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INNOVATION BANKING SERVICES AND PROFITABILITY OF COMMERCIAL BANKS LISTED AT THE NAIROBI SECURITIES EXCHANGE (NSE), KENYA

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ABSTRACT

For banks to survive in the unstable and evolving market and meet their goals and objectives in a market-driven environment, they have implemented creative approaches geared towards sustainability and growth. The study incorporated three theories, namely; digital transformation theory, open innovation theory and dynamic capabilities theory. The study utilized causal research design where by the study population was the 12 commercial banks listed at the Nairobi securities exchange. The study covers a period of five years from 2020 to 2024. Data was collected from the 11 banks using both a questionnaire and data collection sheet to take care of both the primary and secondary data respectively. Data collected was analyzed using multiple regression model. The research finding depicted that product innovation had a direct influence on the profitability of commercial banks listed at the Nairobi securities which was significant. Process innovation had significant influence on profitability of commercial banks listed at the Nairobi securities and technological innovation had a direct influence on the profitability of commercial banks listed at the Nairobi securities exchange which was significant. The management of commercial banks listed at NSE, Kenya reap manifold advantages for one, the management are able to appreciate the banking evolution process of the banking industry and have an insight on the logic of lowering operating costs which has been a threat in the old dispensation of conventional banking where many branches are needed for profitability increase. Policymakers will also benefit from the research findings. For instance, central bank of Kenya which is the oversight body for commercial banks will be able to focus on an online regulatory framework to set standards to eliminate cybercrime issues hence protect the interest of the depositors in a seamless manner. The academicians are amongst the beneficiaries of this endeavor for the commercial banks adopting the innovative approach in banking gives the former new tools for applying in financial management and a base for areas of further research which in return positively contribute to the existing body of knowledge.

Key Words: Product Innovation, Process Innovation, Technological Innovation

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INTRODUCTION

In today's vigorous and global competitive environment, innovation is becoming more pertinent for organizations (Frame, Wall, & White, 2018). To survive in the unstable and evolving market and meet their goals and objectives in a market-driven environment, commercial banks have implemented creative approaches geared towards sustainability and growth (Mutuku, 2014). As the financial sector adapts to the digital age, innovation in banking services has emerged as a key tactical necessity for commercial banks purposing to enhance operational efficiency, enhance user experience, and achieve sustainable profitability (Dong et al., 2020). According to Arisa (2018), banks are increasingly adopting mobile banking, agency banking, internet banking, Automated Teller Machines (ATMs), and digital lending platforms as core service delivery channels. Alraja, Imran, Khashab, and Shah (2022) identified that organizations that do not choose to innovate are placing their firm at risk.

Africa's banking sector has experienced transformative shifts largely driven by mobile money, agent banking, and partnerships with fintechs (Ndung'u & Oguso, 2023). Additionally, Lee, Wang, and Ho (2020) recognized that Sub-Saharan Africa has appeared to lead in mobile money adoption, with over 60% of the world's mobile money accounts located in the region. As such, innovations such as MTN Mobile Money in Uganda, M-PESA in Kenya and Ecobank's digital platform across West Africa have made it possible for millions to have access to financial services virtually (Adu, 2019). Kariuki, Ofusori, and Goyayi (2025) noted that African banks are increasingly focusing on digital platforms to extend reach, particularly in underserved areas, enhance transaction speed, and reduce operational costs. Therefore, banking innovations in the region have improved financial inclusion, resulting in increased deposits, greater customer volumes, and enhanced Return on Assets (ROA) for a digitally proactive bank (Kraemer-Mbula, 2021).

Kenya's banking has undergone major shifts in recent years, primarily inspired by rapid technological breakthroughs, progressive user expectations, and competitive market dynamics (Mundia, 2025). Kirui and Munene (2024) noted that Kenya's banking sector is considered among the most innovative in Africa, driven by a conducive regulatory environment, high mobile penetration, and growing customer demand for convenience and efficiency. The Return on Assets (ROA) has contributed to supporting innovation through regulations, fintech guidelines, and policies that lead to digital service delivery (Mundia, 2025). Amiru and Mwanzia (2025) identified that Kenyan banks have adopted various innovations, such as internet banking, mobile banking apps, digital loan products, agency banking, as well as automated customer service platforms. A study by Muia (2017) found that agency banking contributed to improved transaction volumes and customer satisfaction, which in turn enhanced profitability.

According to Kimani (2023), profitability refers to the measurement by which a business invests its capital to produce income as well as achieve effectiveness over a given period of time. Alkanawi (2024) stated that profitability reflects the financial efficiency and sustainability of an organization and is often used by investors, regulators, and management to assess the viability of operations and to inform strategic decisions. Additionally, Gyau et al. (2024) pointed out that profitability in the banking industry is a guide of a bank's capability to grow its income, manage operational costs, and generate satisfactory returns to shareholders. Similarly, Gyau et al. (2024) defined profitability as the extent to which a banking institution meets its financial goals, which is measured through quantitative indicators such as profit ratios, asset utilization, and cost management metrics.

In Kenya, the rapid evolution of customer expectations, technological developments, and regulatory support has led commercial banks to invest in service innovations as a means of staying relevant in an increasingly digital financial ecosystem (Misati, Osoro, Odongo, & Abdul, 2024). According to Mhlanga (2022), banking service innovations include agency banking, mobile banking, digital lending platforms, internet banking, core banking upgrades, and also, the deployment of intelligent customer support systems such as chatbots and AI-

driven interfaces. Ebong and Babu (2020) reported that service innovations have not only changed how banks interact with users but have also extended to banking services, particularly in marginalized zones.

Odhiambo & Oloko (2021) indicated that adoption of banking service innovation is assessed by the number and diversity of digital platforms deployed, customer adoption rates, transaction volumes through digital channels like mobile and agency, system uptime, turnaround time for services, and user satisfaction scores. The widespread uptake of mobile banking offered virtually by all commercial banks in Kenya has enabled customers to access financial services 24/7, conduct seamless transactions, and manage their accounts without visiting physical branches (Ndung'u & Oguso, 2023).

Kenya's banking sector is regulated by numerous regulatory bodies, including companies, banks, and Central Bank of Kenya Acts, as well as strict guidelines and policies issued by CBK (Amiru & Mwanzia, 2025). Due to the poor performance of banks in 1994, Kenya's banking sector underwent major reforms. The performance of Nairobi Securities Exchange (NSE) listed commercial banks remains a subject of key interest to stakeholders due to their systemic importance and regulatory visibility (Mwangi & Omwenga, 2022).

Statement of the Problem

In an increasingly digital and competitive banking environment, profitability remains the cornerstone of institutional sustainability and stakeholder confidence (Mwenda & Muthimi, 2025). Kiragu (2017) noted that commercial banks should gain strong profitability by strategically leveraging service innovations. Innovations such as mobile banking, agency banking, internet banking, and digital credit platforms are expected to optimize performance, generate new business opportunities, improve user satisfaction, and increase revenue streams (Adu, 2019). Abubakar (2021) suggested that financial institutions that effectively implement service innovations tend to outperform their peers in profitability and shareholder value.

Despite the widespread adoption of service innovations by Nairobi Securities Exchange (NSE) listed commercial banks, expected improvements in gains have been inconsistent, as well as, in some cases, underwhelming (Amiru & Mwanzia, 2025). Kirui and Munene (2024) noted that while some financial institutions have undergone improved profitability, reduced costs, and increased customer acquisition over digital platforms, others continue to report stagnation or declining financial indicators despite similar innovation investments. Mwenda and Muthimi (2025) noted that banks have rolled out mobile apps, agency networks, and online platforms, yet they struggle with high operating costs, low uptake of digital services, security concerns, and thinning profit margins. Moreover, the performance trends among these banks over the past five years reveal fluctuations that suggest a disconnect between service innovation and financial outcomes (Ndungu, 2021).

Most existing studies offer generalized views, with limited focus on listed banks, whose innovation strategies are under strong investor examination and whose financial results are publicly disclosed. Further, there is insufficient empirical observation on how banks measure and align innovation efforts with performance targets, especially in a rapidly evolving digital ecosystem. These gaps contribute to the observed disconnect between service innovation efforts and profitability outcomes among NSE-listed commercial banks. Without strong evidence linking innovation to profitability, bank managers and regulators may struggle to design strategies, policies, and benchmarks for innovation success. Therefore, this investigation proposes to narrow the disparities by thoroughly examining the association between banking service innovation and profitability among the Nairobi Securities Exchange listed commercial banks, Kenya.

Research Objectives

The general objective of the study was to examine the effects of banking service innovation on profitability of commercial banks listed on the NSE. The study was guided by the following objectives:

- To determine the influence of product innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.

- To examine the influence of process innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.
- To evaluate the influence of technological innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.

The research hypotheses were;

- **HO₁:** There is no significant influence of product innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.
- **HO₂:** There is no significant influence of process innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.
- **HO₃:** There is no significant influence of technological innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.

LITERATURE REVIEW

Theoretical Framework

Digital Transformation Theory

Digital Transformation Theory was first contributed to by Venkatraman's in 1994 by introducing the literature on the five levels of IT-enabled business transformation. Later on in the 2010 to 2013 Capgemini in collaboration with MIT added on the theory and came up with the term Digital Transformation. Other contributors to the theory include Westerman, Bonnet, and McAfee in 2014 Khanom, (2023), described Digital Transformation Theory as to a theory that explains how organizations integrate digital technologies across all aspects of their operations; therefore, altering how they deliver value, engage with customers, and achieve performance outcomes. This theory lays emphasis on the importance of leveraging digital transformation as opposed to just embracing technology with the aim of achieving strategic business goals and objectives. Digital transformation involves rethinking of business models, processes and overall organizational culture and aligning it to technological advancements and market demand (Yunis, Mirza, Safi, & Umar, 2024).

Noor (2024), emphasized that digital transformation extends beyond just the automation of process to include digital adoption in the firms. He reported that it involved the incorporation of digital technologies into every aspect of commercial undertaking to drastically alter value delivery and operations. To agree with this, Maulana (2025) reported that for a firm to increase their efficiency and effectiveness, that firms has to successfully adopt digital technologies. Stefanova and Vasilev (2024) contributed to this discussion by adding that digital transformation involves strong abilities that enable companies to sense digital opportunities, take them, and then restructure their internal processes accordingly. Digital Transformation theory is impactful to the banking sector as commercial banks face increasing pressure to modernize their services, (Khanom, 2023). This is in response to the rapid and highly volatile technological changes and customer expectations. . As that, digital transformation in banks includes innovations such as and not limited to mobile banking, internet banking, digital loan processing, chatbot-driven customer support, core banking upgrades, and open bank APIs (Mwenda & Muthimi, 2025). These digital transformation innovations allow banks to minimize transaction costs, improve service speed, enhance customer satisfaction, and access new market segments.

Open Innovation Theory

Open Innovation Theory was introduced by Henry Chesbrough in 2003. This theory advocates for the strategic use of external ideas, collaborations, and partnerships to accelerate innovation and improve performance (Chen, Cai, Luo, & Mao, 2025). According to Molavi et al. (2025), using both monetary and non-monetary methods in accordance with the business model of the organization, open innovation is a

distributed innovation process built on purposefully managed knowledge flows across organizational boundaries.

Central premise of Open Innovation Theory is that in an increasingly complex and fast-moving environment, firms benefit by leveraging internal capabilities as well as external information derivation, for example, customers, suppliers, startups, universities, also technology firms, in order to co-create, improve, and commercialize innovations (Sun, Majchrzak, & Malhotra, 2024).

Unlike the traditional closed innovation model, which relies heavily on in-house R&D, the open innovation model allows for ideas to flow inward and outward, thereby enhancing innovation speed, reducing costs, and expanding market reach (Figenschou, Li-Ying, Tanner, & Bogers, 2024). Empirical studies support the utilization of open innovation principles by the banking and commercial services sectors. For example, Bogers et al. (2017) showed that companies that engaged in open innovation partnerships reported higher innovation outcomes, quicker time-to-market, and stronger profitability. Commercial banks collaborated with external developers and mobile service providers such as Safaricom and Airtel in Kenya, to launch and manage digital money lending so as to improve operation efficiency and to also have a competitive advantage, (Gekonde and Gachoka, 2021). This in turn led to customer attraction and maintenance as well as profitability

Open Innovation Theory is particularly important to the current research because it pays attention to banking service innovations among Nairobi Securities Exchange (NSE) listed commercial banks. Bogers et.al. (2019) noted that due to the competitive nature of firms in the financial services sector, traditional banks are now forming partnership with fintech companies, mobile services providers and API providers to digitize their operations. Therefore, this theory gives explanation as to why such partnerships lead to improved service innovation, which in turn may influence profitability. This theory also guide researchers in understanding how knowledge sharing and cross-sectoral innovation can help banks listed on the NSE respond more effectively to market demands and regulatory expectations. By recognizing the importance of open systems and partnerships, the study will examine whether banks that embrace open innovation models achieve superior financial outcomes compared to those relying solely on internal innovation.

Dynamic Capabilities Theory

The Dynamic Capabilities Theory sought to address how establishments adjust to the rapidly changing environment while maintaining their competitive advantage. The theory was first introduced by David Teece and Gary Pisano in 1994 and was further elaborated by Teece, Pisano, and Amy Shuen in 1997. The dynamic capability theory argued that for organizations to sustain superior performance in dynamic markets, they must develop capabilities that enable them to adapt to shifting market and technological conditions by involving, implementing, and rearranging environmental competencies (Bogers et al., 2019). Therefore, this theory moves beyond the basic view of the Resource-Based View (RBV) by focusing on in what manner does companies evolve as well as renew their asset base over time to maintain relevance and profitability.

This theory focuses on three core activities namely: sensing (identifying and assessing opportunities), seizing (mobilizing resources to capture value from those opportunities), and reconfiguring (realigning organizational assets and structures to adapt). Liang et.al. (2025), argued that these capabilities can be proven by focusing on how financial institutions identify emerging digital trends, invest in appropriate technologies or partnerships, and restructure their operations to align with market demands and regulatory shifts. By so doing, financial institutions can witness enhance performance outcomes in turbulent environments (Chasapi et.al, 2024).

Empirical Review

Product innovation refers to the introduction of contemporary or significantly improved commercial products and services aimed at meeting emerging customer needs, enhancing satisfaction, and increasing competitiveness (Attah, Garba, Gil-Ozoudeh, & Iwuanyanwu, 2024). Product Innovation in the banking sector includes mobile loan products, digital savings accounts, bundled service offerings, buy-now-pay-later (BNPL)

solutions, and micro-insurance embedded in banking platforms. Liozu and Hinterhuber (2023) posited that innovations are designed not only to attract and retain customers but also to generate new revenue streams and enhance profitability.

Mutuku (2020) sort to understand the impact of introduction of digital credit products on Kenyan commercial banks. He noted that the introduction majorly strengthened user acquisition and loan disbursement volumes thus contributing positively to both ROA and non-interest income growth. In addition to this, the research concluded that digital loan innovations offered scalability and cost-efficiency, especially when integrated with mobile platforms. Similarly, Mwangi and Omwenga (2022), in their study of NSE listed commercial banks, reported that banks that introduced flexible and customized financial products, including youth accounts, SME packages, and instant mobile overdrafts, recorded improved profitability over a three-year period. Therefore, the study linked product innovation to increased customer deposits, fee-based income, and higher ROE.

According to Molavi et al. (2025) process innovation refers to the execution of contemporary or much enhanced methods of service provision, internal operations, or support systems that increase efficiency, reduce cost, improve service quality, or speed up responsiveness. Biswas et.al. (2024) noted that process innovations include and are not limited to adoption of digital loan processing, automation of office operations, biometric verification systems, and e-KYC (Know Your Customer) in credit scoring and fraud detection in the banking sector. .

Investigating the impact automation in commercial banks across Southeast Asia, Abubakar (2021) linked robotic process automation (RPA) to improved profitability measures such as ROE and cost-to-income ratio. Noor, (2024) added that banks that have digitized their services including customer onboarding; internal loan processing and document verification significantly reduced operation costs and therefore improving turnaround times. Yanamala and Suryadevara (2024), researching digital transformation, made an observation that process innovation which is mainly enabled by data analytics and artificial intelligence, significantly improved internal processes efficiency and let to profitability in the long run. Their findings showed a positive correlation between process automation and higher Return on Assets (ROA), especially within large commercial banks that invested in adaptable infrastructure.

Technological Innovation is an important force driving profitability in the commercial sector (Gyau et al.,2024) Technological innovation, which include automation and machine learning are positively influencing the efficiency in service delivery and profitability of companies(Oberoi and Kansra,2022) To research this Ozili(2023), in a study investigated banking sector performance in emerging markets, found that technology-driven innovation significantly enhanced profitability and operational cost reduction. Correspondingly, Sulehri et al. (2024) studied FinTech adoption in European commercial banks and observed a strong link between technological integration and improved cost-to-income ratios, asset utilization, and innovation-led revenues. In a study by Mhlanga (2022) in China, it was concluded that the adoption of core system upgrades and AI platforms had a positive impact on Return on Investment and also operational efficiency moreso in customer-facing operations. Consequently, these global studies confirm that banks embracing digital transformation are at an advantage of remaining competitive and profitable.

In the African context research such as one done by Abubakar (2021) to examine commercial banks in Nigeria made a discovery that that technology-enabled platforms such as internet banking and mobile applications, significantly improved net interest income and customer outreach. Similarly, a probe in Zimbabwe, by Munyoro and Zinyemba (2021) established that ATM upgrades and improved internet banking platforms had a great impact on profitability and client retention. To add on this, Bongomin et al. (2020), focusing on Uganda, linked technological innovation with improvements in financial inclusion and service efficiency, this indirectly contributed to better ROE. That being observed some regional research lacked attention on direct financial metrics or relied heavily on perceived rather than audited data.

METHODOLOGY

Research Design

This investigation utilized descriptive research design, which is befitting for studies aiming to examine as well as depict the qualities of a phenomenon, population, or relationship as it naturally occurs. Pandey and Pandey (2021) emphasizes that descriptive research is useful in instances where the goal is to produce a true and systematic description of variables under observation, without influencing or manipulating them. Dubey and Kothari (2022) further explain that descriptive designs allow researchers to analyze situations in their natural settings and provide factual and interpretive accounts of the phenomena being studied. Descriptive research design was chosen, for it helped in assessing the effect of banking service innovation on the profitability of NSE-listed commercial banks and the impact of the selected innovation on profitability of the banking institutions.

Target Population

The subject matter to be discussed herein is the commercial banks listed at the NSE. In this study the total number of such banks were 12 as at the time of data collection for the banks in existence between 2020 up to 2024.

Sampling Design and Sample Size

Mugenda and Mugenda (2003). The definition of population is stated as the total of all the observable unit of analysis to be investigated, and to which generalization of the results of the study can be applied. The population was all the NSE-listed commercial banks in Kenya. The reason for this is that listed banks publish their financial statements, which ensures the availability of reliable, consistent, and verifiable data needed for the study. According to the Nairobi Securities Exchange (NSE), there are 12 commercial banks listed on NSE. The study considered 11 top management employees from the 11 banks to be the unit of observation who responded to the questionnaires. For the 1(one) put aside was used to test the validity of the structured questionnaire.

Data Collection Instrument

Massey (2023) stated that a data collection instrument or tool represents a device utilized in gathering data. Massey (2023) stated that the effectiveness and trustworthiness of the research instruments are crucial. The investigation utilized questionnaires for obtaining data from respondents. The questionnaire was calibrated using a five-point Likert Scale. It was also structured in five sections, at which the foremost section incorporated background information, whilst the rest of the four sections covered questionnaires based on attaining the objectives of the study.

Instrument Validity

Orodho (2019) defines validity as the authenticity of the conclusions drawn from the study findings. This was assessed through discernment of the supervisor as well as the researcher to ascertain that there is no potential consequence effect of the components of the questionnaire. It was additionally helped confirm the feasibility of the investigation techniques and ensured an impeccable questionnaire was distributed.

Instrument Reliability

Dubey and Kothari (2022) Defined reliability as based on the degree as in connection which a device consistently yields uniform results after multiple trials. Therefore, the internal consistency method was employed for the evaluation of the dependability of the research tools. This approach linked scores obtained from one item in the instrument to scores obtained from other items. To determine how the correlated objects related to one another, Cronbach's Coefficient Alpha (the general version of the Kuder-Richardson 20 formula) was evaluated. The process of confirmation was achieved by pilot testing where one of the banks was used to interrogate one top employee of the bank selected out of the 12. Such that during data collection

for the primary data, it is only the 11 commercial banks whose top management were involved in that exercise.

Data Collection Procedure

In an effort to gather the necessary data, the questionnaires were distributed by the researcher to the relevant respondents. Given the preferred subjects' hectic programs, a drop-and-pick-up later approach was as employed to administer questionnaires to ensure minimum disturbance to their day-to-day routine and commercial activity.

Data analysis and Presentation

Analyzing entails drawing conclusions and critically examining the coded data. This investigation used quantitative analysis. There was utilization of the Statistical Package for Social Sciences (SPSS) version 21, which necessitated utilization of a spreadsheet. In quantitative analysis, numerical values are measured, and descriptive statistics like frequency, counts, means, percentages, and standard deviations are used. Tables, bar charts, and figures were harnessed to illustrate the study's findings.

There was utilization of Regression analysis to draw conclusions from data gathered about more generalized circumstances. Also, inferential statistics such as correlation was undertaken for demonstration of type as well as the degree of relationships laid down between independent and dependent variables. to achieve this outcome, triangulation process was applied for the study used both primary data which is cross-sectional while ROE data is longitudinal. That is secondary data. Regression analysis assumed the following model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Whereby:

Y = Profitability

β_0 = Constant

$\beta_1 - \beta_4$ = Beta coefficients

X_1 = Product innovation

X_2 = Process innovation

X_3 = Technology innovation

ε = Error term

RESULTS

Response Rate

The total number of questionnaires issued were 11 for the eleven top management officials who positively responded to the queries there in at a hundred percent level. Such a response was due to the fact that those banks are few and top officials know one another at personal level. So the research assistant got referrals from one official to the other in an easy manner. Therefore, the 100% return rate was in tandem with the observations made by Mugenda and Mugenda (2003) and Levinsen, (2017) who in their opinion a 50% return rate is to the expectations.

Descriptive Analysis

The general movement of a study variable is key in understanding if it is normal or otherwise. Therefore, the current study apart from diagnostic test, further established the aforementioned aspect as indicated below.

Product Innovation of Commercial Banks Listed at the Nairobi Securities Exchange, Kenya

The participants in this study were asked to put forward their view on the issue of product innovation and the scale used was made up of SA:5 (Strongly Agree); A:4(Agree); N:3 (Neutral); D:2 (Disagree) and SA:1(Strongly Disagree).

The outcome thereof was as indicated in Table 1.

Table 1: Product Innovation Descriptive Results for Commercial Banks Listed at the Nairobi Securities Exchange, Kenya

	n.		SD	D	N	A	SA	Mea n	Std. Dev.
Product Innovation									
Our bank has launched new loan products tailored to specific market segments	11	Frq. %	1 9.1	1 9.1	0 0	3 27.3	6 54.5	3.967	1.337
We have introduced savings products with differentiated features like goal-based savings	11	Frq. %	1 9.1	1 9.1	0 0	3 27.3	6 54.5	4.183	1.311
The bank regularly reviews and updates existing products based on customer feedback	11	Frq. %	1 9.1	1 9.1	1 9.1	1 9.1	7 63.6	4.167	1.403
Product development in our bank is driven by market research and innovation strategies.	11	Frq. %	0 0	0 0	1 9.1	3 27.3	7 63.6	4.583	0.669
We offer personalized financial products based on customer behaviour and preferences.	11	Frq. %	0 0	0 0	1 9.1	4 36.4	6 54.5	4.417	0.669
The bank bundles products and services (for example insurance with loans, savings with digital wallets).	11	Frq. %	0 0	0 0	5 45.4	4 36.4	2 18.2	3.833	0.835
Our new financial products are enabled or enhanced through digital platforms (for example mobile apps, USSD).	11	Frq. %	0 0	1 9.1	1 9.1	3 27.3	6 54.5	4.25	0.965
Our bank has adopted FinTech collaborations to support innovative product delivery.	11	Frq. %	1 9.1	0 0	0 0	7 63.6	3 27.3	4.102	1.044
Composite mean								4.175	

From Table 1, the issue of bank having launched new loan products tailored to specific market segments was brought on board. The response was as follows, one, 9(81.8%) of the participants supported the researchers claim while 2(18.2%) went against that aforementioned suggestion by the researcher with a line mean of 3.967 which was lower than the grand mean score of 4.175. The implication being that the issue of loan facility being launched in specific market did not have significant influence on the profitability of the commercial banks in Kenya. Further the researcher sought the implication of introduction of savings products with differentiated features like goal-based savings. The respondents who depicted that there was significant

contribution towards profitability were 9 (81.8%). Those against were 2(18.2%). The corresponding line mean was 4.183 which was above the overall score of 4.175 implying that this aspect of product innovation was of value addition to profitability of commercial banks listed at the NSE.

This inquiry further investigated the influence of regular reviews and updates of existing products based on customer feedback. The outcome was as follows, the majority of the respondents were for the idea which was represented by 8(72.7%). Other 2 (18.2%) of the respondents were not for the suggestion of the researcher. The rest 2(18.2%) were neutral on the opinion. The corresponding mean in this case was 4.167 which was slightly below the overall average. This implies that the aspect aforementioned influenced profitability in a manner which was not significant. The concern of product development in the banks being driven by market research and innovation strategies was brought to question. 10(90.9%) were in agreement while 1(9.1%) were silent as pertains that opinion. The line mean that prevailed was greater than the mean score (line mean=4.583) which straightaway portrayed the statistical importance the innovation aspect had on profitability of the banks listed at the NSE, Kenya.

The aspect of offering personalized financial products based on customer behaviour and preferences was brought to discussion. The majority of the respondents 6(90.9%) were in support of that claim. 5(45.4%) did not take any side. The line mean score was 4.417 which was above the mean score of 4.175. This means that the innovation aspect was significantly contributing to the profitability expansion of the commercial banks under study. The bank bundles products and services (for example insurance with loans, savings with digital wallets) is a product innovation amongst commercial banks listed at the NSE and the inquiry aimed at establishing if this aspect was fruitful in profitability boosting. The results depicted that 6(54.6%) were in support while 5(45.4) did not suggest anything pertaining that matter. Since the line means score was below the composite mean score for it was 3.833, then the matter of innovation in question did not significantly improve the performance.

Also, the researcher sought to interrogate the issue of new financial products being enabled or enhanced through digital platforms (for example mobile apps, USSD). The response portrayed that 9(90.9%) were in agreement to the suggestion given by the researcher. On the other hand, 1(9.1%) was in disagreement. Then the remaining 1(9.1%) was neutral and did not suggest anything. The aligned line mean was 4.250 which was more than the composite score of 4.175. The conclusion was that this sphere of product innovation was significant on variations observed on the profitability aspect of commercial banks listed at the NSE. Again, further interrogation was performed where the aim was to establish the influence of banks having adopted FinTech collaborations to support innovative product delivery. The respondents showed that the majority took the day with 10(90.9%) being in agreement while those who disagreed were the minority with 1(9.1%). The corresponding line mean was 4.102 which was less than the composite score of 4.175. That means the influence of this innovative aspect was not statistically significant to profitability of commercial banks listed at the NSE, Kenya.

Process Innovation of Commercial Banks Listed at the Nairobi Securities Exchange

The participants in this study were asked to put forward their view on the issue of process innovation and the scale used was made up of SA:5 (Strongly Agree); A:4(Agree); N:3 (Neutral); D:2 (Disagree) and SA:1(Strongly Disagree). The outcome thereof was as indicated in Table 2.

Table 2: Process Innovation Descriptive Results for Commercial Banks Listed at the Nairobi Securities Exchange, Kenya

	n.		SD	D	N	A	SA	Mea n	Std. Dev.
Process Innovation									
The bank has automated most internal banking operations for example loan processing	11	Frq. %	1 9.1	1 9.1	0 0	3 27.3	6 54.5	3.967	1.337
Use of workflow management systems has reduced turnaround time in service delivery.	11	Frq. %	1 9.1	1 9.1	0 0	5 45.4	4 36.4	4.083	1.311
The bank has digitized manual and paper-based processes	11	Frq. %	1 9.1	1 9.1	1 9.1	1 9.1	7 63.6	4.167	1.403
Process improvements have led to faster resolution of customer service issues.	11	Frq. %	0 0	0 0	1 9.1	3 27.3	7 63.6	4.583	0.669
The bank uses data analytics and dashboards to monitor operational performance in real-time.	11	Frq. %	0 0	0 0	1 9.1	4 36.4	6 54.5	4.417	0.669
Innovative tools like fraud detection systems are used to strengthen compliance and risk management.	11	Frq. %	0 0	0 0	4 36.4	4 36.4	3 27.3	3.833	0.835
Process innovation has improved audit trails and internal controls.	11	Frq. %	0 0	1 9.1	1 9.1	4 36.4	5 45.4	4.25	0.965
Composite mean								4.190	

In Table 2 above, the aspect of banks having automated most internal banking operations for example loan processing was brought to focus. The majority of the respondents 9(81.8%) were in support of that claim. 2(18.2%) disagreed with that opinion. The line mean score was 3.967 which was less than overall mean score of 4.190. This means that the innovation aspect was contributing to the profitability expansion of the commercial banks under study but not significant. It was also felt that use of workflow management systems has reduced turnaround time in service delivery amongst commercial banks listed at the NSE and the inquiry aimed at establishing if this aspect was any value addition in profitability fostering. The results depicted that 9(81.8%) were in support while 2(18.2%) disagreed. Since the line means score was below the composite mean score for it was 4.083, then the matter of innovation in question did not significantly increase the financial performance in terms of ROE.

Again, from Table 4.9, the issue of banks having digitized manual and paper-based processes was brought on board. The response was as follows, one, 8(72.7%) of the participants supported the researchers claim while 2(18.2%) went against that aforementioned suggestion by the researcher with a line mean of 4.167 which was lower than the grand mean score of 4.190. The implication being that the issue of banks having digitized manual and paper-based processes did not have significant influence on the profitability of the commercial

banks in Kenya. Further the researcher sought the implication of process improvements leading to faster resolution of customer service issues.. The respondents who depicted that there was significant contribution towards profitability were 10(90.9%). Those against were 1(9.1%). The corresponding line mean was 4.583 which was above the overall score of 4.190 implying that this aspect of process innovation was of value addition to profitability of commercial banks listed at the NSE.

Also, the researcher sought to interrogate the issue of banks using data analytics and dashboards to monitor operational performance in real-time. The response portrayed that 10(90.9%) were in agreement to the suggestion given by the researcher. On the other hand, 1(9.1%) was neutral. The associated line mean was 4.417 which was more than the composite score of 4.190. The conclusion was that this sphere of process innovation was significant on variations observed on the profitability aspect of commercial banks listed at the NSE. Again, further interrogation was performed where the aim was to establish the influence of innovative tools like fraud detection systems being used to strengthen compliance and risk management.. The respondents showed that the majority 7(63.7%) being in agreement while those who took no side were the minority with 4(36.4%). The corresponding line mean was 3.833 which was less than the composite score of 4.190. That means the influence of this innovative aspect was not statistically significant to profitability of commercial banks listed at the NSE, Kenya.

This inquiry further investigated the influence of process innovation had improving audit trails and internal controls.. The outcome was as follows, the majority of the respondents were for the idea which was represented by 9(81.8%). Other 1(9.1%) of the respondents were not for the suggestion of the researcher. The rest 1(9.1%) were neutral on the opinion. The corresponding mean in this case was 4.250 which was above the overall average. This implies that the aspect aforementioned influenced profitability in a manner which was significant.

Technological Innovation of Commercial Banks Listed at the Nairobi Securities Exchange

The participants in this study were asked to put forward their view on the issue of technological innovation and the scale used was made up of SA:5 (Strongly Agree); A:4(Agree); N:3 (Neutral); D:2 (Disagree) and SA:1(Strongly Disagree). The outcome thereof was as indicated in Table 3.

Table 3: Technological Innovation Descriptive Results for Commercial Banks Listed at the Nairobi Securities Exchange, Kenya

	n.		SD	D	N	A	SA	Mean	Std. Dev.
Technological Innovation									
The bank has adopted modern technologies such as Artificial Intelligence (AI), Machine Learning, or Blockchain.	11	Frq. %	1 9.1	1 9.1	0 0	2 18.2	7 63.6	3.977	1.337
Cloud computing technologies are used to support flexible and scalable banking operations.	11	Frq. %	1 9.1	1 9.1	0 0	3 27.3	6 54.5	4.073	1.311
The bank has developed or integrated Application Programming Interfaces (APIs) to enhance service delivery and innovation	11	Frq. %	1 9.1	1 9.1	1 9.1	1 9.1	7 63.6	4.067	1.403
Cybersecurity tools and innovations have been implemented to protect customer data and systems.	11	Frq. %	0 0	0 0	1 9.2	3 27.3	7 63.6	4.483	0.669
Digital platforms (e.g., mobile apps, internet banking systems) are continuously improved through technological upgrades.	11	Frq. %	0 0	0 0	1 9.1	4 36.4	6 54.5	4.417	0.669
The bank uses data analytics or business intelligence tools for customer insights and product development.	11	Frq. %	0 0	0 0	5 45.4	4 36.4	2 18.2	3.733	0.835
Technology has improved decision-making by providing real-time access to financial and operational data	11	Frq. %	0 0	1 9.1	1 9.1	3 27.3	6 54.5	4.27	0.965
Automation tools (e.g., bots, workflow systems) have reduced human error and improved productivity.	11	Frq. %	1 9.1	0 0	0 0	7 63.6	3 27.3	4.302	1.044
Composite mean								4.159	

As per Table 3, an inquiry on the influence of the adopted modern technologies such as Artificial Intelligence (AI), Machine Learning, or Blockchain in banks levels of profitability was carried out. The outcome was as follows, the majority of the respondents were for the idea which was represented by 9(81.8%). Other 2(18.2%) of the respondents did not support the suggestion of the researcher. The corresponding mean in this case was 3.977 which was below the overall average of 4.159. This implies that the aspect aforementioned influenced profitability in a manner which was not significant. The concern of cloud computing technologies being used to support flexible and scalable banking operations was brought to question. 9(81.8%) were in agreement while 1(9.1%) disagreed and another 1(9.1%) were silent as pertains that opinion. The line mean that

prevailed was less than the mean score which was 4.067 which straightaway portrayed there was no statistical importance the innovation aspect had on profitability of the banks listed at the NSE, Kenya.

Also, the researcher sought to interrogate the issue of banks having developed or integrated Application Programming Interfaces (APIs) to enhance service delivery and innovation. The response portrayed that 8(72.7%) were in agreement to the suggestion given by the researcher. On the other hand, 2(18.2%) was in disagreement. Then the remaining 1(9.1%) was neutral and did not suggest anything. The aligned line mean was 4.067 which was less than the composite score of 4.159. This portrays that the aspect of innovation did not significantly influence profitability of commercial banks listed at the NSE. Again, further interrogation was performed where the aim was to establish the influence of cybersecurity tools and innovations implemented to protect customer data and systems. The respondents showed that the majority took the day with 10(90.9%) being in agreement while those who disagreed were the minority with 1(9.1%). The corresponding line mean was 4.483 which was more than the composite score of 4.159. That means the influence of this innovative aspect was statistically significant to profitability of commercial banks listed at the NSE, Kenya.

The aspect of having digital platforms (e.g., mobile apps, internet banking systems) continuously improving through technological upgrades was brought to discussion. The majority of the respondents 10(90.9%) were in support of that claim. 1(9.1%) did not take any side. The line mean score was 4.417 which was above the mean score of 4.159. This means that the innovation aspect was significantly contributing to the profitability expansion of the commercial banks under study. The bank usage of data analytics or business intelligence tools for customer insights and product development is a technological innovation amongst commercial banks listed at the NSE and the inquiry aimed at establishing if this aspect was fruitful in profitability boosting. The results depicted that 6(54.6%) were in support while 5(45.4%) did not suggest anything pertaining that matter. Since the line mean score was below the composite mean score for it was 3.733, then the matter of innovation in question did not significantly improve the performance.

From the same Table 3, the issue of technology having improved decision-making by providing real-time access to financial and operational data was interrogated. The response was as follows, one, 9(81.8%) of the participants supported the researcher's claim while 1(9.1%) went against that aforementioned suggestion by the researcher and another 1(9.2%) were neutral with a line mean of 4.270 which was higher than the grand mean score of 4.159. The implication being that the innovative issue had significant influence on the profitability of the commercial banks in Kenya.

Further the researcher sought the implication of automation tools (e.g., bots, workflow systems) leading to reduced human error and improved productivity. The respondents who depicted that there was significant contribution towards profitability were 10(90.9%). Those against was 1(9.1%). The corresponding line mean was 4.302 which was above the overall score of 4.159 implying that this aspect of technological innovation was of value addition to profitability of commercial banks listed at the NSE.

Profitability of Commercial Banks Listed at the Nairobi Securities Exchange

The study focused on the general profitability of the commercial banks listed at the Nairobi securities exchange, Kenya and the variations observed in terms of mean and deviations were presented in Table 4 for the period covering between 2020- 2024 time span.

Table 4: Profitability

	Minimum	Maximum	Mean	Std. Deviation
2020	0.044	0.034	0.272	0.207
2021	0.016	0.064	0.055	0.013
2022	0.032	0.105	0.063	0.037
2023	0.023	0.071	0.070	0.034
2024	0.063	0.082	0.052	0.029

Correlation Analysis

Pearson Product-Moment correlation coefficient acts as a guide to demonstrate the relationship between two study variables. This information is crucial for it test the strength and the direction of the connection between the two constructs. This study conducted the test and the outcome was as indicated in Table 5.

Table 5: Correlation Analysis Matrix

		Pro	PI	ProI	TI
Pro	Pearson Correlation	1.000	.433**	.405**	.478**
	Sig. (2-tailed)		.000	.002	.000
PI	Pearson Correlation		1.000	-.606*	.275*
	Sig. (2-tailed)			.000	.029
ProI	Pearson Correlation			1.000	.383*
	Sig. (2-tailed)				.001
TI	Pearson Correlation				1.000
	Sig. (2-tailed)				

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

As per Table 5, product innovation (PI) had a direct association with profitability of commercial banks listed at the NSE, Kenya with a unit change in product innovation resulting to 0.433 units change in profitability with ($p=0.000$) at 0.01 significance level. Further, process innovation (ProI) portrayed a direct connection with profitability of commercial banks listed at the NSE, Kenya such that a unit change in process innovation resulted to 0.405 units change in profitability with ($p=0.002$) at 0.01 of significance level. Again, the association between technological innovation and profitability was tested and there was a direct relationship between the two variables such that a unit variance in technological innovation resulted to 0.478 change in profitability (ROE) at significant level of (0.01) with ($p=0.000$).

On the other hand, the correlation between product innovation and process innovation was found to be inverse but significant such that a unit change in process innovation, resulted to 0.606 unit change in process innovation with ($p=0.000$) at 0.05 significant level. While product innovation portrayed a direct correlation with technological innovation where by a one unit change in technological innovation resulted to 0.275-unit change in product innovation with ($p=0.029$) at 0.05 significant level. For technological innovation, a unit change resulted to a positive change of process innovation by 0.383 units at 0.05 significance level with ($p=0.001$).

Regression Analysis Results

The study performed multiple regression analysis to test the researchers claim or hypotheses. The study variables under consideration were product innovation, process innovation and technological innovation as the independent variables. While the dependent variable utilized was profitability in terms of ROE.

Innovation Banking Services and profitability of Commercial Banks Listed at the NSE, Kenya

To assess if there was significance influence of the independent variables, namely product innovation, process innovation and technological innovation on the ROE of those banks, the following specific objectives were relied upon

- To determine the influence of product innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.
- To examine the influence of process innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.

- iii. To evaluate the influence of technological innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.

HO₁: There is no significant influence of product innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.

HO₂: There is no significant influence of process innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.

HO₃: There is no significant influence of technological innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.

Table 6: Regression Results of Innovation Banking Services and Profitability of Commercial Banks Listed at the NSE, Kenya

Model Summary ^b						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.778 ^a	.681	.562	.60872		
a. Predictors: (Constant), PI, ProI, TI						
b. Dependent Variable: Pro						
ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	111.601	3	46.339	121.771	.000 ^b
	Residual	33.675	8	.251		
	Total	155.372	11			
a. Dependent Variable: FP						
Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.577	.327		.531	.534
	PI	.623	.171	.456	5.847	.000
	ProI	.548	.126	.606	16.444	.000
	TI	.712	.122	.551	14.212	.000

Table 6 depicted that the F statistic of model 1 on the degree to which innovation banking services influenced profitability of commercial banks listed at the NSE, Kenya. The outcome depicts that F statistic assumed 121.771 with (p=0.000) value. This can be interpreted as that Innovation Banking Services and Profitability model was statistically significant in estimation at 95% confidence level. In addition, the study focused on the matter of test of the slope or the goodness of fit test which entailed the coefficient of determination and (β). The outcome are as indicated.

In this case, coefficient of determination for model 1 from Table 4.12 was (Adjusted R^2 =0.562), which implies that when the factors defining innovation banking services namely; product innovation, process innovation and technology innovation taken together explained 56.2% of variances observed in profitability of commercial banks listed at the NSE, Kenya Whereas, 43.8 % of changes of Commercial Banks Listed at the NSE, Kenya profitability was predicted by other factors which were not fused in this model.

Test of the slope, (β) showed that a unit change product innovation translated to 0.456 unit change in profitability and was statistically significant with p=0.000). Additionally, a unit adjustment of process innovation resulted to a direct variance of 0.606 units of profitability which was statistically significant with (p=0.000). Lastly, the technological innovation depicted that its one unit change resulted to 0.551 unit change on profitability with (p=0.000). The resulting empirical model after the analysis was as indicated below;

$$\text{Pro} = 0.577 + 0.456\text{PI} + 0.606\text{ProI} + 0.551\text{TI}$$

Where;

Pro is Profitability

PI is Product Innovation

ProI is Process Innovation

TI is Technological Innovation

Similar studies which have been undertaken in the past has portrayed results in tandem with the current study. Research by Mutuku (2020) on Kenyan commercial banks established that the introduction of digital credit products majorly strengthened user acquisition and loan disbursement volumes, contributing positively to both ROA and non-interest income growth. Further, Osoro, Misati, and Tiriongo (2024) examined banks in East Africa and discovered an optimistic connection amidst financial product innovation and financial inclusion, which in turn led to increased transaction volumes, higher interest income, and reduced operating ratios. Das, Raval, and Faisal (2024) did a study on mobile-based product innovation in European retail banks and reported that banks launching mobile-only financial products, such as instant savings, digital loans, and micro-investment tools, saw increased transaction volumes, customer retention, and profitability.

Abubakar (2021) investigated the impact of process automation in commercial banks across Southeast Asia and found a positive relationship between robotic process automation (RPA) and improved profitability measures for example ROE and cost-to-income ratio. Ibrahim (2024) examined process innovation in East African banks and observed that those that streamlined loan processing and digitized KYC procedures reported improvements in operational efficiency and profitability. Abubakar (2021) Examined commercial banks in Nigeria and found that technology-enabled platforms such as internet banking and mobile applications significantly improved net interest income and customer outreach. Muriu (2022) found that core banking systems upgrades in NSE-listed banks significantly improved ROE and asset utilization. Uwamariya and Loebbecke (2020) revealed that innovations contributed to increased ROA, particularly through expanded customer reach and service convenience

CONCLUSIONS AND RECOMMENDATIONS

Failure to accept the null hypothesis (H_{01}) translated to acceptance of the alternative hypothesis which states that; “There is no significant influence of product innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.” This displays that when product innovation issues namely; introduction of new digital loan products, mobile savings accounts and bundled services were incorporated by commercial banks listed at the NSE, Kenya, this directly and significantly caused profitability in terms of ROE to increase.

Failure to accept the null hypothesis (H_{02}) translated to acceptance of the alternative hypothesis which states that; “There is no significant influence of process innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.” This portrays that when process innovation issues namely; automated loan processing, AI-driven credit scoring and digital on-boarding were brought to board by commercial banks listed at the NSE, Kenya, this directly and significantly caused profitability in terms of ROE to change positively.

Failure to accept the null hypothesis (H_{03}) translated to acceptance of the alternative hypothesis which states that; “There is no significant influence of technological innovation on profitability of commercial banks listed at the Nairobi securities exchange, Kenya.” This shows that when technological innovation issues namely; use of chat bots, core banking system upgrades and Open APIs were factored in by commercial banks listed at the NSE, Kenya, this directly and significantly caused profitability in terms of ROE to vary as supposedly.

The management of commercial banks listed at NSE, Kenya reap manifold advantages for one, the management are able to appreciate the banking evolution process of the banking industry and have an insight on the logic of lowering operating costs which has been a threat in the old dispensation of conventional banking where many branches are needed for profitability increase. Secondly, the innovation approach justifies why there is need for financial inclusion of the unbanked as it has been in the past hence increasing market share and competitive edge.

Policymakers will also benefit from the research findings. For instance, central bank of Kenya which is the oversight body for commercial banks will be able to focus on an online regulatory framework to set standards to eliminate cybercrime issues hence protect the interest of the depositors in a seamless manner. By extension, the CBK will further be in a position to oversee progress in financial stability and risk management of the commercial banks by offering superior online fraud and risk detection measures to their client which is the commercial banks.

The academicians are amongst the beneficiaries of this endeavor for the commercial banks adopting the innovative approach in banking gives the former new tools for applying in financial management and also the new knowledge give them a new base for areas of further research which in return positively contribute to the existing body of knowledge.

Suggestion for further Areas of Research

The study outcome portrays that there is a direct causal effect implication of innovation banking services on profitability. However, the model used was multivariate for multiple regression approach was used. There is therefore need to consider intervening factors which could intervene the model other than just having the direct link status as it is now. This will improve the decision making process of commercial banks.

Again, there is need to consider other moderating variables that may represent conditional issues that may either make the current direct causal effect of innovation banking services and profitability not to function as it ought to be. So, instead of having the independent variables already utilized as pure predictors of profitability, a conceptual gap can be put in to consideration where an innovative factor can be tested for moderation effect on the same model. Contextually, the model aforementioned has demonstrated a statistically significant influence on profitability. But the big question is, in any economy there are various financial institutions such as SACCOs, microfinance banks and insurance companies. So it possible to generalize the current outcome. This calls for further interrogation to see whether applicability of the same study variables works for the other financial service providers to bridge a contextual gap thereof improving the theoretical foundation thereof.

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