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AVAILABILITY AND EXTENT OF UTILIZATION OF TECHNOLOGICAL APPLICATIONS FOR FINANCIAL FRAUD CONTROL AND PREVENTION IN COMMERCIAL BANKS

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Abstract
The study ascertained the availability and extent of utilization of technological applications for financial fraud control and prevention in Commercial banks in Anambra State, Nigeria. The study adopted a descriptive survey research design. Two research questions guided the study and two null hypotheses were tested at 0.05 level of significance. The population of the study comprised 1,092 management Staff from the 156 Commercial banks operating in Anambra State. Proportionate Stratified Random Sampling was used to select 624 respondents as sample for the study. Structured questionnaire containing 38 items was used for the study. The questionnaire was validated by three experts. The reliability of the instrument was ascertained using 20 management Staff from Commercial banks in Delta State which were not part of the population. Reliability of the instrument was established using Cronbach Alpha's method and the coefficient value of 0.88 was obtained. Copies of the questionnaire were administered by the researchers with the help of three research assistants. Data collected were analyzed using percentage, mean and standard deviation, while, z-test was used to test the null hypotheses. Findings of this study revealed that most of the technological applications for financial fraud control and prevention in Commercial banks were available and highly utilized, while a few were not available and some were lowly utilized. It was recommended that the management of Commercial banks should regularly review the availability and extent of utilization of technological applications to ensure adequate availability and effective utilization of technological applications for financial fraud control and prevention.

Keywords: Availability, Utilization, Technological Applications, Financial Fraud Control and Prevention, Commercial Banks.

Introduction

Commercial banks play a critical role in the financial system of any country. They serve as intermediaries between savers and borrowers. They also provide credit facilities, support investments and facilitate smooth financial transactions in both the private and public sectors. According to Mittal, Tayal, Singhal and Gupta (2024); Sadilloyevna (2024), Commercial banks operate through various branches offering digital and traditional services aimed at providing convenience and financial inclusion. However, alongside these advancements, comes the persistent threat of financial fraud, which continues to undermine the integrity and security of banking operations.

Financial fraud refers to the intentional act of deception involving financial transactions for personal gain, usually at the expense of an institution or its customers. According to Obidile, Emeh and Chibuzo (2026), financial fraud refers to any deliberate act of deception or misrepresentation intended to gain unlawful financial advantage. Similarly, Okoye and Gbegi (2013); Aziz (2023) defined financial fraud as the deliberate manipulation of information or systems with the intention of committing theft, embezzlement or illicit gain. In the same vein, Reurink (2019) defined financial fraud as any act involving dishonesty, concealment or breach of trust used to gain an unfair or unlawful financial advantage. These definitions highlight the systemic nature of fraud in financial institutions, hence there is need for constant vigilance and effective prevention mechanisms. Over the years, financial fraud in Nigeria has manifested in various forms, including Automated Teller Machine (ATM) fraud, Cyber

fraud, Identity theft, Fake bank alerts and Electronic payment fraud. Statistics from the Nigeria Inter-Bank Settlement System NIBSS, (2022) revealed that Nigerian banks lost over ₦14.65 billion to fraud-related activities in 2021 alone, with 98% of the fraud attempts occurring through digital platforms such as mobile banking, internet banking and Point of Sale (POS) terminals. These figures illustrate the growing complexity and frequency of fraud, driven by increased digitalization of banking services and the relative weaknesses in technological infrastructure and fraud detection systems within the banking sector.

Technological applications refer to the use of scientific knowledge and innovation to solve problems and improve efficiency (Kumari & Devi, 2022). In the context of this study, technological application refers to the use of electronic systems, software applications and digital platforms to carry out financial operations, monitor transactions and secure information for improved efficiency. The use of technology in fraud control and prevention has become increasingly vital due to the increasing sophistication of fraudsters and the need for rapid automated response to financial fraud. Some of the most commonly deployed technologies in financial fraud control and prevention include data encryption, biometric verification, two-factor authentication (2FA), transaction monitoring systems, artificial intelligence (AI)-based risk engines and secure socket layers (SSL). These tools work by either restricting unauthorized access, tracking irregular transaction patterns, or alerting bank personnel of suspicious activities in real-time. For instance, biometric authentication; using fingerprints or facial recognition ensures that only the rightful account holder can access their account. AI-powered tools can study transaction history and flag unusual behavior for further investigation, while encryption ensures that data cannot be read or intercepted by unauthorized individuals (CBN, 2018). These technologies not only enhance financial security but also reduce fraud attempts.

In Anambra State, where commercial banking thrives due to high economic activity in cities like Onitsha, Nnewi and Awka, these fraudulent activities pose a serious concern. Financial fraud not only leads to financial losses but also erodes public confidence in banking services and discourages investments. Many Commercial banks have recorded multiple incidents of financial fraud, particularly ATM fraud and internal collusion cases, causing reputation damage and customer distrust (Anumba, 2023). Nevertheless, these incidents of financial fraud could be curbed with the use of technological applications. However, the extent to which these technological applications are available and being utilized by Commercial banks could differ based on their location, customer base and infrastructural investment. Some Commercial banks may have made notable strides in deploying biometric ATMs, 2FA systems and centralized fraud monitoring centers in their branches across the State while some others may not. Furthermore, Commerial banks in rural branches may not possess these advanced systems due to budget constraints, lack of skilled personnel or poor network infrastructure. According to Alanezi (2016); Ayodeji (2024), some banks in the rural areas, still rely heavily on manual checks and lack up-to-date fraud prevention tools, which could increase their vulnerability to fraud.

Given these realities, this study was conducted to ascertain the availability and extent of utilization of technological applications for financial fraud control and prevention in Commercial banks in Anambra State.

Research Questions

The following research questions guided the study;

i. What technological applications are available for financial fraud control and prevention in Commercial banks in Anambra State?
ii. To what extent are technological applications being utilized for financial fraud control and prevention in Commercial banks in Anambra State?

Null Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

$H0_1$: There is no significant difference in the mean ratings of the respondents on the availability of technological applications for financial fraud control and prevention in Commercial banks as a result of location (Urban and Rural).
$H0_2$: There is no significant difference in the mean ratings of the respondents on the extent of utilization of technological applications for financial fraud control and prevention in Commercial banks as a result of location (Urban and Rural).

Methods

The study adopted a descriptive survey research design. The population of the study comprised 1,092 Management Staff from the 156 Commercial bank branches operating in Anambra State. The Management Staff include; the Manager, the Accountant, the Supervisor and the ICT Personnel. Proportionate Stratified Random sampling was used to select 624 Management Staff as sample for the study (4 Management Staff from 156 Commercial banks). The instrument for data collection was a structured questionnaire titled 'Availability and Extent of Utilization of Technological Applications for Financial Fraud Control and Prevention in Commercial banks (AEUTAFFCPCB)'. The questionnaire was validated by three experts. The input of the experts were incorporated before the final production of the instrument. The questionnaire has two sections (A & B). Section A contains the respondents' demographic information covering the category of staff or job position and the location of the Commercial bank. Section B contains B1 and B2. Section B1 deals with research question one. It contains 19 items and has response options of Available and Not Available. Section B2 deals with research question two. It also contains 19 items. The response options were structured on a five–point Likert rating scale of Very Highly Utilized (VHU) =5, Highly Utilized (HU) =4, Moderately Utilized (MU) =3, Lowly Utilized (LU)=2, and Very Lowly Utilized (VLU)=1. Reliability of the instrument was ascertained using 20 management Staff from Commercial banks in Delta State which were not part of the population. The reliability was established using Cronbach Alpha's method and the coefficient value of 0.88 was obtained. The study utilized a direct method of questionnaire administration. Copies of the questionnaire were administered by the researchers with the help of three research assistants. Out of 624 copies of the questionnaire shared, 611 copies were retrieved. Data collected from the respondents were analyzed using percentage, mean and standard deviation to answer the research questions, while, z-test was used to test the null hypotheses at 0.05 level of significance.

Results

Research Question 1

What technological applications are available for financial fraud control and prevention in Commercial banks in Anambra State?

Table 1: Mean Responses of Respondents on Availability of Technological Applications for Financial Fraud Control and Prevention in Commercial banks (N=611)

S/N	Items	Available		Not Available	
		Frequency	%	Frequency	%
1	Spread Sheet tool	590	96.6	21	3.4
2	Big data technologies	428	69.3	183	30.7
3	Computer and Forensic Analytics Software	611	100	0	0
4	Text Analytic Tools	611	100	0	0
5	Expert Systems such as Data Mining Analyst	258	41.4	353	58.6
6	Integrated Personnel and Payroll Information System (IPPIS)	117	20.2	494	79.8

7	Government Integrated Financial Management Information System (GIFMIS)	209	34.0	402	66.0
8	Credit and debit alert systems	597	92.7	14	7.3
9	Biometric identifiers for identifying customers such as fingerprint, palm veins, face recognition, palm print, retina, etc	544	87.3	67	12.7
10	Computerized system like Distributed Ledger Technology (DLT) for monitoring bank transactions such as money transfer, deposits and withdrawals	601	98.5	10	1.5
11	Inter and intra bank connectivity system	611	100	0	0
12	Password technology	611	100	0	0
13	Challenge- response and call-back Protocol	506	81.6	105	18.4
14	Electronic methods of authentication and authorization of Payments	603	98.8	8	1.2
15	Firewall and data encryption technology	553	88.9	58	11.1
16	Database for lost cheques and other banking instruments	415	64.9	196	35.1
17	Web geo-location technology for locating internet users for financial activities	364	57.3	247	42.7
18	Database of fraudsters and suspected customers	449	71.5	162	28.5
19	Overt and closed- circuit surveillance systems	528	84.0	83	16.0

Data in Table 1 show that most of the technological applications for financial fraud control and prevention are available in Commercial banks as shown in items 1, 2, 3, 4, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19. However, the data also reveal that a few technological applications for financial fraud control and prevention are not available as shown in items 5, 6 and 7.

Research Question 2

To what extent are technological applications being utilized for financial fraud control and prevention in Commercial banks in Anambra State?

Table 2: Mean Responses of Respondents on the Extent of Utilization of Technological Applications for Financial Fraud Control and Prevention in Commercial banks (N=611)

S/N	Items	$\bar{X}$	SD	Remarks
1	Spread Sheet tool	5.00	0.52	Very Highly Utilized
2	Big data technologies	3.47	0.61	Moderately utilized
3	Computer and forensic Analytical software	4.48	0.42	Highly Utilized
4	Text Analytical Tools	4.37	0.44	Highly Utilized
5	Expert Systems such as Data Mining Analyst	1.41	0.68	Very Lowly Utilized
6	Integrated personnel and Payroll Information System (IPPIS)	1.28	0.65	Very Lowly Utilized
7	Government Integrated Financial Management Information System (GIFMIS)	1.33	0.66	Very Lowly Utilized
8	Credit and debit alert systems	4.40	0.56	Highly Utilized
9	Biometric identifiers for identifying customers	4.32	0.50	Highly Utilized
10	Computerized system like Distributed Ledger Technology (DLT) for monitoring bank transactions such as money transfer, deposits and withdrawals	4.20	0.44	Highly Utilized

11	Inter and intra bank connectivity system	4.25	0.59	Highly Utilized
12	Password technology	4.30	0.40	Highly Utilized
13	Challenge-response and call-back protocol	4.17	0.67	Highly Utilized
14	Electronic method of authentication and authorization of payments	4.48	0.50	Highly Utilized
15	Firewall and data encryption technology	4.42	0.57	Highly Utilized
16	Database for lost cheques	3.41	0.66	Moderately Utilized
17	Web geo-location technology for locating internet users for financial activities	2.47	0.62	Lowly Utilized
18	Database of fraudsters and suspected customers	4.22	0.63	Highly Utilized
19	Overt and closed-circuit surveillance systems	4.48	0.52	Highly Utilized

Data in Table 2 show the mean responses of respondents on the extent of utilization of technological applications for financial fraud control and prevention in Commercial banks. The results show that item 1 has the mean response of 5.00 which indicates very highly utilized while items 3, 4, 8, 9, 10, 11, 12, 13, 14, 15, 18 and 19 have their mean responses ranging from 4.17 to 4.48, which indicate highly utilized. The mean responses of items 2 and 16 which range from 3.47 to 3.41 respectively, show moderately utilized, while item 17 with the mean response of 2.47 shows lowly utilized. Furthermore, items 5, 6 and 7 with mean responses ranging from 1.28 to 1.41 show very lowly utilized. The standard deviation of the items which ranges from 0.40 to 0.68 shows that the opinions of the respondents are closely related. This entails that the respondents have similar opinions on the extent of utilization of technological applications for financial fraud control and prevention in Commercial banks.

Null Hypothesis 1

There is no significant difference in the mean ratings of the respondents on the availability of technological applications for financial fraud control and prevention in Commercial banks as a result of location.

Table 3: The z-Test Analysis of the Urban and Rural Respondents on the Availability of Technological Applications for Financial Fraud Control and Prevention

Variables	N	$\overline{X}$	SD	Df	p-value	α	Remark
Urban	394	14.86	1.24	609	0.093	0.05	Not Significant
Rural	217	15.59	1.22				

Table 3 shows that the p-value of 0.93 at 609 degree of freedom is greater than α –value of 0.05 (0.093> 0.05). This means that there is no significant difference in the mean ratings of the respondents on the availability of the technological applications for financial fraud control and prevention in Commercial banks in Anambra State as a result of location. Therefore, the null hypothesis is not rejected.

Null Hypothesis 2

There is no significant difference in the mean ratings of the respondents on the extent of utilization of technological applications for financial fraud control and prevention in Commercial banks as a result of location.

Table 4: The z-Test Analysis of the Urban and Rural Respondents on the Extent of Utilization of Technological Applications for Financial Fraud control and Prevention in Commercial banks

Variables	N	$\overline{X}$	SD	Df	p-value	α	Remark
Urban	394	54.01	2.50	609	0.082	0.05	Not Significant
Rural	217	54.43	2.33				

Table 4 shows that the p-value of 0.082 at 609 degree of freedom is greater than α –value of 0.05 (0.082 > 0.05). This means that there is no significant difference in the mean ratings of the respondents on the extent of utilization of the technological applications for financial fraud control and prevention in Commercial banks in Anambra State as a result of location. Therefore, the null hypothesis is not rejected.

Discussion

Findings of research question one revealed that most technological applications for financial fraud control and prevention in Commercial banks were available. These technological applications include; Spread sheet tool, big data technologies, Computer and forensic analytics software, Text analytic tool, Credit and debit alert systems, Biometric identifiers, Computerized system, Inter and intra bank connectivity system, Password technology, and Challenge response and call back protocol. Others include; Electronic methods of authentication and authorization of Payments, Firewall and data encryption technology, Database for lost cheques and other banking instruments, Web geo-location technology for locating internet users for financial activities, Database of fraudsters and suspected customers and Overt and closed- circuit surveillance systems. These technological applications could be used for financial fraud control and prevention, as each tries to give maximum quality of service. This finding is in line with the findings of Idolor (2020) which revealed that Commercial banks in Nigeria have technological applications and manuals of operation to ensure due process and protect the integrity of their operations.

Findings from hypothesis one revealed no significant difference in the mean ratings of the respondents on the availability of technological applications for financial fraud control and prevention with regards to location. This could be as a result of the importance of technological applications towards the financial fraud control and prevention in the banking sector, that might have caused every bank, irrespective of their location to provide the technological applications for financial fraud control and prevention.

Findings of research question two revealed that most of the technological applications for financial fraud control and prevention were utilized in Commercial banks. This is in line with Obafemi (2021) who stated that Commercial banks utilize technological applications to strengthen the banks' defence against electronic and online fraudulent activities. Furthermore, Akeem (2019), maintained that Commercial banks usually adopt web geo-location technology to ascertain the location of the customer at the point of the on-line and electronic transaction in real- time. However, since some of the technological applications for financial fraud control and prevention were lowly utilized, factors militating against their usage should be looked into so that Commercial banks would enhance the utilization of technological applications to curb financial fraud.

Findings from the test of hypothesis two also revealed no significant difference in the mean ratings of the respondents on the extent of utilization of technological applications for financial fraud control and prevention with regards to location. This entails that Commercial banks utilize technological applications for financial fraud control and prevention irrespective of their location.

Conclusion

The study concluded that most of the listed technological applications for financial fraud control prevention were available and utilized in Commercial banks in Anambra State, despite their location, except for a few that were not available and some that were lowly utilized.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. The management of Commercial banks should regularly review the availability and extent of utilization of technological applications, to ensure adequate availability and effective utilization of technological applications for financial fraud control and prevention.
2. The management of Commercial banks should devote more time and resources for research and training of their staff in financial fraud control and prevention, to keep pace with the best practices in financial institutions.

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