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ANALYSIS OF USER AUTHENTICATION EXPERIENCE IN ELECTRONIC BANKING: A CASE OF COMMERCIAL BANK CUSTOMERS IN YAOUNDE, CAMEROON

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Abstract

E-Banking is beneficial to both the bank and the bank customers but the authentication methods have posed some security challenges to users of e-banking facilities. It is on this premise that this study is aimed at investigating users' authentication experience in e-banking: A case of commercial bank customers in Yaounde, Cameroon. The study adopted the quantitative method and the philosophical underpinnings of pragmatism epistemology. The research design is deductive and data collection tools were structured questionnaire. The survey involved the head offices of commercial banks in Yaounde. The research was guided by four objectives and hypotheses were tested using the Covariance-Based Structural Equation Model [CB-SEM] with the aid of SPSS 23 and Amos 23 analytical packages. Results from the study revealed that there is significant statistical evidence to suggest that Performance expectancy, Effort expectancy, social influence, and Facilitating conditions have negative effects on the e-banking activities of selected bank customers in Yaounde, Cameroon. Based on the above-mentioned results, this study thus recommends; additional authentication methods that are simple, fast, and seamless to use, improving transparency in terms of security measures, investing in improving network connectivity, simplifying the user interface, and reducing response time to enhance user authentication experience in e-banking.

Keywords: E-banking; Authentication experience; commercial bank customers

Introduction

The advancement in technology changed how financial services are offered and used (Kumar et al., 2022; Soderberg et al., 2022; Adrian, 2021; Malaquias and Hwang, 2019). The rapid growth experienced in Information and Communication Technologies (ICT) last two decades has enabled companies to create value in a digital environment (Schreieck & Wiesche, 2017). This advancement in technologies brought about innovative opportunities that focused more on customers. Electronic banking(e-banking) is a payment system that allows customers to conduct financial transactions over the Internet (Carranza et al., 2021). It offers valued services that created competitive benefits such as checking account balances, paying bills, transfers, and text message notifications (Mostafa, 2020; Khan, 2017).

The use of digital technology, particularly the internet, has become a part of everyday life in society. In 2017, the number of internet users in Indonesia increased to 143.26 million, with 44.16% conducting internet activities using smartphones and 39.28% using a combination of smartphones and computers, and the number of users who use the internet in the economic sector increased by 7.39% (APJII, 2017). Mobile banking is a type of internet-based banking activity model that uses wireless devices, as well as a service that allows bank customers to complete banking transactions through phones such as mobile smartphones. Customers can use this mobile banking service by utilizing the menus on their SIM (Subscriber Identity Module) cards, USSD (Unstructured Supplementary Service Data), or by downloading and installing applications (OJK, 2015). Financial transactions have grown astronomically in both urban and rural areas, particularly in many emerging nations in Asia, thanks to the accessibility and simplicity of cellular connectivity (Misra and Bisht, 2013). Financial technology businesses, who are emerging as new rivals, have an effect on business transactions in the banking sector. The result is a shift in consumer behavior away from customary activities like visiting bank branches and toward digital transaction activities.

Only 17.04% of people utilize mobile banking to make financial transactions, compared to 7.39% of internet users who use banking services (APJII, 2017). But based on data from one bank as of March 2019, from 4.2 million retail banking customers, 18.5% of whom were registered in the mobile banking application, and only 41.4% of whom were actively using it, or 7.7% of all consumers. 1.63 million transactions totaled 1656 billion rupiah in value and 1.63 million transactions were completed. The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) variable was found to have a substantial impact on behavioral intention to use mobile banking in prior studies. According to Gharaibeh et al. (2018), the adoption of mobile banking in Jordan was significantly influenced positively by effort expectancy, performance expectancy, social influence, trust, and the media. In their 2015 study on behavioral intention in mobile banking in Mozambique, Baptista and Oliveira found that experience, hedonic incentive, and effort expectancy all had a significant influence. In addition to the factors of effort expectation, performance expectancy, and social influence, Bhatiasevi (2015) noted that the perception factors of credibility and perceived comfort had a substantial positive impact on behavioral intention to use mobile banking in a country such as Thailand.

In the year 2012, Al-Jabri and Sohail indicated that while risk perception had a negative influence on behavioral intention in mobile banking in Saudi Arabia, the relative profit, compatibility, and observability aspects had a significant positive impact. According to Blaise et al. (2016), the adoption of m-commerce in North America is significantly influenced by performance, expectation efforts, social impact, facility circumstances, perceived trust, and perceived risk. This study differs from earlier studies in that it takes into account the observability, risk perception, and UTAUT2 variables from the Diffusion of Innovation theory. The most important indicator variable for behavioral intention is also examined in this study.

E-banking is used in performing banking activities, without being physically present (Malaquias et al., 2019). It permits consumers to conduct transactions electronically through the Internet (Chong et al., 2010). It is flexible and can be accessed 24/7 from any location (Worku et al., 2016). It is cost-saving and helps customers to compare products and services among banks (Asiyanbi, & Ishola, 2018). Customers easily obtain information from banks' websites about their products, services, and policies (Vaciago et al, 2016). E-banking has added value to several businesses (Baabdullah et al., 2019). Internet services provided opportunities for interaction with companies

that allow consumers to participate in the development and improvement of products and services (Carranza et al., 2021). The strong competition in the banking system has made e-banking the most cutting-edge and self-service distribution channel (Malaquias & Hwang, 2019). Mobile devices and desktops are the tools customers use in e-banking to pay for products and services (Zhang et al., 2018).

Most bank customers find this process of code authentication unacceptable and lose confidence in the entire process because of several login failures and the quick expiration of the generated code (Ibor et al., 2014). Login failure occurs in the event of the expiration of the 30-second count for the user to supply the authentication code (Chen et al., 2022; Wang et al., 2022; Reese et al. 2019). The user is redirected back to the login page at the expiration of the generated code (Ibor et al., 2014). The authentication process is repeated to complete the login session (Ako, & Kim, 2018). In the study case of Cameroon, the bank customers become uninterested due to the process of authentication with the OTP code (Tarhini et al., 2015). Most customers do not want to use online banking apps as they need to enter security codes many times due to constant login failure (Wang et al., 2020; Jibril et al., 2020). They prefer to bank across the counter.

Cameroon is a developing nation. However, security and privacy on e-banking Platforms remain a major problem to positive user experience as most users do not have the required knowledge of e-banking services and the safety measures required (Akogwu S., 2012). Many customers are still not using e-banking services (Chaouali et al., 2016). They are not comfortable with the security features and would rather bank across the counter (Kim & Yi, 2015). This is affecting the adoption of the cashless policy implemented in July 2014 in Cameroon and the CEMAC region by BEAC which is aimed at financial inclusion.

Literature Review

In the last two decades, several banks have integrated e-banking into their banking operations (Ohiani, 2020). In 2013, the European Central Bank (ECB) directed all payment service providers to apply high-level authentication for both Internet payments and gaining access to sensitive banking information. Many banks complied with the ECB directives by implementing high safety measures to safeguard their platform. The Bank of Central African States (BEAC) in 2003 issued electronic banking procedures for electronic payment. Customer experience in e-banking starts from access to services. User experience is the customer's feeling after the use of a product or service. User experience is a continuous process valued by the user in each transaction. A decent experience will affect the bank's value and its services recommended to others. In implementing bank authentication, speed and convenience for the user should be considered. Users want their security to be guaranteed and data protected.

One of the most significant strategic developments to affect retail banking in more than a decade is mobile banking (m-banking). The banking sector may now thrill its consumers by providing immediate solutions to their difficulties through the use of self-service technology thanks to changes in technological interfaces. The financial sector now provides its clients with a wide choice of channel services, including traditional branch services, automated teller machines (ABMS), telephone banking, internet banking, and mobile banking. Customers can use Internet banking to carry out financial activities such as account transfers, bill payments, stock exchange transactions, and other financial services on a secure website provided by the financial institution. This website is often accessed through a laptop device or desktop personal computer (PC) (Shaikh

and Karjaluoto, 2015). For banks to supply goods and services to their consumers, internet banking and m-banking are frequently seen as two comparable alternative self-service channels (Thakur, 2014). Self-service technology can provide extra benefits including cost savings and cross-selling opportunities; thus, many banks are encouraging their customers to embrace it (Sharma et al., 2015; Sharma and Govindaluri, 2014; Hoehle and Huff, 2012; Al-Somali et al., 2009). The interaction between banks and their clients is improved by the availability of various multi-channel services and products (Laukkanen, 2007). Due to these factors, the body of study on e-commerce is extensive, and its influence on the financial sector is expanding as well. The bulk of studies looking at m-banking, the newest channel in the financial sector, concentrate on adoption. The majority of empirical m-banking studies aim to comprehend the variables and drivers that affect adoption or behavioral intention (Baptista &Oliveira, 2016).

Studies on the post-adoption stage, retention, or even continued use of mobile banking are scarce, nonetheless. The purpose of this study is to comprehend how using mobile banking might improve user performance, particularly on an individual basis. Although many authors such as Manzoor, 2012; Adler and BenbunanFich, 2012; Mahdi et al., 2014, link "performance" to productivity and effectiveness, we link individual performance in the context of mobile banking with effectiveness and efficiency in the execution of m-banking tasks as a benefit for the user.

Based on the research methods suggested by Orlando et al. (2013), we did a thorough literature analysis to ascertain the current state of the art and future directions in m-banking research. First, we used Google Scholar and Ebsco to conduct a thorough literature search based on the terms "mobile banking" and "m-banking." The search period covered the fifteen years from 2002 to 2016. Our search phrases, which frequently contain the terms "m-commerce," "e-commerce," and "m-payments," assist us to determine the range of what we mean when we define "m-banking". Despite not being exhaustive, this search provides a thorough foundation for understanding m-banking research. Second, we found published publications about m-banking by reading the abstracts and rejecting studies that were not wholly focused on our research goal.

E-banking makes banks more reliant on information technology, which in turn raises the level of technical difficulty associated with a wide range of operational and security concerns. It also furthers a trend toward increasing the number of partnerships, alliances, and outsourcing arrangements with third parties, many of whom are not subject to any kind of government oversight. As a result of this trend, new business models involving banks and non-blank businesses, including Internet service providers, telecommunication companies, and other technology enterprises, have begun to emerge (Ololade, & Ogbeide, 2017). By its very nature, the Internet is available everywhere in the world. It is an open network accessible from anywhere in the world by unknown parties, with routing of messages through unknown locations and via fast-evolving wireless devices.

This work makes used of the theory of diffusion of innovation. Diffusion of Innovation (DOI) theory contributes by examining innovation and the success of technology dissemination through more appropriate consumer behavior indicators, as well as attempting to explain how, why, and at what level a new technology idea spreads, as well as a process when innovation is communicated from time to time in social systems (Rogers, 2003).

Empirical Review (Hypothesis Development)

This section dwells on the empirical review on the concepts of the study so as to bring out what other authors have said in their studies. It also enabled the researcher to formulated hypotheses for the study.

Performance Expectancy (PE)

This is the degree to which using technology is perceived to be useful in accomplishing tasks with speed. An individual will accept any technology if it helps him/her to accomplish his work speedily and effortlessly. Studies carried out by scholars confirmed that PE is an important determinant of technology adoption. This was found to be true in the case of smartwatch acceptance in Taiwanese (Hong et al., 2017; Wu et al., 2016; Hsiao, 2017), South Korean (Choi & Kim, 2016; Kim &Shin, 2015), Malaysian (Chuah et al., 2016) and French (Mani & Chouk, 2017). Consumers will accept new technology if they perceived it useful in performing their tasks. Therefore, it is hypothesized:

H_1: Performance expectancy (PE) has a negative significant effect on e-banking adoption of selected bank customers in Cameroon.

Effort Expectancy (EE)

This is the degree of effortlessness linked with the use of technology. It is based on the notion that there is a relationship between effort and work. Studies carried out revealed that effort expectance plays a role in technology acceptance (Chuah et al.,2016). This is seen in smartwatch adoption in Malaysian and South Korea (Kim & Shin, 2015). It is believed that when a technology is easy to use and understandable the adoption rate will be high. Therefore, it is hypothesized:

H_2: Effort expectancy (EE) has a negative significant effect on the e-banking adoption of selected bank customers in Cameroon.

Social Influence (SI)

This is the environmental influence on the prospective user. It is a determinant element in information systems research (Venkatesh et al., 2012). It is found to have an important link with smartwatch use in Taiwanese (Wu et al., 2016; Hsiao, 2017). Therefore, the hypothesis:

H_3: Social influence (SI) has a negative significant effect on e-banking adoption of selected bank customers in Cameroon

Facilitating condition (FC)

Facilitating condition is consumers' perceptions of the availability of resources and support for a particular technology. It is believed that the accessibility of resources will enrich the preference of consumers. Facilitating conditions played an important role in wearable device adoption (Spagnolli et al.,2014). The following hypothesis was developed based on the explanation.:

H_4: Facilitating conditions (FC) has a negative significant effect on the e-banking adoption of selected bank customers in Cameroon.

Hedonic motivation (HM)

Hedonic motivation is the pleasure an individual gets from using technology. It is the strongest determinant of an individual's behavioral intention. It was found to influence smartwatch adoption by South Korean and Taiwanese users (Wu et al., 2016; Hong et al., 2017). It is believed that an individual will be interested in using a technology when they are absorbed. Therefore, individuals

who find using technology pleasurable will adopt it. Therefore, it is hypothesized:

H_5: Hedonic motivation (HM) has a negative significant effect on e-banking adoption of selected bank customers in Cameroon

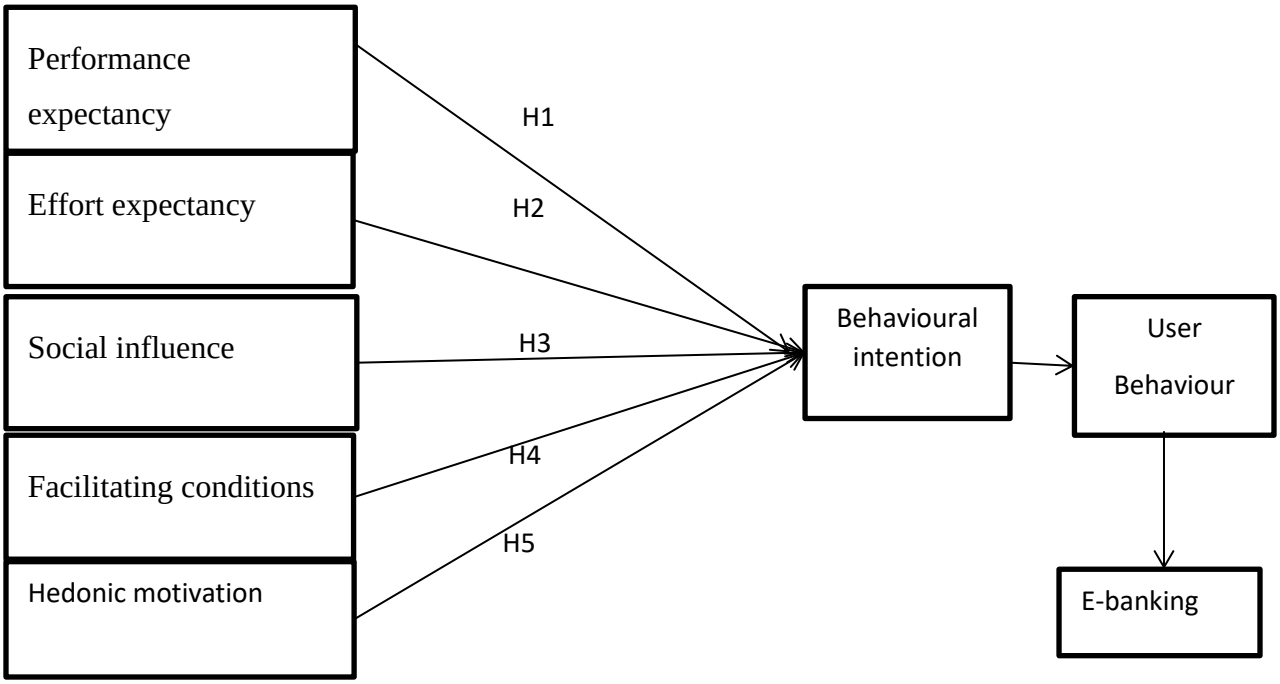
Gaps in Literature

The literature reviewed shows that users' experience with authentication might affect e-banking and e-banking is beneficial to the banks and the customers. Several scholars have researched the issues that affect adoption, and technology usage. However, the user authentication experience in e-banking has not been given much attention. Theories like UTAUT, TAM, UTAUT2, etc. have been used independently and collectively to examine technology usage and adoption. The identified gaps in the kinds of literature reviewed are issues of (i) the minimum time required for user authentication which is 30 seconds (ii) several times of login attempts that may be required and (iii) login failure during the process of users' authentication. This study make used of the UTAUT2 model to investigate the identified gaps and come up with recommendations.

Research Framework

The research framework depicted in Figure 1 is based on hypothesis development.

Figure 1: Conceptual Framework



Source: Drawn by Author (2024)

Method

A quantitative method is adopted for the study. This study collected primary data by distributing questionnaires to all head offices of commercial banks in Yaounde, Cameroon. This study will use the deductive approach. The UTAUT2 theory will be tested. The hypothesis developed aligned with the phenomenon of social influence on behavior intention or user authentication

experience in e-banking in Cameroon. A conclusive research design approach will be used and the instrument is questionnaires. Data will be analyzed using SPSS and Amos statistical software. The data collection will take place in all the head offices of commercial banks in Yaounde, Cameroon. For this study, a pilot study will aid to test- run the practicability, the feasibility of the instrument, and note mistakes in the procedure (Green & Albaum, 1988).

Sampling Technique

The questionnaire of this study is composed of questions representing the indicators of the latent constructs. The research work is examining user authentication experience in e-banking in Nigeria. It will adopt the purposeful sampling technique because it has some specific elements that satisfy some pre-determined criteria (Palinkas, L.A. et al.,2015). Therefore, the researcher chose bank staff and customers of selected banks within each area in Yaounde. This technique is convenient for this research study as it is accessible and efficient to test the hypotheses.

Sampling size determinant

This measures the number of individuals in a sample frame that will participate in a survey. The target population are bank customers in Yaounde. The simple random sampling was used to select the survey participants because it is unbiased. For this study, Cochran's (1977) formula was used for calculating sample size. Adjustments for population will be made if the sample size exceeds 5% of the population and for real situations if the response rate is below 100%. The sampling method used in primary data collection is probability and non-probability. The probability sampling method allows equal participation of members in the study. The non-probability sampling technique does not give every member equal participation in the study. The probability method will be used for this study as it makes research of any type and size manageable. It is cost-effective, and the result of the finding is more accurate. Also, information processing is more efficient thus accelerating the speed of data collection.

Operationalization of Variables

Independent Variable	**Latent Constructs**	**Indicators**	**Source (Citations)**
Users' authentication experience	1.Performance Expectancy	Task, speed, useful	Hanafizadeh P. et al,(2014) Luthfihadi M. et al. (2013) Davids F.D (1989), Akturan and Tezcan (2012), Nasri and Cherfeddine (2012)
	2.Effort Expectancy	Devices, services, products, procedures	Krol, Philippou, De Cristofaro & Sasse (2015); Suganya, Sujatha & Alex, 2012), Liebana-Cabanillas et al.,2013
	3. Social Influence	Opinion, subjective norm, voluntariness	Venkateshet al., (2003), Sharma et al., (2017),

			Venkatesh and Davis (2000)
	4. Facilitating conditions	Infrastructure, Resources	[Venkatesh et al. (2012), p.159]. Chen and Shih (2014) and, Spagnolli et al. (2014)
	5.Hedonic motivations	Satisfaction, accessibility, speed, security	Lee et al., (2015); Mashari et al., (2014)
Main Dependent Variable	**Latent Constructs**	**Indicator**	**Source**
E-banking	Behavioral Intention	banking services	R. T. Kreutzer and K.-H.Land, Springer, (2014), P. Hanafizadeh, B. W. Keating, and H. R. Khedmatgozar,(2014)

Source. Author (2024)

3.8.2 Model Specification and Analysis

The measurement specification for the study includes; Goodness fit index (GFI), Incremental fit index (IFI), Comparative fit index (CFI), Normed fit index (NFI), Standardized root means square residual (SRMR), Root means a square error of approximation (RMSEA). The model specification aligned with the hypotheses. The statistical model displayed below aims to analyze user authentication experience in Nigerian e-banking.

Model specification

$UX = \beta_0 + \beta_1 PE + \beta_2 EE + \beta_3 SI + \beta_4 FC + \beta_5 HM + €(1)$

Where

User experience = UX

UX = (PE + EE + SI+ FC+HM)

Performance Expectancy = PE

Effort Expectancy = EE

Social Influence = SI

FC= Facilitating condition

HM = Hedonic Motivation

$EB = \beta_0 + \beta_1 PE + \beta_2 EE + \beta_3 SI + \beta_4 FC + \beta_5 HM + €(2)$

While all other independent variables remain as defined above. EB represents e-banking as a dependent variable in equation (2). The expectation regarding the impacts of independent variables is that they will influence the adoption of e-banking.

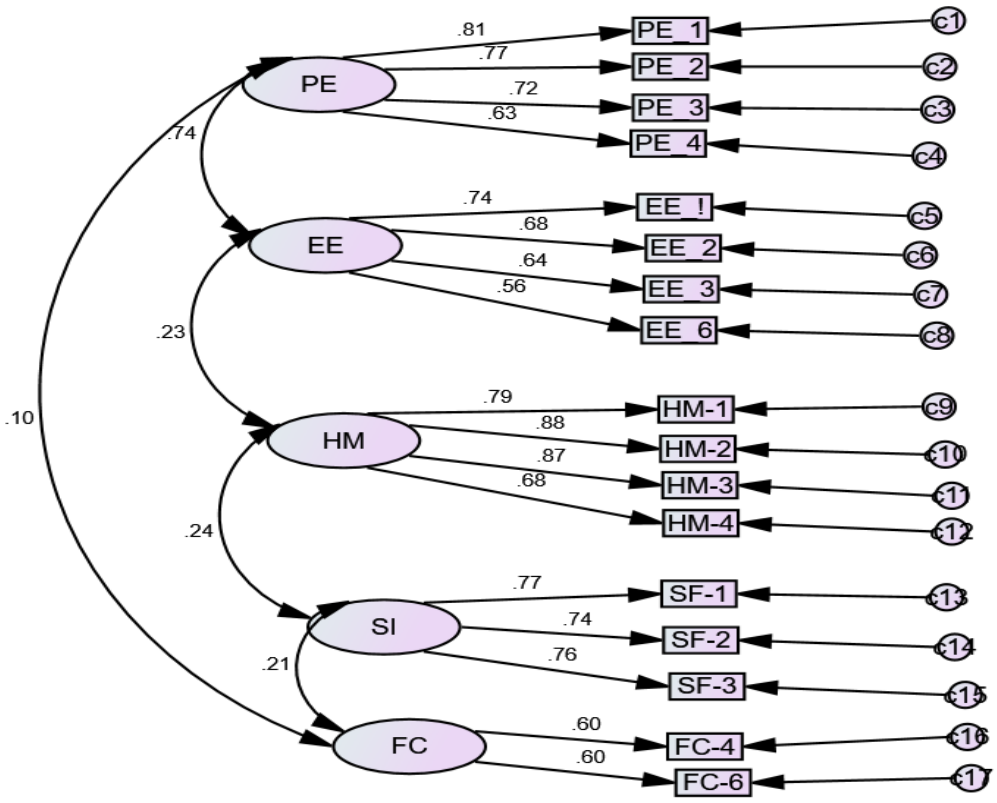
Result and Discussion

The data gotten from the questionnaire was clean and tested. After identifying the missing data, further analysis regarding the nomenclature of missing data was completed using Little's MCAR test. The Little's MCAR test is defined by the guidelines of the null 104 hypothesis which opined missing data is completely at random. The implication of this provision shows that missing data is unintentional. For this test to be admissible there must be insignificant statistical evidence not to reject the null hypothesis. Based on the result of the test of missing data, Chi-Square [X2] =660.990, DF [Degree of Freedom] = 586, and μ = [Sig. =0.17> 0.05] suggest that there is insignificant statistical evidence to reject the null hypothesis. The missing data observed in the dataset was completely random. The missing data for all values in the analysis was less than 5%. The pattern of missing values shows that 65.12%, 89.09%, and 99.71% of data were completed for variables, cases, and values.

Confirmatory Factor Analysis for Retained Construct under EFA

Additional data cleaning was tested for CFA however, the CFA model did not meet the model fitness specifications and not all factor loadings for the respective indicators were appropriate. The minimum requirement for factor loadings is 0.5 otherwise such indicators are removed from the model. Path SP2 has a coefficient of 0.45 < 0.5-factor loading threshold. Based on this limitation as shown below, CFA was inconclusive as the model did not fit the data. Some further downsizing

was conducted by removing inappropriate. In this regard, the study retained only indicators and constructs used under the EFA process. The result of the five factors correlated CFA model is represented in Figure directly below.



CMIN= 442.105, PV = 000, CMIN/DF = 3.878, GFI = .886, IFI = .882, TLI = .858, CFI = .881, RMSEA = 0.86

Figure 1: Five factors correlated CFA model

Source: Field data (2024)

In the CFA model, the entire path coefficient was statistically significant.

Regression Weights: (Group number 1 - Default model)

Dependent Variable	Effects	Latent construct	Estimate	S.E	C.R	P	Label
E-banking	<---	Performance expectancy	.092	.070	1.309	.191	PE1
E-banking	<---	Effort expectancy	.123	‘065	1.874	.061	EE1

E-banking	<---	Social influence	0.30	.058	.530	.596	SI1
E-banking	<---	Facilitating conditions	.016	.048	.326	.774	FC4
E-banking	<---	Hedonic motivation	.154	.050	3.086	.002	HM1

Source: Field data (2024)

Standardized regression weights result is presented in 2

Standardized Regression Weights

Endogenous variable	Effects	Exogenous variable	Estimate
E-banking	<---	Performance expectancy	.072
E-banking	<---	Effort expectancy	.104
E-banking	<---	Social influence	.027
E-banking	<---	Facilitating conditions	.017
E-banking	<---	Hedonic motivation	.154

Source: Field data (2024)

Structural Equation Modeling and Specification Parameters

SEM is used to assess reliability, validity and to determine relationships between study variables by estimating regression weights, path coefficients, and model fit indices. To use SEM; the data set must be complete without missing values. The study used a structural model to assess the direct and indirect relations between the latent variables. This was done to establish the actual statistical relationships between the variables and compare them with those in the hypothesized model. The structural model was generated and tested for the overall goodness of fit. According to Hair et al. (2010), important model fit tests include baseline indices like the Goodness of Fit Index (GFI) (>.95), the Standardized Root Mean Square Residual (SRMR) (>.95), Chi-square statistic (>.05), Comparative Fit Index (CFI) (> .95), Increment Fit Index (IFI) (>.95), and the Root Mean Square Error Approximation (RMSEA). The structural model developed was examined using the regression weights relating to each variable and path coefficients explained by the standardized estimates (β coefficients) to determine the extent to which the independent variables affect user

authentication experience in e-banking.

H1: Performance expectancy [PE] has a negative significant effect on E-banking in Cameroon.

H2: Effort expectancy [EE] has a negative significant effect on e-banking in Cameroon

. H3: Social influence [SI] has a negative significant effect on e-banking in Cameroon.

H4: Facilitating conditions [FC] has a negative significant effect on e-banking in Cameroon.

H5: Hedonic motivation [HM] has a negative significant effect on e-banking in Cameroon.

The structural equation modeling specification parameter result is presented in Figure below

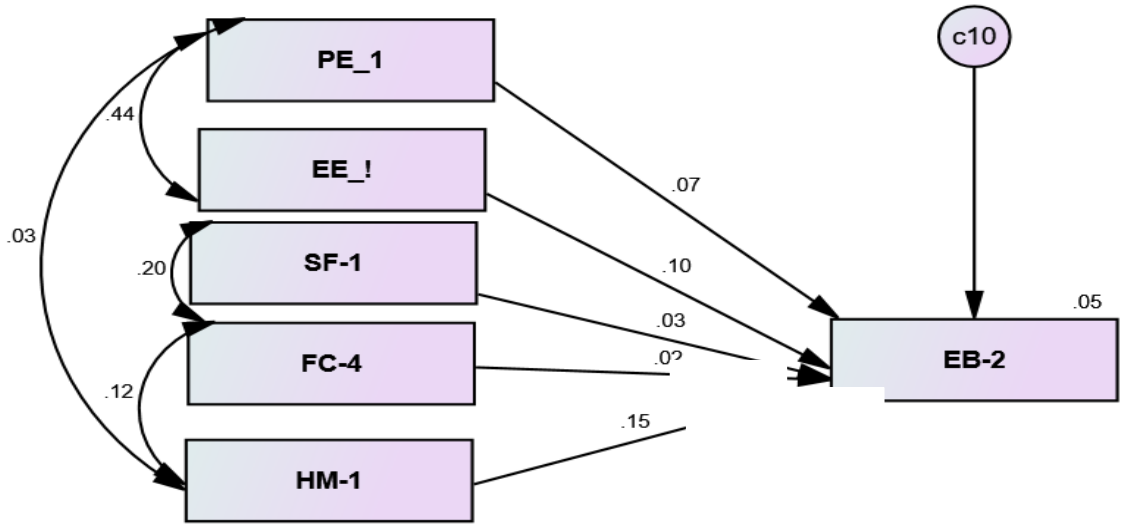


Figure: Structural equation modeling specification parameter

CMIN = 149.284, DF = 6, P = .000, CMIN/DF =24.881, GFI =.890, IFI = .496, TLI = -.301, CFI = .480, RMSEA = .248

The standardized regression weights result is presented in Table below.

Regression Weights: (Group number 1 - Default model)

Dependent Variable	Effects	Latent construct	Estimate	S.E	C.R	P	Label
E-banking	<---	Performance expectancy	.092	.070	1.309	.191	PE1

E-banking	<---	Effort expectancy	.123	‘065	1.874	.061	EE1
E-banking	<---	Social influence	0.30	.058	.530	.596	SI1
E-banking	<---	Facilitating conditions	.016	.048	.326	.774	FC4
E-banking	<---	Hedonic motivation	.154	.050	3.086	.002	HM1

Source: Field data 2024

Standardized regression weights result is presented in Table 4.

Table.: Standardized Regression Weights

Endogenous variable	Effects	Exogenous variable	Estimate
E-banking	<---	Performance expectancy	.072
E-banking	<---	Effort expectancy	.104
E-banking	<---	Social influence	.027
E-banking	<---	Facilitating conditions	.017
E-banking	<---	Hedonic motivation	.154

Source: Field data (2024)

Harmonized test of hypotheses result is presented in Table 2.

Harmonized Test of Hypotheses

Hypotheses	**P-Value at 95% (CI)**	**Decision / Conclusion**

H1: Facilitating conditions (FC) has a negative significant effect on e-banking adoption of selected bank customers in Yaounde.	[H0: μ= .191 > 0.05, β = - .072, CI =95%]. positive statistically significant.	Accept the null hypothesis and conclude that there is significant statistical evidence to suggest that Performance expectancy [PE] has a negative significant effect on user authentication experience in e-banking [EB] of selected bank customers in Yaounde
H2: Effort expectancy [EE] has a negative significant effect on e-banking customers in Yaounde	[H0: μ= 0.61 > 0.05, β = -.104, CI =95%]. positive statistically significant.	Accept the null hypothesis and conclude that there is significant statistical evidence to suggest that Effort expectancy [EE] has a negative significant effect on the User authentication experience [EB] of selected bank customers in Yaounde
H3: Social influence [SI] has a negative significant effect on e-banking bank customers in Yaounde	[H0: μ= .596 > 0.05, β = .027, CI =95%]. positive statistically significant	Accept the null hypothesis and conclude that there is significant statistical evidence to suggest that social influence [SI] has a negative significant effect on User authentication experience in e-banking [EB] of selected bank customers in Yaounde
H4: Facilitating conditions [FC] has a negative significant effect on e-banking customers in Yaounde	[H0: μ= .774 > 0.05, β = - .017, CI =95%]. positive statistically significant	Accept the null hypothesis and conclude that there is significant statistical evidence to suggest that Facilitating conditions [FC] has a negative significant effect on user authentication experience in e-banking [EB] of selected bank customers in Yaounde
H5: Hedonic motivation [HM] has a negative significant effect on e-banking customers in Yaounde	H0: μ= 0.002 < 0.005, β = . 154, CI =95%]. CI =95%]. Negative statistically significant	Reject the null hypothesis and conclude that there is significant statistical evidence to suggest that Hedonic motivation [HM] has a positive significant effect on user authentication experience in e-banking [EB] of selected bank customers in Yaounde

The discussion of findings is based on major inputs of quantitative analysis

Hypothetic Deductive Statistics

The discussion at this level refers to the influence of the independent variables on the dependent variable e-banking.

The Impact of Performance Expectancy on E-banking Adoption

The objective of the study is to explore the effect of authentication on customers in e-banking adoption Cameroon. Therefore, it was hypothesized that Performance expectancy has a negative influence on e-banking adoption in Cameroon. After going through the analysis, the findings revealed significant statistical evidence that suggests Performance expectancy has a negative effect on e-banking adoption by customers in Yaounde. The author of this research study estimates that a customer will accept any technology if it helps him/her to accomplish his or her

work speedily and effortlessly. Therefore, consumers are more likely to accept new technologies once they are sure they will assist them in their job. Hence performance expectancy is seen as an important factor in e-banking adoption.

The Impact of Effort Expectancy on E-banking Adoption

The objective of the study was to assess the extent to which effort expectancy affects e-banking adoption in Cameroon. Hence it was hypothesized that effort expectancy has a negative influence on e-banking adoption in Cameroon. After going through the analysis, the findings revealed that there is significant statistical evidence to suggest that effort expectancy has a negative effect on e-banking adoption in Cameroon. The author of this study believes that effort expectancy constitutes the very core of e-banking. Effort expectancy is the ease associated with the use of technology. It is believed that if the technology is easy to use and understandable, the adoption rate will be high. The suggestion that effort expectancy influences technology adoption is seen among Malaysian and South Korean smart watches (Chuah et al., 2016; Shin, 2015).

The impact of Social Influence on E-banking adoption.

The purpose of the study was to evaluate the influence of social influence on e-banking adoption in Yaounde. Hence, it was hypothesized that social influence has a negative influence on e-banking adoption e-banking in Yaounde, Cameroon. Social influence is the effect of friends, family members, colleagues, and superiors, on prospective adopters. After going through the analysis, the findings revealed that there is significant statistical evidence to suggest that social influence has a negative effect on e-banking adoption in Yaounde. The author of this research believes that social influence contributes to e-banking adoption. This is documented by several works of literature. Social influence is one of the determinant factors in information systems adoption. It was found to have a significant relationship with smartwatch adoption among Taiwanese (Wu et al., 2016; Hsiao, 2017).

The Impact of Facilitating Conditions on E-banking Adoption

The objective of the study was to evaluate the influence of facilitating conditions on e-banking adoption in Yaounde. It was, therefore, hypothesized that Facilitating conditions have a negative influence on e-banking adoption in Yaounde. After going through the analysis, the findings revealed that there is significant statistical evidence to suggest that facilitating conditions have a negative significant effect on e-banking adoption in Yaounde. Facilitating conditions impact the phenomenon of study. The author of this study argues that the appropriate facilitating conditions will encourage the use of e-banking. It would enhance the preference of consumers and positively influence their adoption. This is upheld by other scholars including Chen & Shih (2014) who believed that facilitating condition is an important determinant for wearable device adoption.

The Impact of Hedonic Motivation on E-banking Adoption

The objective of the study was to evaluate the influence of hedonic motivation on e-banking adoption in Yaounde. It was hypothesized that Hedonic motivation has a negative influence on e-banking adoption in Yaounde. Hedonic motivation is the fun or pleasure an individual derives from using technology. After going through the analysis, the findings revealed that there is significant statistical evidence to suggest that Hedonic motivation has a positive significant effect on e-banking adoption in Yaounde. Hedonic motivation impacts the phenomenon of this study. The author of this study argues that hedonic motivation will encourage the use of e-banking. This is corroborated by several other scholars as it was found to have a significant impact on smartwatch

adoption among South Korean, Taiwanese (Choi and Kim, 2016; Wu et al., 2016; Hong et al., 2017). It is expected that individuals who believe using e-banking as being pleasurable, are more likely to adopt it. Therefore, hedonic motivation is considered an important determinant for e-banking adoption.

Conclusion

The main research objective is to examine users' authentication experience on e-banking adoption in Yaounde. Five constructs were used to test the relationship between the independent variables and the dependent variable e-banking. The analysis shows that

i. Performance Expectancy Has a positive effect on E-banking Users in Cameroon
ii. Effort Expectancy has positive effects on e-banking users in Cameroon
iii. Social Influence has positive effect on e-banking users in Cameroon
iv. Facilitating conditions has a positive effect on E-banking users in Cameroon
v. Hedonic Motivation has a positive significant effect on e-banking users in Cameroon.

The majority of e-banking customers in Cameroon find the services useful but believe there is still room for improvement as they want the providers of e-banking services to implement more authentication methods that are fast, simple, and seamless to use as this will enhance users' authentication experience. Therefore, the study has achieved all the research questions and objectives.

RECOMMENDATIONS

The study, therefore, recommends the use of biometric features in a combination of username, and password. As this is expected to improve the authentication method in e-banking. Safety measures can be adopted by both customers and banks in carrying out e-banking.

Safety measures adopted by customers include: the customers must change password frequently. Customers should avoid using password base on their names, spouse name, and date of birth or others which are easy to guest, customers should report any suspected misappropriation from the accounts to the bank immediately, they should combine alphanumeric with special character; they should not share their password or identity card with others

Safety measures adopted by banks: They should generate and dispatched user identity card separately, they should prohibit employees of the banks to ask for the users' ID and passwords of customers, banks should respect banking secrecy, banks should maintain a high level of security standard for website, they should randomly verify or authenticate the customers ATM or credit card number.

Limitations

This research study employs the deductive approach. To this end, the data collection was through a questionnaire.

i. The researcher had difficulty convincing participants to complete the Questionnaires,
ii. Some banks were reluctant to allow the questionnaire to be distributed in their banks
iii. It should be noted that the data collection was done in Head office of commercial banks only.
iv. The researcher also had difficulty locating literature as there are very limited academic published works on determinants of user authentication experience in e-banking in Cameroon.

Areas for Future Studies

To keep promoting inclusive use of e-banking in Nigeria, further research studies are:
i. To investigate user authentication experience in e-banking in other parts of the country in Cameroon.
ii. Other methods can be used to investigate users' authentication experience in e-banking e.g. qualitative, mixed method, etc.
iii. Studies can be carried out on how to improve response time in e-banking authentication.

REFERENCES

Adisu, Z. (2018). E-Banking Service Practices and Its Challenges on Trade Activities In Selected Commercial Banks (In Case Of Debre Berhan) (Doctoral Dissertation).

Afshan et al., (2016). Acceptance of mobile banking framework in Pakistan. Telematics and Informatics volume 33, issue 2, May 2016, pages 370-387. Elsevier

Alvi, M.H. (2016): A Manual for Selecting Sampling Techniques in Research. https://mpra.ub.uni-muenchen.de/70218/

Adewuyi, I. (2011). Electronic Banking in Nigeria: Challenges of the Regulatory Authorities and the Way Forward. International Journal of Economic Development Research and Investment, 2, 149-156

Apuke, O. D (2016) Social and Traditional Mainstream Media of Communication: Synergy and Variance Perspective. Journal of New Media and Mass Communication, 53, 83-86. Available at www.iiste.org

Adrian, T. (2021). BigTech in financial services.

Anna Spagnolli et al., (2014). Measuring User Acceptance of Wearable Symbiotic Devices: Validation Study Across Application Scenarios. International Workshop on Symbiotic Interaction. Symbiotic 2015: Symbiotic Interaction pp. 87–98

Agrawal, D., Bernstein, P., Bertino, E., Davidson, S., Dayal, U., Franklin, M., & Widom, J. (2011). Challenges and opportunities with Big Data 2011-1.

Akinola Kayode E., et al.,(2017). Internet Banking In Nigeria: Authentication Methods, Weaknesses and Security Strength. American Journal of Engineering Research (AJER) e-ISSN: 2320-0847 p-ISSN: 2320-0936 Volume-6, Issue-9, pp-226-231

Choubey J. & Choubey B.(2013).Secure User Authentication in Internet Banking: A Qualitative Survey. International Journal of Innovation, Management, and Technology, Vol. 4, No. 2, April 2013.

Creswell, John W. (2014) Research Design: Choosing Among Five Approaches. USA: Sage Publications, Inc. Research Design Qualitative, Quantitative, and Mixed Method Approaches. USA: Sage Publications, Inc. C

Carranza, R., Díaz, E., Sánchez-Camacho, C., & Martín-Consuegra, D. (2021). e-Banking adoption: an opportunity for customer value co-creation. Frontiers in Psychology, 11, 621248.

Dagnachew, A. (2021). Electronic Banking Service Practice and Challenges On Trade Activities (In Case Of Debre Berhan) (Doctoral dissertation).

Drost, J, A. J. W. Van der Does, N. Antypa, F. G. Zitman, R. Van Dyck & Ph. Spinhoven(2012). General, Specific and Unique Cognitive Factors Involved in Anxiety and Depressive Disorders. Cognitive volume 36, pages621–633

Djellali, et al., (2015).Design of Authentication Model Preserving Intimacy and Trust in Intelligent Environments. Network Protocols and Algorithms ISSN 1943-3581 2015, Vol. 7, No. 1

Driga Imola & Isaac Claudia (2014). E-banking services – features, challenges, and benefits Annals of the University of Petrosani, Economics, 2014, vol. 14, issue 1, 49-58

Dipo Olowookere(2021). Nigerian Banks' e-banking Income Drops 27.3% Despite High Transactions

Gerea, C., & Herskovic, V. (2022). Transitioning from multichannel to Omnichannel customer experience in service-based companies: Challenges and coping strategies. Journal of Theoretical and Applied Electronic Commerce Research, 17(2), 394-413.

Glavee-Geo, et al.,(2017).Mobile banking services adoption in Pakistan: Are there gender differences? International Journal of Bank Marketing 35(7):1088-1112 DOI:10.1108/IJBM-09-2015-0142

Gray, GC, Silbey, SS (2014) Governing inside the organization: Interpreting regulation and compliance. American Journal of Sociology 120(1): 96–145

Harvey Glickman, (2005): The Nigerian "419" Advance Fee Scams: Prank or Peril?. Canadian Journal of African Studies Volume 39,2005, issues 3

Haac et al., (2017). The IceCube Neutrino Observatory: instrumentation and online systems. Journal of Instrumentation, Volume 12, March 2017.

Hong et al., (2017). Understanding the determinants of online review helpfulness: A meta-analytic investigation. Decision Support Systems Volume 102, October 2017, Pages 1-11

Inder, S., Sood, K., & Grima, S. (2022). Antecedents of behavioral intention to adopt Internet banking using structural equation modeling. Journal of Risk and Financial Management, 15(4), 157.

Ibor, A. E., Adesola, A. W., Udofia, C. E., & Ibi, E. E. (2014). Towards The Security of User Authentication For Internet Banking Sites–The Nigerian Situation. Microwave, 53.

Jibril, A. B., Kwarteng, M. A., Botchway, R. K., Bode, J., & Chovancova, M. (2020). The impact of online identity theft on customers' willingness to engage in e-banking transaction in Ghana: A technology threat avoidance theory. Cogent Business & Management, *7*(1), 1832825

Jolly, V. (2016).The Influence of Internet Banking on the Efficiency and Cost Savings for Banks' Customers. International Journal of Social Sciences and Management 3(3):163 DOI:10.3126/ijssm.v3i3.15257

Kabanda and Brown(2017).A structuration analysis of Small and Medium Enterprise (SME) adoption of E-Commerce: The case of Tanzania. Telematics and Informatics 34(4) DOI 10.1016/j.tele 2017.01.002

Ki Joon Kim &Donghee Shin(2015). An acceptance model for smartwatches: Implications for the adoption of future wearable technology. Internet research 25(4), DOI: 10.1108/IntR-05-2014-0126

Khan, H. F. (2017). E-banking: Benefits and issues. American Research Journal of Business and Management, 3(1), 1-7.

Lawal,O.B et.al (*2013*).Internet Banking Authentication Methods in Nigeria Commercial Banks. African Journal of Computing & ICT

Malinka, K., Hujňák, O., Hanáček, P., & Hellebrandt, L. (2022). E-Banking Security Study—10 Years Later. IEEE Access, 10, 16681-16699.

Menoka Bal, M.B. (2013). Stakeholder Engagement: Achieving Sustainability in the Construction Sector. Sustainability ISSN 2071 – 1050, pp 696-71

Rodrigo F. Malaquiasa, Yujong Hwangb (2019), Mobile banking use: A comparative study with Brazilian and U.S. participants, International Journal of Information Management journal homepage: www.elsevier.com/locate/ijinfomgt

Okpa, J. T., Ajah, B. O., Nzeakor, O. F., Eshiotse, E., & Abang, T. A. (2022). Business e-mail compromise scams, cyber victimization, and economic sustainability of corporate organizations in Nigeria. Security Journal, 1-23.

Ogbanufe, O., & Kim, D. J. (2018). Comparing fingerprint-based biometrics authentication versus traditional authentication methods for e-payment. Decision Support Systems, 106, 1-14.

Okoye, et al., (2019), "Customer service delivery in the Nigerian banking sector through engineering and technology-based channels", International Journal of Civil Engineering and Technology, Vol. 10 No. 1, pp. 2156-2169.

Orji, U. J. (2019). Protecting Consumers from Cybercrime in the Banking and Financial Sector: An Analysis of the Legal Response in Nigeria. Tilburg Law Review, 24(1).

Patil, P. P., Dwivedi, Y. K., & Rana, N. P. (2017). Digital Payments Adoption: An Analysis of Literature. In Conference on e-Business, e-Services, and e-Society (pp. 61-70). Springer, Cham

Partala, T., & Saari, T. (2015). Understanding the most influential user experiences in successful and unsuccessful technology adoptions. Computers in Human Behavior, *53*, 381–395. https://doi.org/10.1016/j.chb.2015.07.012.

Paul Fermor (2022) Customer experience: key pillars for continuous improvement. https://Internationalbankers.com/Technology/customer experience-key-pillar-for-continuous-improvement

Polit D.F and C. T. Beck (2012), Nursing research: generating and assessing evidence for nursing practice. 9th ed. Philadelphia: Lippincott, Williams & Wilkins, 2012.

Reese, Ken, et al. (2019). "A usability study of five two-factor authentication methods." Proceedings of the Fifteenth Symposium on Usable Privacy and Security. 2019.

Rahnamaee A. and P. D. Berger, "Investigating consumers' online purchasing behavior: single-brand e- retailers versus multi-brand e-retailers," Journal of Marketing Analytics, vol. 1,

no. 3, pp. 138–148, 2013.

Tarhini, A., Mgbemena, C., Trab, M. S. A., & Masa'Deh, R. (2015). User adoption of online banking in Nigeria: A qualitative study. The Journal of Internet Banking and Commerce, 20(3).

Singh, I. & Srivastava, R.K. (2020). "Understanding the intention to use mobile banking by existing online banking customers: an empirical study," Journal of Financial Services Marketing, Palgrave Macmillan, vol. (3), pages 86-96, December.

Sepehri A. et al.,(2019)An application of DEMATEL for transaction authentication in online banking International Journal of Data and Network Science 3(2):71-76 DOI:10.5267/j.ijdns.2019.1.002.

Shubhi, & Archna (2020). COVID-19 and Its Impact on Indian Economy. International Journal of Trade and Commerce, 9, 1-2.

Saunders, M., Lewis, P. and Thornhill, A. (2007) Research Methods for Business Students. 4th Edition, Financial Times Prentice Hall, Edinburgh Gate, Harlow

Sauro, J. (2015). 5 Reasons to Perform a Qualitative Study. https://www.studocu.com/en-us/document/florida-state-university/special-topics-in- religion/lecture-notes/measuring-u-5-types-of-qualitative-methods/2768371/view

Soderberg, G., Bechara, M. M., Bossu, W., Che, M. N. X., Davidovic, S., Kiff, M. J., ... & Yoshinaga, A. (2022). Behind the scenes of central bank digital currency: Emerging trends, insights, and policy lessons.

Tarhini A., Mazen El- Masri, Maged Ali, Alan Serrano(2016).Extending the UTAUT model to understand the customers' acceptance and use of Internet banking in Lebanon: A structural equation modeling approach. Information Technology & People ISSN: 0959-3845

Taherdoost, Hamed (2016). Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research. International Journal of Academic Research in Management (IJARM), 2016, 5. final-02546796f

Venkatesh et al.,(2003). User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, Vol. 27, No. 3 (Sep. 2003), pp. 425-478 (54 pages), Published By: Management Information Systems Research Center, University of Minnesota

Wang, V., Nnaji, H., & Jung, J. (2020). Internet banking in Nigeria: Cyber security breaches, practices, and capability. International Journal of Law, Crime, and Justice, 62, 100415.

Zhang, et al.,(2018).Deep learning for sentiment analysis: A survey. WIREs Data mining and knowledge Discovery