



## Accessing customer perspective on the effectiveness of online banking in Liberia. A case study of Ecobank Liberia Limited and United Bank of Africa Liberia Limited

<sup>1</sup> Ludmilla Teco Dwana, <sup>2</sup> Jiangming Ji, <sup>3</sup> Diop Mouhamadou Moustapha

<sup>1</sup>Department of Information Engineering Huzhou University, Zhejiang Province, China

<sup>2</sup>Department of Economics and Management Huzhou University, Zhejiang Province, China

<sup>3</sup>Department of Information Engineering Huzhou University, Zhejiang Province, China

Email – <sup>1</sup>[ludmilla.dwana@yahoo.com](mailto:ludmilla.dwana@yahoo.com), <sup>2</sup>[energy2006@163.com](mailto:energy2006@163.com), <sup>3</sup>[moustaphanabi94@gmail.com](mailto:moustaphanabi94@gmail.com)

**Abstract:** Since electronic technologies, electronic banking has been a critical component of practically every organization. The usage of ATMs, phone banking, and internet banking has dramatically improved the contact between the user and the bank. In the financial services industry, new information technology is becoming increasingly significant. On the other hand, electronic banking systems come with associated information security dangers and vulnerabilities that must be assessed if bank clients are to be happy with banking services. Banks and their clients are both affected by electronic banking security threats and concerns. Internet banking consumers' main concerns are the privacy and security of electronic financial transactions and the confidentiality of personal information. The deployment of ATMs, internet banking, and mobile banking has significantly increased the connection between users and their banks. As a result, this study aims to get a customer's opinion on the usefulness of online banking. Liberia is a country in Africa. Eco-bank Liberia Limited and the United Bank of Africa Liberia are the subjects of a case study. The survey of this study was conducted online by selecting samples of questionnaires from customers from both Ecobank and UBA Liberia, using a survey method, whether customers subscribe for online banking or not. A questionnaire was formed to collect information from the target audience and to make visible the possible correlation between age, sex, knowledge of computer systems, knowledge of electronic applications, and trust in online banking. Customers are concerned about their security and privacy, according to the data. The most common security measures are encryption, pin codes, passcodes, and passwords. Although the bank claims that its services are secure, some clients believe more extraordinary security measures should be implemented. The key idea is that having a dual mechanism application will reduce the danger of fraud and threat, giving customers more happiness when banking and encouraging customers who have not opened an account.

**Key Words:** Internet banking, security, privacy, customer.

### 1. INTRODUCTION :

Since the invention of internet banking, it has made banking more accessible and convenient for customers; with the rapid improvement of technology. Electronic banking has become more critical to the customer and the banking institution. The development of internet banking varies in different countries depending on the speed of internet access and the features of websites. In Liberia, most banks have their banking websites designed to improve efficiency. Customers will find internet banking convenient, and it will encourage them to execute transactions more conveniently and efficiently using the banking website. Internet banking is also beneficial to banks because it reduces their operating costs. Electronic banking, however, is faced with the main problem, which has to do with security and privacy. More customers have not subscribed for online banking due to security and privacy issues. Previous research showed that there are only small percentages of customers who prefer to perform investments such as making personal investments, borrowing loans, and paying housing mortgages through Internet banking [1]. Instead, most customers prefer traditional banking transactions over the counter as face-to-face communication with the staff of traditional banks, which allows customers to make inquiries and obtain more detailed information. The banking industry is one of the most significant industries related to online presence and banking services. Electronic commerce is where banking alternatives and convenience are provided to the banks' customers [2].

Most banks have updated their corporate goals, plans, and policies to provide online banking systems to their consumers to optimize benefits, increase performance, and reduce operational costs [2]–[4]. As a result of these better strategies, plans, and policies, internet banking users can now access their bank accounts and conduct transactions anytime and anywhere in the world [2][5]. In 2000, Thai commercial banks was permitted by the Bank of Thailand



(BOT) to provide electronic transaction services along with traditional transaction services to their customers [6]. However, with the introduction of the Internet, both online banking consumers and the banking sector have faced information security dangers and risks defined as low, medium, and high—privacy and security of internet banking transactions and personal information confidentially [7]. The most widespread internet banking security threats and risks are adware, malware, spyware, keyloggers, phishing, Trojans, and viruses [8]. These risks and threats can manipulate typical banking customers. In June 2019, Ecobank Liberia Limited (ELR) became a wholly owned subsidiary of Ecobank Transnational Incorporated (ETI); in 1985, a bank holding company incorporated was under the laws of Togo. ETI owns 100% of the issued ordinary shares of Ecobank Liberia Limited. There are nine licensed banks in Liberia which Ecobank is the leading role. The bank currently has 11 branches and Cash Centers and over 30 ATMs and POS, meeting the needs of its customers across Liberia. On October 10, 2006, United Bank of Africa Liberia Limited became a private limited liability company, and on July 17, 2008, it was licensed by the Central Bank of Liberia. UBA, for short, opened on July 18, 2008, at the freeport, Bushrod Island. The leading in the Digital world of banking in Liberia is UBA which controls the market with local currency ATM machines, Visa prepaid cards, MasterCard, which are used international, etc. UBA is one of Africa's leading financial institutions offering universal banking to more than 17 million customers across 1000 branches in 20 African countries. With a presence in New York, London, and Paris and assets of more than \$19b. The main objective of this research is to access customers' perspectives on the effectiveness of online banking in Liberia. A case study of Eco-bank Liberia limited, and United bank of Africa Liberia limited .This study will extend to how the bank can protect their customers from fraud and increase their internet banking customers.

## **2. METHODOLOGY:**

This section presents the research methodology on which the study is grounded. Information for this study was collected through quantitative research to address the research objectives. The statistics for the research was mainly from both primary and secondary data. The study utilized questionnaire as an instrument for the study in collecting primary data. A questionnaire is research instrument that is used in data collection when dealing with a large sample. Primary data was collected Assessing Customer perspective on the effectiveness of online banking in Liberia. The primary data was obtained by administering questionnaires to 200 respondents and a total of 200 responses were obtained. The questionnaire consisted of both open-ended and closed questions. For the information to be valid, the targeted sources of information were people who had valid accounts with those commercial banks in Liberia . The first section of the questionnaire collected data on the general information of the respondents while the remaining sections captured the objectives of the study. Secondary data included Articles ,banks websites, documents and journals.

## **3. RESEARCH ETHICS:**

The study considers the following ethical considerations: Permission from the Customer, right to confidentiality, and respect for human rights. Data collected by the researcher is highly confidential from third parties. Respondents were also assured that any information provided in aid of the study would be used exclusively for academic purposes. Respondents' rights to privacy, willingness, voluntary participation, and informed consent were guaranteed in terms of human rights.

## **4. RESEARCH APPROACH:**

The survey of this study was conducted online by selecting samples of questionnaires from customers from both Ecobank and UBA Liberia, using a survey method, whether customers subscribe to online banking or not. A questionnaire was formed to collect information from the target audience and to make visible the possible correlation between age, sex, knowledge of computer systems, knowledge of electronic applications, and trust in online banking.

## **5. STATISTICAL ANALYSIS:**

This method makes it easy to identify boundaries of the conceptual content of the field and contribute to theory advances. In line with the qualitative research tradition, SPSS is an analytical approach widely used to integrate different findings from various studies on the same subject of inquiry from different contexts. The qualitative SPSS using the descriptive model was applied as a suitable approach and essential stage towards enlarging the research and setting the basis for analyzing the contributions of this paper. Data analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate data. The research used both primary and secondary data, the data obtained from questionnaires and annual financial reports was



summarised and analysed by using descriptive and inferential statistical techniques. For Further analysis of the quantitative data, Statistical Package for Social Sciences (SPSS) version 22.0 was used.

**6. RESULTS AND DISCUSSIONS:**  
**BACKGROUND INFORMATION OF RESPONDENTS**

The participants’ demographic data showed that more than half of the respondents representing 65.5 %were male and 35.5 % were female. These include their ages, gender, educational level, and job descriptions. This was to access the customer’s perspective of online banking in Liberia.

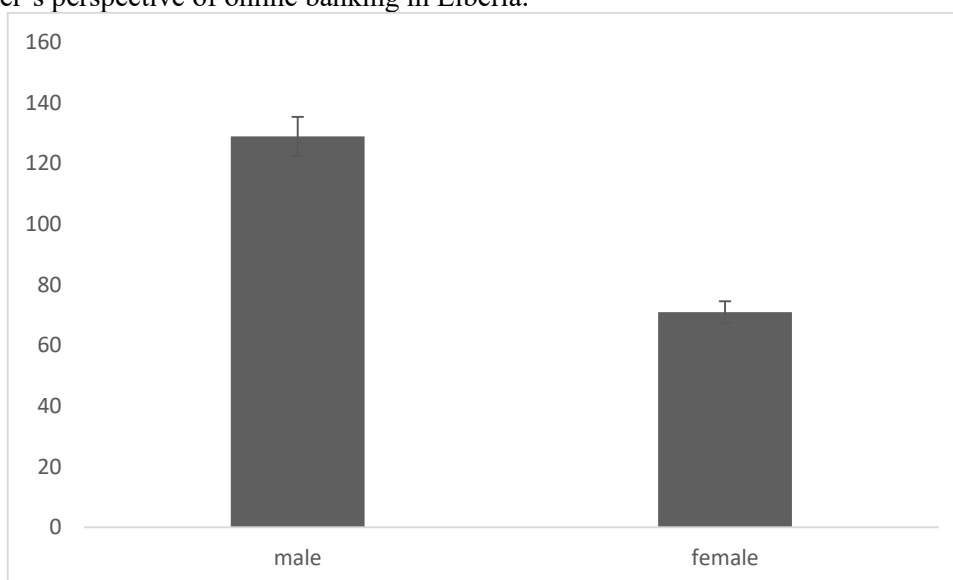


Fig 1 Gender of the respondents showed that more than half of the respondents with a frequency of 130 were male, while females had a frequency of 70.

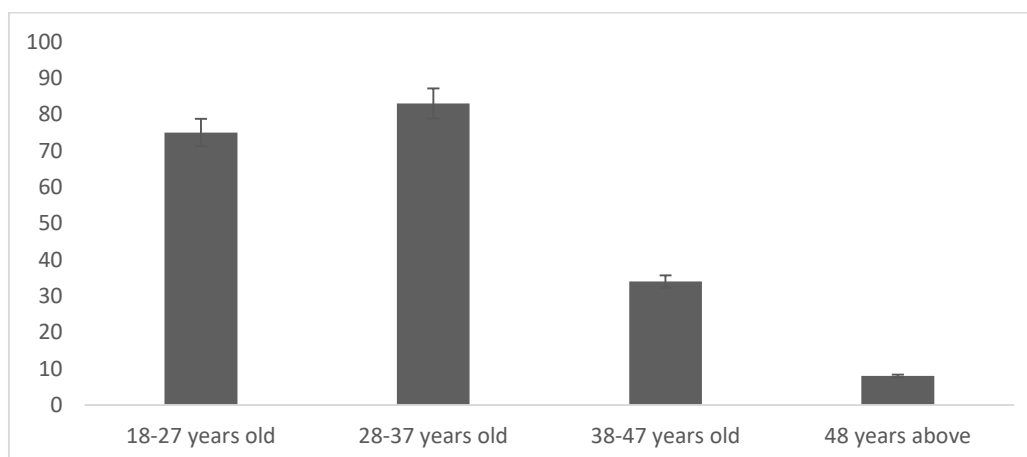


Fig 2 Age range of the respondents, age 18-27 with 37% with a frequency of 75, while 28-37 have the highest of 41% and a total frequency of 82, moving on to the age 38-47 which had 16.5% with the frequency of 33 and lastly 48 above is 5% with a Frequency of 10.

**Table 1** Indicates a customer of Eco-bank and/ or UBA banks.

Description	Frequency	Percent (%)
Eco-bank Liberia	88	44.0
UBA Liberia	79	39.5
Both	33	16.5
Total	200	100.0



Table 1 shows the results of customers who have an account with Eco-bank Liberia limited, having a %age of 44.0% (88 respondents), 39.5% (79 respondents) has an account with UBA Liberia, and 16% (33 respondents) indicated having an account with both banks.

Table 2 Those that Subscribes for online banking

Description	Frequency	Percent (%)
Yes	128	64.0
No	72	36.0
<b>Total</b>	200	100.0

The results indicate that 64% (128 respondents) customers have subscribed for online banking, and 36% (72 respondents) have not subscribed for online banking. The descriptive statistics revealed that people have an idea of online banking but are afraid to subscribe due to the security measures involved.

Despite the benefits of e-banking services and the significant expenditures made by banks in internet banking technology, many clients remain hesitant to use them [9], [10]. This agreed with [11], [12]. Customers' adoption is quite poor, which is not what was planned [11], [12]. Turkish and English banks have not successfully built enthusiasm among their clients for online banking adoption and acceptance. Despite the ubiquitous Internet use, e-banking has a low adoption rate [13], [14].

### HOW INTERNET BANKING IS PERCEIVED IN THE LIBERIAN BANKING COMMUNITY

Table 3 Show those that trust online bank

Description	Frequency	Percent(%)
Trust worthy	84	42.0
Not trustworthy	30	15.0
Neutral	49	24.5
None of the above / I do not use online banking	37	18.5
<b>Total</b>	200	100.0

According to the above data, the report from customers who have started online banking reported that 42% (84 respondents) believe online banking is trustworthy, whereas 30% (15 respondents) do not believe online banking is trustworthy, 24.5 % (49 respondents) are neutral, and 18.5 % representing 37 respondents have not opened online banking.

This finding aligns to Messaggi (2013) [15], who reported that trust is considered one of the most critical factors in (I.S.) in the internet security research area, especially when it is related to monetary transaction innovations such as internet banking. Consumers' trust in internet banking is classified into two concepts: trust in internet banking vendors (bank)and Internet and technology [16]. Technology trustworthiness is one of the factors influencing users.

### Average weekly banking activity of respondents

Table 4 Number of times customers use ATM for transactions

Description	Frequency	Percent (%)
3-4 times	145	72.5
4-6 times	30	15
More than 7 time	25	12.5
<b>Total</b>	200	100.0

The above table shows customers' various weekly banking, ATM, cashless, and bank visits. According to the analysis, the participants who use ATM weekly indicated that 72.5% (145 respondents) go to the ATM 3-4 times a week, while 15% (30 respondents) go 4-6 times and 12.5% (25 respondents) were indicated go more than seven times a week.

### Average weekly banking activity of respondents

Table 5 Number of times customers make Cashless transactions



Description	Frequency	Percent (%)
3-4 times	126	63
4-6 times	40	20
More than 7 time	34	17
<b>Total</b>	200	100.0

The above table shows customers' various weekly banking, ATM, cashless, and bank visits. According to the analysis, the participants who use ATM weekly indicated that 63% (126 respondents) go to the ATM 3-4 times a week, while 20%(40 respondents) go 4-6 times and 17%(34 respondents) were indicated go more than seven times a week.

**Average weekly banking activity of respondents using that does traditional banking**

Table 6 Number of times customers Visit the bank for transactions

Description	Frequency	Percent (%)
3-4 times	164	82
4-6 times	19	9.5
More than 7 time	17	8.5
<b>Total</b>	200	100.0

From the above analysis, 82% (164 respondents) of the participants indicated visiting the bank less than seven times a week, while 9.5% (19 respondents) indicated visiting the weekly bank 4-6times. Moreover, 8.5% (17 respondents) identified that they use the bank 3-4times in a week. These results indicate that the majority are still involved in the traditional form of banking compared to those who use ATMs and are cashless.

Like many other developing countries, Jordan has a low internet penetration rate, which has allowed banks to reach a more extensive consumer base. However, many people prefer traditional methods of obtaining financial services (human contact) when conducting business, which could explain the low adoption rate of online banking. As a result, banks must better control the elements that influence customer adoption of online banking to enhance usage [17].

**FACTOR(S) THAT ARE MOST IMPORTANT TO THE CUSTOMER WHEN SELECTING A BANKING INSTITUTION**

Table 7 Bank Reputation

Description	Frequency	Percent (%)
No	106	53.0
Yes	94	47.0
<b>Total</b>	200	100.0

Table 8 Bank online Premise

Description	Frequency	Percent (%)
No	156	78.0
Yes	44	22.0
<b>Total</b>	200	100.0

Table 9 Bank Customer Service

Description	Frequency	Percent (%)
No	119	59.5
Yes	81	40.5
<b>Total</b>	200	100.0

Table 10 Security and Privacy

Description	Frequency	Percent (%)
No	72	36
Yes	128	64.0
<b>Total</b>	200	100.0



From the table, 53% (106 respondents) of the participants do not consider bank reputation when selecting an online banking institution, and 47% (94 respondents) indicated to have considered a banking reputation. Regarding online bank premises, 78% (156 respondents) did not consider, and 22% (44 respondents) indicated to have considered. Following customer's service, 59.5% (119 respondents) did not consider, 40.5% 9 (81 respondents) indicated to have considered, and lastly, the majority of the customers indicated to have considered security and privacy with 64% (128 respondents). These results report that most customers are concerned about the banking institution they are involved with, including security and privacy, which is very important because their transactions are mainly done online, looking at online fraud and others. This finding is supported by Chen (2008) [18], who stated that internet banking security concerns are user concerns about security measures that ensure confidentiality, authorization, authentication, availability, non-repudiation, and fraud detection. The first issues of online environment transaction are security concerns because it is considered a critical element for trust to exist [19]. Consumers conducting internet banking transactions must feel secure concerning their personal information, credit card details, and others. For these, security can be considered one of the main requirements for a trust [20], given the importance of perceived security impact on users' trust to accept internet banking services.

**THE PRIMARY REASONS THAT DROVE CUSTOMERS TO SIGN UP FOR THEIR ONLINE BANKING SERVICE.**

Table 11 Low service charged

Description	Frequency	Percent (%)
No	143	71.5
Low service Charged	57	28.5
Total	200	100.0

Table 12 Safe and Secured

Description	Frequency	Percent (%)
No	149	74.5
Safe and Secured	51	25.5
Total	200	100.0

Table 13 Curiosity

Description	Frequency	Percent(%)
No	169	84.5
Curiosity	31	15.5
Total	200	100.0

Table 14 Convenience (24/7service anytime anywhere connectivity)

Description	Frequency	Percent (%)
No	127	63.5
Convenience24/7serviceanytimeanywhereconnectivity	73	36.5
Total	200	100.0

Table 15 Not applicable

Description	Frequency	Percent (%)
No	161	80.5
Not applicable	39	19.5
Total	200	100.0

According to the above data, 71.5% (143 respondents)of the customers did not agree that low service charges drove them to open an online account. In comparison, 28.5% (57 respondents) agreed, 74.5% (149 respondents) did not agree that safe and secured was the reason that drove them, 25.5% (51 respondents) agreed to this, 84.5% (169 respondents) said curiosity droved them, while 15.5% (31 respondents) agreeing, 63.5% (127 respondents) did not agree that convenience that drove them 36.5% (73 respondents) agreeing and 19.5% (39 respondents) are customers who already have an online banking account. From the findings, customers from either of the banks that opened online



banking stated that convenience is the main reason they open their online bank account, including e-transfer, e-money, bill payment, and more. Customers who use Internet banking are motivated mainly by convenience [21]. According to a previous study, most clients prioritized the convenience of utilizing Internet banking [22]. Kassim and Abdullah (2010)[23] Customer satisfaction was positively connected to ease of use. Customers who used Internet banking were more concerned with the convenience of banking transactions [1].

Table 16 These reasons best describes customer use of online banking.

Description	Frequency	Percent (%)
Online transfers	89	44.5
Checking account balance	26	13.0
Paying bills	19	9.5
Mobile top-up	25	12.5
Applying for banking services such saving accounts, insurance, etc	12	6.0
None of the above / I don't use on-line banking	29	14.5
<b>Total</b>	<b>200</b>	<b>100.0</b>

The table shows that 44.5% (89 respondents) of customers prefer online bank transfers, followed by 13% (26 respondents) checking account balance, 9% (19 respondents) paying bills, 12.5% (25 respondents) mobile top-up, applying for banking services such as saving account, insurance and so on 6% (12 respondents) and lastly 14.5% (29 respondents) customers who have not to open online banking. In summary, most customers are involved in online transactions, such as online bank transfer is typical compared to other services that are indicated. This implies that other services are manually paid for, this reveals that Liberian have not yet adopted the total usage of e-services compared to other countries. Customers can complete financial transactions such as buying and fund transfers quickly and efficiently [24]. Customers profit from e-banking services in particular since they may conduct transactions and other financial operations from the comfort of their own homes. As a result, providing multichannel banking has become a competitive need and guarantees bank-customer contact [25]. E-banking services assist both banks and clients. Customers can open accounts, make deposits, transfer funds across accounts, and make payments entirely online, allowing banks to increase banking efficiency [26].

### THE KEY BARRIERS AND CHALLENGES ARE HINDERING CUSTOMERS IN THE BANKING INSTITUTION OF LIBERIA.

Table 17 Customers who are willing to provide credit card and purchase information through telephone

Description	frequency	Percent(%)
Agree	88	44
Disagree	112	56
<b>Total</b>	<b>200</b>	<b>100.0</b>

Table 18 Those that are willing to provide credit card and purchase information through the web or email

Description	Frequency	Percent(%)
Agree	98	49.8
Disagree	102	50.2
<b>Total</b>	<b>200</b>	<b>100.0</b>

Table 19 Those willing to provide credit card and purchase information over the Internet when information is encrypted.

Description	Frequency	Percent (%)
Agree	133	66.5
Disagree	67	33.5
<b>Total</b>	<b>200</b>	<b>100.0</b>

Table 20 Customers who are willing to provide credit card information and personal information over the Internet to a bank employee who is well known and reliable.

Description	Frequency	Percent (%)
Agree	101	50.5



<b>Disagree</b>	99	49.5
<b>Total</b>	200	100.0

The above shows the results of customers willing to provide credit cards and purchase information through the telephone; the data collected was scaled on agree and disagree, with 44% (88 respondents) agreeing and 56% (112 respondents) Disagreeing. Furthermore, a customer who was willing to provide credit card and purchase information through the web or email had 49% (98 respondents) agreed, and 50% (100 respondents) Disagree For those who were willing to provide credit cards and purchase information over the Internet when information is encrypted had, 66.5%(133 respondents) agreed, and 33.5% (67 respondents) disagreed; on the other hand, customers who were willing to provide credit card information and personal information over the Internet to a bank employee who is well known and reliable were 50.5% (101 respondents) agreed and 49.5% (99 respondents) disagreed The result suggests that security and privacy are customers' primary concerns; the need for well-encrypted systems will encourage the customer to get fully involved with online services like e-commerce (buying and selling ), wherein they will feel secure by providing their credit card information. Data transmission must be secured: for confidentiality, the connection between the bank and the device should be encrypted. Application and data access must be controlled: before users can receive any sensitive information related to their bank accounts, a certain degree of verification must be completed to prevent man-in-the-middle attacks, and communication encryption can be used. Protecting the data if a mobile phone is lost or stolen is a frequent issue, and one suggestion is to make non-volatile memory encrypted and a secure store for cryptic keys. Remote device management and remote firmware update mitigate the user's involvement, possibly choosing not the most appropriate option in these cases. Operational systems may handle phone data and processes in different ways, presenting different security aspects. The designers of iOS and Android based their security implementations on five elements: Carey Nachenberg. A window into mobile device security. Technical report, Symantec, 2011 monicaEncryption: seeks to conceal data at rest on the device to address device loss or theft. The security of a Mobile App Mobile bank apps provides a direct link from the device to the bank without going through any other browser or third-party application. This means banks have much better control over the security and connection of customer interactions. Because these apps are built specifically for a particular bank and its customers, the bank can provide a secure connection using SSL encrypted. If someone can obtain a customer's phone, they will still be required to put in a username and password and, if available, provide a second factor of authentication to gain access to the accounts. Along with these two factors of authentication, many banks have started implementing the third method of security: a profile of a customer's actions. Banks and other financial institutions can monitor a customer's actions when banking via a mobile application, creating a profile of those interactions. Another plus to using a mobile application is that most smartphones and tablets can now be cleared or reset from remote locations. Thus, if someone steals or obtains a mobile device, the customer can use his or her computer or any other device with an Internet connection to clear any data and apps from the device, eliminating the possibility that someone else can use the phone to access the customer's account. As customers become more familiar with mobile banking app security and trust a bank's mobile app brand, they will be more willing to use these tools [27] option and two-factor authentication that meets the institution's unique needs.

Table 21 The significant reasons customers have not yet opened an online bank account.

<b>Description</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Never heard of Internet banking</b>	17	8.5
<b>Concerned about security and privacy</b>	71	35.5
<b>Not available through my bank</b>	5	2.5
<b>I am not comfortable with computers</b>	4	2.0
<b>Not Applicable</b>	103	51.5
<b>Total</b>	200	100.0

According to table 21, 8.5% (17 respondents) had never heard of internet banking, 35.5%(71) were concerned about security and privacy, 2.5% (5 respondents)indicated that banking app was not available in their bank, 2% (4 respondents) were not comfortable with computers. Lastly, 51.5% (103 respondents) were those who already have online banking services. Regarding the discussion, customers of either bank Eco-bank Liberia limited or the United bank of Africa Liberia limited who have not yet opened an online banking service are mainly concerned about security and privacy. Understanding consumers' decisions in adopting e-banking are important for both bankers and regulators to formulate appropriate strategies that will guarantee effective implementation and adoption of e-banking and increase e-banking adoption rates [28]. Scott Sargent (2018)[29] performed annual online banking risk assessments





and got to know it is important to identify those accounts or account types that may be most susceptible to fraud and implement appropriate controls to mitigate potential losses. Privacy includes users' concerns about losing control over the provided and required personal information when he/she is using internet banking in conducting transactions. These concerns include personal information collection, storage, usage and disclosures, location, traction, and unsolicited advertising [30]. To increase trust in internet banking, the protection of personal information is a significant factor. There are many examples of privacy concerns, such as customers' worries that banks may share their profile information with other firms and be used in publishing advertisements. Perceived fears of disclosure of personal information negatively influence trust to accept internet banking services.

Table 22 How likely are customers to open an Internet banking account in the next 12 months

Description	Frequency	Percent (%)
Very Unlikely	28	14.0
Somewhat Unlikely	15	7.5
Neither Unlikely nor Likely	11	5.5
Somewhat Likely	30	15.0
Very Likely	42	21.0
Not Applicable	74	37.0
<b>Total</b>	200	100.0

According to the above data, 14% (28 respondents) of the customer were doubtful to open an online banking service, with 7.5% (15 respondents) being somewhat unlikely to open an account, 5.5% (11 respondents) were unlikely nor likely to open an account, 15% (30 respondents) were somewhat likely to open an account. In comparison, 21% (42 respondents) were very likely to open an account, and lastly, 37% (74 respondents) of the customers were those who had already opened online banking. From the above analysis, customers are very likely to open an online banking account with their various banks or banks in the nearest future if the security sectors are well secured. According to Abdel et al. (2020) [31], customer purchase intention and the impact of e-service quality are of more significant concern. Service and privacy were also found in a significant positive association with customer purchase intention. This agrees with this present student. E-banking adoption rate [10], [28]. strategies to improve the take-up of online banking. Electronic payment methods (EPM) are streamlined and individualized methods of completing financial transactions (through mobile or the Internet) without cash or paper checks. Lowering the number of people who have to carry huge sums of money and wait in long lines at banks to perform a financial transaction [32]. Compared to traditional banking, e-banking provides speed, efficiency, comfort, and security. Banking procedures, automated teller machines (ATMs), and point of sale (POS) have reduced the need for cheque and paper paperwork [32]. As a result, bank executives must be aware of the elements that can impede or facilitate e-banking acceptability and usage to develop strategies to improve the situation of online banking [10].

## RECOMMENDATIONS AND GUIDELINES THAT ARE REQUIRED TO BOOST ONLINE BANKING IN LIBERIA

Customers chose below the type of security measure they want their banks to have

Table 23 Regular text password

Description	Frequency	Percent (%)
No	142	71.0
Yes	58	29.0
<b>Total</b>	200	100.0

Table 24 One-time password

Description	Frequency	Percent (%)
No	141	70.5
Yes	59	29.5
<b>Total</b>	200	100.0

Table 25 Facial Recognition

Description	Frequency	Percent (%)
No	132	66.0
Yes	68	34.0



<b>Total</b>	200	100.0
--------------	-----	-------

Table 26 Biometric (fingerprint)

Description	Frequency	Percent (%)
No	110	55.0
Yes	90	45.0
<b>Total</b>	200	100.0

Table 27 Unsure

Description	Frequency	Percent (%)
No	172	86.0
Yes	28	14.0
<b>Total</b>	200	100.0

The above question was to get customers' opinions on what guidelines and recommendations can be implemented to boost online banking in Liberia. Of respondents, 71 % (142 respondents) of the customers do not prefer regular text passwords, with 29% (58 respondents) recommending regular passwords as a guideline, 70.5% (141 respondents) did not agree on time passwords, 29.5% (59 respondents) agreed to one-time passwords as a guideline and recommendation to boost the online banking system, 66% (132 respondents) said no to facial recognition. In comparison, 34% (68 respondents) recommended the implementation of facial recognition. 55% (110 respondents), on the other hand, did not prefer the use of biometrics (fingerprinter), while 45% (90 respondents) recommended the use of biometrics, 14% (28 respondents) were are not unsure with which mechanism their banks should use, and 86% (172 respondents) agreed on the mechanism can be implemented on the online. According to Matthews (2012)[27], helping users reduce their fears about mobile banking should be a priority for financial institutions; to achieve this, customers should know about the security used for mobile banking apps, which is one of the steps. Most users want more accessible and convenient access to their bank accounts, but they are unaware of how safe using a mobile banking app is. In reality, banking via a mobile app is as 27 safes as walking into a bank and interacting directly with a teller, and it is much more secure than banking through a browser on a personal computer. Banks can control the security of an app much more accessible than through a browser [27]. When customers use their browser to do their banking, they leave themselves open to malware and man-in-the-middle attacks. In recent bank breaches, hackers could gain valuable information about users' bank login credentials, even their two-factor authentication credentials in some cases, by key-logging and stepping in between a user and his or her bank's website. Even when a bank has strong security, if users' computers are infected with malware or a virus, they may be vulnerable to attack.

**THE FOLLOWING INDICATES HOW ESSENTIAL IT IS FOR THE CUSTOMER WHEN THEY ARE SELECTING THEIR ONLINE BANKING SERVICE**

Table 28 Better rate and lower service charge

Description	Frequency	Percent (%)
Not at all important	16	8.0
Slightly important	47	23.5
Important	123	61.5
Fairly important	10	5.0
No opinion	4	2.0
<b>Total</b>	200	100.0

Table 29 Bank Familiarity

Description	Frequency	Percent (%)
Not at all important	26	13.0
Slightly important	61	30.5
Important	100	50.0
Fairly important	6	3.0
No opinion	7	3.5



Total	200	100.0
-------	-----	-------

Table 30 Bank location (geographic)

Description	Frequency	Percent (%)
Not at all important	16	8.0
Slightly important	57	28.5
Important	114	57.0
Fairly important	9	4.5
No opinion	4	2.0
Total	200	100.0

Table 31 The size of the bank (in terms of asset)

Description	Frequency	Percent (%)
Not at all important	15	7.5
Slightly important	27	13.5
Important	146	73.0
Fairly important	9	4.5
No opinion	3	1.5
Total	200	100.0

Table 32 Security of Transaction

Description	Frequency	Percent (%)
Not at all important	36	18.0
Slightly important	53	26.5
Important	94	47.0
Fairly important	12	6.0
No opinion	5	2.5
Total	200	100.0

Table 33 Convenience (24 hours Service from Anywhere)

Description	Frequency	Percent (%)
Not at all important	23	11.5
Slightly important	74	37.0
Important	89	44.5
Fairly important	6	3.0
No opinion	8	4.0
Total	200	100.0

Table 34 Quick service (Transaction completed in seconds instead of minutes)

Description	Frequency	Percent (%)
Not at all important	14	7.0
Slightly important	39	19.5
Important	135	67.5
Fairly important	7	3.5
No opinion	5	2.5
Total	200	100.0

Table 35 Variety of features and services that are offered (for example; bill payment, account reconciliation, electronic bill payment )

Description	Frequency	Percent (%)
Not at all important	20	10.0
Slightly important	54	27.0
Important	116	58.0



Fairly important	7	3.5
No opinion	3	1.5
Total	200	100.0

Table 36. Integrated value-added services using other online services and resources (for example; other brokerage account summaries)

Description	Frequency	Percent (%)
Not at all important	28	14.0
Slightly important	63	31.5
Important	92	46.0
Fairly important	8	4.0
No opinion	9	4.5
Total	200	100.0

Banking has evolved into a competitive need and guarantees engagement between banks and their clients [25]; e-banking benefits both banks and customers. From Scott Sargent (2018)[29], Implement layered security controls, including multi-factor authentication for higher-risk transactional online banking services, and examine available security controls that could be or should be implemented. In disputes over liability for unauthorized transactions, many courts determine whether a security procedure is commercially reasonable by combining the analysis with applicable regulatory guidance.

## 7. CONCLUSION:

Based on the study's findings, it is possible to conclude that modern technology has had little impact on the banking sector in Liberia. Despite the fact that bank innovations have been in place in the country for over two decades, there is still much that needs to be done to improve the service's performance. From the analysis result, it can be concluded that there is a positive response from customers who have subscribed for online banking. Customers have a guideline on how they select and prefer the security of the transaction. E-banking is an emerging form of banking in Liberia, especially when selling and buying goods and services. This form has improved customer satisfaction and has enabled customers to control their accounts better than ordinary banking. Banking has a high possibility rate for customers to expand their online services fully. In a nutshell, e-banking has positively impacted customer satisfaction. Research and development does play a significant role in enhancing commercial bank operations. There is a lot that commercial banks need to put in place to improve their service quality as well as their profitability, such as having qualified personnel, increasing client awareness, and developing better goods and services that impact the banks' profitability.

## 8. RECOMMENDATIONS:

The banks should organize official training for customers to increase awareness about banking rather than providing them with cards. It will lead to an increased understanding of the usage of the internet and mobile banking, since the world is becoming more digital; it is critical for consumers to adapt. Banks should check their banking platform regularly to upgrade their system in case of an attempt to hack into the system. This helps minimized security threats, risks and maximize customers' satisfaction. Lastly, customers do not know which biometric mechanism to help protect their accounts from being hacked. A dual mechanism is proposed to protect customer accounts from hackers; this implementation will increase customer trust, get more customers to start their business online, and encourage potential customers to subscribe and start doing transactions online.

## REFERENCES:

1. A. Sulaiman, L. C.H, and A. WEE, "Prospects and Challenges of E-Banking In Malaysia," *Electron. J. Inf. Syst. Dev. Ctries.*, vol. 22, no. 1, pp. 1–11, 2005, doi: 10.1002/j.1681-4835.2005.tb00139.x.
2. R. M. Peter G. Keen, "The Freedom Economy: Gaining the Mcommerce, Edge in the Era of the Wireless Internet",.,  
*McGraw-Hill Prof.*, 2001.
3. R. T. and M. Kamala, "Improving E-Banking Security with Biometrics, Modelling User Attitudes and Acceptance," 2009.
4. M. G. and S. Sankaranarayanan, "Biometric security mechanism in Mobile payments, Wireless And Optical Communications Networks (WOCN)," 2010.
5. M. Prenske, "What Can You Learn from A Cell Phone? – Almost Anything", 2004.
6. and N. R. C. Narendiran, S. Rabara, "Performance evaluation on end-to-end security architecture for mobile banking



- system, | *Wireless Days*,” 2008.
7. K. P. and M. Schurig, “Assessment of today’s mobile banking applications from the view of customer requirements, | *System Sciences Proceedings of the 37th Annual Hawaii International Conference*,” 2004.
  8. Chen Xin, “M-Commerce Development and Challenges Facing, | *Services Science, Management and Engineering*,” 2009.
  9. N. Chaouali, W., Ben Yahia, I. and Souiden, ““The interplay of counter-conformity motivation, social influence, and trust in customers’ intention to adopt Internet banking services,” *J. Retail. Consum. Serv.*, vol. Vol. 28 No, pp. 209-218., 2016.
  10. A. Tarhini, A., El-Masri, M., Ali, M. and Serrano, ““Extending the UTAUT model to understand the customers’ acceptance and use of internet banking in Lebanon: a structural equation modeling approach”, *Information Technology & People*,” vol. Vol. 29 No, pp. 830-849., 2016.
  11. H. Shaikh, A. and Karjaluo, “‘Mobile banking adoption: a literature review’, *Telematics and Informatics*,” vol. Vol. 32 No, pp. 129-142., 2015.
  12. K.-H. Shih, H.-F. Hung, and B. Lin, “Assessing user experiences and usage intentions of m-banking service,” *Int. J. Mob. Commun.*, vol. 8, no. 3, pp. 257–277, 2010.
  13. H. Celik, ““What determines Turkish customers’ acceptance of internet banking?”,” *Int. J. Bank Mark.*, vol. Vol. 26 No, pp. 353-370., 2008.
  14. M. Yousafzai, S. and Yani-De-Soriano, ““Understanding customer-specific factors underpinning internet-banking adoption,” ”, *Int. J. Bank Mark.*, vol. Vol. 30 No, pp. 60–81, 2012.
  15. M. M. Kaya, “Trust and Security Risks in Mobile Banking,” no. March, pp. 1–47, 2013, [Online]. Available: [http://s3.amazonaws.com/academia.edu.documents/33094504/Trust\\_and\\_security\\_risks\\_in\\_mobile\\_banking.pdf?AWSAccessKeyId=AKIAJ56TQJRTWSMTNPEA&Expires=1480346564&Signature=L8%2FuLhdofDMBqKwNMVi1p7awdzc%3D&response-content-disposition=inline%3Bfilename%3DTrus](http://s3.amazonaws.com/academia.edu.documents/33094504/Trust_and_security_risks_in_mobile_banking.pdf?AWSAccessKeyId=AKIAJ56TQJRTWSMTNPEA&Expires=1480346564&Signature=L8%2FuLhdofDMBqKwNMVi1p7awdzc%3D&response-content-disposition=inline%3Bfilename%3DTrus).
  16. J. G. P. and G. R. F. Yousafzai, S.Y., “A proposal model of e-trust for electronic banking .,” *Technovation*, 23:847-860., 2003.
  17. H. Montazemi, A. and Qahri-Saremi, ““Factors affecting adoption of online banking: a meta-analytic structural equation modeling study’, *Information & Management*,” vol. Vol. 52 No, pp. 210-226., 2015.
  18. L. . Chen, “A model of customer acceptance of mobile payment,” *Int. J. Mob. Commu*, 632-52, 2008.
  19. B. Hernandez-Ortega, “The role of post-use trust in the acceptance of a technology :Drivers and consequences. *Technovation*, 31:523-538.,” 2011.
  20. S. S. and N. M. Y. Alam, “What factors influence online brand trust,” *Evid. from online tickets Buy. Malaysia. J. Theor. Appl. Electron Commer. Res.*, 578-89, 2010.
  21. S. S., “Internet Banking in Pakistan, D Master Thesis, Department of Business Administration and Social Sciences, Luleå University of Technology, Sweden,” 2006.
  22. M. Lallmahamood, “An Examination of Individual’s Perceived Security and Privacy of the Internet in Malaysia and the Influence of This on Their Intention to Use E-Commerce: Using An Extension of the Technology Acceptance Model.,” *Internet Bank. Commer.* 12(3), 2-26., 2007.
  23. N. Kassim and N. A. Abdullah, “The effect of perceived service quality dimensions on customer satisfaction, trust, and loyalty in e-commerce settings: A cross cultural analysis,” *Asia pacific J. Mark. Logist.*, 2010.
  24. G. M. Ling, Y. S. Fern, L. K. Boon, and T. S. Huat, “Understanding Customer Satisfaction of Internet Banking: A Case Study In Malacca,” *Procedia Econ. Financ.*, vol. 37, no. 16, pp. 80–85, 2016, doi: 10.1016/s2212-5671(16)30096-x.
  25. A. StoiStoica, O., Mehdiian, S. and Sargu, A. ca, O., Mehdiian, S. and Sargu, “The impact of internet banking on the performance of Romanian banks: DEA and PCA approach”, *Procedia Economics and Finance*,” vol. Vol. 20 No, pp. 610-622., 2015.
  26. J. Takeddine, S. and Sun, ““Internet banking diffusion: a country-level analysis’, *Electronic Commerce Research and Applications*,” vol. Vol. 14 No, pp. 361–371, 2016.
  27. T. Matthews, “DARLET GROUP TANZANIA.” <https://darletgroup.blogspot.com/2012/09/>.
  28. Z. Liébana-Cabanillas, F., Marinković, V. and Kalinic, ““A SEM-neural network approach for predicting antecedents of m-commerce acceptance’, *International Journal of Information Management*,” vol. Vol. 37 No, pp. 14-24., 2017.
  29. B. S. Sargent and B. Donelson, “Electronic banking : Risks and requirements,” 2018.
  30. M. . and P. A. P. Featherman, “Predicting e-services adoption: A perceived risk facets perspective. *Int. J. Hum.*,” *Comput. Stud.*, 59.451-474., 2003.
  31. A. L. M. Anouze and A. S. Alamro, “Factors affecting intention to use e-banking in Jordan,” *Int. J. Bank Mark.*, vol. 38, no. 1, pp. 86–112, 2020, doi: 10.1108/IJBM-10-2018-0271.
  32. M. Jenevive, O. C., & Anyanwaokoro, “Electronic Payment Methods and Profitability of Banking Firms in Nigeria: A Panel Data Analysis.,” *Int. J. Financ. Account.* 6(3), 67-74, 2017.