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Original Research

FACTORS AFFECTING THE ADOPTION AND USE OF INTERNET BANKING IN TANZANIA

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Abstract
This paper evaluates the use of Internet banking services in Tanzania. In surveying and evaluating selected bank websites in Tanzania, factors that affect the adoption and usage of Internet banking have been identified. The respondents were drawn from six (6) Banks in Arusha City using convenient and judgmental sampling. 284 surveyed questionnaires were distributed with five (5) instruments and nineteen (19) measurement items; only 275 were completed and collected for further analysis. The population of this study focused on potential bank customers who were internet users. Judgment and convenient sampling were employed to provide the information required. Data was analyzed using a combination of Web Assessment Index and the Structural Equation Model (SEM) method. The findings from surveyed bank websites and SEM show that ease of use, service quality, trust and transactional factors significantly affect the use of internet banking. The obtained findings provide useful insight for bank managers in developing appropriate marketing strategies to meet customer satisfaction and will assist both practitioners and academicians in doing future empirical research to understand better common factors for both users and banks as all of them are key players in the success of internet banking services.

Keyword: Internet banking, Trust, Web Assessment Index, Structural equation modeling (SEM), Service Quality, Transactional, survey

1. INTRODUCTION

With the rapid advancement in information technology (IT) and widespread internet usage, the majority of banks in developing countries introduced mobile banking services. Mobile banking refers to an internet-based facility provided by a bank or other financial institutions, allowing users to conduct financial transactions remotely using a mobile device (Allied Market Research, 2020). Internet banking (IB) as one of mobile banking category, is an instant access to online financial management and as a means of non-cash payment instruments. Internet banking refers to the use of the internet via bank websites as an acquisition for banking services (Nazaritehrani & Mashali, 2020). It includes provisions of traditional banking services such as balance enquiry, printing statements, and banking transactions such as fund transfers to other accounts and bill payments (Aboobucker & Bao, 2018) but also to provide stock trading, exchange rates and interest rates, bill payments, credit card request and investment advice (Miranda *et al.*, 2006), in the centralized banking system database that is web-enabled (Vyas, 2012).

Various Studies found that, with internet banking, banks increases its market share and hence increase profitability, growth, and survival (Khan, Ahmad, & Chan, 2018). Banks and financial organizations strive to grow and to survive in a competitive environment (Nazaritehrani & Mashali, 2020) in this era of technological advancement. Banks with lower market share also see the Internet banking technology as a means to increase the market share by attracting more and more customers through this new channel of delivery (Malhotra & Singh, 2007). Therefore, huge efforts are required to get an in-depth understanding about the ways and means to develop internet banking in developing countries (Bhat & Tariq, 2020).

Many countries, banks have been moving from conventional banking services to electronic distribution channel banking (Banan, 2010) without diminishing the existing service level (Akinci *et al.*, 2004). Reasons for introducing IB into the banking industry includes: reducing

operation costs and gaining competitive advantage over competitors (Hashim & Chaker, 2008), retaining existing customers as well as attracting new ones to the banking services (Bhat & Tariq, 2020). Additionally, it increases market penetration, survival in business (Laudon & Laudon, 2009), improvement in customer service, easy access of account information and performing various transactions securely and conveniently among others (Rahi & Abd-Ghani, 2019). In general, as pertains to customers, there is increase in service availability, convenience, flexibility, ease of transactions, customer commitment, reduction in customer visits to the banks and hence an opportunity for a customer to get bank services anytime and anywhere in the world. In case of banks, it increases service quality, customer satisfaction, and market share, improving customer services and reducing costs in service.

Globally, the internet penetration rate reached 65.6 % percent with 5.16 billion internet users worldwide as of march 2021 (Internet World Stats, 2021). In Tanzania, internet penetration rate was estimated to reach 29.1 Million in March 2021. This has been increased from 26.83 Million in March 2020 (Communications Regulatory Authority (TCRA), 2021). The increase usage is due to the facts that, mobile phone is the primary channel for accessing the internet (GSMA Association, 2121). With the increase of internet usage, the global mobile banking market was valued at $715.3 million in 2018 and is expected to reach $1,824.7 million by 2026(Allied Market Research, 2020).

Despite the continuous growth of internet usage and its potential benefits of internet banking for customers, internet banking are not fully utilized and remained to be unnoticed by many customers, and no known study has been conducted to reveal the reasons for the customers' low rate of internet banking adoption in Tanzania (Kessy, 2021). Further, the growth adoption rate is still a big challenge with little contribution to countries economy (Rahi & Abd-Ghani, 2019; Aboobucker & Bao, 2018). For example, in Tanzania, by November 2019, internet banking transaction volume, reached 372,831 out of 5,110,307 of the total volume of transaction in mobile banking usage. This shows that, the volume contributed only 7 % (BOT, 2019) which data prove that the country's adoption rate is very minimal. In this regard, there is a still need of more studies to investigate the slow rate on the adoption of internet banking to the bank customers.

The successful use of internet banking depends on how the customer understands the system (Sepasgozar *et al.,* 2020). It is very crucial to understand why internet banking adoption and diffusion in developing countries such as Tanzania is still minimal (Kessy, 2021). To fill this gap, therefore, this study aims to evaluate internet banking web service technology and investigate critical factors for key players in the adoption of internet banking in Tanzanian for selected banks. Understanding and assessing the use and adoption of internet banking services will help bank managers to come up with a right solution to improve internet banking service, increase the rate of internet banking usage to customers, and hence allow banks in achieving their goals on the internet banking implementation. Additionally, it will explore various areas of future research and contributes to the theory and practice within the domain of internet banking usage in the context of developing countries such as Tanzania.

2. LITERATURE REVIEW

The research hypothesis and proposed conceptual model were developed from previous empirical studies and theories. Theories on the use of internet banking services and the internet banking services Web Assessment Evaluation were modified to suit the internet banking service context of this study. The following sections hereunder are the theoretical models and empirical studies used for the development of conceptual model in this study.

Theories on Technology Acceptance Models

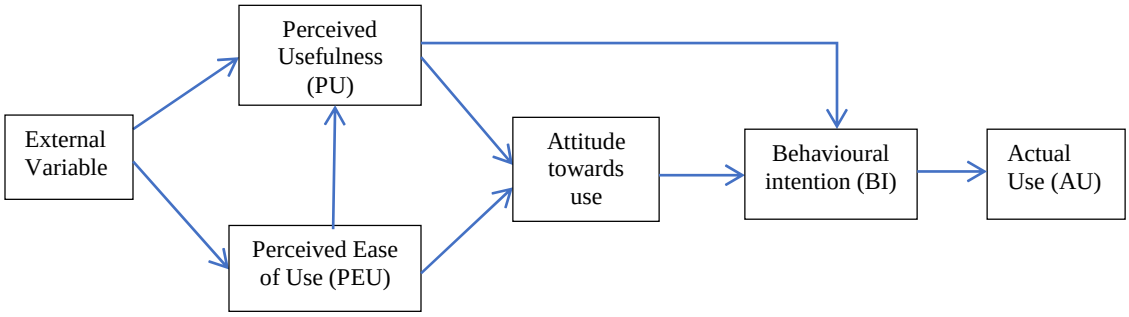
Customers' decision to accept or reject new information technology such as internet banking services may be influenced by numerous factors. Among such factors are availability of technology, service quality, transaction costs, ease and usefulness of services, convenience, website trust e.t.c (Kessy, 2021, Sepasgozar et al., 2020; Bhat & Tariq, 2020; Mansour, 2016; Chiou & Shen, 2012). Globally, many theories and models have been developed to investigate determinants that influence consumers' acceptance and their intention to use new technologies. These theories and models are named to be traditional frameworks (Taherdoost, 2018). Many researchers have used these to validate their researches and others have used to combine to come up with extended models (Taherdoost, 2018). Among well-known traditional theories are Theory of Diffusion of Innovations developed by Rogers(1962) which is one of the oldest social science theories, the Theory of Reasonable Action (Fishbein & Ajzen, 1975), the Technology Acceptance Model (Davis, 1989), Theory of Planned Behavior (Ajzen, 1991), the Theory of Task-technology fit (Goodhue & Thompson, 1995), Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, and Davis, 2003), DeLone and Mclean's IS Success Model(DeLone and Mclean, 2003).

It has been noted that, more than one theoretical approach is required for complete understanding and clarity to determine the variables in total (Taherdoost, 2018). Therefore, this study utilized two well-known theories, namely the tradition Technology Acceptance Model (Davis, 1989) and the updated Information System Success Model (ISS)(DeLone and McLean, 2003). This is because, the study aimed at evaluation and investigating technical features and the quality rather than social influence to account the overall success of internet banking services. Combining these theories together would give more insight of investigation of internet banking services.

Technology Acceptance Model (Davis, Bogozzi & Warshaw, 1989)

This theory has been widely used and cited in many technology adoptions studies. The theory found that Perceived Usefulness (PU) and Perceived Ease of Use (PEU) are the critical factors for predicting of new technology adoption. PU is defined as the degree to which a person believes that using a particular system (e.g: internet banking services) would enhance his or her job performance while PEU refers to the degree to which a person believes that using a particular system would be free of effort. TAM is a valid and robust model with applications in a wide range of different disciplines such as decisions sciences, management sciences, information technology and management information systems (Halawi &McCarthy, 2006).

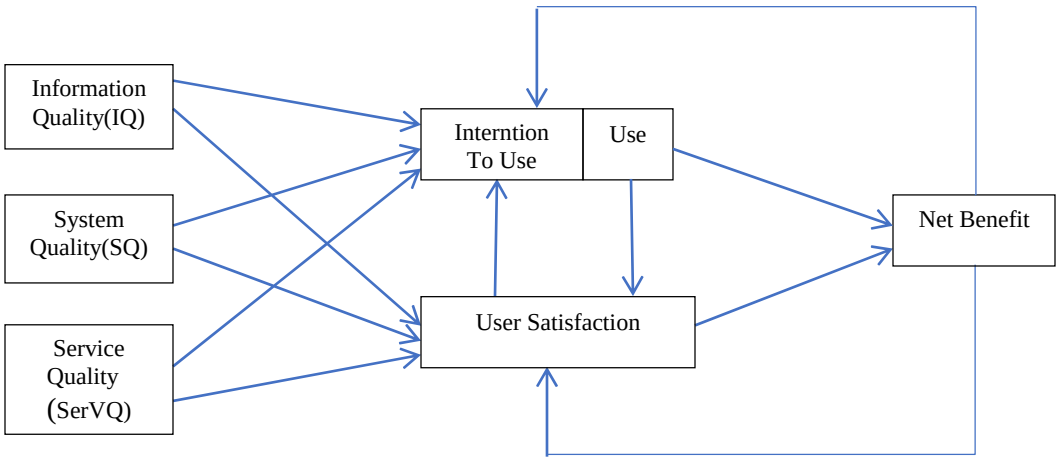
Figure 1: Technology Acceptance Model



Source: Davis, Bogozzi & Warshaw, 1989

The Updated Information System Success Model (ISS) (DeLone and McLean, 2003)
The updated ISS Model consists of six interrelated dimensions of information systems success: System quality (SQ), Information quality (IQ), Service quality (SerVQ), Use, intention to use User satisfaction, and Net benefits as depicted in fig 2 below. The model explains that SQ, IQ and SerVQ all affect the intention to use the system and User satisfaction. The system USE can affect the degree of user satisfaction either positively or negatively. The system Use and user satisfaction are the determinants for the organisation to realize the net benefits of the system (e.g: internet banking services). Therefore, this study utilised SQ as the one determinant of the customer acceptance and use of internet banking services

Figure 2: Updated D&M IS Success Model



Source: DeLone and McLean, 2003

Theories on Web Assessment Evaluation
Various theoretical frameworks have been developed in measuring and evaluating general-purpose websites (Chmielarz & Zborowski, 2020). The adoption and usage of internet banking services depend on several criteria or factors. Among these factors are usability, functionality, visualization, reliability and trust, availability and quality (). The determinants of web site quality are accessibility, speed, contents and Navigability (Diniz *et al*., 2005; Miranda *et al.*, 2006). Chung and Payter(2002) on evaluation of internet banking in New Zealand, came up

with tailored Hersey's model which added legal disclaimer, privacy policy and security policy. This study used only components that was seems to be critical components for the banking industry. The table 1 below summarizes critical factors for evaluation of internet banking web site services.

Table 1: Derived Components and Element of Web Assessment Index (WAI)

Components	**Elements**	**Components**	**Elements**
Trust (TR)	Legal Disclaimer	Ease of Use (EOU)	Frequently asked questions (FAQs)
	Privacy policy		Search functions
	Security policy		Help functions
	Change of Password		Tutorial/Demonstration
	Use of Encryption for transaction		Navigation Menu/buttons
Transactional Factor (TC)	Check account balance	Service Quality (SQ)	Update frequency(daily)
	Transfer funds		Response time (within 5 seconds)
	Check bank statements		Download time (within 10 second)
	Online Tax Payment		free from technical problems
	Download account information		Innovation features
	Make bill payment		After sale services (e.g. email, telephone, address enquiries)
	Order cheque or deposit book		Competitions / rewards
	Cheque reconciliation		Community contribution
	Loan Application		

Source: Adapted from Diniz *et al.*, 2005; Chung and Payter, 2002; Miranda *et al*., 2006

Empirical Literature Review

Ease of Use (EOU): Ease of use is the key factor that promotes customer use of internet banking. Several studies found that EOU influences customer intention to use internet banking (Sepasgozar *et al.*, 2020; Bhat & Tariq, 2020; Mansour, 2016; Chiou & Shen, 2012). Perceived ease of use is the degree in which for someone to use a particular technology, would not incur cost, not be difficult to understand, and require little effort to learn or operate (Rogers, 1983; Davis, 1989; Zeithaml, 2002). A study conducted by Al-Hajri (2008) on the use and adoption of internet banking, observed four perception issues among others was ease of use. According to Hersey's tailored model (Chung & Paynter, 2002), the items that need to be assessed for ease of use using a website assessment index are Frequently Asked Question (FAQ), Tutorial/Demonstration, search function, help function, navigation menu/buttons.

H1: *Ease of use has a significant influence on customers to adopt and use internet banking*

Trust (TR): The trust in transactions is one of the most critical factors that influence the use and adoption of internet banking. Trust is one of the drivers of clients' attraction to use internet banking (Skvarciany & Jurevi˘ciene, 2018). TR defines the customer's confidence to get internet banking services as expected (Bashir & Madhavaiah, 2014). Trust of internet banking service is a wider concept than security (Bhat & Tariq, 2020). TR includes privacy, safety, security, reliability, reputation mechanisms and assurance (Yu *et al.*, 2015, Zhu, 2015). Despite the benefits of internet banking, many customers do not use online banking because of the lack of safety and security of services (Hashim & Chaker, 2008). No internet banking service will succeed without trust proper mechanisms to keep the transactions more secure. Individuals fear

providing sensitive information such as financial details on the Internet, as a result of security and privacy defects and distrust of dealing less scrupulous service providers (Lichtenstin& Williamson. 2006). Essentially, the banks must provide various mechanisms to maintain privacy, security, reliability and assurance with their online banking clients. The banks are required to improve security and privacy functions in INTERNET BANKING that will safeguard customers' personal information and prevent fake web sites at the lowest costs for customers (Bhat & Tariq, 2020).

H2: *Trust has a significant influence on customers to adopt and use internet banking*

Service Quality (SQ): Service quality can be defined and measured in several ways. This study defines the service quality as a customer's satisfaction using internet banking service (Parasuraman *et al.*, 1988; Singh, 2019). Haque (2009) found that service quality is the most important variable in expansion and strengthening the operations of internet banking. Banks have introduced internet banking to improve customer service (Rahi & Abd-Ghani, 2019). Service quality includes Access speed, Update of information frequency (daily), page response time, download time, free from technical problems, Innovation features, after sales services using email email, telephone and address enquiries, competitions / rewards and community contribution (Miranda *et al*., 2006; Chung and Payter,2002)

H3: *Service quality has a significant influence on customers to adopt and use internet banking*

Transactional factors: Internet banking significantly reduces operational and fixed costs to both customers and banks (Onay & Ozsoz, 2013). Customers may transfer and receive funds with other people if the transaction cost is affordable and cost saving (Jolly, 2016). Internet banking is the solution for the enhancement of efficiency and the lowering of bank costs (Stoica *et al.,* 2015). The transactional contents that are found in each internet banking websites can include check account balance, transfer funds between accounts, check bank statement, purchase bank product (e.g. open an account, shares), download account information, make payment, Order cheque or deposit book, Request loan changes, Cheque reconciliation, interest rates(Miranda *et al*., 2006; Chung and Payter,2002)

H4: *Transactional factors have a significant influence on customers to adopt and use internet banking*

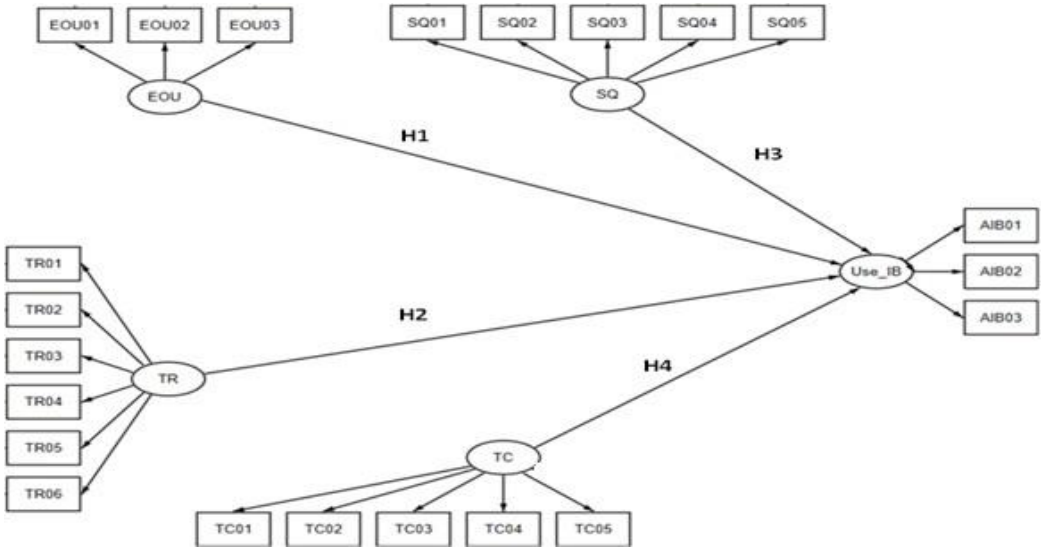
Table 2: Construct and Measurement Item

Construct	Literature	Item Code	Description of Measurement Item
EOU	Sepasgozar *et al.*, 2020; Bhat & Tariq, 2020; Mansour, 2016; Chiou & Shen, 2012; Chung & Paynter, 2002; Al-Hajri, 2008; Rogers, 1983; Davis, 1989; Zeithaml, 2002	EOU01	I have no problem using internet banking since it is friendly, clear and makes me want to use
		EOU02	I can use internet banking without help and have more access to more services
		EOU03	Using internet banking I find it easy to do what I want to
SQ	Miranda *et al*., 2006; Chung and Payter,2002;	SQ01	I use internet banking because I can get prompt support 24-7 without problems.

	Haque, 2009; Rahi & Abd-Ghani, 2019; Parasuraman *et al.*, 1988; Singh, 2019	SQ02	The internet banking staff have adequate knowledge to help me when I experience any problems with the internet banking services
		SQ04	Internet banking services is Real time, suitable and appropriate to use
		SQ05	I can get urgent Services by Support staff when I send money to wrong recipient
TR	Skvarciany & Jurevi˘ciene, 2018 Bashir & Madhavaiah, 2014 Bhat & Tariq, 2020 Yu *et al.*, 2015, Zhu, 2015 Hashim & Chaker, 2008 Lichtenstin& Williamson. 2006 Bhat & Tariq, 2020	TR01	I believe that internet banking is trustworthy
		TR02	I receive confirmation SMS every time I use the service
		TR04	Every time I use internet banking service, I must provide a transaction password
		TR05	There are no uncertainties that my money will be received by unintended recipient when using internet banking
		TR06	I do not have fear of accessing internet banking due to loss of PIN codes, hacking and loss of personal information
TC	Onay & Ozsoz, 2013; Jolly, 2016 Miranda *et al*., 2006; Chung and Payter,2002 *al.*, 2015 Stoica *et al.*, 2015	TC01	I do not have fear of losing my money while I make a transfer due to network errors using internet banking
		TC02	The fee charges I incur in using internet banking service is reasonable and affordable
		TC03	Internet banking is beneficial to me since I can do more transactions
		TC04	I can complete transactions faster and shorten transaction times using internet banking
		TC05	At the current price, internet banking provides good value.
Adoption of Internet Banking (AIB)		AIB01	I intend to use internet banking services in the next months
		AIB02	I plan to use internet banking frequently
		AIB03	I will always try to use internet banking in my daily life

Source: adapted from various research findings

Figure 3: Hypotheses and Proposed Conceptual Model of the study



Source: adapted from various research findings

3. Methodology

This study utilises two strategies to evaluate the use and adoption of internet banking services. The first part of the study was to evaluate internet banking web sites using a Web Assessment Index (WAI). The second part of the study was a survey to obtain customers' perceptions regarding internet banking. The setting for the study was in Arusha, Tanzania, a developing country in East Africa.

3.1 Internet banking Web sites assessment

The first part, internet banking web service technology, was surveyed and evaluated using Web Assessment Index (WAI). The criteria for evaluation were obtained from the analysis of previous studies (Chung and Payter, 2002; Diniz *et al.*, 2005; Miranda *et al*., 2006). All criteria were quantified in an objective and logical way to avoid subjectivity (Miranda *et al*., 2006). Further, the study took only main factors that seemed to be more essential in evaluation of internet banking services. A score of one was assigned for the presence of the item and zero for the absence of the item (Chung and Payter, 2002)

Only six (6) Banks were conveniently and judgmentally surveyed and evaluated. These banks were chosen as they have branches in Arusha and operate internet banking services. These banks are: CRDB Plc, NMB Bank Plc, Stanbic Bank, Exim Bank and Standard Chartered. The study used categories (instruments), factors (items), ratings and total score as a web assessment tool (Miranda *et al.,* 2006).

3.2 Type of Data and Data collection

The second part was to obtain customers 'perceptions regarding internet banking services in Tanzania. The structured questionnaire was designed as an instrument for data collection. All instruments and items for the questionnaire was derived from literature review based on the adoption and use of internet banking services (Sepasgozar *et al.,* 2020; Miranda *et al*., 2006; Chung and Payter, 2002; Vukovic *et al.,* 2019; Sudarsono *et al.,* 2020) and seems to be preferable and most relevant based on the research goal (Fan *et al.,* 2016). A five-point Likert scale 1=strongly disagree to 5=strongly agree was used (Likert, 1932), and questionnaires were physically distributed to customers who were clients from selected sampled banks, and seemed to be familiar with using internet access through their mobile phone or actual users of internet banking services. Using Likert-scale questionnaires, data can be gathered relatively quickly from large numbers of respondents to provide highly reliable person ability estimates and is commonly used in most technology acceptance surveys (Sepasgozar *et al.,* 2020; Nemoto & Beglar, 2014). The collection of data was by direct contact with the targeted respondents at the bank branches.

3.3 Sampling Technique and Sample Size

The population of this study focused on bank customers who were internet users. Judgment and convenient sampling were employed to provide the information required. The respondents were chosen from selected bank branches in Arusha City Council. This is because, the researcher lives in Arusha, therefore it was easier and convenient to reach the target respondents. The banks were chosen as they have internet banking services. Since the population of users of internet banking services are unknown, the number of sample sizes was determined based on the two type of data analysis technique. Firstly, Since this study used SEM and many of the fit indices in SEM are affected by sample size (Civelek, 2018), some researchers suggest that the sample

size should be from 30 to 460 (Wolf et al., 2013) or at least 10 times the number of measurement items that can be estimated in the model (Jayaram *et al.*, 2004). Secondly, since this study had nineteen (19) measurement items, therefore, the minimum sample size of 50+ 8K is required, where K is the number of predictors. 240 questionnaires were distributed to the respondents. The researcher also added 10% to the sample size to compensate for respondents that were unable to be reached (Israel, 2013). Out of 284 distributed questionnaires, only 275 were completed and collected for further analysis.

3.4 Pilot study

A pilot study was conducted to validate the designed questionnaire. About 35 questionnaires were given to experts who are using internet banking. Those experts were requested to see whether the questionnaire given was easy to complete, straightforward and questions make sense (Rowley, 2014). Out of 35 questionnaires distributed, only 25 have been returned. All raised concerns from the experts, were adjusted and incorporated to make sure that questionnaire is well understandable and does not consume too much time in filling it.

3.5 Data treatment and analysis

Structural Equation Modeling (SEM) technique was used to examine causal effects among variables. SEM allows researchers to examine both measurement items and latent constructs with a single model (Civelek, 2018). Further, it assesses the degree to which the data fits the specified model and provides a comprehensive statistical approach for testing existing hypotheses (Hoyle, 1995). SEM consists of two basic components: a structural model and measurement model. The first step was to choose constructs those categories for critical web site evaluation. The constructs in the structural model for evaluating internet banking web sites were broadly categorized into four (4): Ease of Use, Service Quality, Trust, and Transactional Factor with a total of twenty-four (24) measurement items. Data was treated based on the assumption that, in SEM, data need to be normally distributed, linear, absence of outliers and missing data (Civelek, 2018).

4. Findings

Under this section, bank websites for internet banking services has been evaluated using modified web assessment index and Structural Equation Modeling. The following below are the key findings: -

4.1 Internet banking Web sites assessment

The evaluations of websites for internet banking services reveal that there was no such a big difference in TR, TC, EOU and SQ banks as shown in Table 4.1 below. The actual banks names have been given letter (i.e A, B, C, D, E, F) for the purpose of preserving confidentiality. As table 4.1 below, it shows the total score of each bank vertically and the total score of each component element horizontally. This study found that some of the banks lack elements such as security policy statement, Cheque reconciliation, download of account information, Tutorial/Demonstration, and Update frequency (daily) on which they got a zero (0) score (i.e. 0%). Bank A, B and F bank websites appear to have a high percentage (i.e. 83%) while bank B and E has a low percentage (i.e. 68%). This implies that users of Banks A, B and F can find what they want quicker and do what they want easier as well, hence improving user confidence in using the bank website.

However, all surveyed banks put more emphasis on TR and TC, of which they scored high. This is because they are very essential components in internet banking services. Banks should pay attention to improving updating frequency (daily), Download account information, frequently asked questions (FAQs), after sale services (e.g. email enquiries) and order of cheque or deposit books and Online Loan Application.

Table 4.1: Website Assessment for internet banking services

Components	Elements	BANKS						Total Score per Element	% score per Element
		A	B	C	D	E	F		
TR	Legal Disclaimer	1	1	1	1	1	1	6	100%
	Privacy policy	1	1	1	1	1	1	6	100%
	Security policy	1	1	1	1	0	1	5	83%
	Change of Password	1	1	1	1	1	1	6	100%
	Use of Encryption for transaction	1	1	1	1	1	1	6	100%
	Score	5	5	5	5	4	5	29	97%
	% score	100%	100%	100%	100%	80%	100%	97%	
TC	Check account balance	1	1	1	1	1	1	6	100%
	Transfer funds	1	1	1	1	1	1	6	100%
	Check bank statements	1	1	1	1	1	1	6	100%
	Online Tax Payment	1	0	1	1	1	1	5	83%
	Download account information	1	1	0	0	1	1	4	67%
	Make bill payment	1	1	1	1	1	1	6	100%
	Order cheque or deposit book	1	1	0	0	0	1	3	50%
	Cheque reconciliation	0	0	0	0	0	0	0	0%
	Online Loan Application	1	0	0	0	0	0	1	17%
	Score	8	6	5	5	6	7	37	69%
	% score	78%	44%	56%	56%	67%	89%	69%	
EOU	Frequently asked questions (FAQs)	1	1	0	1	0	0	3	50%
	Search functions	1	1	1	1	1	1	6	100%
	Help functions	1	1	1	1	1	1	6	100%
	Tutorial / Demonstration	0	1	0	0	0	0	1	17%
	Navigation Menu/buttons	1	1	1	1	1	1	6	100%
	Score	4	5	3	4	3	3	22	73%
	% score	60%	0%	20%	40%	20%	20%	73%	
SQ	Update frequency (daily)	0	1	0	0	0	0	1	17%
	Response time (within 5 seconds)	1	1	0	1	1	1	5	83%
	Download time (within 10 second)	1	0	1	1	1	1	5	83%
	free from technical problems	1	1	1	1	1	1	1	0%
	Innovation features	1	1	1	0	0	1	3	50%
	After sale services (e.g. email, telephone, address enquiries)	1	1	1	1	1	1	1	100%
	Score	5	5	4	4	4	5	16	53%
	% score	83%	83%	67%	67%	67%	83%	44%	
Total number of presences		22	21	17	18	17	20	104	
Score for each bank in percentage		88%	84%	68%	72%	68%	80%	80%	

Source: This research finding

4.2 Structural Equation Modeling (SEM)

Structural equation modeling (SEM) was employed as a technique for data analysis. SEM is used to establish causal relationship among dependent and independent variables. Using SEM, measurement model is analysed to assess the reliability and validity of the construct and measurement of items. Thereafter, hypotheses were tested through structural model. The following sections are the summaries.

4.2.1 Reliability and Validity of constructs and measurement items

The evidence of validity and reliability are prerequisites to assure the integrity and quality of measurement instruments (Kimberlin & Winterstein, 2008). It is a mandatory requirement for all types of research with formulated theoretical hypotheses (Oliver, 2010). Validity is the extent to which any measuring instrument measures what it is intended to measure (Thatcher, 2010). Validity is the extent to which the interpretations of the results of a test are warranted (Kimberlin & Winterstein, 2008). Reliability measures consistency, accuracy, precision, repeatability, and trustworthiness of research results (Chakrabartty, 2013). The result of a researcher is considered reliable if consistent results have been obtained in identical situations but different circumstances (Haradhan, 2017) and reproduced the same results under a similar methodology (Joppe, 2000).

4.2.2 Reliability and Validity of the Measurements Items

Before data interpretation for meaningfully, using Structural Equation Modelling (SEM) with the aid of STATA software using the maximum likelihood estimation method. The study used Confirmatory Factor Analysis (CFA) to estimate whether all derived measurement items can be reduced into a smaller number, so as to measure the same construct, stastically significance and adequate model fit to the data for further analysis (Anderson & Gerbing, 1988). The cut-off point for loading factors in study was recommended to be 0.5 or greater (Chin, 1998; Henseler, Ringle, & Sinkovics, 2009; Churchill, 1979; Mitchell & Jolley, 2010) and that every item loading less than 0.5 was reexamined or dropped. Further, each construct has been measured by using more than one item to capture the complete meaning of the internet banking services (Zikmund & Babin, 2010).

Table 4.2: Factors Loading for Modified Measurement Item

Construct	Item Code	Description of Measurement Item	Loading Factors
EOU	EOU01	I have no problem using internet banking since it is friendly, clear and makes me want to use	0.912
	EOU02	I can use internet banking without help and have more access to more services	0.863
	EOU03	Using internet banking I find it easy to do what I want to	0.780
SQ	SQ01	I use internet banking because I can get prompt support 24-7 without problems.	0.891
	SQ02	The internet banking staff have adequate knowledge to help me when I experience any problems with the internet banking services	0.867
	SQ04	Internet banking services is Real time, suitable and appropriate to use	0.874
	SQ05	I can get urgent Services by Support staff when I send money to wrong recipient using internet banking	0.641
TR	TR01	I believe that internet banking is trustworthy	0.865
	TR02	I receive confirmation SMS every time I use the internet banking service	0.718

	TR04	Every time I use internet banking service, I must provide a transaction password	0.748
	TR05	There are no uncertainties that my money will be received by unintended recipient	0.812
	TR06	I do not have fear of accessing internet banking due to loss of PIN codes, hacking and loss of personal information	0.971
TC	TC01	I do not have fear of losing my money while I make a transfer due to network errors	0.648
	TC02	The fee charges I incur in using internet banking service is reasonable and affordable	0.733
	TC03	Internet banking is beneficial to me since I can do more transactions	0.861
	TC04	I can complete transactions faster and shorten transaction times using internet banking	0.912
	TC05	At the current price, internet banking provides good value.	0.834
Adoption of INTERNET BANKING(AIB)	AIB01	I intend to use internet banking services in the next months	0.712
	AIB02	I plan to use internet banking frequently	0.850
	AIB03	I will always try to use internet banking in my daily life	0.706

Source: This research finding

If all items measure the same thing, they must have the same variable in common (Bernard, 2006). All the remaining items factor loadings were higher than the recommended cut-point of 0.50 as shown in table 4.2, and therefore, statistically significant, valid, reliable and distinct from each other, and thus allowed the researchers to proceed with the model fit and testing for hypotheses (Bordens & Abbott, 2011).

4.3 Reliability and Validity of the Constructs

Constructs for measurement models were tested for validity and reliability before testing the hypothesized relationships as recommended by Anderson & Gerbing(1988) and Hair Jr, *et al.*, (2014).

4.3.1 Construct Reliability

To measure the reliability of the constructs, two tests were used. As the study employed quantitative data, Cronbach's alpha (CA) and Composite Reliability (CR) were recommended to assess reliability of constructs (Keith, 2018; Henseler *et al.*, 2009) as shown in table 4.2. Cronbach's alpha coefficient was used to calculate internal consistency reliability, that is, how closely related a set of items are as a group intended to measure the same variable, while composite reliability was used to measure the overall reliability of a collection of heterogeneous but similar items (Fornell & Larcker, 1981; Cronbach & Shavelson,2004). This study adopted a cut-off value for CA and CR to be 0.70 or greater as recommended by many scholars (Straub, 1989; Hair *et al.*, 2017; Fornell & Larcker, 1981).

Table 4.2: Constructs Reliability

Hypothesis No.	Construct	No. of Measurement Items	Cronbach's Alpha(α) (CA)	Composite Reliability (CR)
H1	EOU	4	0.901	0.921
H2	SQ	5	0.786	0.870
H3	TR	3	0.824	0.991
H4	TC	3	0.775	0.871
H5	AIB	3	0.881	0.925

Source: This research finding

As shown in Table 3.2, the values of CA ranged from 0.775(NA) to 0.901(EU) while CR ranged from 0.870(SQ) to 0.991(TR). Both CA and CR for all constructs were found to be greater than the recommended cut-off value of 0.70. Therefore, based on these results, it can be confirmed that the reliability of the constructs of the measurement model has satisfactorily fulfilled the requirements and thus qualified for further analysis.

4.3.2 Validity of Constructs

To ascertain the degree of validity, this study employed two types of validity namely convergent and discriminant validity. Convergent validity refers to the degree to which two measures of constructs that theoretically should be related, are in fact related (Hair *et al.,* 2013) or is the degree to which constructs meet in measuring the concept of the construct (Bagozzi *et al.*, 1991). Discriminant validity refers to the degree to which a set of constructs can be different from other constructs and measure distinct concepts (Fornell & Larcker, 1981). It is the lack of a relationship among measures which theoretically should not be related (Messick, 1995). The convergent and discriminant validity were established through estimation of Maximum-Shared Variance (MSV), Average-Shared Variance (ASV), the Average Variance Extracted (AVE) and the Square root of AVE (Hair *et al.*, 2013). AVE was used as the criterion to test convergent validity. The cut-off score was recommended to be 0.5 or above and statistically significant with the *p-value* less than 0.001 (Fornell & Larcker, 1981; Hair *et al.*, 2017; Henseler *et al.*, 2009). For discriminant validity, both the MSV and ASV should be less than the AVE (Hair *et al.*, 2017; Fornell and Larcker, 1981) and the square root of AVE should be higher than the inter-correlation estimates with other corresponding constructs (Chin, 1998; Fornell & Larcker, 1981). As summarised in table 3.3 from the AMOS output file, all constructs for AVE were found to be greater than the cut-off value of 0.5, which achieved convergent validity. Moreover, Both the MSV and ASV of constructs were found to be less than the AVE and and the square root of AVE were again higher than corresponding MSV and ASV, which establish that every construct is discriminant.

Table 4.3: Construct Validity

Hypothesis No.	Construct	Maximum Shared Variance (MSV)	Average Shared Variance (ASV)	Average-Extracted Variance (AVE)	Square root of AVE
H1	EOU	0.403	0.427	0.772	0.596
H2	SQ	0.391	0.461	0.862	0.743
H3	TR	0.478	0.345	0.719	0.517
H4	TC	0.351	0.411	0.878	0.771
H5	AIB	0.472	0.360	0.773	0.598

Source: This research finding

4.4 Findings from SEM

Since results of the final CFA depicted acceptable model fit, then structural model fit and hypotheses testing were then examined

4.4.1. Structural Model Fit

The model fit explains whether the developed model can be accepted or rejected (Civelek, 2018) and be considered for interpretations of the path coefficients. This study employed most

commonly fit indices, such as Root Mean Square Error of Approximation (RMSEA), Tucker - Lewis index (TLI), Comparative Fit Index (CFI), and Standardized Root Mean Square Residual (SRMR) to evaluate the compliance of the model. Table 4.4 summarises the output file from STATA program, all the fit indices were found within recommended cut-off value as such: RMSEA = 0.054, CFI =0.947, TLI =0.967, SRMR=0.046

Table 4.4: Fit statistics and model value

Fit Statistic	Model Value	cut-off value	Result
RMSEA	0.054	.06 or below	accepted
CFI	0.920	above .95	accepted
TLI	0.976	above .95	accepted
SRMR	0.046	.08 or below	accepted

Source: This research finding

All model fit indices had adequate fit to data, and therefore, be considered for interpretations of the path coefficients (Civelek, 2018, Hair *et al.*, 2017, Lai, 2018).

4.4.2 Hypotheses testing

As shown from the proposed model in figure 4.1, the following were found based on path coefficients at p-value 0.01:

H1: *Ease of use has a significant influence on customers to adopt and use internet banking*
The outcome of path coefficients of EOU and the use of internet banking service was 0.41 at $p < 0.01$ and β 0.29. This result confirms the significance of relationships. This indicates that EOU statistically positively influences the usage of internet banking service. Thus, H1 has been confirmed.

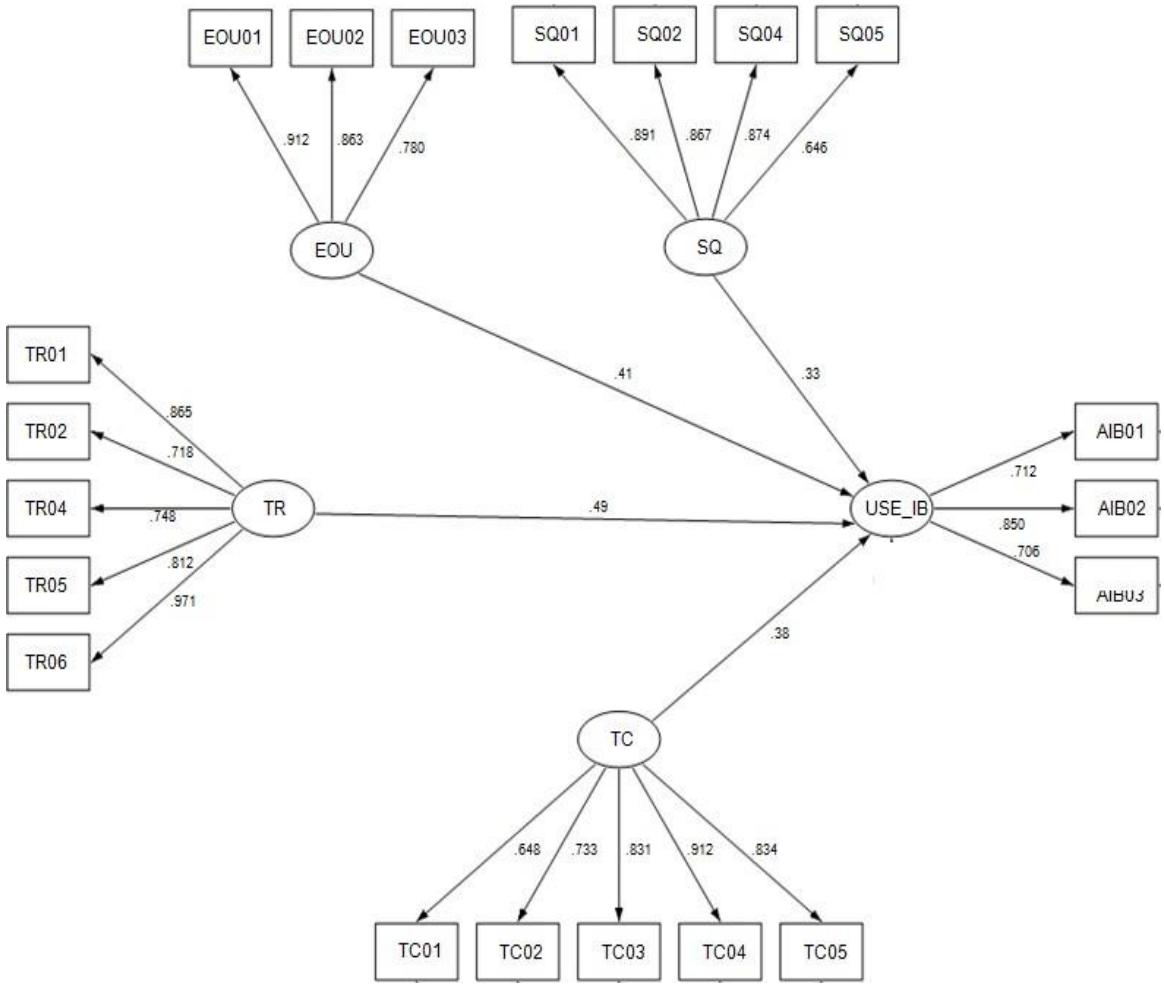
H2: *Trust has a significant influence on customers to adopt and use internet banking*
The outcome of path coefficients for H2 is 0.49 at $p < 0.01$ and β 0.19. Also shows a positive and significant effect between TR and the use of internet banking. So, this hypothesis has been confirmed.

H3: *Service quality has a significant influence on customers to adopt and use internet banking*
The outcome for H3 shows the relationship is meaningful. Path coefficient is 0.33 at $p < 0.01$ and $\beta = 0.37$. This result reflects a positive and significant effect between SQ and the use of internet banking. So, this hypothesis has been confirmed.

H4: *Transactional factors have a significant influence on customers to adopt and use internet banking*

The outcome for H4 also shows that TC is a determinant affecting the use of internet banking services. Path coefficient is 0.53 at $p < 0.01$ and $\beta = 0.17$. This result reflects a positive and significant effect between SQ and the use of internet banking. So, this hypothesis has been confirmed.

Figure 4.1: Structural Path coefficient with factor loading for Items



Source: This research finding

5. Discussion of findings

From the above findings including both survey and evaluation of bank websites, this study has revealed that ease of use, service quality, trust and transactional factor are the strong variables in determining user's acceptance of internet banking services as discussed below: -

5.1 Trust (TR)

Based on evaluation of WAI and SEM, Trust of the internet banking services was the major determinant in influencing people to use internet banking services. People will intend to use internet banking services if it gives them privacy, reliability and assurance of transaction. This result is similar to the study conducted by Skvarciany & Jurevi˘ciene(2018) which observed that, trust is one of the drivers of clients' attraction to use internet banking. Users of internet banking services need privacy, safety, security, reliability, reputation mechanisms and

assurance (Yu *et al.,* 2015, Zhu, 2015) in performing mobile transactions. No internet banking service will succeed without trust proper mechanisms are required to keep the transactions more secure (Bhat & Tariq, 2020). Therefore, bank websites need to strengthen their security mechanisms to make the internet banking services truth worth.

5.2 Ease of Use (EOU):

Ease of use is the key factor that promotes customer use of internet banking. This study confirms a strong impact on relationships between EOU and the usage of internet banking service. In comparison of the results with previous studies, they found that EOU influences customer intention to use internet banking service (Sepasgozar *et al.*, 2020; Bhat & Tariq, 2020; Mansour, 2016; Chiou & Shen, 2012). For example, a study conducted by Al-Hajri (2008) on the use and adoption of internet banking, observed four perception issues among others was ease of use. Chung & Paynter (2002) noted that, bank websites for internet banking services needs to includes the items that need to be assessed for ease of use using a website assessment index are Frequently Asked Question (FAQ), Tutorial / Demonstration, search function, help function, navigation menu/buttons.

5.3 Service Quality (SQ):

Banks have a lot of influence on users to use internet banking service. The study found a positive significant effect between SQ and the use of internet banking. This study is similar to Haque (2009) which found that service quality is the most important variable in expansion and strengthening the operations of internet banking. Banks have introduced internet banking to improve customer service (Rahi & Abd-Ghani, 2019). The evaluation and analysis based on the bank websites reveal that more effort should be made on uploading general bank information in order to attract customers to use their services from websites. Service quality includes Access speed, Update of information frequency (daily), page response time, download time, free from technical problems, Innovation features, after sales services using email, telephone and address enquiries, competitions / rewards and community contribution as found by Miranda *et al*., (2006) and Chung and Payter(2002)

5.4 Transactional factors(TC):

Internet banking significantly reduces operational and fixed costs to both customers and banks (Onay & Ozsoz, 2013). This study confirms that TC is a strong determinant of the use of internet banking services. Result reflects a positive and significant effect between SQ and the use of internet banking. It has been found that customers may transfer and receive funds with other people if the transaction cost is affordable and cost saving (Jolly, 2016). Internet banking is the solution for the enhancement of efficiency and the lowering of bank costs (Stoica *et al.,* 2015). Therefore, transactional contents of each internet banking websites can includes check account balance, transfer funds between accounts, check bank statement, purchase bank product (e.g. open an account, shares), download account information, make payment, Order cheque or deposit book, Request loan changes, Cheque reconciliation, interest rates(Miranda *et al*., 2006; Chung and Payter,2002)

6. Conclusions and Lessons Learned for Future Research

From the above discussions, the findings of this study provide useful insight for bank executive managers and planners to develop appropriate internet banking strategies. This will enable

banked customers in adopting and using internet banking services. To enhance the use of internet banking services, banks need to improve trust for users to use and get satisfaction towards the use of internet banking services (Skvarciany & Jurevi˘ciene, 2018; Yu *et al.*, 2015; Zhu, 2015; Bhat & Tariq, 2020). In addition, both banks need to improve their website to some of the key information such as legal statements, frequently asked questions (FAQs), after sale services (e.g. email enquiries) (Rahi & Abd-Ghani, 2019; Miranda *et al.*, 2006; Chung and Payter; 2002). However, issues like navigation menu/buttons, update frequency (daily) information, innovation features, community contributions and download of account information which seems to be of more importance to the users but receive little attention in design bank websites Sepasgozar *et al.*, 2020; Bhat & Tariq, 2020; Mansour, 2016; Chiou & Shen, 2012.

Since this study was based on the evaluation and assessing the adoption and the use of internet banking services, it is true that the researcher did not investigate other types of mobile money services like mobile phone banking, point of sale devices, telephone banking etc. This study recommended that, in future research, these services should be taken into consideration for future benefit and useful insight for bank executive managers, academicians and practitioners. However, much empirical research should be done among various banks (i.e. Local and Foreign) and among different user groups based on gender, education level, income and location to reveal actual usage of internet banking services in developing countries such as Tanzania. Similarly, issues such as voluntary, mandatory use, online transaction accountability and user support for customers should be taken into consideration for future research. Moreover, it could be of more importance if future research is to be done to see whether there is a causal relationship between digital gap and security issues in relation to users of internet banking services in Tanzania. Also, more emphasis could be put in internet banking and mobile phone banking because these services seem to be new in developing countries such as Tanzania.

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