UNIVERSITI PUTRA MALAYSIA

E-SERVICE QUALITY MODEL FOR ASSESSING CUSTOMER SATISFACTION OF MOBILE BANKING APPLICATION

JUDE NDUBUISI OWUAMANAM

FSKTM 2022 10

E-SERVICE QUALITY MODEL FOR ASSESSING CUSTOMER SATISFACTION OF MOBILE BANKING APPLICATION

By

JUDE NDUBUISI OWUAMANAM

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfillment of the Requirements for the Degree of Master of Science

July 2021

DEDICATIONS

I dedicate this thesis to my family

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

E-SERVICE QUALITY MODEL FOR ASSESSING CUSTOMER SATISFACTION OF MOBILE BANKING APPLICATION

By

JUDE NDUBUISI OWUAMANAM

July 2021

Chairman: Salfarina binti Abdullah, PhD
Faculty: Computer Science and Information Technology

The increasing growth of mobile device users, as well as the reduction in mobile data charges, have given way for the provision of mobile banking services. Banks are now extending their services from the traditional face-to-face banking interactions to a self-service system. Although mobile banking has grown exponentially, many users are not confident to transact using their phones due to the low e-service quality of mobile banking. To address the issue, this study proposes an enhanced model for assessing the e-service quality of mobile banking while examining the relationship between such e-service dimensions and customer satisfaction. To propose this model, MAPPSQL dimensions was adopted and was further extended by speed recovery and security from E-S-Qual dimensions. The primary data obtained from users of the mobile banking service in Nigeria were measured and analysed. A total number of 156 responses were obtained and analysed using structural equation modelling (SEM) of smart partial least square 2 (SmartPLS 2) software. Hypothesis tests were conducted to determine the relationship between the identified dimensions (i.e., app design, functionality, customization, assurance, fulfilment, service recovery, speed efficiency, and security) and customer satisfaction. The results show that app design, fulfilment and security are positively significant to customer satisfaction while functionality, customization, assurance, service recovery and speed efficiency are not significant to customers satisfaction. The results reveal that service providers should focus more on the dimensions of app design, fulfilment and security because these dimensions are vital indicators of customer satisfaction in mobile banking. The findings in this study will provide guidance and useful information to service providers on how the e-service quality of mobile banking systems can be improved

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

MODEL KUALITI E-PERKHIDMATAN UNTUK MENILAI KEPUASAN PELANGGAN TERHADAP APLIKASI PERBANKAN MUDAH ALIH

Oleh

JUDE NDUBUISI OWUAMANAM

Julai 2021

Pengerusi: Salfarina binti Abdullah, PhD
Fakulti: Sains Komputer dan Teknologi Maklumat

Peningkatan pertumbuhan pengguna peranti mudah alih dan penurunan pesat dalam caj data mudah alih konvensional, telah memberi laluan bagi penyediaan perkhidmatan perbankan mudah alih. Bank kini memperluaskan perkhidmatan mereka dari kaedah perbankan tradisional kepada sistem layan diri. Walau pun perbankan mudah alih berkembang pesat, masih ramai pengguna yang kurang berkeyakinan untuk melakukan transaksi menggunakan telefon mereka memandangkan kualiti perkhidmatan elektronik perbankan mudah alih yang rendah. Untuk menangani isu tersebut, kajian ini mencadangkan model yang dipertingkatkan untuk menilai kualiti perkhidmatan elektronik perbankan mudah alih dan dalam masa yang sama mengkaji hubungan di antara dimensi perkhidmatan elektronik dan kepuasan pelanggan. Data primer yang diperolehi dari pengguna perkhidmatan perbankan mudah alih di Nigeria telah diukur dan dianalisis. Sejumlah 156 maklum balas dikumpul dan dianalisis menggunakan pemodelan persamaan struktur (SEM) (SmartPLS 2). Ujian hipotesis dilakukan untuk menentukan hubungan di antara dimensi yang dikenal pasti yang merangkumi (reka bentuk aplikasi, fungsi, penyesuaian, jaminan, pencapaian, pemulihan perkhidmatan, kecekapan dan keselamatan kelajuan) dan kepuasan pelanggan. Hasil kajian menunjukkan bahawa reka bentuk, pencapaian dan keselamatan aplikasi sangat penting bagi kepuasan pelanggan. Dapatan kajian ini akan menyediakan garis panduan dan maklumat berguna kepada pembekal perkhidmatan tentang bagaimana kualiti perkhidmatan elektronik sistem perbankan mudah alih boleh dipertingkatkan.

ACKNOWLEDGEMENTS

Above all, I am very grateful to Almighty God for all the bounties that he showed on me, for enabling me to finish this master thesis. I must say, "Thank you, Lord".

I would not desist to show my endless thanks to my supervisor, Dr Salfarina Abdullah who generously gave me space when I wanted it and provide me with maximum guidance when I needed it. Thank you for the encouragement, assistance, inspiration and friendship that you extended to me as my supervisor. Without your time spent in the discussions and your swift response with comments, the process of this thesis would have not been achieved. My profound thanks also go to my co-supervisors AP Dr Yusmadi Yah Jusoh and AP Dr Noraini Che Pa for their insightful comments and encouragement.

I would also express my heartfelt thanks to the administrative and academic staff of the graduate school of Computer science and Information Technology, Universiti Putra Malaysia (UPM) for providing the enabling study environment, supports, facilities and advice. I also express my appreciation to everyone who helped me to administer the questionnaire used in this thesis.

I will not forget to acknowledge my friend Mr Khairi Azhar Bin Aziz who helped me to arrange his colleagues from five different banks in Malaysia who participated in the expert review of my work. I appreciated your assistance.

I am also extending my appreciation to many people who helped in one way or another, most especially Mr Umar Ali Bukar.

Finally, very special thanks go to my wonderful family, my mother, siblings and number one in my heart, my son, David Ndubuisi. Thank you for your love and support. In several ways, this thesis is ours. I dedicate the completion of my master thesis to all of you.

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

Salfarina binti Abdullah, PhD
Senior Lecturer
Faculty of Computer Science and Information Technology
Universiti Putra Malaysia
(Chairperson)

Yusmadi Yah binti Jusoh, PhD
Associate Professor
Faculty of Computer Science and Information Technology
Universiti Putra Malaysia
(Member)

Noraini binti Che Pa, PhD
Associate Professor
Faculty of Computer Science and Information Technology
Universiti Putra Malaysia
(Member)

ZALILAH MOHD SHARIFF, PhD
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 10 February 2022

Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

Signature: _____
Name of
Chairman of
Supervisory
Committee: Salfarina binti Abdullah

Signature: _____
Name of
Member of
Supervisory
Committee: Yusmadi Yah binti Jusoh

Signature: _____
Name of
Member of
Supervisory
Committee: Noraini binti Che Pa

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ASP	Application Service Provider
ATM	Automated Teller Machine
AVE	Average Variance Extracted
E-RECS-QUAL	Electronic Recovering Service Quality
E-S-QUAL	Electronic Service quality
GPRS	General Packet Radio Service
IRSQ	Internet Retail Service Quality
IS	Information System
ISSM	Information System Success Model
IT	Information Technology
MAPPSQL	Mobile Application Service Quality
M-S-QUAL	Mobile Service Quality
PDA	Personal Digital Assistant
PLS	Partial Least Square
SEM	Structural Equation Model
SERVPERF	Service Performance
SERVQUAL	Service Quality
SITEQUAL	Site Quality
SPSS	Statistical Package for the Social Sciences
SSTQUAL	Self-service Technology Service Quality
TTF	Task–Technology Fit
WAP	Wireless Access Point
WEBQUAL	Web Quality

CHAPTER 1

INTRODUCTION

1.1 Preface

An overview of the thesis is presented in this chapter. This includes the background of the study, problem statement, research objectives, scope of the study and thesis organisation.

1.2 Background of the Study

The progress of digital technology within the sphere of information and telephone communication has prompted the growth of the world market. Similarly, many financial sectors have been positively impacted by the rapid advancement in information technology. Moreover, the invention of mobile phone technology has changed the way people communicate. Now, phone users can use their mobile devices to communicate with greater flexibility as compared to the analogue system. Thus, phone manufacturers produce mobile phones supporting wireless technologies, such as General Packet Radio Service (GPRS) and Wireless Access Point (WAP), to meet the new demand for mobile communication (Lee et al., 2003; Puriwat and Tripopsakul, 2017).

Mobile phone technology has advanced over the years. Currently, mobile phone users can enjoy the applications and services that were previously enjoyed by personal computer users. With the availability of the internet and multifunctional user application interface, mobile phone users can now perform e-transactions using applications on their mobile devices (Anckar and D'incau, 2002; Phongtraychack and Dolgaya, 2018). Thus, many studies have re-introduced the concept of e-transaction to include a mobile phone, which is almost at the same level as the personal computer (Donner and Tellez, 2008).

Evidence has shown that there are more mobile phone users than personal computer users due to the portability of mobile phones (Riivari, 2005). Besides, mobile applications have peculiar features that extend the regular computer applications (Laukkanen, 2007). Now, mobile phones have advanced from transmitting messages to carrying data and money (Karjaluoto et al., 2010). These new advancements in mobile technology have motivated many sectors in the world to adopt mobile applications for their e-transactions (Pedersen and Ling, 2002; Puriwat and Tripopsakul, 2017).

The banking industry is one of the sectors that have adopted mobile applications. It has devoted more resources and time to designing products and services via mobile platforms, one of which is mobile banking. Mobile banking is the use of mobile devices to access banking services through a wireless connection (Afshan and Sharif, 2016). It authorises its users to make financial transactions remotely by adopting a mobile device like Personal Digital Assistant (PDA), smartphone, or mobile phones (Al-Jabri and Sohail, 2012). Mobile banking is beneficial to banks and customers (Baabdullah et al., 2019) as some customers' needs can be responded to by this technology without visiting any bank branch or an ATM.

The exponential growth in the use of mobile devices has positively influenced the demand for mobile banking (Veríssimo, 2016). Consequently, the banking system has transformed significantly such that both professional and personal banking operations can be carried out on mobile phones through mobile banking (Alalwan et al., 2016). This means that users can utilize mobile devices to conduct different services such as bill payments, money transfers, and account inquiries (Zhou, 2012a).

The literature on mobile banking has primarily focused on educating customers on the benefits of mobile banking. Although previous studies have improved the public's understanding of mobile banking and e-service quality in the last few years, not all customers have fully embraced mobile banking services (Yu et al., 2015). One of the reasons for this relates to its low e-service quality (De Leon, 2019). Hence, improving the service quality of mobile banking is key to maximizing the potential in the sector.

In this regard, this research examines the e-service quality of mobile banking and customer satisfaction. Bearing in mind that service quality plays a crucial role in customer satisfaction (Baker and Crompton, 2000; Cronin Jr et al., 2000), this study intends to explore all the key dimensions of service quality in mobile banking that require immediate attention and investigate their impacts on customers' satisfaction.

1.3 Problem Statement

Despite the recent advancements in mobile banking, data obtained from customer satisfaction surveys have shown that potential users still lack confidence in adopting the system due to its low e-service quality (De Leon et al., 2020; Daniyan and Akinbowale, 2017). E-service quality is one of the challenging factors affecting the use of mobile banking (Purohit et al., 2021; Zhang et al., 2018). The reluctance is also traced to the fact that current studies on mobile banking focus more on adoption and use intention. Adoption is the customer's ability to accept the use of mobile banking services. Some of the dimensions of adoption are usefulness, benefit, performance expectancy, and customer awareness. Meanwhile, the use intention is how

determined people are willing to use mobile banking services. Examples of use intention dimensions are risk, cost, and compatibility with lifestyle and habits. These factors have limitations that deter the introduction and promotion of the use of mobile banking. The use intention approach does not encapsulate specific aspects and features of mobile e-service quality. For instance, the gap in service quality is not defined and key dimensions of e-service quality have not been identified despite that they require urgent improvement (Tsai et al., 2018). Moreover, mobile banking has some specific characteristics that make it different from other web based e-services. These emphasize the need to identify those dimensions and measure them precisely to improve the service quality of mobile banking (De Leon et al., 2020; Mallikarjuna and Murali, 2014; Malviya, 2015). From the issues mentioned above, it is clear that there are unaddressed issues with respect to improving mobile banking e-service quality. There is always a competition among banking institutions in terms of retaining customers in their mobile banking services. Hence, there is a need to making sure that the quality of e-service achieves/meets the customers' expectations (Masrek et al., 2018).The degree of satisfaction in banking sector increases with e- service quality (Asiyanbi and Ishola, 2018).Therefore, recognizing the relative importance of e-service quality dimensions can help the banking sectors focus on what satisfies the customers most (Hammoud et al., 2018).For this reason, recognizing the relative importance of e-service quality dimensions can help the banking sectors focus on what satisfies the customers most.

1.4 Objective of the Study

The objectives of this research are as follows:

- To propose an enhanced model for assessing e-service quality and customer satisfaction in mobile banking.
- To validate the relationship between the dimensions of mobile banking e-service quality and customer satisfaction.

1.5 Scope of the Study

The scope of this study is within improving e-service quality for mobile banking to satisfy customers by enhancing the mobile banking e-service quality assessment model. The data involved the banking system in Nigeria. Specifically, the main focus of this study it to improve e-service quality of mobile banking as well as identify the critical dimensions of mobile banking e-service quality and then propose an enhanced model for assessing the mobile banking e-service quality. As such, the relationship between the dimensions of mobile banking and customer satisfaction is also studied. This study will help service providers to improve on the e-service quality delivered to their users.

Moreover, the research setting, Nigeria, comprises 36 states with numerous banks located across the country. Many bank customers prefer mobile banking because of its convenience and portability. To ensure that the research objectives are achieved, the population sample is bank customers who transact through mobile banking in Nigeria. Surveys were administered to mobile banking customers through internet channels to collect primary data. Since this study focuses on mobile banking, customers from telephone and online banking were excluded from the sample population.

1.6 Research Contribution

This research contributes to the existing literature on the e-service quality of mobile banking theoretically and practically.

- Theoretical: It presents quantitative information about the dimensions and attributes of e-service quality of mobile banking. This knowledge could be used as a reference in future studies on e-service quality of mobile banking.
- Practical: It proposes an enhanced e-service quality model for mobile banking. This model could be used by mobile banking providers to improve the e-service they deliver to users.

1.7 Organisation of Thesis

This thesis is organised as follows:

Chapter 1 introduces this research. It describes the research problem, objectives, scope, and contributions.

Chapter 2 reviews the related literature on service topology (e-service quality and IS/IT service quality) and other e-service quality models for mobile banking. The resources gathered provide useful information towards identifying the research gaps and limitations of the previous works.

Chapter 3 discusses research methodology which includes the philosophical perspective, research design, population, sampling design, survey instruments, and data collections procedure for pilot studies.

Chapter 4 presents the enhanced model for assessing the e-service quality of mobile banking and customer satisfaction. This is motivated by the literature review in Chapter 2.

Chapter 5 is dedicated to data analysis. This includes the descriptive analysis of frequencies and percentages, as well as, the measurement and structural models.

Chapter 6 describes the overall significance of this research, conclusions derived based on the set objectives, the limitations and suggestions for future research.

1.8 Summary

This chapter introduces the background of the thesis. The research problem, objectives, scope, contributions, and thesis outline are stated.

REFERENCES

Abu-ELSamen, A. A., Akroush, M. N., Al-Sayed, A. L., and Hasan, H. J. (2012). An empirical model of customer service quality and customer loyalty in an international electronics company. *International Journal of Electronic Business*, 10(1):39–63.

Afshan, S. and Sharif, A. (2016). Acceptance of mobile banking framework in pakistan. *Telematics and Informatics*, 33(2):370–387.

Agarwal, S., Driscoll, J. C., Gabaix, X., and Laibson, D. (2009). The age of reason: Financial decisions over the life cycle and implications for regulation. *Brookings Papers on Economic Activity*, 2009(2):51–117.

Akturan, U. and Tezcan, N. (2012). Mobile banking adoption of the youth market: Perceptions and intentions. *Marketing Intelligence & Planning*, 30(4):444–459.

Al-Jabri, I. M. and Sohail, M. S. (2012). Mobile banking adoption: Application of diffusion of innovation theory. *Journal of Electronic Commerce Research*, 13(4):379–391.

Al-Sayyed, N. M., Suifan, T. S., and Alawneh, A. R. (2015). Exploring the effect of perceived service quality on customers satisfaction: A study of banking sector in jordan. *Journal of management research*, 7(1):122–138.

Alalwan, A. A., Baabdullah, A. M., Rana, N. P., Tamilmani, K., and Dwivedi, Y. K. (2018a). Examining adoption of mobile internet in saudi arabia: Extending tam with perceived enjoyment, innovativeness and trust. *Technology in Society*, 55:100–110.

Alalwan, A. A., Dwivedi, Y. K., Rana, N. P., and Algharabat, R. (2018b). Examining factors influencing jordanian customers' intentions and adoption of internet banking: Extending utaut2 with risk. *Journal of Retailing and Consumer Services*, 40:125–138.

Alalwan, A. A., Dwivedi, Y. K., Rana, N. P., and Williams, M. D. (2016). Consumer adoption of mobile banking in jordan: Examining the role of usefulness, ease of use, perceived risk and self-efficacy. *Journal of Enterprise Information Management*, 29(1):118–139.

Alawneh, A., Al-Refai, H., and Batiha, K. (2013). Measuring user satisfaction from e-government services: Lessons from jordan. *Government Information Quarterly*, 30(3):277–288.

Alfred, O. (2017). Service quality and customer satisfaction: A comparativite study of the ghanian public vs private bank. *European Journal of Research in Social Sciences Vol*, 5(1).

Alfred, O. and Dwomoh, H. A. (2017). Investigating customer satisfaction levels with self service technology within the banking sector:(a case study of automated teller machines (atms)). *American Journal of Operations Management and Information Systems*, 2(4):97–104.

Alipoor, V. (2016). The effect of service quality of mobile banking technology on customer brand image. *International Journal of Computer Information Technology*, 4(1):13–19.

Amiri Aghdaie, S. and Faghani, F. (2012). Mobile banking service quality and customer satisfaction (application of servqual model). *International Journal of Management and Business Research*, 2(4):351–361.

Anckar, B. and D'incau, D. (2002). Value creation in mobile commerce: Findings from a consumer survey. *Journal of Information Technology Theory and Application (JITTA)*, 4(1):8.

Anderson, J. C. and Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin*, 103(3):411.

Aruna, D. (2018). Service quality dimension of e-banking services – a study with reference to vellore district. *IARJSET*, 5:45–52.

Asfour, H. K. and Haddad, S. I. (2014). The impact of mobile banking on enhancing customers' e-satisfaction: An empirical study on commercial banks in jordan. *International Business Research*, 7(10):145.

Asiyanbi, H. and Ishola, A. (2018). E-banking services impact and customer satisfaction in selected bank branches in ibadan metropolis, oyo state, nigeria. *Accounting*, 4(4):153–160.

Baabdullah, A. M., Alalwan, A. A., Rana, N. P., Kizgin, H., and Patil, P. (2019). Consumer use of mobile banking (m-banking) in saudi arabia: Towards an integrated model. *International Journal of Information Management*, 44(1-1):38–52.

Bagozzi, R. P. and Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the academy of marketing science*, 16(1):74–94.

Baharuddin, R., Singh, D., and Razali, R. (2013). Usability dimensions for mobile applications-a review. *Res. J. Appl. Sci. Eng. Technol*, 5(6):2225–2231.

Baker, D. A. and Crompton, J. L. (2000). Quality, satisfaction and behavioral intentions. *Annals of tourism research*, 27(3):785–804.

Barnes, S. and Vidgen, R. (2000). Webqual: an exploration of website quality. *ECIS 2000 proceedings*, page 74.

Barnes, S. J. and Vidgen, R. (2001a). An evaluation of cyber-bookshops: the webqual method. *International journal of electronic commerce*, 6(1):11–30.

Barnes, S. J. and Vidgen, R. T. (2001b). Assessing the quality of auction web sites. In *Proceedings of the 34th annual Hawaii international conference on system sciences*, pages 10–pp. IEEE.

Barnes, S. J. and Vidgen, R. T. (2002). An integrative approach to the assessment of e-commerce quality. *J. Electron. Commerce Res.*, 3(3):114–127.

Bateson, J. (1985). The service encounter: Managing employee/customer interaction in service businesses. *Perceived control and the service encounter*, pages 67–82.

Berry, L. L., Seiders, K., and Grewal, D. (2002). Understanding service convenience. *Journal of marketing*, 66(3):1–17.

Bidar, R., Fard, M. B., Salman, Y. B., Tunga, M. A., and Cheng, H.-I. (2014). Factors affecting the adoption of mobile banking: sample of turkey. In *16th international conference on advanced communication technology*, pages 1278–1282. IEEE.

Bolton, R. N. and Drew, J. H. (1991). A multistage model of customers' assessments of service quality and value. *Journal of consumer research*, 17(4):375–384.

Boonsiritomachai, W. and Pitchayadejanant, K. (2017). Determinants affecting mobile banking adoption by generation y based on the unified theory of acceptance and use of technology model modified by the technology acceptance model concept. *The Kasetsart Journal of Social Sciences*, 40(1):349–358.

Brar, T. P. S., Sharma, D., and Khurmi, S. S. (2015). E-banking service quality: A study of retail customer's perspicacity.

Bryman, A. and Bell, E. (2011). Business research methods 3rd ed. new york.

Carrillat, F. A., Jaramillo, F., and Mulki, J. P. (2007). The validity of the servqual and servperf scales: A meta-analytic view of 17 years of research across five continents. *International Journal of Service Industry Management*, 18(5):472–490.

Carrillo-Álvarez, E., Villalonga-Olives, E., Riera-Romaní, J., and Kawachi, I. (2019). Development and validation of a questionnaire to measure family social capital. *SSM-population health*, 8:1–10.

CFI (2021). Top banks in nigeria- overview of nigeria's leading financial institutions.

Chen, C. (2013). Perceived risk, usage frequency of mobile banking services. *Managing Service Quality: An International Journal*, 23(5):410–436.

Cox, J. and Dale, B. G. (2001). Service quality and e-commerce: an exploratory analysis. *Managing Service Quality: An International Journal*, 11(2):121–131.

Creswell, J. W. and Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

Cronin Jr, J. J., Brady, M. K., and Hult, G. T. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of retailing*, 76(2):193–218.

Cronin Jr, J. J. and Taylor, S. A. (1992). Measuring service quality: a reexamination and extension. *Journal of marketing*, 56(3):55–68.

Dabholkar, P. A., Thorpe, D. I., and Rentz, J. O. (1996). A measure of service quality for retail stores: scale development and validation. *Journal of the Academy of marketing Science*, 24(1):3.

Damabi, M., Firoozbakht, M., and Ahmadyan, A. (2018). A model for customers satisfaction and trust for mobile banking using delone and mclean model of information systems success. *Journal of Soft Computing and Decision Support Systems*, 5(3):21–28.

Daniyan, O. V. and Akinbowale, O. E. (2017). Adoption and challenges of mobile banking innovation services in benin-city. *Journal of Global Accounting*, 5(2):73–89.

De Leon, M. V. (2019). Factors influencing behavioural intention to use mobile banking among retail banking clients. *Jurnal Studi Komunikasi*, 3(2):118–137.

De Leon, M. V., Atienza, R. P., and Susilo, D. (2020). Influence of self-service technology (sst) service quality dimensions as a second-order factor on perceived value and customer satisfaction in a mobile banking application. *Cogent Business & Management*, 7(1):1–17.

de Sena Abrahão, R., Moriguchi, S. N., and Andrade, D. F. (2016). Intention of adoption of mobile payment: An analysis in the light of the unified theory of acceptance and use of technology (utaut). *RAI Revista de Administração e Inovação*, 13(3):221–230.

De Vaus, D. (1993). Surveys in social research (3rd eds).

De Vaus, D. (2001). *Research design in social research*. Sage.

Donner, J. and Tellez, C. A. (2008). Mobile banking and economic development: Linking adoption, impact, and use. *Asian journal of communication*, 18(4):318–332.

Ecer, F. (2018). An integrated fuzzy ahp and aras model to evaluate mobile banking services. *Technological and Economic Development of Economy*, 24(2):670–695.

Fassnacht, M. and Koese, I. (2006). Quality of electronic services: conceptualizing and testing a hierarchical model. *Journal of service research*, 9(1):19–37.

Field, J. M., Heim, G. R., and Sinha, K. K. (2004). Managing quality in the e-service system: development and application of a process model. *Production and Operations management*, 13(4):291–306.

Fornell, C. and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 18(1):39–50.

Fuller, C. M., Simmering, M. J., Atinc, G., Atinc, Y., and Babin, B. J. (2016). Common methods variance detection in business research. *Journal of Business Research*, 69(8):3192–3198.

Gliem, J. A. and Gliem, R. R. (2003). Calculating, interpreting, and reporting cronbach's alpha reliability coefficient for likert-type scales. pages 82–88. Midwest Research-to-Practice Conference in Adult, Continuing, and Community ....

Gronroos, C. (1982). Strategicmanagementandmarketingin the service sector. *New York: MarketingScienceInstitute*.

Gronroos, C. (1984). A service quality model and its marketing implications. *European Journal of Marketing*, 18(4):36–44.

Hair, J. F., Risher, J. J., Sarstedt, M., and Ringle, C. M. (2019). When to use and how to report the results of pls-sem. *European business review*, 31(1):2–24.

Hair Jr, J. F., Sarstedt, M., Ringle, C. M., and Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*. saGe publications.

Hamidi, H. and Safareeyeh, M. (2019). A model to analyze the effect of mobile banking adoption on customer interaction and satisfaction: A case study of m-banking in iran. *Telematics and Informatics*, 38:166–181.

Hammoud, J., Bizri, R. M., and El Baba, I. (2018). The impact of e-banking service quality on customer satisfaction: Evidence from the lebanese banking sector. *SAGE Open*, 8(3):1–12.

Hanafizadeh, P., Behboudi, M., Koshksaray, A. A., and Tabar, M. J. S. (2014). Mobile-banking adoption by iranian bank clients. *Telematics and Informatics*, 31(1):62–78.

Hartwig, K. and Billert, M. S. (2018). Measuring service quality: A systematic literature review.

Henseler, J., Hubona, G., and Ray, P. A. (2016). Using pls path modeling in new technology research: updated guidelines. *Industrial management & data systems*, 116(1):2–20.

Henseler, J., Ringle, C. M., and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, 43(1):115–135.

Hinkin, T. R. (1995). A review of scale development practices in the study of organizations. *Journal of management*, 21(5):967–988.

Hossain, N. and Hossain, Y. (2015). Mobile banking and customer satisfaction: The case of dhaka city. *World review of business research*, 5(3):108–120.

Huang, E. Y., Lin, S.-W., and Fan, Y.-C. (2015). Ms-qual: Mobile service quality measurement. *Electronic Commerce Research and Applications*, 14(2):126–142.

Hussain, A., Abubakar, H. I., and Hashim, N. B. (2014). Evaluating mobile banking application: Usability dimensions and measurements. In *Proceedings of the 6th international Conference on Information Technology and Multimedia*, pages 136–140. IEEE.

Janda, S., Trocchia, P. J., and Gwinner, K. P. (2002). Consumer perceptions of internet retail service quality. *International journal of service industry management*, 13(5):412–431.

Karjaluoto, H., Püschel, J., Mazzon, J. A., and Hernandez, J. M. C. (2010). Mobile banking: proposition of an integrated adoption intention framework. *International Journal of bank marketing*.

Kaur, N. and Kiran, R. (2015). E-banking service quality and customer loyalty: Changing dynamics of public, private and foreign bank consumers in india. *Global Business & Management Research*, 7(1).

Kettinger, W. J. and Lee, C. C. (2005). Zones of tolerance: alternative scales for measuring information systems service quality. *MIS quarterly*, pages 607–623.

Khadem, P. and Mousavi, S. (2013). Effects of self-service technology on customer value and customer readiness: The case of banking industry. *Management Science Letters*, 3(7):2107–2112.

Khan, M. Y., Javeed, A., Mehmood, N., and Khan, W. (2019). Mobile banking service quality and customer satisfaction: An application of carter model. *Sarhad Journal of Management Sciences*, 5(1):15–26.

Kock, N. (2015). Common method bias in pls-sem: A full collinearity assessment approach. *International Journal of e-Collaboration (ijec)*, 11(4):1–10.

Kotler, P. (2003). Marketing management 11de uitgawe.

Krajewski, L. J. and Ritzman, L. P. (2005). *Operations Management: Processes and Value Chains*. Pearson Education International/Prentice Hall.

Kumar, M., Kee, F. T., and Manshor, A. T. (2009). Determining the relative importance of critical factors in delivering service quality of banks: An application of dominance analysis in servqual model. *Managing Service Quality: An International Journal*, 19(2):211–228.

Kumar, R. (2017). A proposed scale of assessing mobile app service quality (mappsql). *ELK Asia Pacific Journal of Marketing and Retail Management*, 8(1):1–11.

Lam, L. W. (2012). Impact of competitiveness on salespeople's commitment and performance. *Journal of Business Research*, 65(9):1328–1334.

Laukkanen, T. (2007). Customer preferred channel attributes in multi-channel electronic banking. *International Journal of Retail & Distribution Management*, 35(5):393–412.

Laukkanen, T. (2016). Consumer adoption versus rejection decisions in seemingly similar service innovations: The case of the internet and mobile banking. *Journal of Business Research*, 69(7):2432–2439.

Lee, M. S., McGoldrick, P. J., Keeling, K. A., and Doherty, J. (2003). Using zmet to explore barriers to the adoption of 3g mobile banking services. *International Journal of Retail & Distribution Management*, 31(6):340–348.

Lewis, R. C. and Booms, B. H. (1983). The marketing aspects of service quality. *Emerging perspectives on services marketing*, 65(4):99–107.

Lin, J.-S. C. and Hsieh, P.-l. (2006). The role of technology readiness in customers' perception and adoption of self-service technologies. *International Journal of Service Industry Management*, 17(5):497–517.

Lin, J.-S. C. and Hsieh, P.-L. (2011). Assessing the self-service technology encounters: development and validation of sstqual scale. *Journal of retailing*, 87(2):194–206.

Ma, Q., Pearson, J. M., and Tadisina, S. (2005). An exploratory study into factors of service quality for application service providers. *Information & Management*, 42(8):1067–1080.

MacKenzie, S. B. and Podsakoff, P. M. (2012). Common method bias in marketing: Causes, mechanisms, and procedural remedies. *Journal of retailing*, 88(4):542–555.

Madu, C. N. and Madu, A. A. (2002). Dimensions of e-quality. *International Journal of Quality & reliability management*, 19(3):246–258.

Mallikarjuna, V. and Murali, S. (2014). Conceptual model for assessing service quality of mobile banking. *Journal of Management*, 4(4).

Malviya, S. (2015). Exploring mobile banking service quality dimensions for public and private sector banks in indore district of madhya pradesh. *International Journal of Advance Research in Computer Science and Management Studies*, 3(1).

Malviya, S. and Sharma, G. (2014). Exploring usage pattern of mobile banking among public and private sector banks in indore. *Asian Journal of Research in Banking and Finance*, 4(1).

Mandari, E. and Richard, E. M. (2017). Factors influencing usage of mobile banking services: The case of ilala district in tanzania.

Masrek, M. N., Halim, M. S. A., Khan, A., Ramli, I., et al. (2018). The impact of perceived credibility and perceived quality on trust and satisfaction in mobile banking context. *Asian Economic and Financial Review*, 8(7):1013–1025.

Masrury, R. A., Alamsyah, A., et al. (2019). Analyzing tourism mobile applications perceived quality using sentiment analysis and topic modeling. In *2019 7th International Conference on Information and Communication Technology (ICoICT)*, pages 1–6. IEEE.

Moghavvemi, S., Lee, S. T., and Lee, S. P. (2018). Perceived overall service quality and customer satisfaction. *International Journal of Bank Marketing*, 36(5):908–930.

Munoz-Leiva, F., Climent-Climent, S., and Liébana-Cabanillas, F. (2017). Determinants of intention to use the mobile banking apps: An extension of the classic tam model. *Spanish Journal of Marketing-ESIC*, 21(1):25–38.

Musteen, M., Francis, J., and Datta, D. K. (2010). The influence of international networks on internationalization speed and performance: A study of czech smes. *Journal of World Business*, 45(3):197–205.

Nachtigall, C., Kroehne, U., Funke, F., and Steyer, R. (2003). Should we use sem? pros and cons of structural equation modeling. *Methods Psychological Research Online*, 8(2):1–22.

Nahida Afroz, N. (2019). Effect of service quality on customer satisfaction evidence from banks in tangail. *Management Studies and Economic Systems*, 4(2):145–159.

Narteh, B. (2018). Service quality and customer satisfaction in ghanaian retail banks: the moderating role of price. *International Journal of Bank Marketing*, 36(1):68–88.

Nunnally, J. C. (1978). Psychometric theory 2nd ed.

Oliver, R. L. (1981). Measurement and evaluation of satisfaction processes in retail settings. *Journal of retailing*, 57(3):25–48.

Oppong, P., Adjei, H., and Poku, K. (2014). The role of information technology in building customer loyalty in banking: A case study of agricultural development bank ltd., sunyani. *British Journal of Marketing Studies*, 2(4):9–29.

Orlikowski, W. J. and Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information systems research*, 2(1):1–28.

Parasuraman, A., Zeithaml, V. A., and Berry, L. L. (1988). Servqual: A multiple-item scale for measuring consumer perc. *Journal of retailing*, 64(1):12.

Parasuraman, A., Zeithaml, V. A., and Malhotra, A. (2005). Es-qual: A multiple-item scale for assessing electronic service quality. *Journal of service research*, 7(3):213–233.

Pedersen, P. E. and Ling, R. (2002). Mobile end-user service adoption studies: A selective review. *Scandinavian Journal of Information Systems*, 14(1):3–17.

Pedhazur, E. and Pedhazur Schmelkin, L. (1991). Exploratory factor analysis. *Measurement, design and analysis: An integrated approach*, pages 590–630.

Pereira, J., Cerpa, N., Verner, J., Rivas, M., and Procaccino, J. D. (2008). What do software practitioners really think about project success: A cross-cultural comparison. *Journal of Systems and Software*, 81(6):897–907.

Peters, C., Maglio, P., Badinelli, R., Harmon, R. R., Maull, R., Spohrer, J. C., Tuunanen, T., Vargo, S. L., Welser, J. J., Demirkan, H., et al. (2016). Emerging digital frontiers for service innovation. *Communications of the Association for Information Systems: CAIS*, 1(39):online.

Petridou, E., Spathis, C., Glaveli, N., and Liassides, C. (2007). Bank service quality: empirical evidence from greek and bulgarian retail customers. *International Journal of Quality & Reliability Management*, 24(6):568–585.

Phongtraychack, A. and Dolgaya, D. (2018). Evolution of mobile applications. In *MATEC Web of Conferences*, volume 155, page 01027. EDP Sciences.

Polit, D. F. (2010). *Essentials of nursing research*. Wolters Kluwer Health/Lippincott Williams & Wilkins.

Poon, W.-C. (2008). Users' adoption of e-banking services: the malaysian perspective. *Journal of business & industrial marketing*, 23:59–69.

Puriwat, W. and Tripopsakul, S. (2017). The impact of e-service quality on customer satisfaction and loyalty in mobile banking usage: Case study of thailand. *Polish Journal of Management Studies*, 15:183–193.

Purohit, D., Arora, D., et al. (2021). The benefits and challenges of mobile banking at the bottom of the pyramid. *Journal of Contemporary Issues in Business and Government*, 27(1):2222–2229.

Rahman, A., Hasan, M., and Mia, M. A. (2017). Mobile banking service quality and customer satisfaction in bangladesh: An analysis. *The Cost and Management*, 45(2):25–32.

Ramayah, T., Cheah, J., Chuah, F., Ting, H., and Memon, M. A. (2018). Partial least squares structural equation modeling (pls-sem) using smartpls 3.0.

Riivari, J. (2005). Mobile banking: a powerful new marketing and crm tool for financial services companies all over europe. *Journal of Financial Services Marketing*, 10(1):11–20.

Ringle, C. M., Wende, S., and Will, A. (2005). Smartpls 2.0 (beta). hamburg.

Rolland, S. and Freeman, I. (2010). A new measure of e-service quality in france. *International Journal of Retail & Distribution Management*, 38(7):4977–517.

Sagib, G. K. and Zapan, B. (2014). Bangladeshi mobile banking service quality and customer satisfaction and loyalty. *Management & Marketing*, 9(3).

Sekaran, U. and Bougie, R. (2016). *Research methods for business: A skill building approach*. John Wiley & Sons, New York.

Shareef, M. A., Baabdullah, A., Dutta, S., Kumar, V., and Dwivedi, Y. K. (2018). Consumer adoption of mobile banking services: An empirical examination of factors according to adoption stages. *Journal of Retailing and Consumer Services*, 43:54–67.

Sharma, S. K. and Sharma, M. (2019). Examining the role of trust and quality dimensions in the actual usage of mobile banking services: An empirical investigation. *International Journal of Information Management*, 44:65–75.

Siddiqi, K. O. (2011). Interrelations between service quality attributes, customer satisfaction and customer loyalty in the retail banking sector in bangladesh. *International journal of business and management*, 6(3):12.

Sigala, M., Christou, E., Glaveli, N., Petridou, E., Liassides, C., and Spathis, C. (2006). Bank service quality: evidence from five balkan countries. *Managing Service Quality: An International Journal*.

Sikdar, P. and Makkad, M. (2015). Online banking adoption: A factor validation and satisfaction causation study in the context of indian banking customers. *International Journal of Bank Marketing*, 33(6):760–785.

Siu, N. Y.-M. and Mou, J. C.-W. (2005). Measuring service quality in internet banking: the case of hong kong. *Journal of International Consumer Marketing*, 17(4):99–116.

Square, L. (2013). Investigating the impact of service quality on consumer's intention to use mobile banking.

Straub, D., Boudreau, M.-C., and Gefen, D. (2004). Validation guidelines for is positivist research. *Communications of the Association for Information systems*, 13(1):24.

Streiner, D. L., Norman, G. R., and Cairney, J. (2015). *Health measurement scales: a practical guide to their development and use*. Oxford University Press, USA.

Swaid, S. I. and Wigand, R. T. (2009). Measuring the quality of e-service: Scale development and initial validation. *Journal of Electronic Commerce Research*, 10(1):13–28.

Taap, M. A., Chong, S. C., Kumar, M., and Fong, T. K. (2011). Measuring service quality of conventional and islamic banks: a comparative analysis. *International Journal of Quality & Reliability Management*, 28(8):822–840.

Taherdoost, H. (2016). Validity and reliability of the research instrument; how to test the validation of a questionnaire/survey in a research. *International Journal of Academic Research in Management (IJARM)*, 5(3):28–36.

Tam, C. and Oliveira, T. (2016). Understanding the impact of m-banking on individual performance: Delone & mclean and ttf perspective. *Computers in Human Behavior*, 61:233–244.

Tam, C. and Oliveira, T. (2017). Understanding mobile banking individual performance: The delone & mclean model and the moderating effects of individual culture. *Internet Research*, 27(3):538–562.

Tavakol, M. and Dennick, R. (2011). Making sense of cronbach's alpha. *International journal of medical education*, 2:53.

Tee, D. K., Preko, A., and Tee, E. (2018). Understanding the relationships between service quality, customer satisfaction and loyalty: An investigation of ghana's retail banking sector. *British Journal of Marketing Studies*, 6(2):1–19.

Toor, A., Hunain, M., Hussain, T., Ali, S., and Shahid, A. (2016). The impact of e-banking on customer satisfaction: Evidence from banking sector of pakistan. *Journal of Business Administration Research*, 5(2):27–40.

Tsai, M.-C., Chien, Y.-Y., and Cheng, C.-C. (2018). Upgrading service quality of mobile banking. *International Journal of Mobile Communications*, 16(1):82–115.

Tse, D. K. and Wilton, P. C. (1988). Models of consumer satisfaction formation: An extension. *Journal of marketing research*, 25(2):204–212.

Tull, D. S. and Hawkins, D. I. (1984). *Marketing research: measurement and method: a text with cases*. Macmillan.

Urbaach, N. and Ahlemann, F. (2010). Structural equa-tion modeling in information systems research using partial least square. *Journal of Information Technology Theory and Application*, 11(2):5–40.

Van der Wal, R., Pampallis, A., and Bond, C. (2002). Service quality in a cellular telecommunications company: a south african experience. *Managing Service Quality: An International Journal*, 12(5):323–335.

Van Dyke, T. P., Kappelman, L. A., and Prybutok, V. R. (1997). Measuring information systems service quality: concerns on the use of the servqual questionnaire. *MIS quarterly*, pages 195–208.

Van Dyke, T. P., Prybutok, V. R., and Kappelman, L. A. (1999). Cautions on the use of the servqual measure to assess the quality of information systems services. *Decision sciences*, 30(3):877–891.

Veríssimo, J. M. C. (2016). Enablers and restrictors of mobile banking app use: A fuzzy set qualitative comparative analysis (fsqca). *Journal of Business Research*, 69(11):5456–5460.

Webb, H. and Webb, L. (2001). Business to consumer electronic commerce website quality: integrating information and service dimensions. *AMCIS 2001 Proceedings*, page 111.

Webb, H. W. and Webb, L. A. (2004). Sitequal: an integrated measure of web site quality. *Journal of Enterprise Information Management*, 17:430–440.

Wirtz, J. and Bateson, J. E. (1995). An experimental investigation of halo effects in satisfaction measures of service attributes. *International Journal of Service Industry Management*, 6(3):84–102.

Wolfinbarger, M. and Gilly, M. C. (2003). etailq: dimensionalizing, measuring and predicting etail quality. *Journal of retailing*, 79(3):183–198.

Wynd, C. A., Schmidt, B., and Schaefer, M. A. (2003). Two quantitative approaches for estimating content validity. *Western journal of nursing research*, 25(5):508–518.

Yang, Z. (2010). *Measuring E-service quality and its linkage to customer loyalty: how to attract and retain online customers?* LAP Lambert Academic Publ.

Yang, Z., Peterson, R. T., and Cai, S. (2003). Services quality dimensions of internet retailing: an exploratory analysis. *Journal of services marketing*, 17(7):685–700.

Yen, H. R. (2005). An attribute-based model of quality satisfaction for internet self-service technology. *The Service Industries Journal*, 25(5):641–659.

Yoo, B. and Donthu, N. (2001). Developing a scale to measure the perceived quality of an internet shopping site (sitequal). *Quarterly journal of electronic commerce*, 2(1):31–45.

Yu, C.-S., Li, C.-K., and Chantatub, W. (2015). Analysis of consumer e-lifestyles and their effects on consumer resistance to using mobile banking: Empirical surveys in thailand and taiwan. *International Journal of Business and Information*, 10(2).

Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. *Journal of marketing*, 52(3):2–22.

Zeithaml, V. A. (2000). Service quality, profitability, and the economic worth of customers: what we know and what we need to learn. *Journal of the academy of marketing science*, 28(1):67–85.

Zeithaml, V. A., Parasuraman, A., and Malhotra, A. (2002). Service quality delivery through web sites: a critical review of extant knowledge. *Journal of the academy of marketing science*, 30(4):362–375.

Zhang, T., Lu, C., and Kizildag, M. (2018). Banking "on-the-go": examining consumers' adoption of mobile banking services. *International Journal of Quality and Service Sciences*, 10(3):279–295.

Zhou, T. (2012a). Examining mobile banking user adoption from the perspectives of trust and flow experience. *Information Technology and Management*, 13(1):27–37.

Zhou, T. (2012b). Understanding users' initial trust in mobile banking: An elaboration likelihood perspective. *Computers in Human Behavior*, 28(4):1518–1525.

Zikmund, W. G., Babin, B. J., Carr, J. C., and Griffin, M. (2010). Business research methods, south western. *Cengage Learning*.