below average. Half the respondents considered TBBS to be neither up-to-date nor aesthetically appealing. Responses to the open-ended question included several recommendations to TBBS providers to look at developed countries' TBBS and implement latest technologies in Yemen. It seems that customer perceptions of TBBS design was based on international experiences or diluted by fiction movies.

The service design appeared to be significantly correlated with all other service quality dimensions, SAT, and BI. Service design had a weak correlation with customer BI ($r = .59; p < .001$). In a multiple regression model, design appeared to help predict SAT. However, this service dimension did not contribute to the combined model to predict customer BI.

The findings appeared to indicate that respondents were less concerned with service design in recommending and using TBBS, even though respondents found it a dimension that increased satisfaction. The technology acceptance model by Davis (1989) indicated that customers' perceptions of technology were limited to usefulness and ease-of-use. The appearance and design of the system helped SAT but did not encourage customers to act upon them.

Recommendations. This service design dimension appeared to indicate that bank leaders should continuously improve their technology infrastructures to meet international standards. Customers expect up-to-date technologies and compare services in Yemen with those in other countries. Future research might include a comparison of

the current findings with similar studies conducted in other countries. The results also suggest that customer expectations of world-class technologies might not be achievable by banks in Yemen, which, based on Ajzen's (2005) notion of subjective norms, might be the reason that design did not relate to customers' BI. Bank leaders in Yemen may still need to focus on service design and make TBBS aesthetically appealing to attain SAT.

Convenience. Service convenience refers to the ability of TBS to be easy to use, have convenient operating hours, and have accessible locations (Meuter et al., 2000). The convenience component also includes TBBS accessibility, such as the availability of an Internet connection for website access, mobile handsets for mobile banking services, and nearby ATM locations. The following sections include a discussion on customer evaluation of service convenience, its association with SAT and BI, its implications, and recommendations to interested leaders.

Conclusions and implications. Study respondents evaluated service convenience to be above average, which appeared to indicate that customers were relatively happy with TBBS accessibility, availability, and reachability. The second-most reported issue in the open-ended question, after a desire for error-free services, was respondents' requests for wider distribution of ATM machines. Internet banking and mobile banking were not a concern for respondents because they were convenient and available. Respondents reported that ATM machines needed to be available in more locations. Other issues reported in the responses to the open-ended question included a desire for more services to be conducted via the Internet as well as other media, easier processes to execute services, easier access to other banks' ATM networks, and service recovery.

The service convenience dimensions appeared to have a significant positive linear relationship with other service quality dimensions, SAT, and BI. The relationship seemed to be strong in regression models that predicted SAT and BI (see Tables 16 and 17, respectively). Customers seemed to be satisfied as they perceived TBBS to be easy and convenient to reach, which formed a positive attitude toward TBBS and intention to continue using TBBS and recommending TBBS to their friends. The convenience service dimension was also highly associated with customers' willingness to pay higher fees.

Curran and Meuter (2007) expected Internet banking to continue to grow rapidly in the future. The study findings indicated high customer expectations of what the Internet can offer them, which raises the importance of this study's advice to bank leaders and technology developers in determining critical factors associated with TBBS. Thus, TBBS can offer customers the luxury of selecting between a variety of service delivery options. The implications of such a shift in service options from brick-and-mortar kiosks and ATMs to Internet and mobile banking are expected to change how customers perceive service convenience.

The findings seemed to indicate that service recovery, as requested by the panel experts during the pilot study, are primarily associated with service convenience. McCollough, Berry, and Yadav (2000) noted that service providers are better off offering error-free services than having to recover a service failure. Customers expect an error-free service as discussed earlier, which is perceived as part of service reliability in general and specifically as TBBS functionality. Customers consider service recovery to

be part of service convenience, as the need for recovery plans is a sign of the service being unreliable in the first place.

Recommendations. Bank leaders may need to be seeking ways to make TBBS more convenient to customers. As customers perceive technology to be easy and convenient, they expect bank leaders to focus on this dimension. Bank leaders might increase SAT and favorable BI by expanding ATM networks, computerizing more services with multiple service options, and increasing working hours.

Increasing customer convenience may indicate an attempt to reduce customer sensitivity to price increases. Bank leaders might consider current customer evaluations of service convenience before making plans to increase prices. Bank leaders might consider lowering service fees if customers perceive service convenience to be low. The findings supported Ho and Ko's (2008) contention that customers perceive service value in terms of functional value (timeliness and accessibility) and emotional value (enjoyment).

Customization. The banks' TBBS showed consideration of the individual needs and preferences of customers through service options (Lin & Hsieh, 2006). Technology-based banking services are customizable, indicating that the service is capable of providing tailored and personalized services. The following sections contain a discussion on customer evaluation of service customization, its association with SAT and BI, its implications, and recommendations to interested leaders.

Conclusions and implications. Similar to service convenience, customers reported above average perceptions of service customization. Respondents considered TBBS as responding to their specific needs, having the customers' best interests at heart,

and maintaining features personalized for the customer. This finding seemed to indicate that customers perceived themselves to be in control over TBBS.

The service quality dimension appeared to have a significant, strong, positive association with service quality dimensions, SAT, and BI. The relationship was strong and positive in the bivariate correlation and the combined multiple regression model to try to predict SAT and BI, which led to the conclusion that service customization appeared to be the second-most critical service quality dimension after service enjoyment in predicting SAT and BI.

A reciprocal strong positive relationship was detected in the study between customer response to the service customization item, “The bank’s TBBS have my best interests at heart” and the SAT item, “Overall, I am satisfied with the TBBS offered by the bank” ($r = .68, p < .001$). These two items seem to reflect reciprocal feelings between the customer and the bank. As customers feel that TBBS is taking care of customer interests, the customers seem to feel satisfied with these services. Service customization to meet customers’ specific needs seems to capture SAT and produce BI to continue using these services and to recommend them to friends.

Recommendations. Bank leaders may need to understand that customers’ best interests are the bank’s best interests. As customers feel control over their finances through TBBS, bank leaders may have good control over customers in terms of SAT and BI. Bank leaders may need to develop their TBBS in a manner that gives customers more control over how these services function. As customers find Internet banking personalized to their specific needs, they may feel in control managing their finances online. Behavioral control is a factor of customer behavioral intentions (Ajzen, 2005).

This control might mean customers will continue to use TBBS, recommend TBBS to their friends, and be insensitive to fee changes associated with TBBS.

Open-ended Remarks

Analysis of the open-ended remarks made by respondents appeared to reveal three main themes for bank leaders and researchers. The findings seemed to indicate high levels of concern associated with TBBS error, wide distribution of ATMs and points of sales, and service assurance. The findings provided important insights from customers into how bank leaders, technology leaders, and researchers might define TBBS and measure TBBS in light of the previous findings.

Bank leaders. The findings appeared to indicate that bank leaders need to conduct thorough testing of TBBS before they introduce TBBS to customers. Once introduced, bank leaders might focus on preventive actions to ensure the smooth operation of TBBS, such as suitable locations with backup communications and power supplies. After that, TBBS may need continuous monitoring with preventive and reactive procedures. Bank leaders may need to make sure that a customer call center is available to take care of errors and malfunctions of systems and provide assurance to customers.

Technology providers. Technology providers might work with bank leaders to ensure the standardization and computerization of preventive and reactive procedures. Active reports might provide system error reports that back-office employees can use to take corrective actions and communicate to customers that the bank is aware of the error and a corrective action is under way. Enabling customers to report errors and malfunctions through TBBS is also recommended, such as through an online dispute system or a customer support hotline ready to take care of customer problems.

Researchers. Based on the current survey instrument, service assurance ranked high and customer comments in the open-ended questions revealed low levels of trust and confidence among customers toward their current banks. The two survey items under service assurance did not seem to measure the low levels of trust accurately. Additional research or replacing the two items with more accurate measures of how customers perceive banks' ability to assure customers might provide additional findings. This recommendation was also supported by Parasuraman et al. (2005) within a self-services context, which might also provide more accurate perceptions of service assurance. Such improvements to the survey instrument might help future researchers and practitioners to better measure service assurance and quality in general.

The previous sections involved an attempt to provide conclusions and recommendations based on the findings of the open-ended remarks requested from the respondents. The following section will involve an attempt to address how the data fit an overall model.

Overall Model

The study involved analyzing service quality dimensions, SAT, and BI in a combined model. Structural equation modeling was used in an attempt to answer the study's research question. The following sections include discussions of the model and recommendations.

Conclusions and implications. The present study's analysis included a SEM to examine if the model (see Figure 17) fit the data. The findings indicated a good fit ($\chi^2 = 725$; $p < .0001$; RMSEA = .062; CFI = .947; NFI = .920). Although the model was not a

perfect fit, the fit indices were acceptable (see Chapter 4). The model confirmed that SAT is an antecedent to customer BI.

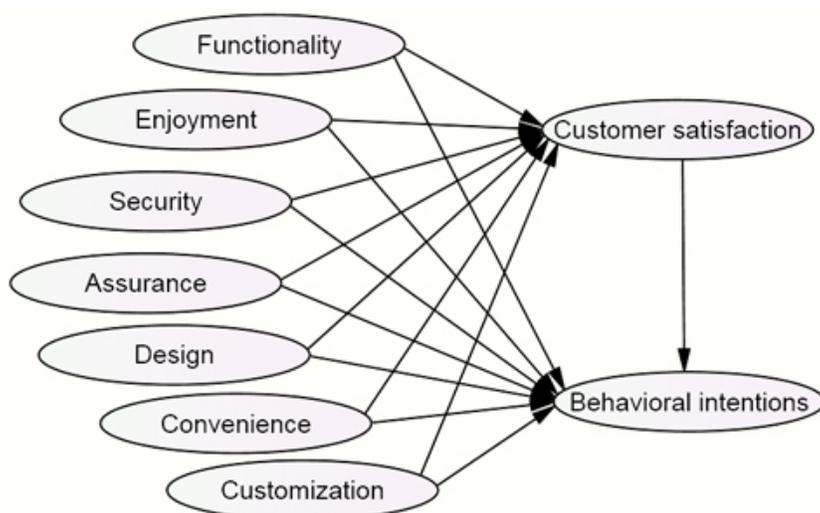


Figure 17. Relationship model used for the structural equation model.

The findings appeared to support previous research by Lin and Hsieh (2006). Table 19 provided a comparison on a fit index level between the current study and Lin and Hsieh's study. The current study seemed to provide a significant contribution to the literature by confirming the findings of Lin and Hsieh in a different population (Yemen) based on a specific industry (banking). The findings provide additional comments regarding the use of the survey instrument given its limitations and strengths.

The present study is unique research that may provide a comprehensive model with which to examine and understand service quality within TBBS in Yemen. First, the study tests were matched to the same model used in Taiwan by Lin and Hsieh (2006) and seemed to provide confirmation of the overall model with detailed recommendations to improve the model fitness. Second, the study findings appeared to provide firsthand research in TBBS in Yemen. The findings could be very important to bank leaders, technology implementers, and policy makers in Yemen and might improve their ability to

implement, manage, and promote TBBS effectively. Third, the model may contribute to the service quality literature given the introduction of technology in Yemen in a specific industry, banking. The model was first tested on a sample of transportation and financial TBS. The current study involved testing the model in financial services only and it provided a good fit. An area of improvement to the model exists for future research.

The model fit highlights the importance of error-free customizable services that require little effort. The literature included a discussion on these issues starting with Gronroos (1978), who defined the nature of services as inseparable, to the triangle model that specifies the roles of employees and customers in producing a service under the company's supervision by Kotler (1994), to the pyramid model when technology was introduced to customize services (Parasuraman, 2000). Technology-based banking services were not any different in terms of the nature of a service that has to deliver reliable, responsive, and assuring quality defined by Parasuraman et al. (1988). An additional examination into how these can be addressed might provide additional insights that can enhance the model fitness to the data.

The structural equations model appeared to confirm the importance of SAT in TBBS in a sequential discussion. Customer satisfaction can be a consequence of service quality and an antecedent of customer BI toward these services. As bank leaders invest in TBBS and expect customers to continue using them and refer their friends, bank leaders may have to provide quality services first to attain SAT. Customer satisfaction as a result may drive favorable customer BI toward TBBS.

Recommendations. Future research might leverage the findings of the current study in light of those found by Lin and Hsieh (2006) to enhance the survey instrument

and provide additional thoughts toward understanding consumer behavior toward TBS, whether in banking or any other industry, and in Yemen or any other country. The current model appeared to fit previous findings in Taiwan, but future researchers might replicate the service quality model in TBBS in other countries to check if the findings match. As TBBS continues to develop, there might also be a need to reinvestigate these findings in the future. Future research may also involve investigating how cultural differences in technology adoption might influence customer perceptions of service quality.

The modified indices appeared to indicate a need for the additional refinement of some survey items in the survey instrument. Future researchers might look into these items and revise them to better minimize the measurement errors of these items in measuring the latent variables. The squared multiple correlations appeared to indicate four items in the survey instrument that did not contribute much to the model in fitting the data. Therefore, future researchers might consider refining these items as well to enhance the survey instrument in measuring customer perceptions of TBBS.

Many researchers have investigated service quality dimensions within TBS and developed models to assess service quality within particular TBS such as eTailQ (Wolfenbarger & Gilly, 2003), SITEQUAL (Yoo & Donthu, 2001), WebQual (Loiacono et al., 2002), and E-S-QUAL (Parasuraman et al., 2005). Researchers have examined service quality dimensions, SAT, and BI (Brady & Cronin, 2001; Lin & Hsieh, 2006; Parasuraman et al., 1988). The introduction of technology within service delivery increased the importance of evaluating TBS (Dabholkar, 1996; Theotokis et al., 2008). The study results involved an attempt to contribute to previous research in TBBS

research and appeared to identify a measurement tool to operationalize service quality assessment within TBBS.

The findings of the study can help practitioners and business leaders prioritize service quality dimensions when implementing development plans to improve TBBS. The findings of the study can significantly improve quality development plans such as failure modes and effects analysis, total quality management, or quality by design.

Research indicated that SAT correlates with profitability (Anderson et al., 1994; Wan et al., 2004), loyalty (Fornell, 1992), and positive customer BI (Zeithaml et al., 1996). Glaveli et al. (2006) considered service quality assessment to be an important leadership task for achieving organizational success. The leadership of bank leaders in Yemen might benefit from the study findings and might increase profitability via increasing SAT.

Summary

In summary, the study involved examining a set of service quality dimensions associated with TBBS in relation to SAT and BI toward TBBS. The study results appeared to confirm that seven service quality dimensions—functionality, enjoyment, security, assurance, design, convenience, and customization—were associated with SAT and BI, and as predicted, SAT was correlated with BI.

Technology-based banking services are quickly expanding and provide cost reductions per transaction, given increasing labor costs. However, TBBS can be very costly if not introduced correctly. Thus, it is critical to have a clear understanding regarding how to best implement, manage, and promote TBBS for success.

Technology-based banking services need to allow customers to enjoy banking at convenient times and locations. Customers seem to expect TBBS to be safe and error-free. Bank leaders may develop marketing strategies that can satisfy customers and establish positive attitudes toward these services so that customers might continue to use them and recommend them to their friends because TBBS is a meaningful and interesting tool to manage finances in the 21st century.

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Appendix A: Survey Instrument

Please answer ALL questions in this survey completely and to the best of your ability.

SECTION ONE: DEMOGRAPHICS

1. What is your age (years)? _____
2. Gender: female () male ()
3. How many year have you been using technology? _____
4. How many years have you been banking with your current bank? _____
5. What is your current bank, please circle your ONE choice which is your main bank if you bank with more than one bank.
 - a. Arab Bank
 - b. CAC Bank
 - c. International Bank of Yemen
 - d. Saba Islamic Bank
 - e. Shamel Bank of Yemen and Bahrain
 - f. Tadamoun International Islamic Bank
 - g. Yemen Commercial Bank
 - h. Yemen Gulf Bank
 - i. Yemen Kuwait Bank
6. Are you required to bank with the above selected bank? Yes () No ()
7. Do you have a credit, debit, or ATM card?
8. I have used technology-based banking services at my above selected bank during the past 30 days? Yes () No ()

SECTION TWO: PERCEIVED QUALITY OF SERVICE QUALITY WITHIN
TECHNOLOGY-BASED BANKING SERVICES¹

20 descriptive statements about technology-based banking services (TBBS) are listed below. For each of the statements, use the scale below to indicate your level of agreement. Only think of TBBS provided by your bank. TBBS include ATM services, mobile banking, Internet banking, and merchant locations (points of sales) that accept your payment card. For each of the following statements, circle your choice.

1 = strongly disagree 7 = strongly agree

1	I can get my service done with the bank's TBBS in a short time	1 - 2 - 3 - 4 - 5 - 6 - 7
2	The service process of the bank's TBBS is clear	1 - 2 - 3 - 4 - 5 - 6 - 7
3	Using the bank's TBBS requires little effort	1 - 2 - 3 - 4 - 5 - 6 - 7
4	I can get my service done smoothly with the bank's TBBS.	1 - 2 - 3 - 4 - 5 - 6 - 7
5	Each service item/function of the TBBS is error-free	1 - 2 - 3 - 4 - 5 - 6 - 7
6	The operation of the bank's TBBS is interesting	1 - 2 - 3 - 4 - 5 - 6 - 7
7	I feel good being able to use the TBBS	1 - 2 - 3 - 4 - 5 - 6 - 7
8	The bank's TBBS have interesting additional functions	1 - 2 - 3 - 4 - 5 - 6 - 7
9	The bank's TBBS provide me with all relevant information.	1 - 2 - 3 - 4 - 5 - 6 - 7
10	I feel safe in my transactions with the bank's TBBS	1 - 2 - 3 - 4 - 5 - 6 - 7
11	A clear privacy policy is stated when I use the bank's TBBS.	1 - 2 - 3 - 4 - 5 - 6 - 7
12	The bank providing the TBBS is well-known	1 - 2 - 3 - 4 - 5 - 6 - 7
13	The bank providing the TBBS has a good reputation	1 - 2 - 3 - 4 - 5 - 6 - 7
14	The layout of the bank's TBBS is aesthetically appealing.	1 - 2 - 3 - 4 - 5 - 6 - 7
15	The bank's TBBS appears to use up-to-date technology	1 - 2 - 3 - 4 - 5 - 6 - 7
16	The TBBS has operating hours convenient to customers	1 - 2 - 3 - 4 - 5 - 6 - 7
17	It is easy and convenient to reach the bank's TBBS	1 - 2 - 3 - 4 - 5 - 6 - 7
18	The bank's TBBS understand my specific needs	1 - 2 - 3 - 4 - 5 - 6 - 7
19	The bank's TBBS have my best interests at heart	1 - 2 - 3 - 4 - 5 - 6 - 7
20	The bank's TBBS have features that are personalized for me.	1 - 2 - 3 - 4 - 5 - 6 - 7

¹ From "The role of technology readiness in customers' perception and adoption of self-service technologies," by Lin, J., & Hsieh, P. (2006). *International Journal of Service Industry Management*, 17(5) 497-517. Copyright 2006 by Emerald database. Adapted with permission.

SECTION THREE: CUSTOMER SATISFACTION

Three descriptive questions are listed below. Think of your perception of your current bank services. All in all, please circle your answer according to the scale next to it.

1	Overall, I am satisfied with the TBBS offered by the bank	1 - 2 - 3 - 4 - 5 - 6 - 7
2	The TBBS offered by the bank exceed my expectations	1 - 2 - 3 - 4 - 5 - 6 - 7
3	The TBBS offered by the bank are close to my ideal TBBS.	1 - 2 - 3 - 4 - 5 - 6 - 7

SECTION FOUR: BEHAVIORAL INTENTIONS

Three descriptive questions are listed below. Think of your perception of your current bank services. All in all, please circle your answer according to the scale next to it.

1	The probability that I will use the TBBS offered by the bank again is	1 - 2 - 3 - 4 - 5 - 6 - 7
2	The likelihood that I would recommend the TBBS offered by the bank to a friend is	1 - 2 - 3 - 4 - 5 - 6 - 7
3	If I had to do it over again, I would still use the TBBS offered by the bank	1 - 2 - 3 - 4 - 5 - 6 - 7

SECTION FIVE: OPEN ENDED REMARKS:

In your opinion, what service issue would you like to see enhanced?

Appendix B: Permissions to Use Copyrighted Material

Sharaf Alkibsi

From: "Brian" <bthompson@ama.org>
To: "Sharaf Alkibsi" <alkibsi@email.phoenix.edu>
Sent: Thursday, October 15, 2009 9:34 PM
Subject: Re: Permission to re-use in a dissertation

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On 10/15/09 5:50 AM, "Sharaf Alkibsi" <alkibsi@email.phoenix.edu> wrote:

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- Figure 3. Service quality model (Gronroos, 1984, p. 40).
- Figure 4. The gap analysis model (Parasuraman et al., 1985, p. 44).
- Figure 5. Determinants of perceived service quality (Parasuraman et al., 1985, p. 48).
- Figure 6. A hierarchical approach on conceptualizing perceived service quality (Brady & Cronin, 2001, p. 37).
- Figure 7. The behavioral and financial consequences of service quality (Zeithaml et al., 1996, p. 33).

References

- Parasuraman, A., Zeithaml, V. A. & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49, 41-50.
- Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioral consequences of service quality. *Journal of Marketing*, 60(2), 31-46.
- Brady, M. K., & Cronin, J. J. (2001). Some new thoughts on conceptualizing perceived service quality: A hierarchical approach. *Journal of Marketing*, 65, 34-50.
- Gronroos, C. (1984). A service quality model and its marketing implications. *European Journal of Marketing*, 18(4), 36-45.

Regards,
 Sharaf Alkibsi

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Title: Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies
Author: A. Parasuraman
Publication: Journal of Service Research
Publisher: Sage Publications
Date: May 1, 2000
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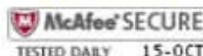
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Sharaf Alkibsi

From: "Emily Hall" <EHALL@emeraldinsight.com>
To: "Sharaf Alkibsi" <alkibsi@email.phoenix.edu>
Sent: Monday, October 19, 2009 2:01 PM
Subject: RE: Permission to use content
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-----Original Message-----

From: Sharaf Alkibsi [mailto:alkibsi@email.phoenix.edu]
Sent: 14 October 2009 22:32
To: Emily Hall
Subject: Permission to use content

Greetings Emily,

Re: Gronroos, C. (1984). A service quality model and its marketing implications. *European Journal of Marketing*, 18(4), 36-45.

I would like to get permission to reproduce a figure of "Service quality model (Gronroos, 1984, p. 40)"

I will include it in my dissertation titled "Customer perceptions of technology-based banking services provided by banks operating in Yemen"

Regards,
 Sharaf Alkibsi

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Appendix C: Service Quality Dimensions

Service Quality Dimensions

Dimension	Description	Items
Tangibility	The visual appearance of the facility, equipment, personnel of the service provider, and visual appealing.	Four
Reliability	The fulfillment of the service provider's promises to customers, service recovery, servicing correctly the first time, promises fulfilled in a timely manner, and insisting on error-free records.	Five
Responsiveness	The service provider's actions to tell customer when the service will be provided, give prompt service, always willing to help, and never too busy to respond.	Four
Assurance	The service provider's ability to inspire trust and confidence via knowledge and courtesy to execute transactions safely; included employee instill confidence, customer feeling safe, consistent employee courtesy, and employee knowledge.	Four
Empathy	The service provider's demonstration of its concern and care for the individual needs and interests of customers; included individual attention, operating hours, personal attention, best interest at hart, and understanding specific customer needs.	Five

Note. Based on Parasuraman et al. (1991).

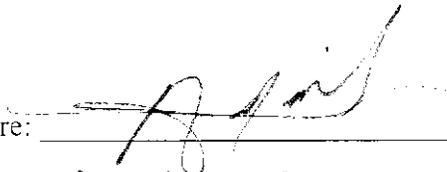
Appendix D: Permissions for Using Sources

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I, hereby authorize Sharaf M. Alkibsi, student of the University of Phoenix, to use the premises, name, and or/subjects requested to conduct a study entitled "Customer Perceptions of Technology-Based Banking Services Provided by Banks Operating in Yemen."

Signature:  Date: 20.4.2009
 Title YEMEN COMMERCIAL BANK
 Name of Facility: D. U. M. BR. MANABEA.

University of Phoenix

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SUBJECTS

Name of Facility, Organization, University, Institution, or Association

I, hereby authorize Sharaf M. Alkibsi, student of the University of Phoenix, to use the premises, name, and or/subjects requested to conduct a study entitled "Customer Perceptions of Technology-Based Banking Services Provided by Banks Operating in Yemen."

Signature:  Date: APRIL 2012, 2009
Title GENERAL MANAGER
Name of Facility: YEMEN GULF BANK - YEMEN

University of Phoenix

INFORMED CONSENT: PERMISSION TO USE PREMISES, NAME, AND/OR
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Name of Facility, Organization, University, Institution, or Association

I, hereby authorize Sharaf M. Alkibsi, student of the University of Phoenix, to use the premises, name, and or/subjects requested to conduct a study entitled "Customer Perceptions of Technology-Based Banking Services Provided by Banks Operating in Yemen."

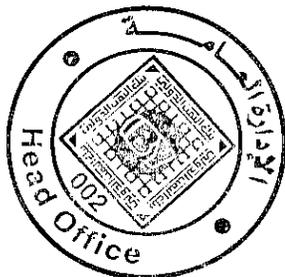
Signature: _____

Date: 27/4/2009

Title _____

GENERAL Manager

Name of Facility: _____

International Bank of YemenSANA'A Yemen

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I, hereby authorize Sharaf M. Alkibsi, student of the University of Phoenix, to use the premises, name, and or/subjects requested to conduct a study entitled "Customer Perceptions of Technology-Based Banking Services Provided by Banks Operating in Yemen."

Signature: Sharaf M. Alkibsi Date: 22/8/2009
 Title Sana's Trade Center manger..
 Name of Facility: Sana's Trade Center / Mall.



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I, hereby authorize Sharaf M. Alkibsi, student of the University of Phoenix, to use the premises, name, and or/subjects requested to conduct a study entitled "Customer Perceptions of Technology-Based Banking Services Provided by Banks Operating in Yemen."

Signature: Mohammad AlShomi Date: Apr. 20, 2009Title Acting General ManagerName of Facility: Yemen Kuwait Bank.



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SUBJECTS

Name of Facility, Organization, University, Institution, or Association

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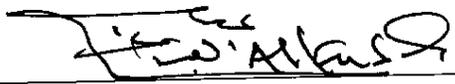
Signature:  Date: 5/5/2009
 Title Regional Manager
 Name of Facility: Omar Al-Souli

University of Phoenix

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I, hereby authorize Sharaf M. Alkibsi, student of the University of Phoenix, to use the premises, name, and or/subjects requested to conduct a study entitled "Customer Perceptions of Technology-Based Banking Services Provided by Banks Operating in Yemen."

Signature:  Date: 19th April, 2009

Title Deputy General Manager

Name of Facility: Shamil Yemen & Bahrain Bank



Appendix E: Informed Consent Form and Confidentiality Form

Dear Participant,

I am a student at the University of Phoenix working on a Doctoral of Business Administration. I am conducting a research study entitled “Customer Perceptions of Technology-Based Banking Service Quality Provided by Banks Operating in Yemen.” The purpose of the quantitative correlational descriptive research study is to determine if a set of technology-based banking service quality dimensions have an association with customer satisfaction and behavioral intentions toward technology-based banking services in Yemen.

Your participation will involve a 45-question survey, which takes around 15-20 minutes to complete. Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, you can do so without penalty or loss of benefit to yourself. The results of the research study may be published but your name will not be used and your answers will be maintained in confidence. All information provided by you will be kept in strict confidence and your anonymity is guaranteed.

In this research, there are no foreseeable risks to you. Although there may be no direct benefit to you, the possible benefit of your participation is to allow leaders of banks to reflect on their technology-based banking services to assure service quality and measure customer satisfaction in relation.

If you have any questions concerning the research study, please contact me via email [_____].

Sincerely,

[_____]

Researcher and Doctoral Candidate

Doctoral of Business Administration

University of Phoenix

I, the undersigned, acknowledge that I understand the nature of the study, the potential risks to me as a participant, and the means by which my identity will be kept confidential. My signature on this form also indicates that I am 18 years old or older and that I give my permission to voluntarily serve as a participant in the study described.

Participant's signature: _____ Date: _____

Appendix F: Confidentiality Agreement

University of Phoenix

RESEARCH CONFIDENTIALITY AGREEMENT FOR RESEARCH
INVOLVING HUMAN PARTICIPANTS

I _____ have agreed to assist the primary investigator Sharaf M. Alkibsi, doctoral candidate for the research project entitled CUSTOMER PERCEPTIONS OF TECHNOLOGY-BASED BANKING SERVICE QUALITY PROVIDED BY BANKS OPERATING IN YEMEN. I agree not to discuss or disclose any of the content or personal information contained within the surveys, forms, or other research records with anyone other than the Principal Investigator. All surveys, forms, or other research records will be kept strictly confidential, not shared with any outside parties, and returned to the Primary Investigator as the data collection is completed. I agree to maintain confidentiality at all times.

Date: / /

Research Assistant Signature

Date: / /

Principal Investigator

Appendix G: Permission to Use an Existing Survey

UNIVERSITY OF PHOENIX
PERMISSION TO USE AN EXISTING SURVEY

Date 25/8/09

Mr. /Ms Sharaf M. Alkibsi
 Address 14 Damascus st P. O. Box 18087
 Sana'a, Yemen

Thank you for your request for permission to use SSI-QUAL in your research study. We are willing to allow you to reproduce the instrument as outlined in your letter at no charge with the following understanding:

- You will use this survey only for your research study and will not sell or use it with any compensated management/curriculum development activities.
- You will include the copyright statement on all copies of the instrument.
- You will send your research study and one copy of reports, articles, and the like that make use of this survey data promptly to our attention.
- You will only use SSI-QUAL.

If these are acceptable terms and conditions, please indicate so by signing one copy of this letter and returning it to us.

Best wishes with your study.

Sincerely,


 Signature _____ E. Hall, Rights Manager, Emerald Group
 publishing Ltd

I understand these conditions and agree to abide by these terms and conditions.

Signed Sharaf M. Alkibsi Date / /

Expected date of completion / /

**Appendix H: Mapping Survey Questions to the Seven Dimensions of Service Quality
Within Technology-Based Banking Services**

Mapping the survey questions to the seven dimensions of service quality within technology-based banking services.

No.	Survey Item	Dimension
1	I can get my service done with the bank's TBBS in a short time	Functionality
2	The service process of the bank's TBBS are clear	Functionality
3	Using the bank's TBBS require little effort	Functionality
4	I can get my service done smoothly with the bank's TBBS.	Functionality
5	Each service item/function of the TBBS are error-free	Functionality
6	The operation of the bank's TBBS are interesting	Enjoyment
7	I feel good being able to use the TBBS	Enjoyment
8	The bank's TBBS have interesting additional functions	Enjoyment
9	The bank's TBBS provide me with all relevant information.	Enjoyment
10	I feel safe in my transactions with the bank's TBBS	Security
11	A clear privacy policy is stated when I use the bank's TBBS.	Security
12	The bank providing the TBBS are well-known	Assurance
13	The bank providing the TBBS have a good reputation	Assurance
14	The layout of the bank's TBBS are aesthetically appealing.	Design
15	The bank's TBBS appear to use up-to-date technology	Design
16	The TBBS have operating hours convenient to customers	Convenience
17	It is easy and convenient to reach the bank's TBBS	Convenience
18	The bank's TBBS understand my specific needs	Customization
19	The bank's TBBS have my best interests at heart	Customization
20	The bank's TBBS have features that are personalized for me.	Customization

Note. Based on the SSTQUAL from Lin and Hsieh (2006).

Appendix I: Final Survey

Dear Participant,

I am a doctoral student at the University of Phoenix working on a Business Administration degree conducting a dissertation research study entitled "Customer Perceptions of Technology-Based Banking Service Quality Provided by Banks Operating in Yemen." The purpose of this study is to determine if a set of technology-based banking service quality dimension have an association with customer satisfaction and behavioral intentions toward technology-based banking services in Yemen. In other words, I want to find out two things. First, if previously established service quality techniques in banking services promoting the use of technology elsewhere can be applied to satisfying customers in Yemen; and second, to assess if customer intent to use such services will change as a result of improved customer satisfaction.

Your participation will involve a 45-question survey, which takes around 15-20 minutes to complete. Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, you can do so without penalty or loss of benefit to yourself. The results of the research study may be published but your name will not be used and your answers will be maintained in confidence. All information provided by you will be kept in strict confidence and your anonymity is guaranteed.

In this research, there are no foreseeable risks to you. Although there may be no direct benefit to you, the possible benefit of your participation is to allow leaders of banks to reflect on their technology-based banking services to assure service quality and measure customer satisfaction in relation.

If you have any questions concerning this study, please contact me via email alkibsi@email.phoenix.edu

Sincerely,
Sharaf Mutahar Alkibsi
Researcher and Doctoral Candidate
Doctoral of Business Administration
University of Phoenix

I, the undersigned, acknowledge that I understand the nature of the study, the potential risks to me as a participant, and the means by which my identity will be kept confidential. My signature on this form also indicates that I am 18 years old or older and that I give my permission to voluntarily serve as a participant in the study described.

Participant name: _____

Signature: _____ توقيع المشارك :

Date: _____ التاريخ:

عزيزي المشارك،

أنا طالب دكتوراة في جامعة فينيكس بالولايات المتحدة الأمريكية في مجال إدارة الأعمال. و أجري دراسة بحثية بعنوان " انطباعات العملاء عن جودة الخدمات المصرفية المعتمدة على التكنولوجيا التي تقدمها المصارف العاملة في اليمن". والغرض من هذا البحث تقديم دراسة كمية وصفية لتبين ما إذا كانت هناك مجموعة من العوامل المرتبطة بجودة الخدمات المصرفية الآلية المعتمدة على التكنولوجيا ذات علاقة مع رضا العملاء وسلوكياتهم تجاه الخدمات المصرفية الآلية في اليمن.

مشاركتك ستكون بالإجابة على 45 سؤالاً استطلاحيًا ، والتي يستغرق إكمالها حوالي 15-20 دقيقة. مشاركتك في هذه الدراسة هو طوعي. إذا قررت عدم المشاركة أو الانسحاب من هذه الدراسة في أي وقت ، يمكنك أن تفعل ذلك دون أي حرج.

سيتم نشر نتائج هذه الدراسة ولن يتم الإشارة إلى اسمك، حيث ستبقى جميع المعلومات المقدمة منك في سرية تامة و لن يتم الكشف عن هويتك.

في هذا البحث لا توجد عواقب أو مخاطر متوقعة عليك. وقد لا تكون هناك فائدة مباشرة لك، إلا ان هناك إمكانية لأن يستفيد قادة القطاع المصرفي في اليمن من مشاركتك في تحسين الخدمات المصرفية المعتمدة على التكنولوجيا و ضمان جودتها و قياس رضا العملاء بها.

إذا كان لديك أي أسئلة بشأن هذه الدراسة الميدانية، الرجاء الاتصال بي عن طريق البريد الإلكتروني alkibsi@email.phoenix.edu

المخلص،

شرف مطهر الكبسي

باحث و مرشح لنيل درجة الدكتوراه

في مجال إدارة الأعمال

جامعة فينيكس، الولايات المتحدة الأمريكية

أقر ، أنا الموقع أدناه، بأرني فهمت طبيعة هذه الدراسة و العواقب المحتملة على مشاركتك ، وفهمت الوسائل التي سيتم بها الحفاظ على سرية هويتي. وتوحيدي على هذا النموذج يشير ايضا الى ان عمري أكثر من 18 سنة، وأوافق أن أكون مشاركا متطوعا في الدراسة الموضحة أعلاه.

SECTION TWO: PERCEIVED QUALITY OF SERVICE QUALITY WITHIN
TECHNOLOGY-BASED BANKING SERVICES¹

21 descriptive statements about technology-based banking services (TBBS) are listed below. For each of the statements, use the scale below to indicate your level of agreement. Only think of TBBS provided by your bank. **TBBS include** ATM services, SMS banking or mobile banking, Internet banking, and/or purchases at merchant locations (points of sales) that accept your payment card online or offline. For each of the following statements, circle your choice.

1=Strongly disagree 7=Strongly agree

		←————→
1	I can get my service done with the bank's TBBS in a short time.	1-2-3-4-5-6-7
2	The service process of the bank's TBBS is clear.	1-2-3-4-5-6-7
3	Using the bank's TBBS requires little effort.	1-2-3-4-5-6-7
4	I can get my service done smoothly with the bank's TBBS.	1-2-3-4-5-6-7
5	Each service item/function of the TBBS is error-free.	1-2-3-4-5-6-7
6	The operation of the bank's TBBS is interesting.	1-2-3-4-5-6-7
7	I feel good being able to use the TBBS.	1-2-3-4-5-6-7
8	The bank's TBBS have interesting additional functions.	1-2-3-4-5-6-7
9	The bank's TBBS provide me with all relevant information.	1-2-3-4-5-6-7
10	I feel safe in my transactions with the bank's TBBS.	1-2-3-4-5-6-7
11	A clear privacy policy is stated when I use the bank's TBBS.	1-2-3-4-5-6-7
12	The bank providing the TBBS is well-known.	1-2-3-4-5-6-7
13	The bank providing the TBBS has a good reputation.	1-2-3-4-5-6-7
14	The layout of the bank's TBBS is aesthetically appealing.	1-2-3-4-5-6-7
15	The bank's TBBS appear to use up-to-date technology.	1-2-3-4-5-6-7
16	The TBBS have operating hours convenient to customers.	1-2-3-4-5-6-7
17	It is easy and convenient to reach the bank's TBBS.	1-2-3-4-5-6-7
18	The bank's TBBS understand my specific needs.	1-2-3-4-5-6-7
19	The bank's TBBS have my best interests at heart.	1-2-3-4-5-6-7
20	The bank's TBBS have features that are personalized for me.	1-2-3-4-5-6-7
21	When I face difficulties using TBBS, the bank solves it effectively	1-2-3-4-5-6-7

¹ From "The role of technology readiness in customers' perception and adoption of self-service technologies," by Lin, J., & Hsieh, P. (2006). *International Journal of Service Industry Management*, 17(5) 497-517. Copyright 2006 by Emerald database. Adapted with permission.

SECTION THREE: CUSTOMER SATISFACTION

Three descriptive questions are listed below. Think of your perception of your current bank services. All in all, please circle your answer according to the scale next to it.

		1=Strongly disagree 7=Strongly agree
		←—————→
1	Overall, I am satisfied with the TBBS offered by the bank.	1 - 2 - 3 - 4 - 5 - 6 - 7
2	The TBBS offered by the bank exceed my expectations.	1 - 2 - 3 - 4 - 5 - 6 - 7
3	The TBBS offered by the bank are close to my ideal TBBS.	1 - 2 - 3 - 4 - 5 - 6 - 7

SECTION FOUR: BEHAVIORAL INTENTIONS

Three descriptive questions are listed below. Think of your perception of your current bank services. All in all, please circle your answer according to the scale next to it.

		1=Strongly disagree 7=Strongly agree
		←—————→
1	I will probably use the TBBS offered by the bank again.	1 - 2 - 3 - 4 - 5 - 6 - 7
2	I would probably recommend the TBBS offered by the bank to a friend.	1 - 2 - 3 - 4 - 5 - 6 - 7
3	I will continue to use the TBBS offered by the bank even if competing banks offered similar services for lower prices.	1 - 2 - 3 - 4 - 5 - 6 - 7

SECTION FIVE: OPEN ENDED REMARKS

In your opinion, what service issue would you like to see enhanced in the quality of TBBS?

الجزء الأول : المعلومات العامة

الرجاء الإجابة عن جميع الأسئلة في هذا المسح بشكل كامل وعلى حسب قدرتك.

1. ما هو العمر (سنة)؟ _____
2. الجنس : ذكر () أنثى ()
3. كم عدد السنوات التي استخدمت فيها التكنولوجيا؟ (كالحاسوب أو الهاتف النقال أو الصراف الآلي) _____
4. ما هو البنك الذي تتعامل معه حالي، إذا كنت تتعامل مع أكثر من بنك واحد، يرجى تحديد بنك واحد و الذي تتعامل معه بشكل رئيسي

- أ. البنك العربي
- ب. بنك التسليف التعاوني الزراعي
- ت. بنك اليمن الدولي
- ث. بنك سبأ الإسلامي
- ج. مصرف اليمن والبحرين الشامل
- ح. بنك التضامن الإسلامي الدولي
- خ. البنك التجاري اليمني
- د. بنك اليمن و الخليج
- ذ. بنك اليمن والكويت
- ر. البنك الأهلي اليمني

5. كم عدد السنوات التي تعاملت خلالها مع مصرفك الحالي؟ _____
6. هل أنت ملزم بالتعامل مع البنك أعلاه، كأن يكون شرطا لإستلام راتبك؟ نعم () لا ()
7. هل لديك بطاقة الصراف الآلي أو بطاقة الإئتمان من البنك أعلاه؟ نعم () لا ()
8. هل استخدمت الخدمات البنكية المعتمدة على التكنولوجيا المقدمة من البنك المختارة أعلاه خلال الـ 30 يوما الماضية؟ نعم () لا ()

إذا كانت الإجابة نعم ، ما هي الخدمة؟ (يمكن اختيار أكثر من خدمة)

- أ. خدمات الصراف الآلي
- ب. بطاقات الإئتمان
- ت. الرسائل المصرفية (الموبايل المصرفي)
- ث. الخدمات المصرفية عبر الإنترنت
- ج. خدمات قبول بطاقتك لدى مواقع تجارية لسداد قسيمة المشتريات (خدمات نقاط البيع)
- ح. المشتريات عبر الإنترنت

الجزء الثاني : جودة الخدم ات الم صرفية الآلية المعتمدة على التكنولوجيا

تظهر القائمة أدناه واحد و عشريين بندا لوصف الخدمات المصرفية الآلية المعتمدة على تقنية المعلومات حسب ما يقدمها بنكك. اختر لكل منها درجة تبين مدى موافقتك عليها.

الخدمات المصرفية الآلية هي التي تعتمد على التكنولوجيا وتشمل خدمات الصراف الآلي، أو الرسائل المصرفية، أو الخدمات المصرفية عبر الإنترنت ، أو خدمات قبول بطاقتك لدى مواقع تجارية لسداد قسيمة المشتريات (خدمات نقاط البيع) في المحلات التجارية أو على الإنترنت.

1 = لا أوافق بشدة 7 = أوافق بشدة

7-6-5-4-3-2-1	باستخدام الخدمات المصرفية الآلية المقدمة من بنكي ، يمكنني أن أحصل على الخدمة المصرفية في وقت قصير.	1
7-6-5-4-3-2-1	الخدمات المصرفية الآلية المقدمة من بنكي واضحة الاستخدام.	2
7-6-5-4-3-2-1	استخدام الخدمات المصرفية الآلية المقدمة من بنكي يتطلب جهداً قليلاً.	3
7-6-5-4-3-2-1	الخدمات المصرفية الآلية المقدمة من بنكي تسهل من إنجاز أعمالي.	4
7-6-5-4-3-2-1	العمليات المصرفية الآلية المقدمة من بنكي خالية من الأخطاء.	5
7-6-5-4-3-2-1	الخدمات المصرفية الآلية المقدمة من بنكي مثيرة للاهتمام و ممتعة.	6
7-6-5-4-3-2-1	أشعر بالارتياح لكوني قادر على استخدام الخدمات المصرفية الآلية المقدمة من بنكي.	7
7-6-5-4-3-2-1	توفر الخدمات المصرفية الآلية المقدمة من بنكي وظائف إضافية مثيرة للإهتمام و ممتعة.	8
7-6-5-4-3-2-1	الخدمات المصرفية الآلية المقدمة من بنكي تزودني بكافة المعلومات التي احتاجها.	9
7-6-5-4-3-2-1	أشعر بالأمان في تعاملاتي بالخدمات المصرفية الآلية المقدمة من بنكي.	10
7-6-5-4-3-2-1	سياسة الخصوصية و السرية واضحة و محددة للخدمات المصرفية الآلية المقدمة من بنكي.	11
7-6-5-4-3-2-1	يعتبر بنكي معروف بشكل جيد.	12
7-6-5-4-3-2-1	يحظى بنائي بسمعة طيبة.	13
7-6-5-4-3-2-1	تبدو الخدمات المصرفية الآلية المقدمة من بنكي ذات تصميم و ترتيب جميل و جذاب.	14
7-6-5-4-3-2-1	يبدو أن بنكي يستخدم أحدث التقنيات لتقديم الخدمات المصرفية الآلية.	15
7-6-5-4-3-2-1	تعمل الخدمات المصرفية الآلية المقدمة من بنكي خلال ساعات عمل مريحة للعملاء	16
7-6-5-4-3-2-1	الحصول على الخدمات المصرفية الآلية المقدمة من بنكي سهل و مريح.	17
7-6-5-4-3-2-1	تلبي الخدمات المصرفية الآلية المقدمة من بنكي احتياجاتي الخاصة.	18
7-6-5-4-3-2-1	تهتم الخدمات المصرفية الآلية المقدمة من بنكي بمصلحتي كثيراً.	19
7-6-5-4-3-2-1	تحتوي الخدمات المصرفية الآلية المقدمة من بنكي على مزايا تم تخصيصها لي.	20
7-6-5-4-3-2-1	في حالة واجهتني صعوبة في استخدام الخدمات المصرفية الآلية يتم حلها من قبل بنكي بفاعلية و كفاءة.	21

الجزء الثالث : رضا العملاء

أرجو التفكير في إنطباعتك الخاص في الخدمات المصرفية الآلية كما تراها مقدمة من بنكك. اختر لكل عبارة أداة درجة تبين مدى موافقتك عليها.

1 = لا أوافق بشدة ← 7 = أوافق بشدة

7 - 6 - 5 - 4 - 3 - 2 - 1	بصورة عامة، أنا راض عن الخدمات المصرفية الآلية التي يقدمها بنكي.	1
7 - 6 - 5 - 4 - 3 - 2 - 1	الخدمات المصرفية الآلية التي يقدمها بنكي تتجاوز توقعاتي.	2
7 - 6 - 5 - 4 - 3 - 2 - 1	الخدمات المصرفية الآلية التي يقدمها بنكي قريبة مما أتطلع اليه.	3

الجزء الرابع : التوجهات السلوكية

1 = لا أوافق بشدة ← 7 = أوافق بشدة

7 - 6 - 5 - 4 - 3 - 2 - 1	سأستمر في استخدام الخدمات المصرفية الآلية التي يقدمها بنكي.	1
7 - 6 - 5 - 4 - 3 - 2 - 1	سأوصي صديقاً بالخدمات المصرفية الآلية التي يقدمها بنكي.	2
7 - 6 - 5 - 4 - 3 - 2 - 1	سأظل استخدم الخدمات المصرفية الآلية التي يقدمها بنكي حتى لو تقدمت البنوك المنافسة بأسعار أقل.	3

الجزء الخامس : سؤال مفتوح

في رأيك ، ما هو الذي من شأنه تعزيز و تحسين جودة الخدمات المصرفية الآلية؟

الجزء الثالث : رضا العملاء

أرجو التفكير في إنطباعاتك الخاص في الخدمات المصرفية الآلية كما تراها مقدمة من بنكك. اختر لكل عبارة أداة درجة تبين مدى موافقتك عليها.

1 = لا أوافق بشدة ← 7 = أوافق بشدة

7 - 6 - 5 - 4 - 3 - 2 - 1	بصورة عامة، أنا راض عن الخدمات المصرفية الآلية التي يقدمها بنكي.	1
7 - 6 - 5 - 4 - 3 - 2 - 1	الخدمات المصرفية الآلية التي يقدمها بنكي تتجاوز توقعاتي.	2
7 - 6 - 5 - 4 - 3 - 2 - 1	الخدمات المصرفية الآلية التي يقدمها بنكي قريبة مما أتطلع اليه.	3

الجزء الرابع : التوجهات السلوكية

1 = لا أوافق بشدة ← 7 = أوافق بشدة

7 - 6 - 5 - 4 - 3 - 2 - 1	سأستمر في استخدام الخدمات المصرفية الآلية التي يقدمها بنكي.	1
7 - 6 - 5 - 4 - 3 - 2 - 1	سأوصي صديقاً بالخدمات المصرفية الآلية التي يقدمها بنكي.	2
7 - 6 - 5 - 4 - 3 - 2 - 1	سأظل استخدم الخدمات المصرفية الآلية التي يقدمها بنكي حتى لو تقدمت البنوك المنافسة بأسعار أقل.	3

الجزء الخامس : سؤال مفتوح

في رأيك ، ما هو الذي من شأنه تعزيز و تحسين جودة الخدمات المصرفية الآلية؟

Appendix J: Coded Survey Items

Item #	Variable	Item code and question	<i>M</i>	<i>SD</i>
1	Functionality	FUN1 I can get my service done with the bank's TBBS in a short time.	5.40	1.693
2		FUN2 The service process of the bank's TBBS is clear.	5.57	1.568
3		FUN3 Using the bank's TBBS requires little effort.	4.98	1.916
4		FUN4 I can get my service done smoothly with the bank's TBBS.	5.43	1.546
5		FUN5 Each service item/function of the TBBS is error-free.	4.44	1.768
6	Enjoyment	ENJ1 The operation of the bank's TBBS is interesting.	4.77	1.703
7		ENJ2 I feel good being able to use the TBBS.	5.57	1.556
8		ENJ3 The bank's TBBS have interesting additional functions.	4.55	1.793
9		ENJ4 The bank's TBBS provide me with all relevant information.	4.92	1.723
10	Assurance	ASS1 The bank providing the TBBS is well-known.	5.62	1.527
11		ASS2 The bank providing the TBBS has a good reputation.	5.59	1.559
12	Customization	CUS1 The bank's TBBS understand my specific needs.	5.34	1.649
13		CUS2 The bank's TBBS have my best interests at heart.	5.18	1.641
14		CUS3 The bank's TBBS have features that are personalized for me.	4.64	1.834
15	Security	SEC1 I feel safe in my transactions with the bank's TBBS.	5.79	1.549
16		SEC2 A clear privacy policy is stated when I use the bank's TBBS.	5.74	1.524
17	Design	DES1 The layout of the bank's TBBS is aesthetically appealing.	4.79	1.586
18		DES2 The bank's TBBS appear to use up-to-date technology.	4.31	1.921
19	Convenience	CON1 The TBBS have operating hours convenient to customers.	5.53	1.483
20		CON2 It is easy and convenient to reach the bank's TBBS.	5.13	1.611
21	Customer satisfaction	SAT1 Overall, I am satisfied with the TBBS offered by the bank.	5.22	1.668
22		SAT2 The TBBS offered by the bank exceed my expectations.	4.28	1.823
23		SAT3 The TBBS offered by the bank are close to my ideal TBBS.	4.67	1.760
24	Behavioral intentions	BIN1 I will probably use the TBBS offered by the bank again.	5.68	1.541
25		BIN2 I would probably recommend the TBBS offered by the bank to a friend.	5.28	1.806
26		BIN3 I will continue to use the TBBS offered by the bank even if competing banks offered similar services for lower prices.	4.31	2.070
27	Service recovery	REC1 When I face difficulties using TBBS, the bank solves it effectively and efficiently.	4.79	1.781

**Appendix K: Reliability Test: Item Internal Consistency Cronbach's Alpha
Measurements**

Variable type	Variable (scale)	No. items	Cronbach's alpha	Cronbach's alpha for the entire scale
Independent	Functionality (FUN)	5	0.803	0.964
Independent	Enjoyment (ENJ)	4	0.843	
Independent	Assurance (ASS)	2	0.775	
Independent	Customization (CUS)	3	0.812	
Independent	Security (SEC)	2	0.789	
Independent	Design (DES)	2	0.778	
Independent	Convenience (CON)	2	0.797	
Dependent	Customer satisfaction (SAT)	3	0.894	
Dependent	Behavioral intentions (BI)	3	0.816	

Appendix L: Descriptive Analysis of Average Scores

Table L1

Descriptive Analysis—Item Wise (N = 465)

Survey Item	Mean	Median	SE of		Variance	Kurtosis	Skewness
			Mean	SD			
FUN1 I can get my service done with the bank's TBBS in a short time.	5.40	6.00	.078	1.693	2.865	.131	-.971
FUN2 The service process of the bank's TBBS is clear.	5.57	6.00	.073	1.568	2.457	.532	-1.101
FUN3 Using the bank's TBBS requires little effort.	4.98	5.00	.089	1.916	3.670	-.803	-.628
FUN4 I can get my service done smoothly with the bank's TBBS.	5.43	6.00	.072	1.546	2.392	.403	-.984
FUN5 Each service item/function of the TBBS is error-free.	4.44	4.00	.082	1.768	3.126	-.962	-.164
ENJ1 The operation of the bank's TBBS is interesting.	4.77	5.00	.079	1.703	2.902	-.663	-.452
ENJ2 I feel good being able to use the TBBS.	5.57	6.00	.072	1.556	2.422	.598	-1.135
ENJ3 The bank's TBBS have interesting additional functions.	4.55	5.00	.083	1.793	3.213	-.782	-.374
ENJ4 The bank's TBBS provide me with all relevant information.	4.92	5.00	.080	1.723	2.969	-.548	-.580
ASS1 The bank providing the TBBS is well-known.	5.62	6.00	.071	1.527	2.331	.794	-1.166
ASS2 The bank providing the TBBS has a good reputation.	5.59	6.00	.072	1.559	2.431	.656	-1.141
SEC1 I feel safe in my transactions with the bank's TBBS.	5.79	6.00	.072	1.549	2.399	1.208	-1.374
SEC2 A clear privacy policy is stated when I use the bank's TBBS.	5.74	6.00	.071	1.524	2.321	1.308	-1.347
CON1 The TBBS have operating hours convenient to customers.	5.53	6.00	.069	1.483	2.198	.300	-.946

Survey Item	Mean	Median	SE of		Variance	Kurtosis	Skewness
			Mean	SD			
CON2 It is easy and convenient to reach the bank's TBBS.	5.13	5.00	.075	1.611	2.594	.020	-.812
CUS1 The bank's TBBS understand my specific needs.	5.34	6.00	.076	1.649	2.721	-.118	-.883
CUS2 The bank's TBBS have my best interests at heart.	5.18	6.00	.076	1.641	2.691	-.261	-.763
CUS3 The bank's TBBS have features that are personalized for me.	4.64	5.00	.085	1.834	3.364	-.863	-.441
DES1 The layout of the bank's TBBS is aesthetically appealing.	4.79	5.00	.074	1.586	2.515	-.280	-.533
DES2 The bank's TBBS appear to use up-to-date technology.	4.31	5.00	.089	1.921	3.688	-1.027	-.263
REC1 When I face difficulties using TBBS, the bank solves it effectively and efficiently.	4.79	5.00	.083	1.781	3.173	-.692	-.520
SAT1 Overall, I am satisfied with the TBBS offered by the bank.	5.22	6.00	.077	1.668	2.782	-.069	-.857
SAT2 The TBBS offered by the bank exceed my expectations.	4.28	4.00	.085	1.823	3.323	-.892	-.235
SAT3 The TBBS offered by the bank are close to my ideal TBBS.	4.67	5.00	.082	1.760	3.098	-.764	-.413
BIN1 I will probably use the TBBS offered by the bank again.	5.68	6.00	.071	1.541	2.376	1.022	-1.258
BIN2 I would probably recommend the TBBS offered by the bank to a friend.	5.28	6.00	.084	1.806	3.262	-.254	-.881
BIN3 I will continue to use the TBBS offered by the bank even if competing banks offered similar services for lower prices.	4.31	4.00	.096	2.070	4.287	-1.221	-.189

Table L2

Descriptive Analysis—Variable Wise

Variable	<i>M</i>	<i>SD</i>	Variance	Skewness	Kurtosis
Average functionality	5.16	1.27	1.62	-.64	.03
Average enjoyment	4.95	1.40	1.95	-.55	-.38
Average security	5.77	1.40	1.95	-1.28	1.24
Average assurance	5.61	1.39	1.94	-1.21	1.07
Average design	4.55	1.59	2.54	-.34	-.68
Average convenience	5.33	1.41	1.99	-.87	.26
Average customization	5.05	1.46	2.13	-.58	-.43
Average customer satisfaction	4.72	1.59	2.53	-.47	-.58
Average behavioral intentions	5.09	1.56	2.42	-.65	-.35

Note. *N* = 465.

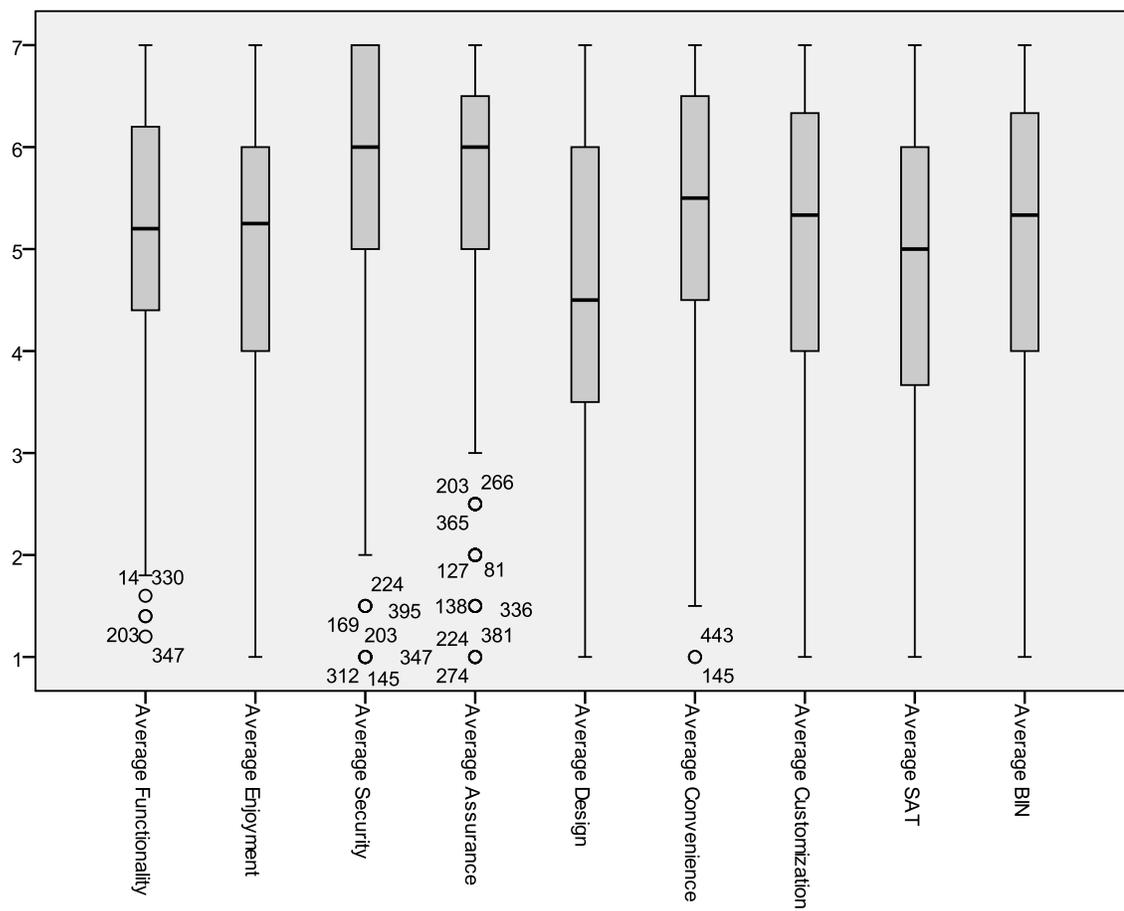
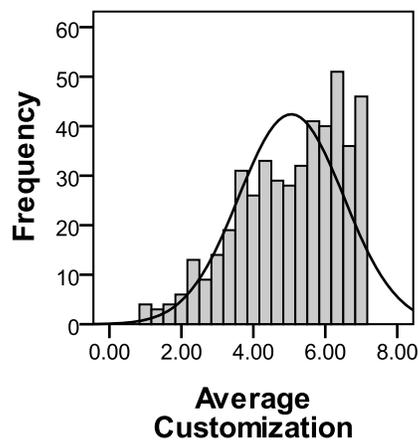
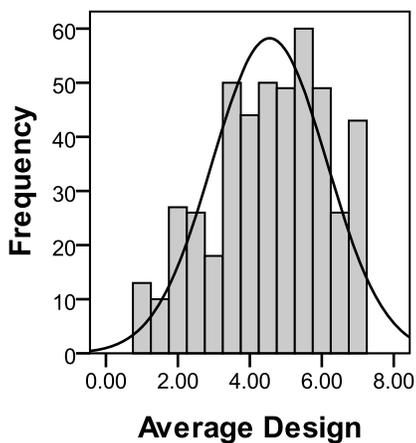
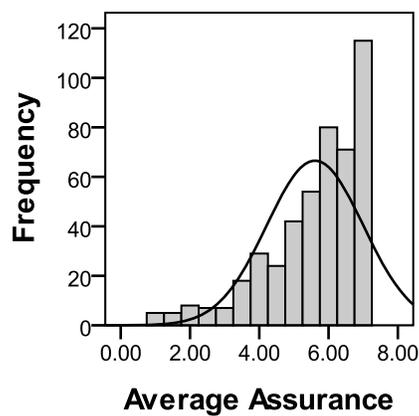
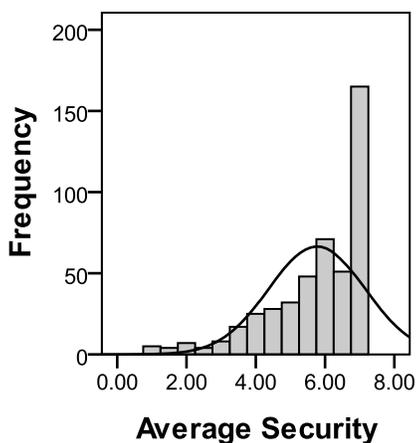
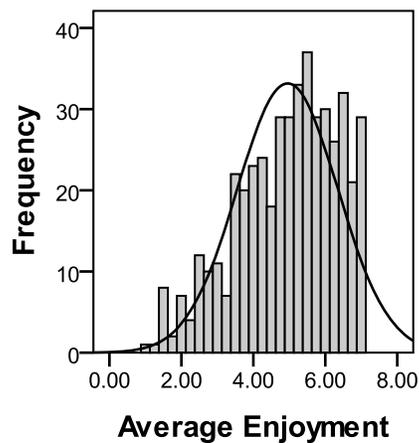
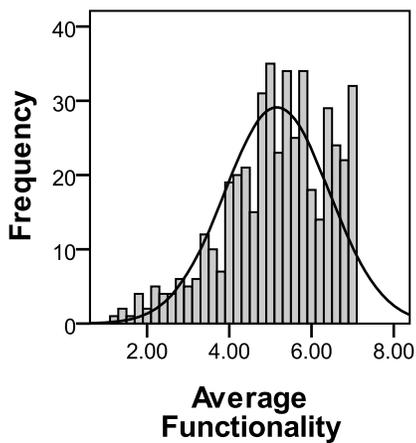


Figure L1. Box plots.



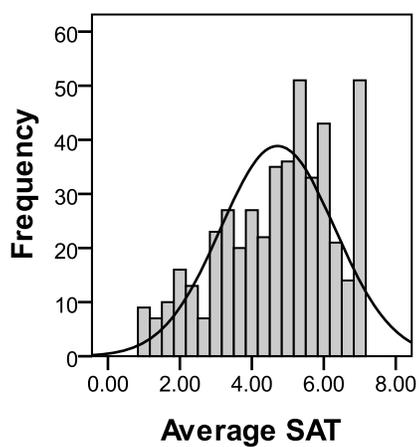
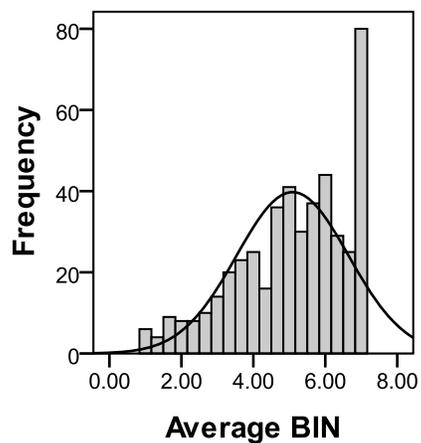
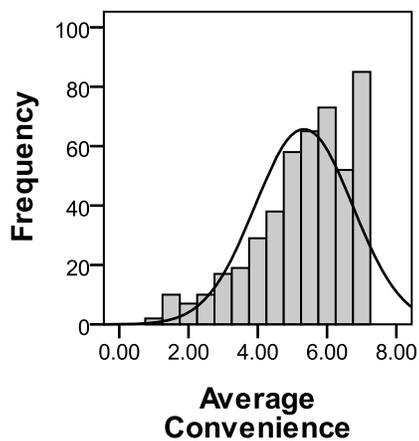


Figure L2. Histograms.

Appendix M: ANOVA Test Tables

Table M1

One-way ANOVA test for variables by age

		SS	df	Mean Square	F	Sig.
Functionality * Age	Between Groups	17.632	4	4.408	2.789	.026
	Within Groups	679.619	430	1.581		
	Total	697.250	434			
Enjoyment * Age	Between Groups	13.388	4	3.347	1.766	.135
	Within Groups	815.111	430	1.896		
	Total	828.499	434			
Security * Age	Between Groups	32.203	4	8.051	4.404	.002
	Within Groups	786.077	430	1.828		
	Total	818.279	434			
Assurance * Age	Between Groups	10.807	4	2.702	1.405	.232
	Within Groups	827.081	430	1.923		
	Total	837.887	434			
Design * Age	Between Groups	10.789	4	2.697	1.093	.360
	Within Groups	1061.392	430	2.468		
	Total	1072.180	434			
Convenience * Age	Between Groups	4.393	4	1.098	.560	.692
	Within Groups	843.897	430	1.963		
	Total	848.291	434			
Customization * Age	Between Groups	38.330	4	9.583	4.807	.001
	Within Groups	857.263	430	1.994		
	Total	895.593	434			
Customer Satisfaction * Age	Between Groups	36.064	4	9.016	3.730	.005
	Within Groups	1039.245	430	2.417		
	Total	1075.309	434			
Behavioral Intentions * Age	Between Groups	10.134	4	2.534	1.087	.362
	Within Groups	1001.841	430	2.330		
	Total	1011.975	434			

Table M2

One-way ANOVA test for variables by gender

		SS	df	Mean Square	F	Sig.
Functionality * Gender	Between Groups	.934	1	.934	.569	.451
	Within Groups	743.375	453	1.641		
	Total	744.309	454			
Enjoyment * Gender	Between Groups	1.532	1	1.532	.774	.379
	Within Groups	896.294	453	1.979		
	Total	897.826	454			
Security * Gender	Between Groups	.221	1	.221	.113	.737
	Within Groups	886.462	453	1.957		
	Total	886.684	454			
Assurance * Gender	Between Groups	2.534	1	2.534	1.306	.254
	Within Groups	879.111	453	1.941		
	Total	881.645	454			
Design * Gender	Between Groups	4.153	1	4.153	1.616	.204
	Within Groups	1164.361	453	2.570		
	Total	1168.514	454			
Convenience * Gender	Between Groups	5.694	1	5.694	2.837	.093
	Within Groups	909.112	453	2.007		
	Total	914.805	454			
Customization * Gender	Between Groups	2.688	1	2.688	1.256	.263
	Within Groups	969.215	453	2.140		
	Total	971.902	454			
Customer Satisfaction * Gender	Between Groups	.540	1	.540	.209	.648
	Within Groups	1169.603	453	2.582		
	Total	1170.143	454			
Behavioral Intentions * Gender	Between Groups	2.015	1	2.015	.830	.363
	Within Groups	1099.156	453	2.426		
	Total	1101.171	454			

Table M3

One-way ANOVA test for variables by technology experience

		SS	df	Mean Square	F	Sig.
Functionality * Technology Experience	Between Groups	25.669	2	12.834	8.049	.000
	Within Groups	714.339	448	1.595		
	Total	740.008	450			
Enjoyment * Technology Experience	Between Groups	20.600	2	10.300	5.291	.005
	Within Groups	872.182	448	1.947		
	Total	892.782	450			
Security * Technology Experience	Between Groups	28.875	2	14.438	7.644	.001
	Within Groups	846.179	448	1.889		
	Total	875.054	450			
Assurance * Technology Experience	Between Groups	29.278	2	14.639	7.751	.000
	Within Groups	846.125	448	1.889		
	Total	875.404	450			
Design * Technology Experience	Between Groups	27.619	2	13.810	5.549	.004
	Within Groups	1114.954	448	2.489		
	Total	1142.573	450			
Convenience * Technology Experience	Between Groups	24.351	2	12.176	6.181	.002
	Within Groups	882.458	448	1.970		
	Total	906.809	450			
Customization * Technology Experience	Between Groups	51.352	2	25.676	12.559	.000
	Within Groups	915.892	448	2.044		
	Total	967.244	450			
Customer Satisfaction * Technology Experience	Between Groups	48.947	2	24.473	9.819	.000
	Within Groups	1116.568	448	2.492		
	Total	1165.515	450			
Behavioral Intentions * Technology Experience	Between Groups	12.290	2	6.145	2.564	.078
	Within Groups	1073.841	448	2.397		
	Total	1086.132	450			

Table M4

One-way ANOVA test for variables by banking experience

		SS	df	Mean Square	F	Sig.
Functionality * Banking Experience	Between Groups	34.072	2	17.036	10.852	.000
	Within Groups	709.579	452	1.570		
	Total	743.652	454			
Enjoyment * Banking Experience	Between Groups	24.001	2	12.000	6.262	.002
	Within Groups	866.245	452	1.916		
	Total	890.246	454			
Security * Banking Experience	Between Groups	37.047	2	18.524	9.766	.000
	Within Groups	857.318	452	1.897		
	Total	894.365	454			
Assurance * Banking Experience	Between Groups	18.363	2	9.181	4.762	.009
	Within Groups	871.573	452	1.928		
	Total	889.936	454			
Design * Banking Experience	Between Groups	17.987	2	8.994	3.599	.028
	Within Groups	1129.549	452	2.499		
	Total	1147.536	454			
Convenience * Banking Experience	Between Groups	27.304	2	13.652	6.975	.001
	Within Groups	884.704	452	1.957		
	Total	912.008	454			
Customization * Banking Experience	Between Groups	37.206	2	18.603	9.009	.000
	Within Groups	933.381	452	2.065		
	Total	970.587	454			
Customer Satisfaction * Banking Experience	Between Groups	37.597	2	18.798	7.568	.001
	Within Groups	1122.685	452	2.484		
	Total	1160.282	454			
Behavioral Intentions * Banking Experience	Between Groups	15.627	2	7.813	3.240	.040
	Within Groups	1089.862	452	2.411		
	Total	1105.489	454			

Table M5

One-way ANOVA test for variables by bank where $n > 25$

		SS	df	Mean Square	F	Sig.
Enjoyment * Bank	Between Groups	38.167	4	9.542	5.086	.001
	Within Groups	772.968	412	1.876		
	Total	811.136	416			
Functionality * Bank	Between Groups	11.431	4	2.858	1.765	.135
	Within Groups	666.908	412	1.619		
	Total	678.339	416			
Security * Bank	Between Groups	24.406	4	6.102	3.170	.014
	Within Groups	792.904	412	1.925		
	Total	817.311	416			
Assurance * Bank	Between Groups	13.202	4	3.301	1.670	.156
	Within Groups	814.353	412	1.977		
	Total	827.555	416			
Design * Bank	Between Groups	18.437	4	4.609	1.803	.127
	Within Groups	1053.082	412	2.556		
	Total	1071.519	416			
Convenience * Bank	Between Groups	29.103	4	7.276	3.647	.006
	Within Groups	821.894	412	1.995		
	Total	850.998	416			
Customization * Bank	Between Groups	44.903	4	11.226	5.498	.000
	Within Groups	841.254	412	2.042		
	Total	886.157	416			
Customer Satisfaction * Bank	Between Groups	47.964	4	11.991	4.916	.001
	Within Groups	1004.862	412	2.439		
	Total	1052.825	416			
Behavioral Intentions * Bank	Between Groups	31.401	4	7.850	3.303	.011
	Within Groups	979.159	412	2.377		
	Total	1010.560	416			

Table M6

Independent sample t tests for variables by whether participants were required to bank with a specific bank

Variable	<i>t</i>	Sig. (2-tailed)
Functionality	2.84	.005
Enjoyment	3.17	.002
Security	3.22	.001
Assurance	3.80	.000
Design	2.66	.008
Convenience	1.87	.062
Customization	1.55	.122
Customer Satisfaction	2.42	.016
Behavioral Intentions	3.92	.000

Note. df = 463.

Table M7

Independent sample t tests for variables by method of data collection online or offline

Variable	<i>t</i>	Sig. (2-tailed)
Functionality	3.48	.001
Enjoyment	1.62	.106
Security	6.37	.000
Assurance	-.12	.904
Design	-.04	.972
Convenience	.90	.371
Customization	7.94	.000
Customer Satisfaction	4.26	.000
Behavioral Intentions	2.75	.006

Note. df = 463.

Appendix N: Structural Equation Model

Structural Equation Model

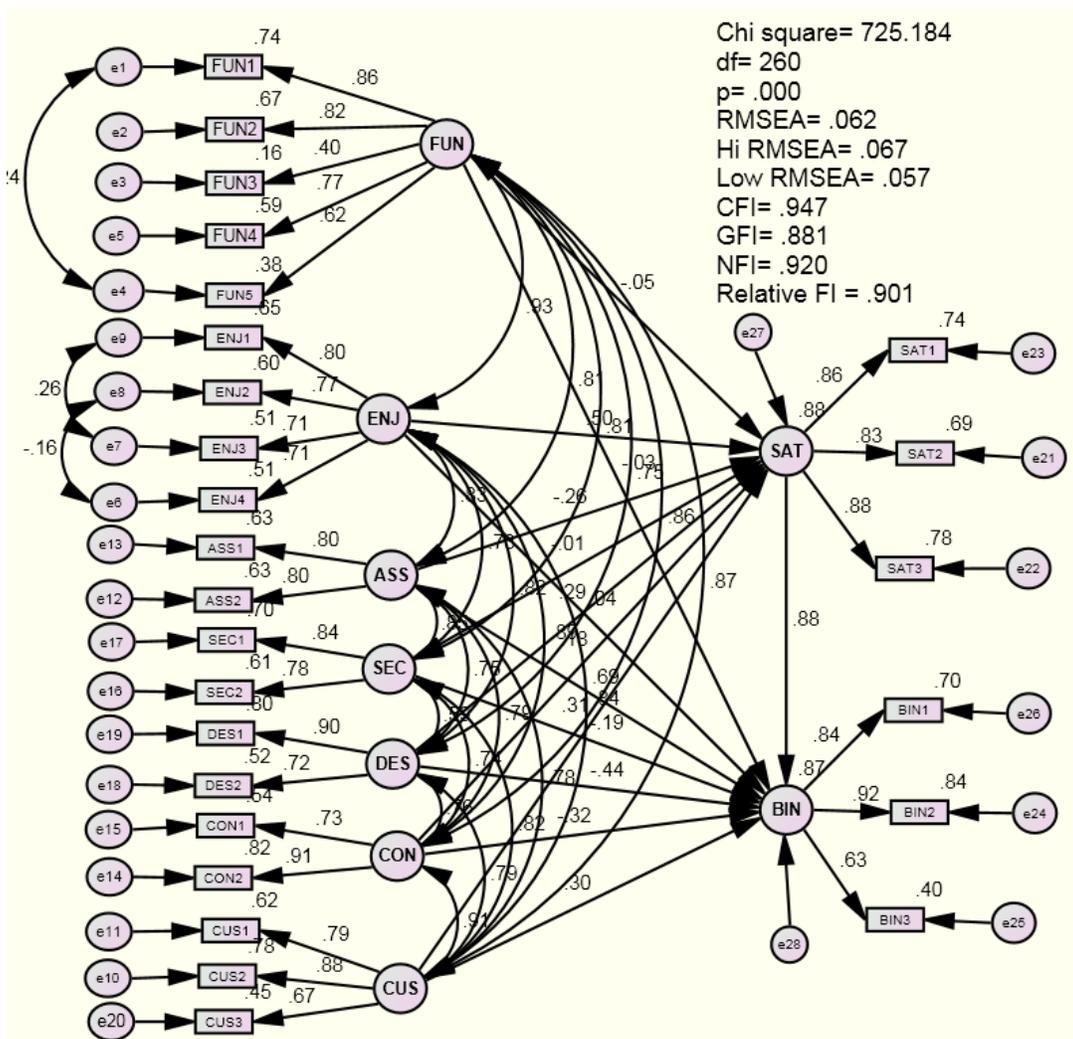


Figure N. Structural equation model diagram.

Table N1

Regression Weights: (Group number 1 - Default model)

	Estimate	SE	C.R.	p
SAT <--- FUN	-.05	.19	-.27	.79
SAT <--- ENJ	.52	.26	2.00	.05
SAT <--- ASS	-.31	.19	-1.66	.10
SAT <--- SEC	-.01	.18	-.04	.96
SAT <--- DES	.29	.13	2.28	.02
SAT <--- CON	.24	.25	.97	.33
SAT <--- CUS	.34	.25	1.39	.17
BIN <--- SAT	.79	.17	4.59	***
BIN <--- FUN	-.02	.20	-.11	.91
BIN <--- ENJ	.03	.30	.11	.91
BIN <--- ASS	.73	.28	2.65	.01
BIN <--- SEC	-.18	.23	-.79	.43
BIN <--- DES	-.40	.18	-2.24	.03
BIN <--- CON	-.37	.31	-1.22	.22
BIN <--- CUS	.29	.31	.95	.34
FUN5 <--- FUN	.75	.06	13.44	***
FUN4 <--- FUN	.82	.04	20.13	***
FUN3 <--- FUN	.53	.06	8.82	***
FUN2 <--- FUN	.88	.04	22.10	***
FUN1 <--- FUN	1.00			
ENJ2 <--- ENJ	.88	.05	18.11	***
ENJ1 <--- ENJ	1.00			
CUS1 <--- CUS	1.00			
CUS2 <--- CUS	1.11	.05	21.42	***
ASS1 <--- ASS	1.00			
ASS2 <--- ASS	1.02	.06	17.64	***
CON1 <--- CON	1.00			
CON2 <--- CON	1.34	.07	18.80	***
ENJ4 <--- ENJ	.90	.05	16.62	***
ENJ3 <--- ENJ	.94	.05	19.39	***
SEC1 <--- SEC	1.00			
SEC2 <--- SEC	.91	.05	17.77	***
DES1 <--- DES	1.00			
DES2 <--- DES	.98	.06	16.83	***
CUS3 <--- CUS	.94	.06	14.94	***
SAT3 <--- SAT	1.08	.04	25.37	***
SAT2 <--- SAT	1.06	.05	22.82	***
SAT1 <--- SAT	1.00			

	Estimate	SE	C.R.	<i>p</i>
BIN2 <--- BIN	1.28	.05	24.47	***
BIN1 <--- BIN	1.00			
BIN3 <--- BIN	1.01	.07	14.59	***

Note. *** significantly different from zero at the $p < .001$ level (two-tailed).

Table N2

Covariances: (Group number 1 - Default model)

	Estimate	SE	C.R.	<i>p</i>
FUN <--> ENJ	1.86	.15	12.06	***
FUN <--> ASS	1.44	.13	11.04	***
FUN <--> SEC	1.52	.13	11.29	***
FUN <--> DES	1.56	.14	11.19	***
FUN <--> CON	1.37	.13	10.88	***
FUN <--> CUS	1.65	.14	11.53	***
ENJ <--> ASS	1.37	.13	10.69	***
ENJ <--> SEC	1.29	.13	10.24	***
ENJ <--> DES	1.60	.14	11.33	***
ENJ <--> CON	1.33	.12	10.77	***
ENJ <--> CUS	1.50	.14	10.96	***
ASS <--> SEC	1.33	.12	11.05	***
ASS <--> DES	1.29	.12	10.54	***
ASS <--> CON	1.04	.11	9.79	***
CUS <--> ASS	1.23	.12	10.29	***
SEC <--> DES	1.09	.12	9.00	***
CON <--> DES	1.17	.11	10.37	***
CUS <--> DES	1.46	.13	11.02	***
CUS <--> CON	1.29	.12	10.77	***
CUS <--> SEC	1.39	.13	10.93	***
CON <--> SEC	1.04	.11	9.78	***
e4 <--> e1	-.28	.07	-4.20	***
e6 <--> e8	-.19	.07	-2.94	.00
e7 <--> e9	.33	.08	4.45	***

Note. *** significantly different from zero at the $p < .001$ level (two-tailed).

Table N3

Squared Multiple Correlations: (Group number 1 - Default model)

Variable	Estimate
FUN3	.163
FUN5	.383
BIN3	.399
CUS3	.450
ENJ3	.511
ENJ4	.511
DES2	.525
CON1	.540
FUN4	.594
ENJ2	.598
SEC2	.606
CUS1	.625
ASS1	.633
ASS2	.634
ENJ1	.645
FUN2	.672
SAT2	.695
BIN1	.699
SEC1	.701
SAT1	.743
FUN1	.744
SAT3	.780
CUS2	.781
DES1	.801
CON2	.820
BIN2	.839
BIN	.869
SAT	.879

Note. $N = 465$.

Table N4

Model Fit Summary, CMIN

Model	NPAR	CMIN	df	p	CMIN/df
Default model	91	725.18	260	.00	2.79
Saturated model	351	.00	0		
Independence model	26	9120.44	325	.00	28.06

Table N5

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.11	.88	.84	.65
Saturated model	.00	1.00		
Independence model	1.40	.13	.06	.12

Table N6

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.92	.90	.95	.93	.95
Saturated model	1.00		1.00		1.00
Independence model	.00	.00	.00	.00	.00

Table N7

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.80	.74	.76
Saturated model	.00	.00	.00
Independence model	1.00	.00	.00

Table N8

NCP

Model	NCP	LO 90	HI 90
Default model	465.18	388.71	549.30
Saturated model	.00	.00	.00
Independence model	8795.44	8487.27	9109.96

Table N9

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1.56	1.00	.84	1.18
Saturated model	.00	.00	.00	.00
Independence model	19.66	18.96	18.29	19.63

Table N10

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.06	.06	.07	.00
Independence model	.24	.24	.25	.00

Table N11

AIC

Model	AIC	BCC	BIC	CAIC
Default model	907.18	918.43	1284.11	1375.11
Saturated model	702.00	745.37	2155.86	2506.86
Independence model	9172.44	9175.65	9280.13	9306.13

Table N12

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	1.96	1.79	2.14	1.98
Saturated model	1.51	1.51	1.51	1.61
Independence model	19.77	19.10	20.45	19.78

Table N13

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	192	203
Independence model	19	20

Appendix O: Open-ended Remarks

Count of main themes reported in the open-ended remarks

Service quality dimension	Service quality theme	Total
Functionality	Functionality	20
	Error-free services	18
	Internet Banking	7
	Little effort	4
Functionality Total		49
Convenience	Time saving services	18
	Wide distribution	17
	Link between ATM networks	5
	Convenience	4
	Service recovery	4
Convenience Total		48
Design	World-class services	12
	Process enhancement	6
	Design	4
Design Total		22
Assurance	Assurance	16
	Employee training	6
Assurance Total		22
Security	Security	10
Customization	Easier interactions with TBBS	5
	Customization	2
Customization Total		7
Prices	Lower prices	6
Enjoyment	Enjoyment	4
Grand Total		168