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Digital Financial Innovation and Financial Performance of Deposit Taking Savings and Credit Cooperative Societies in Mombasa County, Kenya

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ABSTRACT: This study examined the effect of digital financial innovation on the financial performance of DT-SACCOs in Mombasa County, Kenya, while assessing the moderating effect of technology adoption capacity. Specifically, the study evaluated the influence of digital products, digital processes, digital channels, and payment innovations on financial performance and determined whether technology adoption capacity strengthened these relationships. The study was anchored on Schumpeter's Theory of Economic Change, Transaction Cost Theory, and Diffusion of Innovation Theory. The study adopted a descriptive and explanatory research design targeting management and technical employees drawn from the sixteen licensed DT-SACCOs operating in Mombasa County. A stratified random sampling technique was used to select 87 respondents from a target population of 96 employees. Primary data were collected using a structured questionnaire and analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics summarized respondent characteristics and study variables, while correlation and multiple regression analyses were employed to test the study hypotheses. Reliability and validity of the research instrument were established through Cronbach's alpha and expert review respectively, while regression diagnostic tests were conducted to confirm compliance with statistical assumptions. The findings established that digital financial innovation significantly improves the financial performance of DT-SACCOs. Digital products, digital processes, digital channels, and payment innovations each exhibited a positive and statistically significant influence on financial performance. The study further established that technology adoption capacity positively moderated the relationship between digital financial innovation and financial performance, indicating that institutions with stronger ICT infrastructure, staff digital competencies, and organizational readiness derive greater financial benefits from digital innovation. Overall, digital financial innovation enhanced operational efficiency, service delivery, competitiveness, profitability, and financial sustainability among DT-SACCOs. The study concludes that successful implementation of digital financial innovations, supported by adequate technology adoption capacity, is essential for improving the financial performance of DT-SACCOs. It recommends that DT-SACCO management continue investing in digital financial technologies, strengthen ICT infrastructure, enhance staff digital competencies through continuous training, and promote member digital literacy. Policymakers and regulators, particularly the Sacco Societies Regulatory Authority (SASRA), should formulate supportive policies that encourage digital transformation while strengthening cybersecurity, innovation, and digital governance within the SACCO sector. Future studies should employ longitudinal designs and extend the investigation to DT-SACCOs in other counties to enhance the generalizability of the findings.

KEYWORDS: Digital Financial Innovation; Financial Performance; Technology Adoption Capacity; Digital Transformation; Financial Inclusion.

INTRODUCTION

Background of the Study

Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) play a critical role in promoting financial inclusion by mobilizing savings and providing affordable credit to individuals, households, and small and medium-sized enterprises (SMEs). Unlike commercial banks, DT-SACCOs operate as member-owned financial cooperatives established to mobilize savings and provide affordable financial services that improve members' socio-economic welfare (Alonso et al., 2023; Venanzi & Matteucci, 2022). However, the financial services sector is undergoing rapid transformation driven by technological advancement, changing customer expectations, increased competition from commercial banks and FinTech

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firms, and evolving regulatory requirements. Consequently, DT-SACCOs are increasingly adopting digital financial innovations to improve operational efficiency, service delivery, competitiveness, and long-term financial performance. Studies have shown that successful organizational transformation requires not only technological investment but also strategic leadership, organizational readiness, and effective change management (Kimaku, 2021; Seneyia et al., 2026).

Globally, digital financial innovation has significantly transformed cooperative financial institutions. In the United States, credit unions have maintained strong financial stability through continuous investment in digital banking technologies and operational efficiency despite increased regulatory requirements (Boehme et al., 2023). Similarly, cooperative financial institutions in India have expanded financial inclusion through digital banking platforms serving both rural and urban populations (P. Gatimu & Ndung'u, 2025). In Canada and Europe, digital financial technologies, including online banking, electronic payment systems, and mobile financial services, have enhanced operational efficiency, customer satisfaction, profitability, and competitiveness (Alonso et al., 2023; Venanzi & Matteucci, 2022). These experiences demonstrate that digital transformation has become a strategic imperative for enhancing organizational performance and sustainability across cooperative financial institutions. Similar findings by Okello et al. (2026) indicate that digital technologies improve organizational efficiency, decision-making, stakeholder coordination, and overall performance when supported by adequate technological and institutional capabilities.

Across Africa, SACCOs continue to play an indispensable role in promoting financial inclusion, particularly among low-income populations and small enterprises excluded from conventional banking services (Marango, 2023). In Nigeria, cooperative societies have sustained their operations despite governance and credit management challenges, although their operational efficiency largely depends on effective internal controls, sound management practices, and innovation adoption (Makut & Ibrahim, 2021; Ekhorutomwen & Peters, 2021). Uganda has experienced increased adoption of mobile money platforms and digital payment systems following government support for SACCO development, although technological infrastructure and digital literacy remain significant constraints (Ministry of Trade, Industry and Cooperatives, 2024). Likewise, Tanzanian SACCOs have embraced digital banking technologies to improve operational efficiency and loan management despite cybersecurity and technology adoption challenges (Ugulumu et al., 2025). These regional experiences demonstrate that while digital innovation offers substantial opportunities, successful implementation depends on institutional readiness, strategic management capability, and organizational support, factors that Kimaku (2021) identifies as fundamental determinants of successful organizational transformation.

In Kenya, DT-SACCOs constitute an important pillar of the financial sector through mobilization of savings, provision of affordable credit, and promotion of financial inclusion. Regulated by the Sacco Societies Regulatory Authority (SASRA), these institutions have experienced continuous growth in assets, deposits, loan portfolios, and membership (SASRA, 2024). Nevertheless, many DT-SACCOs continue to experience operational challenges, including increasing non-performing loans, liquidity constraints, rising operational costs, and intense competition from commercial banks and financial technology companies. Consequently, many institutions have invested in digital products, digital processes, digital channels, and payment innovations to improve operational efficiency and financial sustainability (SASRA, 2023). Kimaku and colleagues argue that organizations derive maximum benefits from innovation when technological adoption is supported by effective strategic execution, institutional capacity, and change management practices (Seneyia et al., 2026).

Mombasa County provides a unique context for examining digital financial innovation because its economy is driven by trade, tourism, transport, and port-related activities that generate substantial demand for efficient financial services. DT-SACCOs operating within the county serve traders, transport operators, tourism employees, and SMEs whose financial activities increasingly depend on digital financial platforms. Despite increased investment in digital technologies, many DT-SACCOs continue to experience operational inefficiencies, underutilization of digital systems, increasing credit risks, cybersecurity concerns, and inconsistent financial outcomes (Mwangi & Nyakundi, 2022; SASRA, 2024). Research by Mwakima et al. (2025) further emphasizes that effective institutional performance depends on stakeholder participation, supportive governance structures, and appropriate policy implementation, factors that equally influence successful digital transformation initiatives within financial institutions.

Financial performance remains a critical indicator of organizational sustainability and competitiveness among DT-SACCOs. It is commonly measured using profitability, Return on Assets (ROA), Return on Equity (ROE), liquidity, operational efficiency, loan portfolio quality, savings growth, and financial sustainability (SASRA, 2024). Although licensed DT-SACCOs in Mombasa County have experienced growth in assets, deposits, and membership, substantial differences remain in their financial performance. While some institutions have successfully leveraged digital financial innovations to improve profitability and operational efficiency, others continue to experience poor credit management, inefficient operational systems, and low utilization of available technologies (Mwangi & Nyakundi, 2022; SASRA, 2023). According to Kimaku (2021), technology alone cannot guarantee improved organizational performance unless complemented by strategic leadership, organizational culture, stakeholder involvement, and effective implementation mechanisms.

Against this background, the present study examined the effect of digital financial innovation on the financial performance of DT-SACCOs in Mombasa County by focusing on digital products, digital processes, digital channels, and payment innovations while assessing the moderating role of technology adoption capacity. The study is premised on the argument that institutions possessing adequate ICT infrastructure, skilled personnel, organizational readiness, and supportive strategic capabilities are more likely to derive greater financial benefits from digital innovation. The findings are expected to contribute to existing literature while providing practical guidance to DT-SACCO managers, policymakers, and regulators on strengthening financial performance through effective digital transformation.

Statement of the Problem

Digital financial innovation has become a strategic priority for financial institutions seeking to improve operational efficiency, customer satisfaction, competitiveness, and financial performance. Innovations such as digital products, digital processes, digital channels, and electronic payment systems have transformed financial service delivery by reducing transaction costs, enhancing accessibility, and improving service quality (Musyaffi et al., 2022). Globally, empirical evidence indicates that digital financial innovations contribute to improved profitability, operational efficiency, and customer experience in cooperative financial institutions (Boehme et al., 2023; Alonso et al., 2023). Similarly, in Kenya, the increasing adoption of digital financial technologies has positioned Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) to

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respond more effectively to changing customer needs and increasing competition from commercial banks and financial technology (FinTech) firms (SASRA, 2023).

Despite these developments, financial performance challenges continue to persist among many DT-SACCOs. Although the regulated DT-SACCO subsector in Kenya has experienced substantial growth in membership, deposits, assets, and loan portfolios, many institutions continue to report declining profitability, liquidity constraints, rising operational costs, low asset returns, and increasing non-performing loans (SASRA, 2025). These challenges are particularly evident among DT-SACCOs operating in Mombasa County, where institutions continue to experience underutilization of digital technologies, operational inefficiencies, cybersecurity concerns, and inconsistent financial performance despite significant investments in digital financial innovations (Mwangi & Nyakundi, 2022; SASRA, 2024). These inconsistencies raise concerns regarding the extent to which digital financial innovation contributes to improved financial performance.

Although several empirical studies have examined digital financial innovation and organizational performance, most have focused on commercial banks, microfinance institutions, or DT-SACCOs at the national level. Moreover, many previous studies have treated digital financial innovation as a single construct without examining the individual contributions of digital products, digital processes, digital channels, and payment innovations to financial performance. Furthermore, limited attention has been given to the moderating role of technology adoption capacity, despite evidence suggesting that organizational readiness, ICT infrastructure, and staff digital competencies influence the successful implementation of digital innovations (Kimaku, 2021). Consequently, empirical evidence explaining how these individual dimensions of digital financial innovation affect the financial performance of DT-SACCOs, particularly within the unique economic environment of Mombasa County, remains limited.

To address these knowledge and contextual gaps, this study examined the effect of digital financial innovation on the financial performance of Deposit-Taking SACCOs in Mombasa County. Specifically, the study investigated the influence of digital products, digital processes, digital channels, and payment innovations while assessing the moderating effect of technology adoption capacity. The findings are expected to provide empirical evidence that will assist DT-SACCO managers, policymakers, regulators, and other stakeholders in strengthening digital transformation initiatives and improving financial performance within Kenya's cooperative financial sector.

Objective of the Study

The study was guided by two objectives:

i). to determine the impact of digital financial innovation on financial performance of deposit taking Sacco in Mombasa County, and

ii). To determine the moderating effect of technology adoption capacity on the relationship between digital financial innovation and the financial performance of DT-SACCOs in Mombasa County.

Research Hypotheses

The study sought to answer the following research hypotheses:

i). Ho1: Digital financial innovation has no significant effect on the financial performance of deposit taking savings and credit cooperative societies in Mombasa County

ii). Ho2: Technology adoption capacity has no moderating effect on the relationship between digital financial innovation and financial performance of deposit taking savings and credit cooperatives in Mombasa County.

REVIEW OF LITERATURE

The study is anchored on three complementary theories: Schumpeter's Theory of Economic Change, Transaction Cost Theory, and the Diffusion of Innovation Theory. These theories collectively explain how digital financial innovations influence the financial performance of Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Mombasa County. Specifically, Schumpeter's Theory underpins digital products, Transaction Cost Theory explains digital processes, while the Diffusion of Innovation Theory provides the basis for digital channels and technology adoption. Together, they provide a comprehensive explanation of how innovation, efficiency, and technology diffusion contribute to improved financial performance.

Schumpeter's Theory of Economic Change (Schumpeter, 1934) argues that innovation is the principal driver of economic growth and organizational competitiveness. The theory suggests that organizations achieve superior performance through the introduction of new products, services, production methods, and markets. Within DT-SACCOs, digital products such as mobile banking, internet banking, and digital savings products enhance accessibility, customer convenience, service quality, and revenue generation. Although the theory has been criticized for paying limited attention to implementation challenges such as resistance to change and technological constraints, it remains appropriate in explaining how product innovation contributes to improved financial performance.

Transaction Cost Theory, advanced by Coase (1937) and Williamson (1985), explains that organizations seek to minimize the costs associated with transactions, coordination, and information exchange. Digital financial processes, including process automation, electronic funds transfer (EFT) systems, and application programming interface (API) integration, reduce transaction costs, improve operational efficiency, minimize processing errors, and accelerate service delivery. Consequently, lower operational costs enhance profitability, efficiency, and competitiveness among DT-SACCOs.

The Diffusion of Innovation Theory (Rogers, 2003) explains how new technologies are adopted and spread within organizations and society. The theory emphasizes that innovation adoption depends on perceived usefulness, compatibility, complexity, trialability, and observability. In DT-SACCOs, digital channels such as agency banking, Automated Teller Machines (ATMs), SMS banking, and electronic card banking improve customer access and service delivery. However, successful adoption depends on organizational readiness, staff ICT competencies, and members' digital literacy, highlighting the importance of technology adoption capacity. Similar observations have been made by Kimaku (2021), who argues that organizational performance improves when innovation is supported by strategic leadership, institutional capability, and effective implementation. Likewise, Seneyia, Kimaku, and Omido (2026) found that strategic change management enhances organizational performance through effective implementation of new initiatives. Collectively, these theories explain how digital financial innovation improves financial performance by promoting innovation, reducing transaction costs, and facilitating effective technology adoption.

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Conceptually, this study proposes that digital financial innovation—comprising digital products, digital processes, digital channels, and payment innovations, influences the financial performance of DT-SACCOs, measured through profitability, revenue growth, cost efficiency, loan performance, financial sustainability, and savings mobilization. Technology adoption capacity, reflected by ICT investment, staff ICT skills, and member digital literacy, moderates this relationship by strengthening the effectiveness of digital innovations.

Empirical studies generally demonstrate a positive relationship between digital financial innovation and organizational performance, although the magnitude of the effect varies across institutional and geographical contexts. Research on digital products indicates that innovations such as mobile banking, internet banking, and digital savings platforms improve customer convenience, financial inclusion, and profitability by expanding access to financial services (Musyaffi et al., 2022; Mweu & Tirimba, 2024). Studies examining digital processes have established that automation, electronic funds transfer (EFT), and application programming interfaces (APIs) enhance operational efficiency, reduce transaction costs, and improve service quality, ultimately contributing to improved financial performance (Williamson, 1985; Alonso et al., 2023). Similarly, empirical evidence on digital channels, including agency banking, ATM services, SMS banking, and internet banking, shows that they increase customer reach, service accessibility, and organizational competitiveness (Venanzi & Matteucci, 2022; Boehme et al., 2023). Research on payment innovations further reveals that electronic payment systems enhance transaction speed, reduce operational costs, and strengthen financial sustainability, although some studies report mixed effects depending on organizational readiness and technology adoption levels (SASRA, 2024). Kimaku (2021) similarly argues that technological initiatives improve organizational performance only when supported by effective strategic leadership, institutional capacity, and implementation mechanisms. Likewise, Seneyia, Kimaku, and Omido (2026) found that successful implementation of strategic change significantly enhances organizational performance, while Okello, Kimaku, and Mutisya (2026) demonstrated that technology adoption improves institutional efficiency when complemented by adequate organizational capabilities. However, most previous studies have focused on commercial banks or examined digital financial innovation as a single construct, with limited attention to the moderating role of technology adoption capacity and few studies focusing on DT-SACCOs in Mombasa County. These contextual and methodological gaps justified the present study.

Conceptual Framework

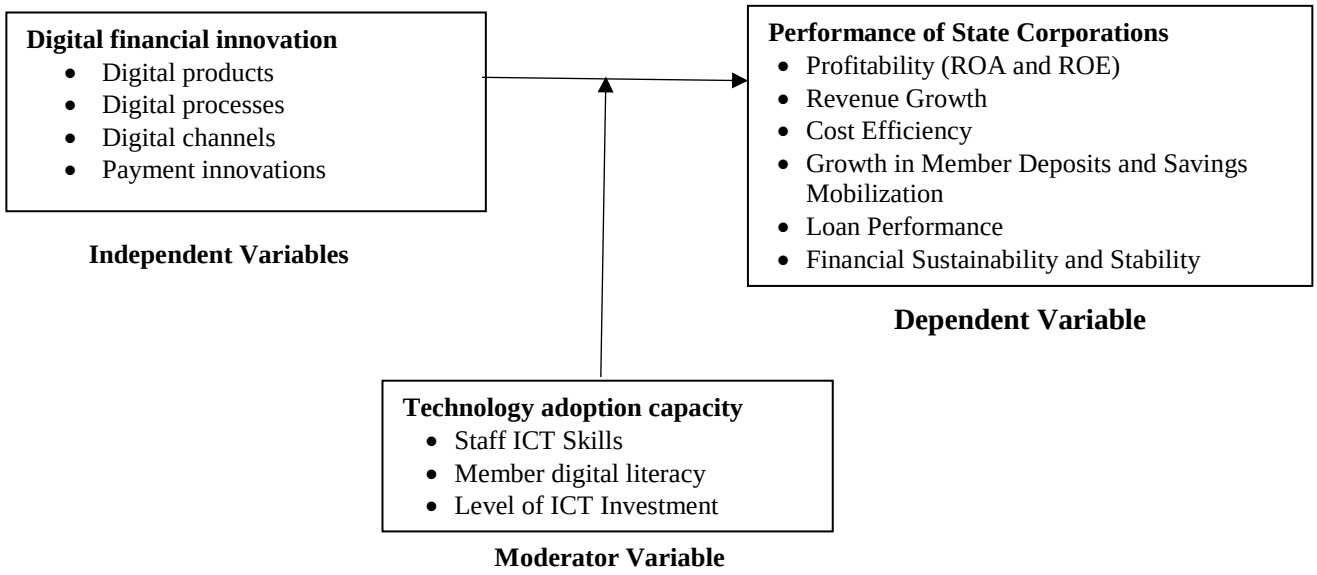


Figure 2.1: Conceptual Framework

MATERIALS AND METHODS

Research Design

The study adopted a descriptive and explanatory research design to examine the effect of digital financial innovation on the financial performance of Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Mombasa County. The descriptive design enabled the researcher to describe the nature and extent of digital products, digital processes, digital channels, and payment innovations adopted by DT-SACCOs, while the explanatory design facilitated examination of the causal relationships between these innovations and financial performance, including the moderating effect of technology adoption capacity. The design was appropriate for quantitatively testing the study hypotheses and establishing relationships among the variables.

Target Population and Sampling Technique

The target population comprised 96 management and technical employees drawn from the 16 licensed DT-SACCOs operating in Mombasa County as recognized by the Sacco Societies Regulatory Authority (SASRA). This study established that each SACCO has at least six staff in these positions, which makes up the target population of (6 x 16 saccos) = 96 comprising of management and technical staff in the SACCOs. The respondents included branch managers, operations managers, credit managers, finance officers, and ICT officers because of their direct involvement in digital financial innovation and financial decision-making. The study employed stratified random sampling, whereby respondents were grouped according to their job categories to ensure adequate representation of each stratum. Green's (1991) formula for multiple regression was used to determine the minimum sample size of 82 respondents. However, five additional eligible respondents participated, resulting in a final sample of 87 respondents, thereby improving the representativeness and precision of the study findings.

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Instrumentation and Data Collection Procedure

Primary data were collected using a structured questionnaire developed from the study objectives and variables. The questionnaire contained closed-ended items measured using a five-point Likert scale to capture respondents' perceptions regarding digital financial innovation and financial performance. Before the main survey, the instrument was subjected to validity and reliability assessment to ensure accuracy and consistency. Following the acquisition of the necessary research authorization, the questionnaires were administered to the selected respondents within the licensed DT-SACCOs in Mombasa County. Respondents were informed about the purpose of the study and assured of confidentiality and anonymity to encourage honest and unbiased responses.

Data analysis

Completed questionnaires were checked for completeness, coded, and entered into the Statistical Package for the Social Sciences (SPSS) for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize respondents' demographic characteristics and describe the study variables. Inferential statistics were then applied to examine the relationships between digital financial innovation and financial performance. Pearson correlation analysis was used to determine the direction and strength of the relationships among the variables, while multiple regression analysis was employed to test the study hypotheses and establish the individual effects of digital products, digital processes, digital channels, and payment innovations on financial performance. The moderating effect of technology adoption capacity was also examined through regression analysis by incorporating the interaction effect into the regression model. Prior to hypothesis testing, the research instrument's validity was confirmed through expert review, while reliability was assessed using Cronbach's alpha coefficients. In addition, regression diagnostic tests, including multicollinearity, heteroscedasticity, and autocorrelation tests, were conducted to verify that the assumptions underlying multiple regression analysis were satisfied. The findings were presented using tables and appropriate statistical interpretations to facilitate objective conclusions and recommendations.

Ethical Considerations

Ethical approval for the study was obtained from the Ethics Review Committee of Taita Taveta University prior to data collection. Participation was voluntary, and all respondents provided informed consent before taking part in the study. To safeguard participants' privacy and confidentiality, unique identification codes were used instead of personal identifiers, and all research data were securely stored with access restricted to the research team. Throughout the data collection process, enumerators adhered to ethical research principles by maintaining professionalism, respecting participants' rights and dignity, and ensuring that respondents were treated with courtesy and impartiality.

RESULTS

A total of 215 questionnaires were issued to respondents, with 207 filled and returned. The returned questionnaires formed a response rate of 96.3% as shown in Table 1.

Table 1: Response Rate

Questionnaire	Frequency	Percent
Returned	87	100
Non returned	0	0
Total	**87**	**100.0**

Demographic Information Analysis

Table 2: Demographic Data

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	46	52.9
	Female	41	47.1
	Other	2	1.0
Age	Below 25 years	13	14.94
	25–34 years	35	40.23
	35–44 years	14	16.09
	45–54 years	16	18.39
	55 years and above	9	10.34
Education Level	Bachelor’s Degree	30	34.48
	Certificate	12	13.79
	Diploma	23	26.44
	Master’s Degree	19	21.84
	PhD	3	3.45
Position	Branch Manager	14	16.1

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Demographic Variable	Category	Frequency	Percentage (%)
	Credit Manager	15	17.2
	Finance Officer	30	34.5
	ICT Officer	14	16.1
	Operation's Manager	14	16.1
Length of Service in the SACCO	2–5 years	38	43.68
	6–10 years	31	35.63
	Above 10 years	2	2.3
	Less than 2 years	16	18.39
Years the SACCO has been in operation	11–15 years	11	12.64
	5–10 years	40	45.98
	Above 15 years	4	4.6
	Below 5 years	32	36.78
Number of members in SACCO	1,000–5,000	20	22.99
	5,001–10,000	10	11.49
	Above 10,000	2	2.3
	Below 1,000	55	63.22
Total		**207**	**100.0**

Key Findings

The descriptive analysis demonstrated that Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Mombasa County have made considerable progress in adopting digital financial innovations to improve service delivery and financial performance. Respondents generally agreed that digital financial products, including mobile banking, internet banking, digital savings, and digital loan services, had enhanced customer convenience, expanded service accessibility, and contributed to improved operational efficiency. Similarly, digital financial processes, such as automated loan processing, electronic record management, and integrated management information systems, were perceived to have streamlined internal operations, reduced processing time, and minimized operational errors.

The findings further indicated that digital financial channels, including mobile applications, USSD platforms, internet banking, agency banking, and ATM services, had significantly improved customer access to financial services while reducing transaction costs and increasing customer satisfaction. In addition, payment innovations, such as mobile money integration, electronic fund transfers, QR-code payments, and automated payment systems, were reported to have accelerated transaction processing, strengthened revenue collection, and enhanced the efficiency of financial operations within DT-SACCOs.

The study also established that technology adoption capacity was generally rated highly across the participating DT-SACCOs. Respondents agreed that adequate ICT infrastructure, management support, staff digital competencies, technological readiness, and sufficient investment in digital technologies enhanced the successful implementation of digital financial innovations. Regarding the dependent variable, respondents reported notable improvements in financial performance, particularly in profitability, revenue growth, operational efficiency, loan performance, deposit mobilization, and overall financial sustainability. Overall, the descriptive findings suggest that DT-SACCOs in Mombasa County have embraced digital transformation to a considerable extent, providing preliminary evidence that digital financial innovations, supported by strong technology adoption capacity, are associated with improved financial performance. These findings provided a solid basis for the subsequent correlation and multiple regression analyses conducted to establish the statistical significance of these relationships.

Table 3: Digital Financial Products and DT SACCO Financial Performance results

Statement	SD	D	N	A	SA
Mobile banking deposit services have increased revenue streams and overall financial performance.	0	5.8	14.9	67.8	11.5
Mobile banking withdrawal services have reduced operational costs and improved financial efficiency	2.3	0	6.9	48.3	42.5
Mobile-based loan repayment systems have enhanced loan recovery rates and profitability.	0	0	9.2	60.9	29.9
Digital balance inquiry services have reduced service delivery costs and improved financial efficiency.	2.3	1.2	6.9	39.1	50.6
Internet banking services have expanded customer reach and increased fee-based income.	3. 5	0	1.2	57.5	37.9
Digital savings products have enhanced deposit mobilization and improved financial performance.	0	1.2	2.3	44.8	51.7

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Table 4: Digital Financial Processes and DT SACCO Financial Performance Results

Statement	SD(%)	D (%)	N (%)	A(%)	SA (%)
Process automation has reduced operational expenses and improved cost efficiency.	0	0	3.45	64.4	32.2
Electronic Funds Transfer (EFT) systems have enhanced transaction speed and increased financial throughput.	1.2	0	4.6	44.8	49.4
Application Programming Interfaces (APIs) have improved transaction accuracy and reduced financial losses.	0	2.3	5.8	63.2	28.7
Digitization of internal processes has minimized operational errors and improved profitability.	0	0	0	50.6	49.4
Real-time transaction processing systems have improved cash flow management and enhanced financial performance.	0	1.2	1.2	62.1	35.6
Digital record management systems have reduced administrative costs and improved financial reporting efficiency.	1.2	1.2	3. 5	46.0	48.3

Table 5: Digital Financial Channels and DT-SACCO Financial Performance Results

Statement	SD(%)	D (%)	N (%)	A(%)	SA (%)
Mobile applications have increased transaction volumes and revenue generation.	0	2.3	1.2	52.9	43.7
USSD platforms have expanded financial access and increased transaction-based income.	0	0	1.2	64.4	34.5
SACCO websites have improved service delivery efficiency and reduced administrative costs.	0	0	2.3	62.1	35.6
Social media platforms have enhanced customer acquisition and contributed to revenue growth.	0	0	1.2	63.2	35.6
Integrated digital channels have improved customer retention and overall financial performance.	0	1.5	3.5	54.0	41.4
Integration of multiple digital channels has reduced transaction costs and improved overall financial efficiency.	2.3	0	3.5	55.2	39.1

Table 6: Payment Innovations and DT-SACCO Financial Performance results

Statement	SD(%)	D (%)	N (%)	A(%)	SA (%)
Mobile money integration has increased transaction volumes and fee-based income.	1.15	1.15	3.5	57.47	36.78
Mobile payment solutions have improved transaction efficiency and reduced operational costs.	0	0	1.15	62.07	36.78
Agency banking has expanded market reach and increased revenue generation	3.45	0	3.45	60.92	32.18
Card payment systems have improved transaction convenience and boosted financial performance.	0	2.3	2.3	62.07	33.33
Electronic payment systems have reduced cash handling costs and improved operational efficiency.	1.15	0	0	60.92	37.93
Interoperable digital payment systems have increased transaction volumes and enhanced fee-based income	0	1.15	2.3	57.47	39.08

Table 7: Technology Adoption Capacity results

Statement	SD(%)	D (%)	N (%)	A(%)	SA (%)
The level of staff training in digital systems enhances the impact of digital financial innovations on profitability	1.2	0	2.3	65.5	31.0
The quality of IT infrastructure strengthens the effect of digital innovations on cost reduction and operational efficiency.	0	1.2	2.3	54.0	42.5
Management support for digital transformation amplifies the contribution of digital innovations to revenue growth.	0	0	1.2	62.1	36.8
The SACCO's technological readiness increases the effectiveness of digital innovations in improving financial returns.	0	1.2	1.2	56.3	41.4
Adequate ICT budget allocation enhances the ability of digital innovations to reduce operating costs and improve the cost-to- income ratio.	0	0	3.5	50.6	46.0
Positive staff attitudes toward technology adoption strengthen the relationship between digital innovations and revenue generation.	1.2	0	1.2	58.6	39.1

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Table 8: Financial Performance of DT-SACCOs resuts

Statement	SD(%)	D (%)	N (%)	A(%)	SA (%)
The DT-SACCO has experienced growth in profitability (e.g., Return on Assets and Return on Equity) over the past few years.	1.2	0	3.5	60.9	34.5
The DT-SACCO has achieved increased revenue growth from its financial operations.	0	1.2	0	50.6	48.3
The DT-SACCO has reduced its operating costs relative to income, improving its cost-to-income ratio.	0	3. 5	2.3	51.7	42.5
The DT-SACCO has experienced growth in member deposits and savings mobilization.	0	1.2	1.2	63.2	34.5
The DT-SACCO has improved loan performance through reduced non-performing loans and higher repayment rates.	0	0	1.2	51.7	47.1
The DT-SACCO has achieved overall improvement in financial sustainability and stability.	1.2	0	6.9	58.6	33.3

Correlation Analysis

Correlation analysis was conducted to determine the direction and strength of the relationships between the independent variables—digital financial products, digital financial processes, digital financial channels, and payment innovations—and the dependent variable, financial performance of Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Mombasa County. Pearson's Product Moment Correlation Coefficient was employed because the study variables were continuous and measured using Likert-scale composites. The analysis established whether increases in the adoption of digital financial innovations were associated with improvements in financial performance. Correlation coefficients (r) ranging from -1 to +1 were used to indicate the strength and direction of the relationships, while the corresponding p-values were used to determine statistical significance at the 5% significance level ($p < 0.05$). The findings revealed positive and statistically significant relationships between each dimension of digital financial innovation and financial performance, suggesting that greater adoption of digital technologies is associated with enhanced organizational performance. The results also provided preliminary evidence supporting the study hypotheses and justified the subsequent multiple regression analysis to establish the predictive effect of the independent variables on financial performance while controlling for the influence of technology adoption capacity.

Table 9: Correlation Matrix for Study Variables

Variable	Y	X1	X2	X3	X4	M
Financial Performance	1					
p-value (Y)						
Digital Financial Products (X1)	0.4519*	1				
p-value	0.000					
Digital Financial Processes (X2)	0.5336*	0.6587*	1			
p-value	0.000	0.000				
Digital Financial Channels (X3)	0.7283*	0.5018*	0.6608*	1		
p-value	0.000	0.000	0.000			
Payment Innovation	0.6744*	0.5480*	0.7494*	0.8090*	1	
p-value (X4)	0.000	0.000	0.000	0.000		
Tech Innovation	0.7082*	0.4907*	0.6812*	0.8045*	0.8076*	1
p-value (M)	0.000	0.000	0.000	0.000	0.000	

Correlation analysis revealed positive and statistically significant relationships between all the dimensions of digital financial innovation and the financial performance of Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Mombasa County. This indicates that improvements in the adoption and utilization of digital financial innovations are associated with corresponding improvements in financial performance. The positive correlation coefficients suggest that as DT-SACCOs enhance their digital financial capabilities, they are likely to experience increased operational efficiency, higher customer satisfaction, improved revenue generation, greater profitability, and stronger financial sustainability.

Among the independent variables, digital financial products exhibited a positive association with financial performance, implying that expanding digital savings, loan products, and mobile banking services contributes to improved organizational outcomes. Similarly, digital financial processes demonstrated a significant positive relationship with financial performance, suggesting that automation of internal operations, electronic record management, and digital transaction processing enhance efficiency while reducing operational costs and errors.

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The findings further established that digital financial channels, including mobile applications, internet banking, USSD services, agency banking, and ATM platforms, were positively related to financial performance. This suggests that expanding customer access to financial services through multiple digital channels strengthens customer engagement, increases transaction volumes, and enhances institutional competitiveness. Likewise, payment innovations showed a significant positive relationship with financial performance, indicating that electronic payment systems, mobile money integration, and digital fund transfer mechanisms facilitate faster, more secure, and cost-effective financial transactions.

The statistically significant correlations ($p < 0.05$) provide preliminary empirical evidence in support of the study hypotheses by confirming meaningful associations between the independent and dependent variables. However, correlation analysis only establishes the strength and direction of relationships and does not imply causality. Consequently, multiple regression analysis was conducted to determine the individual contribution of each digital financial innovation dimension to financial performance while controlling for the influence of the other variables. Overall, the correlation results suggest that greater adoption of digital financial innovations is associated with superior financial performance among DT-SACCOs in Mombasa County.

Regression Analysis

Multiple linear regression analysis was conducted to determine the predictive effect of digital financial innovations on the financial performance of Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Mombasa County. Specifically, the analysis examined the extent to which digital financial products, digital financial processes, digital financial channels, and payment innovations jointly and individually explained variations in financial performance. Regression analysis was appropriate because it not only established the existence of relationships between the study variables but also quantified the magnitude and direction of the influence of each independent variable while controlling for the effects of the others.

The model summary statistics were used to assess the explanatory power of the regression model through the coefficient of determination (R^2), indicating the proportion of variation in financial performance explained by the digital financial innovation dimensions. Analysis of Variance (ANOVA) was performed to determine the overall statistical significance and fitness of the regression model. A statistically significant F-statistic ($p < 0.05$) indicated that the combined effect of the independent variables significantly predicted financial performance.

Further, the regression coefficients (β), t-statistics, and associated p-values were examined to determine the individual contribution of each predictor variable. Variables with positive and statistically significant beta coefficients demonstrated that increased adoption of the respective digital financial innovation dimension contributed to improved financial performance. The regression findings therefore provided empirical evidence for testing the study hypotheses and identifying the digital financial innovation practices that exert the greatest influence on the financial performance of DT-SACCOs in Mombasa County.

Table 10: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.723a	0.523	0.448	0.62312

Table 4.3: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.5528	5	1.5106	22.546	.0000
	Residual	5.424	81	0.067		
	Total	12.9768	86			

The multiple regression model was estimated using data from 87 respondents to determine the combined effect of digital financial products, digital financial processes, digital financial channels, payment innovations, and technology adoption capacity on the financial performance of Deposit-Taking SACCOs in Mombasa County. The model summary indicates an R-squared (R^2) value of 0.582, implying that the predictor variables jointly explain 58.2% of the variation in financial performance. This demonstrates that the model possesses moderate to strong explanatory power, suggesting that digital financial innovation is an important determinant of DT-SACCO performance. The adjusted R^2 of 0.5562 further indicates that, after adjusting for the number of predictors, approximately 55.62% of the variation in financial performance remains explained by the model. The relatively small difference between R^2 and adjusted R^2 confirms that the model is stable and free from overfitting. In addition, the Root Mean Square Error (RMSE) of 0.25877 indicates relatively low prediction errors, demonstrating that the regression model provides reasonably accurate estimates of financial performance.

The ANOVA results confirm that the regression model is statistically significant and provides a good fit for the data. The regression sum of squares (SS = 7.5528) exceeds the residual sum of squares (SS = 5.424), indicating that the independent variables collectively explain a substantial proportion of the variability in financial performance. The model produced an F-statistic of 22.546 with a corresponding p-value of 0.000, which is well below the 0.05 significance threshold. Consequently, the null hypothesis that the independent variables have no joint effect on financial performance is rejected. The findings therefore demonstrate that digital financial products, digital financial processes, digital financial channels, payment innovations, and technology adoption capacity collectively exert a statistically significant influence on the financial performance of DT-SACCOs in Mombasa County.

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Table 11: Multiple Regression Results on Financial Performance of DT-SACCOs

Variable	Coefficient (β)	Std. Error	t-value	p-value	95% Confidence Interval
Constant	1.011268	0.348439	2.9	0.005	[0.3179837, 1.7045520]
Digital Financial Products	0.08688	0.086741	1	0.32	[-0.0857075, 0.2594676]
Digital Financial Processes	-0.08949	0.119622	-0.75	0.457	[-0.3274997, 0.1485192]
Digital Financial Channels	0.357895	0.124205	2.88	0.005	[0.1107668, 0.6050236]
Payment Innovation	0.113553	0.13526	0.84	0.404	[-0.1555727, 0.3826778]
Technology Adoption Capacity	0.303324	0.13559	2.24	0.028	[0.0335422, 0.5731058]

The regression coefficient analysis examined the individual contribution of each predictor variable to the financial performance of DT-SACCOs while controlling for the influence of the other variables. The findings reveal that digital financial channels emerged as the only statistically significant predictor of financial performance. Specifically, digital financial channels recorded a positive regression coefficient ($\beta = 0.358$, $p = 0.005$), indicating that a one-unit improvement in digital financial channels is associated with a 0.358-unit increase in financial performance, holding all other variables constant. This finding suggests that increased utilization of mobile applications, USSD platforms, SACCO websites, social media platforms, and other digital service channels significantly enhances operational efficiency, customer accessibility, service delivery, and ultimately the financial performance of DT-SACCOs.

In contrast, digital financial products ($\beta = 0.087$, $p = 0.320$), digital financial processes ($\beta = -0.089$, $p = 0.457$), and payment innovations ($\beta = 0.114$, $p = 0.404$) did not exhibit statistically significant effects because their p-values exceeded the 0.05 level of significance. Although digital financial products and payment innovations displayed positive coefficients, their effects were insufficient to conclude that they independently influence financial performance after controlling for the other variables. Similarly, digital financial processes produced a negative coefficient, suggesting a slight inverse relationship; however, the relationship was statistically insignificant and may have resulted from implementation costs, organizational differences, or overlapping effects with other innovation dimensions. Overall, the regression findings indicate that while all dimensions of digital financial innovation jointly contribute to explaining financial performance, digital financial channels represent the most influential and reliable predictor. The results therefore suggest that DT-SACCOs should prioritize investment in accessible and efficient digital service delivery channels while strengthening complementary digital capabilities to maximize the financial benefits of digital transformation.

The overall model becomes:

$$\mathbf{Y = 1.011268 + 0.08688X_1 - 0.08949X_2 + 0.357895X_3 + 0.113553X_4 + 0.303324M}$$

Which translates to:

Financial Performance of DT-SACCOs = 1.011268+0.08688(Digital Financial Products) - 0.08949(Digital Financial Processes)+0.357895(Digital Financial Channels)+0.113553(Payment Innovation) + 0.303324(Technology Adoption Capacity)

Interpretation of Findings

The regression analysis established that the overall model was statistically significant ($F = 22.56$, $p < 0.001$), indicating that digital financial innovation variables collectively influence the financial performance of Deposit-Taking SACCOs in Mombasa County. The model achieved an R-squared value of 0.582 and an adjusted R-squared of 0.5562, implying that approximately 55.62% of the variation in financial performance is explained by digital financial products, digital financial processes, digital financial channels, payment innovations, and technology adoption capacity.

Among the predictor variables, technology adoption capacity had a positive and statistically significant effect on financial performance ($\beta = 0.303$, $p = 0.028$). This indicates that improvements in ICT infrastructure, staff digital competencies, organizational readiness, technology investment, and employee attitudes toward digital technologies enhance the financial performance of DT-SACCOs. Similarly, digital financial channels significantly and positively influenced financial performance ($\beta = 0.358$, $p = 0.005$), suggesting that increased utilization of mobile applications, USSD platforms, SACCO websites, and other digital channels improves accessibility, service delivery, operational efficiency, and overall organizational performance. These findings are consistent with previous empirical studies that associate digital maturity and effective digital channels with improved institutional performance. Conversely, digital financial products ($\beta = 0.087$, $p = 0.320$), digital financial processes ($\beta = -0.089$, $p = 0.457$), and payment innovations ($\beta = 0.114$, $p = 0.404$) did not have statistically significant individual effects on financial performance, despite exhibiting positive or weak relationships. This suggests that their independent contributions were insufficient to significantly predict financial performance within the study context.

Practical Implications

The findings of this study provide practical insights for managers of Deposit-Taking SACCOs seeking to improve financial performance through digital transformation. The significant influence of digital financial channels and technology adoption capacity suggests that SACCOs should prioritize investment in mobile banking platforms, internet-based services, USSD platforms, and other customer-centered digital channels to improve accessibility, operational efficiency, and service quality. Management should also strengthen ICT infrastructure, continuously train employees on emerging digital technologies, and enhance members' digital literacy to maximize technology utilization. Furthermore, SACCOs should establish robust cybersecurity frameworks and regularly upgrade digital systems to improve reliability and customer confidence. These initiatives are likely to increase operational efficiency, customer satisfaction, competitiveness, profitability, and long-term financial sustainability within the increasingly digital financial services environment.

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Theoretical Implications

This study contributes to the theoretical understanding of digital financial innovation by providing empirical evidence supporting Schumpeter's Theory of Economic Change, Transaction Cost Theory, and Diffusion of Innovation Theory. The positive influence of digital financial channels demonstrates that innovation adoption enhances organizational competitiveness and financial outcomes, consistent with Schumpeter's proposition that innovation drives organizational growth. The findings also reinforce Transaction Cost Theory by illustrating that digital technologies can improve operational efficiency through reduced transaction costs and streamlined service delivery. Additionally, the significant role of technology adoption capacity supports the Diffusion of Innovation Theory by emphasizing that organizational readiness, technological capability, and user acceptance determine the successful adoption and effectiveness of digital innovations. Consequently, the study strengthens existing theoretical perspectives on digital transformation in cooperative financial institutions

Limitations of the Descriptive Analysis

The descriptive analysis was limited to summarizing respondents' perceptions regarding digital financial innovation and financial performance at a single point in time, making it impossible to establish causal relationships among the study variables. The findings relied on self-reported questionnaire responses, which may have been affected by response bias, social desirability bias, or differences in respondents' understanding of the questionnaire items. Additionally, the study focused exclusively on licensed Deposit-Taking SACCOs in Mombasa County, limiting the generalizability of the descriptive findings to non-deposit-taking SACCOs or institutions operating in different geographical and economic contexts. Despite these limitations, the descriptive analysis provided valuable baseline information that informed the subsequent inferential statistical analyses.

CONCLUSIONS AND RECOMMENDATIONS

The study concludes that digital financial innovation plays an important role in enhancing the financial performance of Deposit-Taking SACCOs in Mombasa County. Overall, the regression model established that digital financial innovation variables jointly exert a statistically significant influence on financial performance, confirming that digital transformation remains a strategic driver of organizational competitiveness and sustainability. Among the individual predictors, digital financial channels emerged as the strongest and statistically significant determinant of financial performance, demonstrating that increased utilization of mobile banking platforms, USSD services, websites, and other electronic delivery channels enhances operational efficiency, service accessibility, customer satisfaction, and institutional performance.

The study further concludes that technology adoption capacity significantly strengthens financial performance by enabling organizations to effectively utilize digital innovations. Adequate ICT infrastructure, staff digital competencies, organizational readiness, and continuous technological investment create an enabling environment for successful digital transformation. Although digital financial products, digital financial processes, and payment innovations exhibited positive relationships with financial performance, their individual effects were not statistically significant after controlling for the other variables. This suggests that successful digital transformation depends not only on introducing digital solutions but also on the institution's capacity to integrate and utilize them effectively. Overall, the findings demonstrate that sustained investment in digital capabilities remains essential for improving profitability, operational efficiency, competitiveness, and long-term financial sustainability among DT-SACCOs.

Based on these findings, the study recommends that management of Deposit-Taking SACCOs prioritize investment in modern digital service delivery channels, including mobile banking applications, internet banking platforms, USSD services, and integrated customer self-service technologies to improve accessibility and service efficiency. SACCOs should strengthen technology adoption capacity through continuous investment in ICT infrastructure, regular staff training, digital literacy programs for members, and organizational change management initiatives that promote technology acceptance.

The study further recommends that SACCO management continuously review and upgrade digital financial products, internal digital processes, and payment innovation systems to improve their effectiveness and integration with customer needs. Robust cybersecurity measures, data protection frameworks, and system reliability mechanisms should be strengthened to enhance customer trust and minimize operational risks associated with digital financial services.

At the policy level, the Sacco Societies Regulatory Authority (SASRA) and other relevant government agencies should formulate supportive regulatory frameworks that encourage responsible digital innovation while promoting cybersecurity standards, digital governance, and technological capacity building across the SACCO sector. Collaboration between regulators, technology providers, and SACCOs should also be strengthened to facilitate innovation, knowledge sharing, and sustainable digital transformation throughout the cooperative financial sector.

Future Research Directions

Future studies should adopt longitudinal research designs to examine how digital financial innovations influence the financial performance of DT-SACCOs over time, thereby providing stronger evidence of causal relationships. Researchers should also extend similar studies to Deposit-Taking SACCOs operating in other counties and non-deposit-taking SACCOs to enhance the generalizability of the findings across different institutional and economic environments. Further research should investigate additional organizational and environmental factors, such as organizational culture, cybersecurity preparedness, leadership support, regulatory compliance, customer trust, and competitive intensity, that may influence the effectiveness of digital financial innovation. Mixed-methods research incorporating interviews with SACCO managers, employees, regulators, and members would provide richer insights into implementation challenges and success factors. Finally, future studies should explore emerging digital technologies such as artificial intelligence, blockchain, big data analytics, and fintech partnerships to determine their contribution to the financial performance and sustainability of cooperative financial institutions.

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Conflict of Interest: The authors declare that they have no competing interests or conflicts of interest related to this study.
Data Availability: The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to applicable ethical and confidentiality requirements.
Ethical Approval and Informed Consent: Ethical approval for this study was obtained from the Ethics Review Committee of Taita Taveta University. Participation was voluntary, and informed consent was obtained from all participants prior to their involvement in the study.

RECOGNITIONS OF THE AUTHOR CONTRIBUTION

Edith Chepkemboi Simatwa - Conceptualization, methodology, data collection, data analysis, writing.
Irene Esther Njeri - Supervision, refining methodology, reviewing and editing.
Edward Kiring'a Simiyu - Supervision, validation, editing and reviewing.
Patrick Mutua Kimaku - Refining methodology, reviewing data analysis and editing.

DATA AVAILABILITY

The datasets generated and analyzed during this study are not publicly available due to confidentiality and privacy considerations. However, anonymized data and relevant supporting materials can be obtained from the corresponding author upon reasonable request, subject to applicable ethical and institutional requirements.

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