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DIGITAL TRANSFORMATION IN COOPERATIVE ENTERPRISES: A STRATEGY FOR NIGERIA'S SOCIOECONOMIC DEVELOPMENT

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Abstract

This study examined digital transformation in cooperative enterprises as a strategy for enhancing Nigeria's socioeconomic development. Specifically, the study sought to examine the extent of digital transformation adoption among cooperative enterprises, identify the digital technologies utilized in improving operational efficiency and service delivery, and assess the effect of digital transformation on the financial performance and productivity of cooperative enterprises in Nigeria. Cooperative enterprises remain critical instruments for grassroots development, financial inclusion, employment generation, and poverty reduction; however, their effectiveness has been constrained by limited technological adoption, inefficient management systems, and poor data management practices. The study adopted a descriptive survey research design using a mixed-method approach. Data were collected from 360 cooperative societies selected across the six geopolitical zones of Nigeria. The study was anchored on the Technology Acceptance Model (TAM). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to analyze the data, while regression analysis was employed to test the hypotheses. The findings revealed that digital transformation significantly enhances cooperative governance, financial management, communication, and record-keeping systems. Approximately 72% of respondents reported increased operational efficiency following the adoption of digital technologies. The regression results indicated a strong positive relationship between digital transformation and cooperative performance ($R = 0.79$, $p < 0.05$), with digital financial management, communication technologies, and electronic record-keeping contributing significantly to improved productivity and organizational effectiveness. However, major challenges affecting digital transformation include inadequate ICT infrastructure, limited technical skills, high implementation costs, and insufficient funding. The study concluded that digital transformation is a viable and strategic tool for improving the sustainability, efficiency, and competitiveness of cooperative enterprises, thereby contributing significantly to Nigeria's socioeconomic development. The study recommends the establishment of government-private sector partnerships to support cooperative digitalization, provision of digital literacy and capacity-building programs, improvement of ICT infrastructure, and formulation of supportive policies that facilitate the integration of digital technologies into cooperative operations nationwide.

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Introduction

The cooperative enterprise model has long been recognized as a vehicle for inclusive growth, social equity, and sustainable community development. In Nigeria, cooperatives serve as instruments for mobilizing grassroots capital, providing access to credit, promoting agricultural production, and facilitating mutual support among members. Despite their historical significance, many cooperatives continue to face operational inefficiencies, poor record management, and weak governance structures. In the contemporary digital era, the integration of technology into cooperative operations has become imperative for enhancing productivity, accountability, and competitiveness.

Digital transformation—the process of embedding digital technologies into organizational functions and structures—has revolutionized sectors such as banking, healthcare, and education. However, its application in the cooperative sector remains underexplored. According to Chukwu and Ibrahim (2020), digital technologies such as cloud computing, online accounting, and mobile applications can strengthen cooperative management systems, improve transparency, and promote member engagement. Similarly, Adeyemi and Ogunlade (2021) argue that the digitization of cooperative processes can increase access to real-time information, minimize administrative errors, and enhance financial inclusion among low-income groups.

In the Nigerian context, the slow pace of digital adoption among cooperatives has been attributed to inadequate ICT infrastructure, lack of technical know-how, and limited financial resources (Eze, 2022). As the nation aspires toward achieving sustainable socioeconomic development goals, promoting digital transformation across cooperative enterprises offers a promising pathway for inclusive growth.

This study therefore investigates the extent to which cooperative enterprises adopt digital transformation, to identify the digital technologies utilized by cooperative enterprises in enhancing their operational efficiency and service delivery and to assess the effect of digital transformation on the financial performance and productivity of cooperative enterprises in Nigeria. It aims to provide empirical evidence on the strategic importance of technology in driving cooperative performance and Nigeria's socioeconomic advancement. Promoting digital transformation across cooperative enterprises offers a promising pathway for inclusive growth. This study therefore investigates the extent to which cooperative enterprises adopt digital transformation, identifies the digital technologies utilized in enhancing operational efficiency and service delivery, and assesses the effect of digital transformation on the financial performance and productivity of cooperative enterprises in Nigeria. It aims to provide empirical evidence on the strategic importance of technology in driving cooperative performance and Nigeria's socioeconomic advancement.

Statement of the Problem

Cooperative enterprises play a significant role in promoting financial inclusion, employment generation, poverty reduction, and socioeconomic development in Nigeria. Through collective action, cooperatives provide members with access to credit, markets, production inputs, and other

essential services that improve livelihoods (International Cooperative Alliance [ICA], 2022; Umebali & Okoye, 2020). As member-owned and democratically controlled organizations, cooperatives contribute substantially to economic empowerment and sustainable community development.

Despite their importance, many cooperative enterprises in Nigeria continue to operate using traditional management systems characterized by manual record-keeping, inefficient communication channels, inadequate financial reporting mechanisms, and weak governance structures (Eboh, 2021; Nwosu & Okeke, 2022). These challenges often result in operational inefficiencies, delays in decision-making, poor accountability, and reduced competitiveness in an increasingly digital economy.

The emergence of digital technologies has transformed organizational operations globally by improving efficiency, transparency, accountability, and service delivery. Technologies such as mobile applications, cloud computing, digital payment systems, electronic record management systems, artificial intelligence, and online communication platforms have enabled organizations to streamline operations, reduce transaction costs, and enhance decision-making processes (Westerman, Bonnet, & McAfee, 2014; World Bank, 2024). However, the level of digital transformation among cooperative enterprises in Nigeria remains relatively low compared to other sectors of the economy (Onyeneke & Amadi, 2023).

Several factors, including inadequate ICT infrastructure, limited technical expertise, poor digital literacy, high costs of technology adoption, and unreliable electricity supply, have constrained the digitalization of cooperative operations in Nigeria (Eze, 2022; Eze, Chinedu-Eze, Okike, & Bello, 2021). Consequently, many cooperatives continue to experience operational inefficiencies, delayed service delivery, weak financial management systems, low member participation, and governance challenges that undermine their ability to contribute optimally to national development.

Although previous studies have examined digital transformation in banking institutions, small and medium-scale enterprises, and microfinance organizations (Adeyemi & Ogunlade, 2021; Chinedu-Eze et al., 2021), limited empirical attention has been given to cooperative enterprises, particularly regarding the extent of digital transformation adoption, the digital technologies utilized, and their effects on financial performance and productivity. Furthermore, existing studies have largely focused on isolated aspects of technology adoption without comprehensively examining how digital transformation can serve as a strategic tool for enhancing cooperative performance and advancing Nigeria's socioeconomic development.

This gap in knowledge necessitates empirical investigation. It is against this backdrop that this study examines digital transformation in cooperative enterprises as a strategy for Nigeria's socioeconomic development, with a view to determining the extent of digital technology adoption, identifying the digital technologies utilized by cooperatives, and assessing the effect of digital transformation on financial performance and productivity.

Research Questions

The following research questions guided the study:

i. To what extent have cooperative enterprises in Nigeria adopted digital transformation initiatives?
ii. What digital technologies are utilized by cooperative enterprises in enhancing operational efficiency and service delivery?
iii. What effect does digital transformation have on the financial performance and productivity of cooperative enterprises in Nigeria?

Objective of the Study

The main objective of this study is to examine digital transformation in cooperative enterprises as a strategy for Nigeria's socioeconomic development

i. Examine the extent of digital transformation adoption among cooperative enterprises in Nigeria.
ii. Identify the digital technologies utilized by cooperative enterprises in enhancing their operational efficiency and service delivery.
iii. Assess the effect of digital transformation on the financial performance and productivity of cooperative enterprises in Nigeria.

Null Hypotheses (H_0)

H_{01}: Digital transformation adoption has not significantly been adopted by cooperative enterprises in Nigeria.

H_{02}: The utilization of digital technologies does not significantly enhance the operational efficiency and service delivery of cooperative enterprises in Nigeria.

H_{03}: Digital transformation has no significant effect on the financial performance and productivity of cooperative enterprises in Nigeria.

Review of Related Literature

Concept of Cooperative Enterprises

A cooperative enterprise is a voluntary association of individuals who come together to meet their common economic, social, and cultural needs through jointly owned and democratically controlled enterprises (International Cooperative Alliance [ICA], 2022). The cooperative model is built on the principles of self-help, self-responsibility, democracy, equality, equity, and solidarity. These enterprises play vital roles in employment creation, poverty alleviation, and wealth redistribution (Umebali & Okoye, 2020). In Nigeria, cooperative societies operate across various sectors, including agriculture, finance, marketing, and housing, contributing significantly to the socioeconomic welfare of their members (Eboh, 2021). Their collective approach makes them crucial vehicles for sustainable development and inclusive economic growth.

Concept of Digital Transformation

Digital transformation refers to the strategic integration of digital technologies into business processes, operations, and service delivery to improve performance, value creation, and competitiveness (Westerman, Bonnet, & McAfee, 2014). It goes beyond the adoption of technology to entail cultural, organizational, and operational change driven by innovation. According to Eze et al. (2021), digital transformation in cludes the use of technologies such as cloud computing, mobile applications, data analytics, block chain, and artificial intelligence to automate processes and enhance decision-making. In cooperative contexts, digital transformation involves applying such tools to improve member registration, communication, accounting, record-keeping, and governance (Onyeneke & Amadi, 2023).

Cooperative Governance and Operations

Governance in cooperative societies refers to the mechanisms and processes through which members exercise control and oversight over management to ensure accountability, transparency, and adherence to cooperative principles (Birchall, 2017). Good cooperative governance entails participatory decision-making, accurate reporting, and member-oriented policies. Digital tools enhance governance by facilitating virtual meetings, digital voting systems, and real-time information sharing (Nwosu & Okeke, 2022). Digitized financial systems—such as mobile savings platforms and electronic payment systems—also reduce fraud and enhance transparency. Furthermore, technology improves operational efficiency through automated accounting, online membership management, and digital communication platforms.

Digital Transformation and Socioeconomic Development

Socioeconomic development involves sustainable improvements in living standards, education, health, and income distribution within a society (Todaro & Smith, 2020). Digital transformation is recognized as a critical enabler of such development by promoting innovation, financial inclusion, job creation, and market access (World Bank, 2024). For cooperatives, digital transformation can expand outreach, strengthen economic participation, and enable data-driven management decisions that foster inclusiveness and growth (Chukwu & Ibrahim, 2020). By bridging the digital divide between rural and urban communities, cooperatives can serve as conduits for equitable national development.

Theoretical Framework

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) developed by Davis (1989) posits that two key factors—perceived usefulness and perceived ease of use—determine users' acceptance and utilization of new technology. In the context of cooperatives, members and leaders are more likely to adopt digital tools if they perceive them as beneficial for efficiency and simple to operate. TAM provides a foundation for understanding behavioral intentions toward technology in cooperative enterprises. The model suggests that attitudes toward digital adoption are shaped by awareness, training, and perceived value to cooperative operations.

Figure 1: Simplified Technology Acceptance Model (TAM)

Variable	Description	Expected Relationship
Perceived Usefulness	The extent to which users believe digital tools enhance cooperative performance	Positive
Perceived Ease of Use	The degree to which users find digital tools simple and user-friendly	Positive
Behavioral Intention	The intention of cooperative leaders/members to use digital systems	Positive
Actual Use	Implementation of digital platforms in cooperative operations	Dependent on behavioral intention

Relevance of the Theory to the Study

TAM provide a strong theoretical foundation for understanding how digital transformation can be successfully introduced and sustained within cooperative enterprises in Nigeria.

Empirical Review

Empirical evidence from global and local studies underscores the transformative impact of ICT on cooperative management. For instance, Adeyemi and Ogunlade (2020) found that web-based record systems improved operational transparency in university cooperatives. Similarly, Chinedu-Eze et al. (2021) observed that ICT-enabled cooperatives recorded higher member participation and efficiency in financial reporting.In Kenya, Mutua (2020) reported that digital savings platforms enhanced accountability and reduced operational costs in rural cooperatives. Within Nigeria, Nwosu and Okeke (2022) highlighted that cooperatives using digital management systems exhibited better communication flow and reduced cases of fund misappropriation. However, Onyeneke and Amadi (2023) noted that most rural cooperatives lack the infrastructure and technical capacity required for full-scale digital transformation. Studies consistently emphasize the need for supportive policy, capacity building, and funding mechanisms to bridge this gap.

Summary of Literature Review and Identified Gaps

From the reviewed literature, it is evident that digital transformation enhances operational performance, transparency, and inclusivity in organizations. However, empirical studies in Nigeria have focused mainly on microfinance institutions, SMEs, or agricultural cooperatives, with limited attention to general cooperative operations and governance. Furthermore, the integration of TAM and IDT models in explaining digital transformation in Nigerian cooperatives has not been sufficiently explored. This study, therefore, extends theoretical and empirical understanding by integrating both models to evaluate how perceived usefulness, ease of use, and innovation attributes influence digital adoption in cooperative enterprises—ultimately linking these processes to Nigeria's broader socioeconomic development agenda.

Materials and Method

This study adopted a descriptive survey research design. The study collected data from a sampled respondent using a structured questionnaire. The area of study covers the six geopolitical Zones. According to data from the Federal Department of Cooperatives (2024), there are approximately 12,400 active cooperative societies in the country, categorized into agricultural, marketing, consumer, and multipurpose cooperatives. For the purpose of this study, emphasis was placed on cooperative societies engaged in finance, production, and service delivery, as these sectors are most affected by digital transformation. The sample size of the study is 360; this was arrived at by the application of Taro Yamane formula. The validity test carried out was a face and content validity while the Cronbach Alpha reliability technique was deployed to test for internal consistency and it returned a coefficient of .989. A total of 360 copies of the questionnaire were distributed to the members of the selected cooperatives in the six geopolitical zones, 360 copies were retrieved which shows a return rate of 100%. Descriptive statistics such as frequencies, percentages, and means were used to summarize demographic data and levels of digital adoption. Inferential statistics and regression analysis were applied to test the study hypotheses.

Demographic Characteristics of Respondents

Table 1 presents the demographic profile of respondents, including gender, age, education, and cooperative type.

Table 1: Demographic Characteristics of Respondents (n = 360)

Variable	Category	Frequency	Percentage (%)
Gender	Male	212	58.9
	Female	148	41.1
Age (Years)	18–30	72	20.0
	31–45	156	43.3
	46–60	102	28.3
	61 and above	30	8.3
Education	Secondary	64	17.8
	Diploma	88	24.4
	Bachelor’s Degree	142	39.4
	Postgraduate	66	18.3

Variable	Category	Frequency	Percentage (%)
Type of Cooperative	Agricultural	112	31.1
	Multipurpose	94	26.1
	Marketing	78	21.7
	Credit & Thrift	76	21.1

Source: Field Survey (2025)

- **Interpretation:**
  The majority of respondents were male (58.9%) and aged between 31–45 years (43.3%), representing the active workforce segment. Educational attainment was relatively high, with 57.7% holding at least a bachelor's degree. Most of them are members of Agricultural cooperatives with (31.1%), followed by multipurpose, marketing and credit & thrift cooperatives indicating that cooperative management in Nigeria is gradually becoming more professionalized.

Level of Digital Technology Adoption

Respondents were asked to rate their level of digital technology adoption across four key operational areas: financial management, communication, record-keeping, and governance.

Table 2: Level of Digital Technology Adoption in Cooperative Operations

Operational Area	Mean Score (1–5)	Std. Dev.	Interpretation
Digital Financial Management	4.02	0.89	High
Digital Communication Tools	3.88	0.94	Moderate–High
Digital Record-Keeping	3.72	1.01	Moderate
E-Governance and Decision Systems	3.54	0.98	Moderate

Overall Mean = 3.79 (SD = 0.96)
Source: Field Survey (2025)

Interpretation:
Results show that the overall level of digital adoption among cooperative societies is moderately high (mean = 3.79). The highest adoption area was financial management, largely through the use of mobile banking and accounting software. Communication tools such as WhatsApp, email, and Zoom were also moderately adopted, especially during post-COVID cooperative meetings.

Perceived Benefits of Digital Transformation

Respondents identified major benefits derived from digital integration in their cooperative activities.

Table 3: Perceived Benefits of Digital Transformation

Benefit	Frequency	Percentage (%)
Improved transparency and accountability	276	76.7
Enhanced communication and information sharing	268	74.4
Faster financial reporting and audit	242	67.2
Increased member participation in governance	226	62.8
Reduced operational cost	204	56.7

Source: Field Survey (2025)

Interpretation:
Most respondents (76.7%) agreed that digital transformation improved transparency and accountability. This aligns with theoretical expectations of the Technology Acceptance Model (TAM)**,** which suggests that perceived usefulness significantly influences system adoption and satisfaction.

Barriers to Digital Transformation
Respondents highlighted several constraints affecting the effective adoption of digital tools within cooperatives.

Table 4: Barriers to Digital Transformation among Cooperatives

Barrier	Frequency	Percentage (%)
Insufficient ICT infrastructure	278	77.2

Barrier	Frequency	Percentage (%)
Lack of technical skills	264	73.3
High cost of digital tools and internet	248	68.9
Poor electricity supply	214	59.4
Resistance to change among members	188	52.2

Source: Field Survey (2025)

Interpretation:
Infrastructure inadequacy and skill gaps remain major impediments. This finding corroborates Eze (2022), who emphasized that poor digital literacy and unstable power supply hinder the modernization of cooperative operations in developing economies.

Regression Analysis
The regression model was applied to test the relationship between digital transformation variables and cooperative performance.

Table 5: Regression Summary Output

Predictor Variable	Coefficient (β)	Std. Error	t-Value	Sig. (p)	Remark
Constant	1.062	0.211	5.04	0.000	—
Digital Adoption (DA)	0.318	0.071	4.48	0.000	Significant
Digital Financial Management (DFM)	0.284	0.066	4.30	0.001	Significant
Digital Communication (DC)	0.219	0.058	3.78	0.004	Significant
Digital Record-Keeping (DRK)	0.198	0.052	3.62	0.007	Significant
Barriers (B)	-0.267	0.079	-3.37	0.009	Significant (Negative)

$R = 0.79$, $R^2 = 0.62$, Adjusted $R^2 = 0.60$, $F(5,354) = 32.14$, $p < 0.05$

Source: (Author's Computation 2025)

Interpretation:
The regression model shows a strong positive relationship (**R = 0.79**) between digital transformation and cooperative performance, explaining about 62% of the variance**.** All independent variables are statistically significant at the 0.05 level. The negative coefficient for barriers (-0.267) confirms that infrastructural and skill-related constraints reduce overall performance out comes.

Hypothesis Testing Summary

All null hypotheses were rejected, confirming that digital transformation—particularly financial management, communication, and record-keeping—significantly improve cooperative performance and governance efficiency in Nigeria.

Discussion of Key Findings

The findings indicate that digital tools enhance accountability, speed, and transparency, leading to stronger cooperative performance. However, lack of infrastructure and limited ICT knowledge still threaten sustainability. These results validate the Innovation Diffusion Theory (Rogers, 2003)**,** which emphasizes the role of perceived relative advantage and compatibility in technology acceptance.

Discussion of Findings
The results of this study clearly demonstrate that digital transformation plays a pivotal role in improving the performance and governance of cooperative enterprises in Nigeria. The findings strongly support the Technology Acceptance Model (TAM) as theoretical lenses through which cooperative digitalization can be understood.

Digital Transformation and Cooperative Performance

The study found that the adoption of digital technologies significantly enhances cooperative performance. The regression results ($R = 0.79$, $R^2 = 0.62$) indicate that digital transformation explains 62% of the variation in cooperative performance. This supports Chukwu and Ibrahim (2020), who established that integrating technology into cooperative activities improves efficiency, transparency, and member satisfaction.

In line with TAM**,** the high adoption rates of digital financial management tools and online record-keeping systems suggest that cooperators perceive these technologies as useful and relatively easy to use, thereby influencing behavioral intention to adopt them.

Digital Financial Management and Transparency

Digital financial management exhibited a strong positive effect ($\beta = 0.284$, $p < 0.05$) on cooperative performance. This implies that the introduction of e-payment systems, accounting software, and digital audit trails has strengthened financial transparency and accountability. This

finding corroborates Adeyemi and Ogunlade (2021), who found that digital accounting reduces manual errors and enhances internal control in community-based organizations.

Furthermore, access to real-time financial data has improved decision-making, aligning with Olawale (2022) who emphasized that digital transformation fosters trust among cooperative members and external stakeholders.

Communication, Record-Keeping, and Governance Efficiency

Digital communication and record-keeping practices were also found to positively influence cooperative governance ($\beta = 0.219$ and $\beta = 0.198$ respectively, $p < 0.05$). Tools such as WhatsApp, Zoom, and online document management platforms have allowed for better member engagement, timely dissemination of information, and improved transparency during decision-making.

This finding reflects the participatory nature of cooperatives, where inclusive communication is vital. According to Rogers' (2003) IDT, cooperatives that leverage communication technologies are better positioned to enhance innovation diffusion among their members, improving responsiveness and trust in governance processes.

Barriers to Digital Transformation

Despite the benefits, several barriers were identified — notably inadequate ICT infrastructure (77.2%), high cost of digital tools (68.9%), and limited ICT skills (73.3%). These constraints resonate with the work of Eze (2022), who observed that digital illiteracy and infrastructural gaps hinder cooperative modernization in developing economies.

The negative regression coefficient ($\beta = -0.267$) for barriers confirms their detrimental effect on performance. This highlights the urgent need for strategic interventions to bridge the digital divide in Nigeria's cooperative sector.

Recommendations

Based on the findings and conclusion, the following recommendations are proposed:

- **Government Policy Support:**
  Federal and state governments should formulate a national cooperative digitalization policy that mandates and supports the integration of ICT in cooperative operations.
- **Capacity Building:**
  There is a pressing need for digital literacy programs for cooperative leaders and members to enhance their technical competence in using e-tools for governance and management.
- **Infrastructure Development:**
  Public–private partnerships should be promoted to provide reliable internet access, electricity, and affordable digital platforms to rural-based cooperatives.

- **Digital Financing Schemes:**
  Cooperative financing institutions should establish ICT support funds to subsidize the cost of adopting software and digital applications for record-keeping and accounting.
- **Regulatory Oversight:**
  The Federal Department of Cooperatives should incorporate digital audit trails and online reporting into its supervision framework to promote accountability.
- **Member Engagement Platforms:**
  Cooperatives should adopt member management systems and e-portals that enable transparent elections, participation in meetings, and access to real-time cooperative updates.

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