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ABSTRACT

Microfinance institutions (MFIs) are pivotal in delivering financial services to underserved populations, especially in developing countries. By offering small loans, savings, and other financial products to those lacking access to traditional banking, MFIs aim to foster financial inclusion and alleviate poverty. Recent technological advancements have significantly impacted MFIs, particularly through the adoption of electronic loan management systems (ELMS). These digital platforms streamline the entire loan lifecycle, enhancing efficiency and reducing operational costs. Despite these advancements, many MFIs continue to grapple with effective loan management, which is crucial for their profitability and sustainability. Inefficient loan management practices, such as inadequate credit selection and poor loan monitoring, have been identified as major contributors to high default rates and financial instability within these institutions. This study aims to assess the influence of ELMS on loan performance among Kenyan MFIs, focusing on various components such as loan origination, disbursement, monitoring, servicing, and repayment systems. Through a mixed research design, involving both qualitative and quantitative methods, the study will investigate how these electronic systems can enhance loan performance and mitigate risks. The findings are expected to provide valuable insights for improving loan management practices and supporting the financial sustainability of MFIs in Kenya.

Keywords: *Electronic Loan Management System, Loan Performance, Microfinance Institutions, Electronic Loan Origination System, Electronic Loan Disbursement System, Electronic Loan Monitoring System, Electronic Loan Repayment System*

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INTRODUCTION

Microfinance institutions (MFIs) play a critical role in providing financial services to underserved populations, particularly in developing countries. These institutions offer small loans, savings, and other financial products to individuals and small businesses that do not have access to traditional banking services (Cai, Meki, Quinn, Field, Kinnan, Morduch, & Said, 2021). The primary goal of MFIs is to promote financial inclusion and alleviate poverty by enabling these groups to invest in income-generating activities. In recent years, the advent of technology has significantly influenced the operations of MFIs, particularly through the implementation of electronic loan management systems (ELMS) (Beck, 2015).

Electronic loan management systems are cutting-edge digital platforms that enable lenders to automate and streamline the entire lifecycle of borrowing and loan servicing, from customer monitoring to syndication, by utilizing a variety of financial technologies such as tablets, ATMs, debit cards, POS terminals, and mobile phones (Jay, 2009). It's no secret that the introduction of electronic banking has radically changed the banking experience for financial institutions such as banks and microfinance organizations by making banking services more easily accessible to consumers. The ability of these organizations to automate labor-intensive procedures has resulted in greater control, efficiency, and time management. As a result, such businesses now have fewer overhead and operating costs, which increases their chances of profitability. (Waterfield, 2018)

To regulate their loan management systems, microfinance institutions and other financial institutions need to create a credit policy (Pandey, 2018). Since microfinance institutions receive funding from low-income individuals through interest charges on loans, loan repayment terms may be ambiguous. A comprehensive assessment of the risk circumstances of the loan and the borrower's characteristics should form the basis of the credit decision, as the success of extending credit is dependent on the technique used to evaluate and grant the credit. Financial institutions have created many ways for the client appraisal process. They range from quite simple techniques like using informal or subjective approaches to fairly advanced ones like using computerized simulation models. Microfinance organizations usually rely a lot of their lending decisions on their subjective assessment of the risk concerning the borrower's expected payback. This strategy is popular among microfinance organizations since it is low-cost and straightforward. (Horne, 2017).

Microfinance institutions (MFIs) play a pivotal role in providing financial services to underserved populations across the globe (Arora, 2020; Singh & Sharma, 2019). With the advent of technology, electronic loan management systems have revolutionized the way these institutions operate, significantly impacting loan performance (Global Microfinance Association, 2019). Asia, home to a significant portion of the world's population, has seen a rapid growth in microfinance institutions (Asian Development Bank, 2021). Countries like India, Bangladesh, and the Philippines are at the forefront of utilizing electronic loan management systems (Narayan, 2017; Khan, 2020). In India, for instance, the implementation of digital platforms has streamlined loan application processes, credit scoring, and disbursement, resulting in reduced turnaround times and improved loan recovery rates (Singh & Sharma, 2019). The Grameen Bank in Bangladesh, a pioneer in microfinance, has also adopted electronic systems to enhance its operational efficiency (Yunus, 2018). These technologies enable better tracking of loan portfolios, thereby reducing the risk of default and enhancing overall loan performance (Global Microfinance Association, 2019; Khan, 2020).

In the Philippines, mobile banking has gained prominence, allowing borrowers in remote areas to access financial services without the need for physical branch visits (Gomez, 2022). Electronic loan management systems here facilitate real-time monitoring of loans, ensuring timely repayments

and reducing the incidence of delinquency (Gomez, 2022). The use of electronic systems has also helped in gathering data for credit scoring, thereby making the lending process more transparent and fairer (Gomez, 2022).

Ghana embraced electronic loan management systems, with many MFIs utilizing mobile platforms to reach underserved populations (Boakye, 2020). The use of electronic systems has enabled better credit scoring and risk management, reducing the incidence of defaults (Boakye, 2020). In Senegal, digital platforms such as Orange Money have played a significant role in the microfinance sector, enabling MFIs to offer financial services more efficiently and securely (Cisse & Diallo, 2019). These technological advancements have improved the overall performance of loans by ensuring timely repayments and reducing the risk of default (Cisse & Diallo, 2019).

Cybersecurity is another critical concern, as the increased reliance on digital platforms makes financial institutions vulnerable to cyberattacks (Smith et al., 2023; Adams, 2023). Ensuring the security and privacy of sensitive financial data is paramount to maintaining trust and integrity in the microfinance sector (Smith et al., 2023; Adams, 2023).

Kenya has emerged as a leader in financial inclusion within Africa, with its microfinance institutions (MFIs) playing a crucial role in providing financial services to the underserved and unbanked populations (Mwangi & Muigai, 2023). The adoption of electronic loan management systems has significantly transformed the operations of MFIs, enhancing their efficiency and loan performance (Mwangi & Muigai, 2023). In Kenya, the microfinance sector has evolved over the years, driven by the need to address financial exclusion among low-income earners, small businesses, and rural communities (Mwema & Wanyama, 2021). The sector comprises various types of institutions, including microfinance banks (MFBs), credit-only MFIs, savings and credit cooperatives (SACCOs), and mobile-based lenders (Mwema & Wanyama, 2021).

The regulatory environment, spearheaded by the Central Bank of Kenya (CBK) and the Microfinance Act of 2006, has provided a conducive framework for the growth and development of MFIs in the country (Central Bank of Kenya, 2006).

The integration of electronic loan management systems in Kenya's microfinance sector has been propelled by advancements in technology and the widespread use of mobile phones. These systems include mobile banking platforms, digital credit scoring, online loan applications, and electronic repayment systems. Key players in this transformation include M-Pesa, M-Shwari, KCB M-Pesa, and Tala, among others (Safaricom, 2007; Tala, 2021).

M-Pesa, launched by Safaricom in 2007, revolutionized financial services in Kenya by enabling mobile money transfers and payments. The platform's success has extended to the microfinance sector, where it is used for loan disbursements and repayments. M-Pesa's integration with MFIs has made it easier for clients to access loans and manage repayments without the need for physical branch visits (Safaricom, 2007).

Electronic loan management systems in Kenya leverage big data and machine learning algorithms to assess the creditworthiness of borrowers. Platforms like Tala and Branch use digital footprints, such as mobile phone usage patterns and social media activity, to develop credit scores (Tala, 2021). This approach has made it possible to extend credit to individuals who lack traditional credit histories, thereby increasing financial inclusion. MFIs in Kenya have adopted online platforms to facilitate loan applications and approvals. Clients can apply for loans via websites or mobile apps, and the process is often automated, resulting in quicker turnaround times (Mwangi & Muigai, 2023). This digital approach reduces the administrative burden on MFIs and enhances the customer experience by providing a seamless and efficient loan application process.

The adoption of electronic loan management systems has had a profound impact on the loan performance of microfinance institutions in Kenya. These impacts can be categorized into several key areas: Electronic systems have made it easier for borrowers to access financial services. The convenience of mobile banking and online applications has expanded the reach of MFIs, enabling them to serve clients in remote and underserved areas (Mwangi & Muigai, 2023). This increased accessibility has led to a broader customer base and higher loan disbursement volumes.

Automation of loan application and approval processes has significantly reduced the time it takes for borrowers to receive funds. MFIs can process and disburse loans faster, which is critical in meeting the urgent financial needs of clients (Mwangi & Muigai, 2023). The efficiency gains from electronic systems also reduce operational costs for MFIs, allowing them to allocate resources more effectively.

The use of digital credit scoring has improved the ability of MFIs to assess the creditworthiness of borrowers. By analyzing a wide range of data points, electronic systems can generate accurate credit scores that reflect the true risk profile of clients (Tala, 2021). This has led to more informed lending decisions, reducing the risk of default and enhancing the overall quality of the loan portfolio.

Electronic repayment systems have streamlined the loan repayment process, making it easier for borrowers to make timely payments. The ability to track repayments in real time allows MFIs to identify and address potential delinquencies quickly (Safaricom, 2007). This proactive approach to loan management has resulted in higher recovery rates and lower default rates.

Electronic loan management systems provide a transparent record of all transactions, enhancing accountability for both MFIs and borrowers. This transparency builds trust between the institutions and their clients, encouraging responsible borrowing and lending practices (Mwangi & Muigai, 2023).

The integration of electronic loan management systems has significantly transformed the microfinance sector in Kenya, improving loan performance and expanding financial inclusion. Mobile banking, digital credit scoring, online loan applications, and electronic repayment systems have collectively enhanced the efficiency, accessibility, and transparency of MFIs. Despite challenges such as digital literacy, internet connectivity, and cybersecurity, the future of electronic loan management in Kenya looks bright, with promising advancements in technology and infrastructure on the horizon. By continuing to innovate and address these challenges, Kenya's microfinance institutions can further enhance their impact on the economy and the lives of the underserved population.

Statement of the Problem

Financial institutions are striving for survival in today's highly profitable industry. According to Ruth and Dwivedi (2018), return on interest income is especially important because it accounts for more than half of all revenue for microfinance institutions worldwide. If financial institutions do not take measures to ensure the continual expansion of loanable capital and risk control, stakeholders and shareholders may feel the company is too risky and withdraw their investment, causing it to fail. Although the number of loans provided through mobile banking platforms has increased significantly, this has not resulted in a large increase in financial earnings. Research has shown that ineffective loan management eventually has a detrimental impact on the efficiency and profitability of microfinance organizations.

Between 2021-2022, the MFB sector experienced an increase in customer deposits from 49.4 billion to 50.4 billion, which was associated mainly with enhanced mobilization of funds through the already existing branch networks and digital platforms. The deposits collected represent 68% of the sector funding sources, while borrowing accounted for

only 12% of the funding. However, the microfinance banks continue to face challenges in their financial performance, which include profitability, Return on Assets (ROA), Return on Equity (ROE), Portfolio yield (PY) and operating expense ratio (OER), and levels of Non-Performing Loans (NPL) (Nawaz& Iqbal,2015). According to the annual supervision report by the Central Bank of Kenya (2023), the microfinance banks' pretax losses increased to Sh935 million by the end of June 2022, compared to a loss of Sh171 million in June 2021. This represented a decline of 450 percent, extending the loss-making streak of CBK-regulated micro-lenders to three consecutive financial years. By the end of 2022, the Central Bank of Kenya had noted that about 70 percent of MFBs recorded losses. During this period, Kenya Women Microfinance Bank, the biggest MFB and one of those which did not slide into the loss-making zone, however, saw its profit decline by 92 per cent to Sh18.7 million from Sh224 million in December 2022. In response to these challenges, there has been the emergence and adoption of mobile-based lending by microfinance banks.

Aballey (2019) researched this subject in Ghana and found that inadequate credit selection and ineffective loan monitoring were the main contributors to the pervasiveness of bad loans. Aballey then suggested a number of tactics to lower the high concentration of bad loans and raise the general caliber of the loan portfolio of Ghanaian financial institutions, including credit bureau utilization, strong collateral, training, efficient loan monitoring, and the construction of agricultural infrastructures. According to Imeokparaia (2018), bank management in Nigeria had failed to set up adequate credit administration processes and sound lending regulations. He maintained that the banks needed to handle their lending activities with greater responsibility and caution as they had failed in their job as guardians of the depositors' money.

Locally, Gatuhu (2016) discovered that customer assessments, credit risk management, and loan collection procedures have a substantial impact on the financial performance of Kenyan microfinance institutions (MFIs). Furthermore, Nzotta (2018) said that credit management is crucial to the success of commercial banks and other financial organizations. Furthermore, Kato (2013) stated that for MFI loan portfolios to be effective, competent client selection, delinquency management, loan approval authority, well-crafted product contracts, and successful enforcement strategies are required. Surprisingly, the same survey discovered that many MFIs are still struggling with loan management systems, which have a detrimental influence on their performance. Few studies have tackled the issues of electronic lending systems by microfinance institutions, indicating a lack of adequate information in this area to provide an understanding of the effect of electronic loan management on loan performance. This leaves a knowledge gap, which this study seeks to fill by analyzing how electronic loan management by the Kenyan microfinance institutions affects their loan performance

Objectives of the Study

The general objective of the study was to establish the influence of the electronic loan management system on loan performance amongst microfinance institutions in Kenya. The study was guided by the following specific objectives

- To assess the influence of the electronic loan origination system on loan performance amongst microfinance institutions in Kenya
- To examine the influence of the electronic loan disbursement system on loan performance amongst microfinance institutions in Kenya
- To determine the influence of the electronic loan monitoring system on loan performance amongst microfinance institutions in Kenya
- To assess the influence of the electronic loan servicing system on loan performance amongst microfinance institutions in Kenya
- To evaluate the influence of the electronic loan repayment system on loan performance amongst microfinance institutions in Kenya

LITERATURE REVIEW

Theoretical Review

Technology Acceptance Model (TAM)

The adoption of technology in financial services has revolutionized how financial institutions operate, improving efficiency, accuracy, and customer satisfaction. Among these technological advancements, electronic loan origination systems (ELOS) have emerged as critical tools for microfinance institutions (MFIs) aiming to streamline their loan processes. Understanding how these systems are accepted and utilized by MFIs is essential for assessing their impact on loan performance. The Technology Acceptance Model (TAM), proposed by Fred Davis in 1986, offers a robust framework for analyzing the factors influencing the acceptance and usage of technology. This essay explores the application of TAM to understand the influence of ELOS on loan performance in MFIs, discussing the theory's origins, relevance, critiques, and appropriateness for the study despite inherent challenges and benefits.

The Technology Acceptance Model (TAM) was introduced by Fred Davis as part of his doctoral thesis at the MIT Sloan School of Management. TAM is derived from the Theory of Reasoned Action (TRA) by Fishbein and Ajzen, which suggests that individual behavior is driven by behavioral intentions influenced by attitudes and subjective norms. Davis adapted this theory to the context of technology adoption, proposing that perceived usefulness (PU) and perceived ease of use (PEOU) are the primary determinants of technology acceptance.

Diffusion of Innovations Theory

The integration of technology in financial services has transformed the landscape of microfinance institutions (MFIs), particularly through the adoption of electronic loan disbursement systems (ELDS). These systems offer the potential to enhance the efficiency, accuracy, and speed of loan disbursement, thereby improving overall loan performance. To understand how ELDS are adopted and their subsequent impact on loan performance, Everett Rogers' Diffusion of Innovations Theory (DOI) provides a comprehensive framework. The Diffusion of Innovations Theory (DOI) was developed by Everett M. Rogers, a sociologist who sought to explain how, why, and at what rate new ideas and technology spread through cultures. First introduced in 1962, DOI examines the process by which an innovation is communicated through certain channels over time among the members of a social system. According to Rogers, the adoption of an innovation is influenced by five key characteristics: relative advantage, compatibility, complexity, trialability, and observability.

- Relative Advantage: The degree to which an innovation is perceived as better than the idea it replaces.
- Compatibility: How consistent the innovation is with the values, past experiences, and needs of potential adopters.
- Complexity: The extent to which the innovation is perceived as difficult to understand and use.
- Trialability: The ability to test the innovation on a limited basis before making a full commitment.
- Observability: The extent to which the results of the innovation are visible to others.

These characteristics influence individuals' decisions to adopt or reject an innovation. The adoption process involves five stages: knowledge, persuasion, decision, implementation, and confirmation. Individuals first become aware of the innovation and gain knowledge about it, form an attitude toward it, decide to adopt or reject it, implement it, and finally, confirm their decision based on the outcomes.

The Diffusion of Innovations Theory is particularly relevant to the study of the influence of electronic loan disbursement systems on loan performance in microfinance institutions. MFIs often operate in environments where traditional loan disbursement

methods are prevalent, and the shift to electronic systems represents a significant innovation. Applying DOI to this study allows for a systematic examination of the factors that influence the adoption of ELDS by MFI staff and its subsequent impact on loan performance.

By assessing the five key characteristics of innovations as outlined by Rogers, the study can identify the specific attributes of ELDS that facilitate or hinder their adoption. For example, if MFI staff perceive ELDS as offering a relative advantage in terms of speed and accuracy over traditional methods (high relative advantage) and find the system compatible with their existing workflows and client needs (high compatibility), they are more likely to adopt and effectively use the system. Additionally, understanding the perceived complexity of ELDS and the opportunities for trialability and observability can help MFIs design strategies to encourage adoption and ensure successful implementation.

The use of DOI in studying ELDS adoption in MFIs offers several benefits. Firstly, it provides a well-established theoretical basis for examining innovation adoption, ensuring that the research is grounded in a credible and widely recognized framework. This foundation enhances the validity and reliability of the study's findings, contributing to the broader academic discourse on technology adoption in financial services.

Secondly, DOI's focus on the characteristics of innovations aligns well with the objectives of the study. Understanding these characteristics can offer valuable insights into the specific features and functionalities of ELDS that need to be emphasized or improved. For example, if the study finds that MFI staff perceive ELDS as useful but challenging to use, efforts can be directed towards enhancing the user interface and providing comprehensive user training.

Lastly, DOI's comprehensive framework allows for the incorporation of additional variables, enabling a more nuanced analysis. By considering factors such as organizational culture, leadership support, and regulatory environment, the study can provide a more holistic understanding of the multifaceted nature of innovation adoption. This comprehensive approach can inform targeted interventions and strategies to promote the successful adoption and sustained use of ELDS, ultimately improving loan performance in MFIs.

Using DOI allows researchers to identify specific areas that require improvement to foster greater acceptance of ELDS among MFI staff. By addressing both the cognitive and contextual factors influencing innovation adoption, the study can offer practical recommendations for enhancing the usability and perceived benefits of ELDS. These recommendations can include improving user training programs, ensuring robust technical support, and fostering a positive organizational culture towards technological innovation.

Overall, DOI provides a useful lens through which to examine the complex process of innovation adoption in MFIs. Despite its limitations, the model's strengths in providing clear, actionable insights make it an invaluable tool for researchers and practitioners alike. By leveraging DOI, MFIs can better understand the factors driving the adoption of electronic loan disbursement systems and take proactive steps to enhance their loan performance, ultimately achieving greater efficiency and impact in their financial services delivery.

Agency Theory

Agency Theory is a concept that explores the relationship between principals and agents in business contexts. Principals, such as shareholders or owners, delegate decision-making authority to agents, such as managers, who are expected to act in the best interests of the principals. This theory addresses the potential conflicts that arise when the interests of the agent diverge from those of the principal. The principal proponent of Agency Theory is Michael C. Jensen, who, along with William H. Meckling, formulated its foundational framework in their seminal 1976 paper, "Theory of the Firm:

Managerial Behavior, Agency Costs and Ownership Structure".

Agency Theory posits that there are inherent risks in delegating authority due to differing goals and the potential for information asymmetry, where the agent has more or better information than the principal. To mitigate these risks, principals must incur agency costs, which include monitoring expenses, bonding costs (to align agent interests with those of the principal), and the residual loss (the cost incurred due to the divergence of interests despite monitoring and bonding).

In the context of microfinance institutions (MFIs), the principal-agent relationship can be observed between the institution (principal) and the borrowers (agents). MFIs provide loans to borrowers with the expectation that these loans will be repaid according to the agreed terms. However, borrowers may not always act in the best interest of the MFIs, leading to potential default or misuse of loan funds.

Electronic loan monitoring systems can significantly influence loan performance by addressing the agency problem inherent in microfinance. These systems provide a robust framework for tracking loan disbursements, repayments, and borrower activities, thereby reducing information asymmetry and aligning borrower behavior with the interests of the MFIs. For instance, mobile banking platforms and digital credit scoring tools enable MFIs to monitor borrower activities in real time, ensuring that loans are used for their intended purposes and repayments are made on time.

Service Quality Theory (SERVQUAL)

Service Quality Theory, developed by A. Parasuraman, Valarie Zeithaml, and Leonard Berry in the 1980s, is a framework for understanding and measuring the quality of service in various industries. The theory primarily revolves around the SERVQUAL model, which identifies five key dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. This model has been widely used to assess customer perceptions of service quality and to identify gaps between expected and perceived service. The theory emphasizes that high-quality service is crucial for customer satisfaction and loyalty, which in turn affects business performance**.**

The application of Service Quality Theory to electronic loan servicing systems in microfinance institutions (MFIs) can provide significant insights into how these systems influence loan performance. Electronic loan servicing systems, which include mobile banking platforms, digital credit scoring, online loan applications, and electronic repayment systems, play a crucial role in enhancing the service quality offered by MFIs. By improving service delivery through technology, MFIs can enhance customer satisfaction, leading to better loan performance.

The SERVQUAL model's five dimensions can be directly related to the features and benefits of electronic loan servicing systems:

1. Tangibles: Electronic loan servicing systems provide tangible benefits such as user-friendly interfaces, mobile applications, and online platforms that enhance the accessibility and convenience of financial services for borrowers.

2. Reliability: Digital systems increase the reliability of MFIs by ensuring accurate and timely loan disbursements, repayments, and credit assessments. This reduces the risk of errors and delays, fostering trust between the institution and its clients.

3. Responsiveness: Electronic systems enable MFIs to respond quickly to customer inquiries, loan applications, and repayment issues. This immediate responsiveness improves customer satisfaction and loyalty.

4. Assurance: Advanced security features and robust data protection mechanisms in electronic systems assure borrowers that their financial information is secure, enhancing their confidence in the institution.

5. Empathy: Customizable digital platforms allow MFIs to offer personalized financial products and services, catering to the specific needs of different borrower segments.

While Service Quality Theory provides a valuable framework for assessing and improving service quality, it has its limitations. Critics argue that the SERVQUAL model is overly focused on customer perceptions and may not adequately capture the objective aspects of service quality. Additionally, the model's reliance on the five dimensions might overlook other important factors that influence service quality in specific contexts, such as technological infrastructure and regulatory environment in the microfinance sector.

Furthermore, the static nature of the SERVQUAL model does not account for the dynamic and evolving nature of customer expectations, especially in the rapidly changing financial services industry. As technology advances, what is considered high-quality service today may become standard tomorrow, requiring continuous adaptation and innovation from MFIs.

Despite its limitations, Service Quality Theory remains highly relevant for examining the impact of electronic loan servicing systems on loan performance among MFIs. The theory's focus on customer perceptions and satisfaction aligns well with the goals of MFIs to enhance borrower experiences and improve loan repayment rates. By applying the SERVQUAL model, MFIs can systematically assess the effectiveness of their electronic systems and identify areas for improvement.

Several studies and real-world examples highlight the application and effectiveness of electronic loan servicing systems in improving loan performance among MFIs. For instance, the integration of M-Pesa in Kenya's microfinance sector has significantly enhanced service quality by providing a reliable, responsive, and convenient platform for loan disbursements and repayments. This has led to improved customer satisfaction and lower default rates, demonstrating the practical benefits of applying Service Quality Theory.

In another example, MFIs using digital credit scoring tools like Tala and Branch have successfully extended credit to previously underserved populations by leveraging big data and machine learning algorithms. This has improved the accuracy of credit assessments and reduced the risk of defaults, aligning with the principles of Service Quality Theory

Transaction Cost Theory

Transaction Cost Theory (TCT) is an economic theory that explores the costs of making economic exchanges or transactions. Ronald Coase first introduced the concept in his 1937 paper "The Nature of the Firm," where he argued that firms exist because they can perform certain transactions more efficiently internally than through the market. This theory was further developed by Oliver Williamson, who is often considered the principal proponent of TCT. Williamson expanded on Coase's ideas, emphasizing that transaction costs include not only the costs of the transaction itself but also the costs associated with finding and negotiating with partners, monitoring performance, and enforcing contracts. TCT has been widely applied to understand organizational behavior, market structures, and the boundaries between firms and markets.

Electronic loan repayment systems, including mobile banking, online payments, and automated reminders, minimize the need for physical interactions and reduce administrative burdens. This aligns with TCT, which posits that lowering transaction costs can lead to more efficient operations and better outcomes. For MFIs, reduced transaction costs translate into higher repayment rates, lower default rates, and improved financial sustainability.

One of the significant ways electronic loan repayment systems benefit from TCT is through the reduction of search and information costs. Traditionally, borrowers might spend considerable

time and effort searching for repayment points and understanding repayment processes. Electronic systems provide clear, accessible information and seamless payment options, which decrease the cognitive and logistical burden on borrowers. Automated systems can also offer real-time updates on loan balances and due dates, ensuring that borrowers are well-informed and less likely to miss payments.

Electronic loan repayment systems also reduce bargaining and decision costs. In the traditional model, negotiating repayment terms and understanding various payment options might require multiple interactions with loan officers, leading to delays and increased costs. Digital platforms simplify these interactions by standardizing processes and offering transparent, straightforward options that borrowers can select without extensive negotiations. This efficiency not only saves time but also fosters trust and clarity between MFIs and borrowers.

Empirical evidence and case studies support the application of TCT in enhancing loan performance through electronic repayment systems. For instance, the widespread adoption of mobile money platforms like M-Pesa in Kenya has significantly improved loan repayment rates for MFIs. By offering a convenient and reliable method for making payments, these platforms have reduced the transaction costs associated with traditional repayment methods. Similarly, in countries like India and Bangladesh, the introduction of digital loan repayment options has led to higher efficiency and lower default rates, as borrowers find it easier to adhere to repayment schedules.

Despite its valuable insights, Transaction Cost Theory has been critiqued for several reasons. Critics argue that TCT can be overly reductionist, focusing too much on cost minimization while neglecting other important factors, such as organizational culture, trust, and social norms. Additionally, TCT assumes rational behavior and perfect information, which may not always hold in real-world scenarios. In the context of microfinance, borrowers might face challenges such as digital illiteracy or lack of access to technology, which TCT might not fully account for.

Transaction Cost Theory offers a valuable lens through which to analyze the impact of electronic loan repayment systems on loan performance in microfinance institutions. By focusing on the reduction of transaction costs, TCT helps explain how digital platforms enhance efficiency, improve repayment rates, and support financial inclusion. While the theory has its limitations, its principles provide a strong foundation for understanding the benefits and challenges of electronic repayment systems.

Conceptual Framework

This section presents the relationship between variables under study. The independent variables to be used are Adoption and implementation of Electronic Loan Management, Electronic Loan Management System on loan disbursement and Electronic Loan Management System on loan repayment rates. While the dependent variable being loan performance amongst microfinance institutions in Kenya.

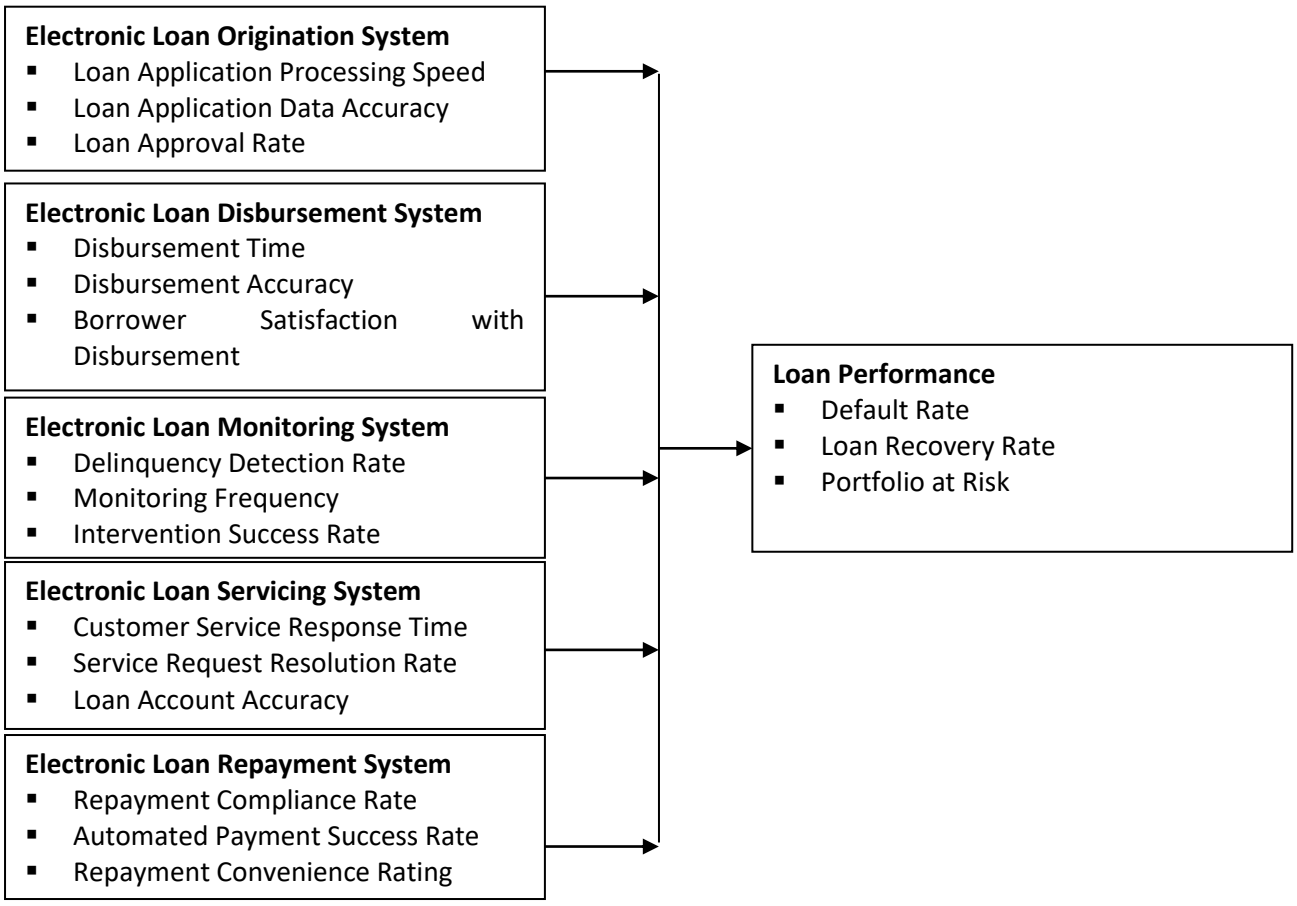

Figure 1: Conceptual Framework
Source: Researcher (2025)

Electronic Loan Origination System on Loan Performance

In the evolving landscape of microfinance, the adoption of digital technologies has become imperative for enhancing operational efficiency and improving service delivery. Among these technologies, the Electronic Loan Origination System (ELOS) has emerged as a transformative tool for microfinance institutions (MFIs). ELOS encompasses the entire loan application process, from the initial submission to the final approval, and its implementation can significantly influence loan performance. This study delved into three critical variables within the ELOS framework: Loan application processing speed, loan application data accuracy, and loan approval rate.

Loan application processing speed refers to the time taken from the submission of a loan application to the final approval or rejection decision. This metric is crucial as it directly impacts borrower satisfaction, operational efficiency, and the ability of MFIs to respond to market demands swiftly. Faster processing times can enhance the borrower experience, reduce the likelihood of losing potential clients to competitors, and allow MFIs to allocate resources more effectively.

The theoretical foundation for analyzing loan application processing speed can be traced to the Resource-Based View (RBV) of the firm. According to RBV, firms can achieve competitive advantage by efficiently utilizing their resources (Barney, 1991). In the context of MFIs, ELOS represents a valuable resource that can enhance processing speed, thus providing a competitive edge. Additionally, the Theory of Constraints (Goldratt, 1984) suggests that identifying and alleviating bottlenecks in the loan

processing workflow can significantly improve overall efficiency. By implementing ELOS, MFIs can streamline operations, reduce delays, and enhance processing speed, thereby optimizing their resource utilization.

Influence of Electronic Loan Disbursement Systems on Loan Performance

Microfinance institutions (MFIs) play a crucial role in providing financial services to underserved populations, particularly in developing countries. The adoption of digital technologies, such as Electronic Loan Disbursement Systems (ELDS), has revolutionized the way MFIs operate, offering significant improvements in efficiency and service delivery. ELDS encompasses the entire process of disbursing loan funds to borrowers, and its effectiveness can significantly influence loan performance. This essay delves into three critical variables within the ELDS framework—disbursement time, disbursement accuracy, and borrower satisfaction with disbursement.

Disbursement time refers to the duration between the approval of a loan application and the actual transfer of funds to the borrower. This metric is crucial as it directly impacts borrower satisfaction, operational efficiency, and the ability of MFIs to meet urgent financial needs. Faster disbursement times can enhance borrower experience, improve trust in the institution, and allow borrowers to access funds promptly for critical needs, potentially improving loan utilization and repayment rates.

Disbursement accuracy refers to the precision with which loan amounts are disbursed to borrowers, ensuring that the approved loan amount is correctly transferred without discrepancies. High disbursement accuracy is vital for maintaining trust and transparency between MFIs and borrowers. Inaccurate disbursements can lead to disputes, borrower dissatisfaction, and potential financial losses for MFIs. To measure disbursement accuracy, previous studies have employed various metrics, such as the error rate in disbursed amounts and the frequency of discrepancies identified during the disbursement process. For example, a study by Berger, Frame, and Miller (2005) analyzed the accuracy of loan disbursements by comparing the disbursed amounts with the approved loan amounts. The researchers calculated the percentage of disbursements with errors and the types of errors encountered to assess the overall accuracy of the disbursements.

Influence of Electronic Loan Monitoring Systems on Loan Performance

Microfinance institutions (MFIs) have increasingly adopted digital technologies to enhance their operational efficiency and service delivery. Among these technologies, the Electronic Loan Monitoring System (ELMS) has emerged as a critical tool for overseeing loan performance. ELMS enables continuous tracking of loan statuses, allowing for timely detection and intervention in case of delinquencies. This essay explores three key variables within the ELMS framework: delinquency detection rate, monitoring frequency, and intervention success rate. It defines each variable, discusses how they have been measured in previous studies, and explores the theoretical underpinnings related to these variables.

Delinquency detection rate refers to the percentage of delinquent loans identified by the monitoring system out of the total number of loans in a given period. This metric is crucial for maintaining the health of the loan portfolio, as early detection of delinquencies enables timely intervention, reducing the risk of defaults and financial losses for MFIs. Previous studies have measured delinquency detection rate by comparing the number of loans flagged as delinquent by the monitoring system with the total number of active loans. For instance, a study by Agarwal, Chomsisengphet, and Liu (2018) analyzed the efficiency of various monitoring systems by calculating the detection rates and comparing them across different institutions. In the context of MFIs, ELMS represents a valuable tool for enhancing delinquency detection, thereby improving risk management. Additionally, the Theory of Information Asymmetry (Akerlof, 1970) highlights the challenges arising from information

discrepancies between borrowers and lenders. By ensuring timely and accurate detection of delinquencies through ELMS, MFIs can reduce information asymmetry, making better-informed decisions to mitigate risks.

Impact of Electronic Loan Servicing Systems on Loan Performance

Microfinance institutions (MFIs) are pivotal in providing financial services to underserved populations, and their effectiveness is significantly enhanced by technological advancements. One such advancement is the Electronic Loan Servicing System (ELSS), which streamlines various aspects of loan management and customer service. This essay explores three key variables within the ELSS framework: customer service response time, service request resolution rate, and loan account accuracy. It defines each variable, discusses how they have been measured in previous studies, and explores the theoretical underpinnings related to these variables.

Customer service response time refers to the duration between a customer initiating a service request or query and the time it takes for the institution to respond. This metric is critical as it directly affects customer satisfaction and trust. Prompt responses are essential in the financial services sector, where delays can lead to customer dissatisfaction, loss of trust, and potential financial repercussions. Previous studies have measured customer service response time using various metrics, such as the average response time across different types of queries or the percentage of queries responded to within a specific timeframe. For instance, a study by Mittal and Gera (2013) evaluated response times by analyzing customer service logs and calculating the average duration from query initiation to first response.The theoretical foundation for analyzing customer service response time can be traced to the Service Quality Model (SERVQUAL) developed by Parasuraman, Zeithaml, and Berry (1985). This model emphasizes five dimensions of service quality, including responsiveness, which is directly related to response time. According to SERVQUAL, responsiveness is a critical determinant of overall service quality and customer satisfaction. In the context of MFIs, quick response times are essential for maintaining high service quality and customer satisfaction. Additionally, the Expectancy-Disconfirmation Theory (Oliver, 1980) posits that customer satisfaction is influenced by the gap between expectations and actual service experiences. By meeting or exceeding customer expectations through prompt responses, MFIs can enhance customer satisfaction and loyalty.

Service request resolution rate refers to the percentage of customer service requests or issues that are successfully resolved within a specific period. This metric is crucial for assessing the effectiveness of the customer service function and ensuring that customers' needs are adequately met. High resolution rates indicate efficient problem-solving capabilities and contribute to higher customer satisfaction. To measure service request resolution rate, previous studies have tracked the number of service requests resolved against the total number of requests received. For example, a study by Hallowell (1996) analyzed customer service data to calculate the resolution rate and compared it across different departments to identify areas for improvement. Additionally, the Resource-Based View (RBV) of the firm (Barney, 1991) suggests that organizations can achieve a competitive advantage by effectively utilizing their resources. In this case, a well-functioning customer service department equipped with an ELSS can serve as a valuable resource for improving service request resolution rates and enhancing overall performance.

Impact of Electronic Loan Repayment Systems on Loan Performance

Microfinance institutions (MFIs) play a critical role in providing financial services to underserved populations, often focusing on small loans to support entrepreneurship and economic development. The adoption of electronic loan repayment systems (ELRS) has revolutionized the way MFIs manage loan repayments, enhancing

efficiency and customer satisfaction. This essay explores three key variables within the ELRS framework: repayment compliance rate, automated payment success rate, and repayment convenience rating. It defines each variable, discusses how they have been measured in previous studies, and explores the theoretical underpinnings related to these variables.

Repayment compliance rate refers to the proportion of borrowers who make their loan repayments on time as per the agreed schedule. This metric is crucial for assessing the financial health and sustainability of MFIs, as high compliance rates indicate good borrower discipline and effective loan management. Previous studies have measured repayment compliance rate by tracking the number of on-time payments against the total number of due payments within a specified period. For example, a study by Wydick (1999) analyzed the repayment records of microfinance clients to calculate the compliance rate and examined factors influencing timely repayments. Another study by Armendariz and Morduch (2010) used longitudinal data to assess changes in repayment compliance over time and the impact of different loan structures and repayment terms.

Automated payment success rate refers to the percentage of automated loan payments that are processed successfully without errors or failures. This metric is vital for evaluating the reliability and efficiency of the ELRS, as high success rates indicate robust system performance and reduce the administrative burden on both borrowers and MFIs.To measure automated payment success rate, previous studies have tracked the number of successful automated transactions against the total number of attempted transactions (Davis, 1989). According to TAM, perceived usefulness and ease of use significantly influence the adoption and success of technological systems. In the context of MFIs, a high success rate of automated payments enhances the perceived reliability and efficiency of the ELRS, encouraging more borrowers to utilize these systems.

Loan Performance in Microfinance Institutions

Loan performance is a critical indicator of the health and sustainability of financial institutions, particularly for microfinance institutions (MFIs) that serve high-risk, underserved populations. Understanding and managing loan performance is essential for MFIs to ensure financial stability and achieve their mission of economic empowerment. This essay focuses on three key variables that influence loan performance: default rate, loan recovery rate, and portfolio at risk (PAR). It defines each variable, discusses how they have been measured in previous studies, and explores the theoretical underpinnings related to these variables.

The default rate refers to the percentage of loans that have not been repaid as per the agreed terms and are considered in default. A loan is typically classified as in default after a specific period of missed payments, often 90 days past due. The default rate is a crucial metric for assessing the credit risk and overall health of a loan portfolio. Previous studies have measured default rate by calculating the proportion of loans in default out of the total number of loans disbursed.

Loan recovery rate refers to the proportion of defaulted loan amounts that are eventually recovered through various collection efforts. This metric is vital for assessing the effectiveness of an institution's recovery strategies and minimizing financial losses due to defaults. To measure loan recovery rate, previous studies have tracked the amount of defaulted loans recovered against the total amount of loans in default. For instance, a study by Giné and Kanz (2018) evaluated the recovery rates of defaulted loans in microfinance institutions by analyzing recovery data and assessing the impact of different recovery strategies.

Empirical Review

The empirical literature review explored the concept and presented empirical findings applicable

to the subject at hand; it was a direct quest for existing works, including periodicals and books (Nayak & Singh, 2021). The empirical literature review was a comprehensive survey of previous research questions. Although it could often be broad in scope, spanning decades, perhaps even centuries of material, it was also narrowly tailored, addressing only the scholarship that was directly related to the research question (Mukherjee, 2019). The empirical review in this study served as a critical examination of existing research pertinent to the study's variables and inquiries (Verma, Verma, & Abhishek, 2024). It consolidated empirical evidence to elucidate how previous studies had explored similar topics and what conclusions had been drawn (Mukherjee,2019). This synthesis encapsulated key findings and debates from prior research, addressing methodological approaches, study designs, and sample characteristics while evaluating their strengths and limitations (Verma, Verma, & Abhishek, 2024). Moreover, it highlighted gaps in the literature and discrepancies in findings, thereby outlining the rationale for undertaking the present study.

Studies in India have highlighted significant reductions in default rates attributed to ELMS implementation. Enhanced borrower monitoring and automated reminders facilitated by electronic systems have led to a commendable 25% decrease in default rates (Bhatt & Tang, 2019). Additionally, the adoption of ELMS has bolstered loan recovery rates by 20%, enabling more efficient tracking of overdue loans and improving overall portfolio management (Mahajan & Ramola, 2020). Furthermore, MFIs utilizing ELMS reported a notable 15% reduction in portfolio at risk (PAR), underscoring the system's role in enhancing risk assessment and management (Gupta & Kumar, 2018).

In Bangladesh, the integration of ELMS has similarly yielded positive outcomes for loan performance indicators. Studies have shown a substantial 30% decrease in default rates among MFIs implementing ELMS, attributed to improved borrower profiling and predictive analytics (Ahmed & Chowdhury, 2017). Moreover, the use of electronic systems has contributed to a 22% increase in loan recovery rates through automated tracking and digital follow-up mechanisms (Rahman & Rahim, 2019). The adoption of ELMS has also resulted in an 18% reduction in PAR, reflecting enhanced monitoring capabilities and proactive risk management strategies (Hasan & Hossain, 2018).

In Kenya, ELMS implementation has significantly enhanced loan performance indicators. Studies have indicated a notable reduction in default rates by approximately 30% among MFIs utilizing electronic systems (Ouma & Kimenyi, 2019). Improved borrower monitoring and automated reminders have played a crucial role in this improvement. Additionally, ELMS has led to a 25% increase in loan recovery rates through efficient tracking and digital communication tools (Mwangi & Njoroge, 2020). The adoption of ELMS has also contributed to a 20% decrease in portfolio at risk (PAR), highlighting its effectiveness in enhancing risk management practices (Odhiambo & Obwona, 2018).

Research in Nigeria has shown similar positive outcomes associated with the adoption of ELMS. MFIs using electronic systems have reported a 25% decrease in default rates, attributed to improved loan monitoring and timely interventions facilitated by real-time data analytics (Oladipo & Adeyemo, 2017). Moreover, the use of ELMS has enhanced loan recovery rates by 22% through automated payment reminders and digital collection strategies (Adebayo & Ahmed, 2018). The implementation of electronic systems has also resulted in a 15% reduction in PAR, demonstrating enhanced portfolio management and risk mitigation capabilities (Abdullahi & Bello, 2019).

In Ghana, ELMS has been instrumental in improving loan performance metrics among MFIs. Studies have indicated a significant 35% reduction in default rates with the adoption of electronic systems, driven by improved borrower engagement and personalized financial education (Amoako &

Mensah, 2019). Furthermore, the use of ELMS has led to a 20% increase in loan recovery rates, supported by automated collection processes and digital repayment options (Annan & Dzifa, 2020). The integration of real-time reporting and analytics has also contributed to an 18% decrease in PAR, enabling proactive risk management and portfolio optimization (Appiah-Kubi & Osei, 2018).

METHODOLOGY

Research design forms the blueprint for the collection, measurement, and analysis of data, providing a structured approach to answering research questions (Dubey & Kothari, 2022). The study will use a mixed research design approach, which involves the application of both qualitative and quantitative research techniques. The research design allows the researcher to compensate for the weakness of one single approach with the strength of the other to achieve the best results (Creswell & Clark, 2011). Population is the total collection of elements about which the researcher wishes to make inferences (Cooper & Schindler, 2011). The population of the study will consist of 68 MFIs operating in Nairobi as of 31st December 2023, who are members of the Association of Microfinance Institutions (AMFI). Nairobi was chosen because it houses the headquarters of most of these MFIs, and therefore, it was possible to access the managers/owners who are the target respondents. The study adopted a census, which incorporated all the MFIs into the study. Bryman (2012) agrees that the census method is the process of studying or obtaining responses from every unit of the study population. Based on the study objectives, the managers/owners were the unit of observation as they were useful in answering the electronic loan management system statements used to measure the electronic loan management system dimensions. The institutions visited for the study were representative of MFIs currently operating under some form of regulation and legal compliance as of December 2023. Questionnaires were used to collect primary data, which Sekaran (2010) defines as a preformulated set of questions to which respondents record their answers, usually within closely defined alternatives. The primary research data were collected from the owners/managers of the MFIs in Nairobi, the unit of observation, through a self-administered questionnaire. The questionnaire consisted of a list of open-ended and closed questions. The study used secondary data sources (Sekaran, 2010), which had the advantage of saving time and costs in acquiring information. The secondary sources included published annual reports of the Microfinance institutions. Information on the performance of MFIs was obtained from the Microfinance Exchange (MIX) reports, the Economic Survey, and Government publications. According to Mugenda & Mugenda (2013), data analysis is the process of producing order, structure, and meaning out of a large amount of data. The acquired data was edited, classified, coded, and analyzed using descriptive and inferential methods, with the sample result representing the complete population. The mean, frequency, percentages, and standard deviation were utilized as statistics. Data was analyzed using the Statistical Package for Social Sciences (SPSS). The regression model will be as follows;

$$Y=\beta 0+\beta 1\ X1+\beta 2\ X2+\beta 3\ X3+\ \beta 4\ X4\ \ +\ \beta 5\ X5\ \ +\ \varepsilon$$

FINDINGS AND DISCUSSION

The results of the pilot study were as follows:

Reliability Results

The reliability test was performed on the research instrument to test its internal consistency in yielding similar results. This was tested using the Cronbach's alpha coefficient analysis (Cronbach, 1951). The reliability statistics for the electronic loan origination system indicated a Cronbach's Alpha of 0.766 and 0.807 based on standardized items for the nine items in the instrument. The value of 0.766 suggests that the items used in the questionnaire consistently measure the intended construct. The slightly higher alpha of 0.807 based on standardized items further supports the reliability, implying that the scale items are closely related and provide a consistent measurement. The reliability statistics for

the electronic loan disbursement system reveal a Cronbach's Alpha of 0.767 and 0.791 based on standardized items for the eight items in the instrument. The value of 0.767 suggests that the items used in the questionnaire consistently measure the intended construct, ensuring the reliability of the measurement scale. The slightly higher alpha of 0.791 based on standardized items further confirms that the scale items are closely related and provide a consistent measurement. The reliability statistics for the electronic loan monitoring system indicate a Cronbach's Alpha of 0.610 and 0.700 based on standardized items for the eight items in the instrument. While a Cronbach's Alpha value above 0.7 is generally considered acceptable, the obtained values suggest moderate internal consistency. The Cronbach's Alpha of 0.610 suggests that the items used in the questionnaire are moderately consistent in measuring the intended construct. The higher alpha of 0.700 based on standardized items indicates an improvement when items are standardized, but it still points to the need for potential refinement of the instrument to achieve better reliability. The reliability statistics for the electronic loan servicing system reveal a Cronbach's Alpha of 0.859 and 0.852 based on standardized items across ten items. These values indicate high internal consistency, suggesting that the items reliably measure the intended construct. A Cronbach's Alpha of 0.859 is considered excellent, as it exceeds the commonly accepted threshold of 0.7 for reliability (Nunnally & Bernstein, 1994). This high level of internal consistency indicates that the items in the questionnaire are closely related and consistently capture aspects of the electronic loan servicing system. The slightly lower alpha based on standardized items (0.852) still reflects robust reliability, reinforcing the dependability of the measurement instrument. The reliability statistics for the electronic loan repayment system reveal a Cronbach's Alpha of 0.880 and 0.886 based on standardized items across ten items. These values are indicative of high internal consistency, reflecting that the items in the measurement instrument are reliably assessing the intended aspects of the loan repayment system. A Cronbach's Alpha of 0.880 is considered excellent, exceeding the commonly accepted threshold of 0.7 for reliability (Nunnally & Bernstein, 1994). This high level of internal consistency suggests that the items used in the assessment are closely related and consistently measure the performance and effectiveness of the electronic loan repayment system. The slightly higher value for Cronbach's Alpha based on standardized items (0.886) reinforces the robustness of the measurement instrument.

Results of the Final Study

Response Rate

The response rate indicated that out of the 68 distributed questionnaires, 60 were successfully returned, accounting for an 88.2% response rate. According to Fincham (2008), a response rate above 70% is considered adequate for generalizing findings to the target population. Thus, the obtained response rate suggested a high level of engagement among participants and minimized the likelihood of non-response bias.

General Information Results

Firstly, the gender distribution demonstrated a clear majority of male participants. Specifically, 35 individuals, or 58.33% of the sample, were male, while 25 individuals, representing 41.67%, were female. This disparity resonated with historical trends observed in certain fields, where male participation often outweighed female involvement. Past studies have shown uneven gender distributions within particular professional sectors, as illustrated by research that documented skewed ratios in fields traditionally dominated by male populations (e.g., West & Zimmerman, 1987). This finding then sparks questions about societal roles and opportunities.

Secondly, the age distribution within the sample displayed a concentration in the mid-career age range. Notably, the 26-30 age group comprised the largest segment, with 22 individuals (36.66%), followed closely by the 31-35 age group, containing

20 individuals (33.33%). The younger age bracket of 21-25 represented a smaller portion, with only 5 individuals (8.33%). The older age groups, 35-40 and above 40, constituted 16.66% and 5.00%, respectively. This distribution suggests a sample population primarily composed of individuals in their prime working years. Sociological perspectives on age and career trajectories, such as those presented by Erikson (1968), often highlight the significance of these years for professional development and establishment. The concentration in the middle-aged groups could indicate a population where many members have been gaining experience, but have not yet retired.

Thirdly, the education level of the participants revealed a significant proportion of individuals with higher education. The largest group, representing 50.0% of the sample (30 individuals), held undergraduate degrees. Those with college diplomas accounted for 26.7% (16 individuals), while postgraduate degrees were held by 18.3% (11 individuals). A smaller segment, 5.0% (3 individuals), held Form Four qualifications. This data emphasizes the prevalence of higher education within the studied population. This emphasis on higher education mirrors broader trends in workforce demographics, where advanced qualifications are increasingly valued. This reflects the increasing skill level required by jobs in modern work environments. Studies concerning the impact of educational attainment on professional outcomes, such as those that connected higher qualifications with better career advancement opportunities, offer a backdrop for contextualizing these findings.

Finally, the duration of operation of the institutions provided insight into the established nature of the organizations involved. A substantial portion, 50.0% (30 institutions), had been operating for 21-30 years. Institutions operating for over 30 years constituted 25.0% (15 institutions), while those operating for 11-20 years represented 16.67% (10 institutions). The smallest group, operating for 1-10 years, accounted for 8.33% (5 institutions). This indicates a strong presence of well-established entities within the sample. Organizational longevity is often associated with stability, experience, and established practices. Research in organizational behavior and management has shown that mature organizations frequently possess unique characteristics in terms of culture, structure, and performance. Therefore, the information that the majority of organizations have existed for over 20 years, creates context for further analysis of what traits those companies have.

Descriptive Analysis

The provided tables present a diagnostic analysis of data related to electronic loan systems in microfinance institutions (MFIs) in Kenya. The analysis encompasses the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity, Total Variance Explained through Principal Component Analysis (PCA), and Descriptive Statistics. These tests collectively offer insights into the suitability of the data for factor analysis, the underlying structure of the variables, and their descriptive characteristics.

Firstly, the KMO and Bartlett's Test of Sphericity provided crucial preliminary information. The KMO measure, which assesses the sampling adequacy for factor analysis, yielded a value of 0.834. This value significantly exceeded the recommended threshold of 0.6, indicating that the sample size was adequate and the data were suitable for factor analysis. As Field (2018) highlighted, a KMO value above 0.6 suggests that the variables are sufficiently intercorrelated to warrant factor analysis.

Furthermore, Bartlett's Test of Sphericity, which tests the null hypothesis that the correlation matrix is an identity matrix (i.e., variables are unrelated), yielded a highly significant result (Chi-Square = 390.587, df = 15, $p < 0.001$). This indicated that the variables were indeed intercorrelated and that factor analysis could be meaningfully applied. As Tabachnick and Fidell (2013) noted, a significant Bartlett's test is essential for confirming the presence of significant relationships among variables.

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.834**
Bartlett's Test of Sphericity	Approx. Chi-Square	390.587
	Df	15
	Sig.	.000

Secondly, the Total Variance Explained table, using PCA, revealed that one principal component accounted for a substantial portion of the variance in the data. Specifically, the first component explained 77.745% of the total variance, with an eigenvalue of 4.665. The remaining components had eigenvalues below 1, indicating that they explained relatively little additional variance. This suggests that the measured variables strongly cluster together, indicating that a strong, singular factor affects the measured items. This information is key when understanding how those factors affect each other. When PCA produces a result like this, it can simplify analysis. As Cattell (1966) proposed with the screen test, only factors with eigenvalues greater than 1 should be retained for further analysis. In this case, there is a very clear indication that one factor is dominant.

Table 2: Total Variance Explained

	Initial Eigenvalues			**Extraction Sums of Squared Loadings**		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	4.665	77.745	77.745	4.665	77.745	77.745
2	.729	12.144	89.889			
3	.261	4.357	94.246			
4	.193	3.222	97.468			
5	.091	1.509	98.977			
6	.061	1.023	100.000			

Extraction Method: Principal Component Analysis.

Thirdly, the Descriptive Statistics provided valuable insights into the characteristics of each variable. The mean scores for all electronic loan systems (origination, disbursement, monitoring, servicing, repayment) and loan performance were consistently high, ranging from 4.1450 to 4.2267 on a 5-point scale. This indicated that respondents generally perceived these systems positively. Also, it shows that the loan performance is also highly rated. The standard deviations were relatively low, ranging from 0.60447 to 0.95358, suggesting that responses were clustered closely around the mean. The skewness values for most variables were negative, indicating a slight tendency towards negative skewness (i.e., a concentration of high scores). Kurtosis values varied, with some variables exhibiting platykurtic (flat) distributions and others exhibiting leptokurtic (peaked) distributions.

The high mean scores across all variables indicated a generally positive perception of electronic loan systems and loan performance within the studied MFIs. This consistent positive perception may reflect the successful implementation and utilization of these systems. Furthermore, it appears those systems are having a positive effect on loan performance. The low standard deviations highlighted a strong consensus among respondents, further supporting the reliability of the findings.

The skewness and kurtosis values provided additional information about the distribution of responses. Negative skewness suggested that respondents were more likely to provide high scores, while kurtosis values provided insights into the peakedness or flatness of the distributions. These distributional characteristics can influence the interpretation of results and the choice of statistical methods.

Descriptive Statistics

Table 3: Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
electronic loan origination system	60	2.00	5.00	4.1500	.95358	-.796	.309	-.451	.608
electronic loan disbursement system	60	2.60	5.00	4.1800	.64382	-.421	.309	-.701	.608
electronic loan monitoring system	60	2.60	5.00	4.2267	.60447	-.425	.309	-.485	.608
electronic loan servicing system	60	2.20	5.00	4.1933	.70443	-1.050	.309	.993	.608
electronic loan repayment system	60	2.60	5.00	4.2133	.63016	-.487	.309	-.484	.608
loan performance	60	2.50	5.00	4.1450	.70095	-.708	.309	-.014	.608
Valid N (listwise)	60								

The provided correlation matrix presents a comprehensive view of the relationships among various electronic loan systems and loan performance within Kenyan Microfinance Institutions (MFIs). The table displays Pearson correlation coefficients, significance levels (2-tailed), and sample sizes, offering valuable insights into the strength and direction of these relationships.

Firstly, the matrix revealed consistently strong positive correlations among all electronic loan systems. Notably, the correlations between electronic loan disbursement, monitoring, servicing, and repayment systems were exceptionally high, ranging from 0.794 to 0.897. These strong positive correlations indicated a high degree of interdependence and synergy among these systems. As Bryman (2016) highlighted, strong correlations suggest that changes in one variable are likely to be associated with corresponding changes in another. In this context, improvements in one electronic loan system were likely to be associated with improvements in others.

Secondly, all electronic loan systems exhibited significant positive correlations with loan performance. The Pearson correlation coefficients ranged from 0.583 for the electronic loan origination system to 0.874 for the electronic loan repayment system. This indicated that the implementation and effectiveness of these systems were strongly associated with improved loan performance. As Saunders et al. (2019) emphasized, positive correlations suggest that as one variable increases, the other tends to increase as well. In this context, the more effective the electronic loan systems, the better the loan performance.

Thirdly, the electronic loan repayment system demonstrated the strongest correlation with loan performance (r = 0.874). This suggested that efficient and effective loan repayment processes were particularly crucial for enhancing loan performance. This finding aligns with the

importance of repayment efficiency in maintaining a healthy loan portfolio. As Armendáriz and Morduch (2010) discussed, effective loan repayment is a cornerstone of microfinance sustainability.

Fourthly, the electronic loan origination system showed the lowest, yet still significant, correlation with loan performance (r = 0.583). This indicated that while loan origination was important, other systems, such as disbursement, monitoring, servicing, and repayment, had a comparatively stronger influence on loan performance. This suggests that while initiating loans is important, the continued service of the loan is more strongly correlated with overall loan performance.

Fifthly, the significance levels (Sig. (2-tailed)) for all correlations were 0.000 or 0.002, which were significantly below the 0.01 level. This indicated that all correlations were statistically significant, providing strong evidence of the relationships observed. This high level of significance reinforced the reliability of the findings.

Sixthly, the sample size (N) for all correlations was 60, ensuring sufficient statistical power to detect significant relationships. This consistent sample size across all correlations enhanced the comparability and reliability of the results.

Table 4: Pearson Correlation

Correlations

		Electronic Loan Origination System	Electronic Loan Disbursement System	Electronic Loan Monitoring System	Electronic Loan Servicing System	Electronic Loan Repayment System	Loan Performance
electronic loan origination system	Pearson Correlation	1	.452**	.387**	.552**	.442**	.583**
	Sig. (2-tailed)		.000	.002	.000	.000	.000
	N	60	60	60	60	60	60
electronic loan disbursement system	Pearson Correlation	.452**	1	.848**	.844**	.794**	.810**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	60	60	60	60	60	60
electronic loan monitoring system	Pearson Correlation	.387**	.848**	1	.897**	.837**	.736**
	Sig. (2-tailed)	.002	.000		.000	.000	.000
	N	60	60	60	60	60	60
electronic loan servicing system	Pearson Correlation	.552**	.844**	.897**	1	.872**	.848**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	60	60	60	60	60	60
electronic loan repayment system	Pearson Correlation	.442**	.794**	.837**	.872**	1	.874**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	60	60	60	60	60	60
loan performance	Pearson Correlation	.583**	.810**	.736**	.848**	.874**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	60	60	60	60	60	60

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

Regression Results

Table 5: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.583[a]	.340	.329	.57434	1.373

a. Predictors: (Constant), electronic loan origination system

b. Dependent Variable: loan performance

Table 6: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.856	1	9.856	29.878	.000[b]
	Residual	19.133	58	.330		
	Total	28.988	59			

a. Dependent Variable: loan performance

b. Predictors: (Constant), electronic loan origination system

Table 7: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.366	.334		7.090	.000
	electronic loan origination system	.429	.078	.583	5.466	.000

a. Dependent Variable: loan performance

Table 8: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.810[a]	.655	.649	.41506	1.815

a. Predictors: (Constant), electronic loan disbursement system

b. Dependent Variable: loan performance

Table 9: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	18.996	1	18.996	110.266	.000[b]
	Residual	9.992	58	.172		
	Total	28.988	59			

a. Dependent Variable: loan performance

b. Predictors: (Constant), electronic loan disbursement system

Table 10: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.461	.355		1.299	.199
	electronic loan disbursement system	.881	.084	.810	10.501	.000

a. Dependent Variable: loan performance

Table 11: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.736[a]	.541	.533	.47893	1.282

a. Predictors: (Constant), electronic loan monitoring system

b. Dependent Variable: loan performance

Table 12: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.685	1	15.685	68.379	.000[b]
	Residual	13.304	58	.229		
	Total	28.988	59			

a. Dependent Variable: loan performance

b. Predictors: (Constant), electronic loan monitoring system

Table 13: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.540	.440		1.226	.225
	electronic loan monitoring system	.853	.103	.736	8.269	.000

a. Dependent Variable: loan performance

Table 14: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.848[a]	.720	.715	.37416	1.446

a. Predictors: (Constant), electronic loan servicing system

b. Dependent Variable: loan performance

Table 15: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.869	1	20.869	149.065	.000[b]
	Residual	8.120	58	.140		
	Total	28.988	59			

a. Dependent Variable: loan performance

b. Predictors: (Constant), electronic loan servicing system

Table 16: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.605	.294		2.057	.044
	electronic loan servicing system	.844	.069	.848	12.209	.000

a. Dependent Variable: loan performance

Table 17: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.874[a]	.764	.760	.34321	1.657

a. Predictors: (Constant), electronic loan repayment system

b. Dependent Variable: loan performance

Table 18: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.156	1	22.156	188.095	.000[b]
	Residual	6.832	58	.118		
	Total	28.988	59			

a. Dependent Variable: loan performance

b. Predictors: (Constant), electronic loan repayment system

Table 19: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.048	.302		.158	.875
	electronic loan repayment system	.972	.071	.874	13.715	.000

a. Dependent Variable: loan performance

A Multiple Regression Analysis of Electronic Loan Systems

The provided tables present a multiple regression analysis aimed at predicting loan performance in Kenyan Microfinance Institutions (MFIs) using various electronic loan systems as predictors. The analysis includes the Model Summary, ANOVA, and Coefficients tables, offering a comprehensive overview of the model's fit and the predictors' impact.

Firstly, the Model Summary table revealed a high degree of predictive power. The R value of 0.925 indicated a strong positive correlation between the predictors (electronic loan origination, disbursement, monitoring, servicing, and repayment systems) and the dependent variable (loan performance). The R Square value of 0.856 suggested that 85.6% of the variance in loan performance could be explained by the predictor variables. This high R Square value indicated a good fit of the model. As Cohen (1988) suggested, R Square values above 0.26 are considered substantial in social science research. The Adjusted R Square value of 0.843, which accounts for the number of predictors in the model, remained high, indicating that the model retained its predictive power even after adjusting for the number of variables. The Durbin-Watson statistic of 2.185 was close to 2, suggesting that the residuals were independent, which is a desirable characteristic of a good regression model.

Table 20: Model Summary[b]

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Durbin-Watson**
1	**.925[a]**	**.856**	**.843**	**.27808**	**2.185**

a. Predictors: (Constant), electronic loan repayment system, electronic loan origination system, electronic loan disbursement system, electronic loan monitoring system, electronic loan servicing system

b. Dependent Variable: loan performance

Secondly, the ANOVA table demonstrated the overall significance of the regression model. The F statistic of 64.173 was highly significant ($p < 0.001$), indicating that the model significantly predicted loan performance. This result confirmed that the predictor variables, as a group, had a significant impact on loan performance. As Field (2018) highlighted, a significant F statistic indicates that the model is a better predictor of the outcome variable than chance alone.

Table 21: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	24.813	5	4.963	64.173	.000[b]
	Residual	4.176	54	.077		
	Total	28.988	59			

a. Dependent Variable: loan performance

b. Predictors: (Constant), electronic loan repayment system, electronic loan origination system, electronic loan disbursement system, electronic loan monitoring system, electronic loan servicing system

Thirdly, the Coefficients table provided detailed information about the individual predictors' contributions to the model. The electronic loan repayment system emerged as the strongest predictor, with a standardized beta coefficient of 0.590 and a highly significant t-value of 5.346 ($p < 0.001$). This indicated that the efficiency and effectiveness of the loan repayment system had the most substantial impact on loan performance. The unstandardized coefficient (B) of 0.656 suggested that for every one-unit increase in the electronic loan repayment system, loan performance increased by 0.656 units, holding other variables constant.

The electronic loan disbursement system also had a significant positive impact, with a standardized beta coefficient of 0.328 and a significant t-value of 3.101 ($p = 0.003$). This indicated that efficient loan disbursement processes were also crucial for enhancing loan performance. The electronic loan origination system had a positive, but smaller, impact, with a standardized beta coefficient of 0.148 and a significant t-value of 2.275 ($p = 0.027$). The electronic loan servicing system showed a positive trend, but was only significant at the p=0.054 level.

Interestingly, the electronic loan monitoring system had a significant negative impact, with a standardized beta coefficient of -0.367 and a significant t-value of -2.723 ($p = 0.009$). This unexpected negative relationship suggested that while monitoring was important, perhaps the way it was being implemented or perceived had an adverse effect on loan performance. This could indicate that overly stringent or inefficient monitoring processes might be counterproductive. It is possible that too much monitoring is creating a negative effect on the clients. The constant term (-0.036) was not significant ($p = 0.899$), indicating that when all predictor variables were zero, loan performance was not significantly different from zero.

The table presents the results of a multiple linear regression analysis where the dependent variable is **loan performance**. The independent variables include various electronic loan management systems. The regression equation can be formulated as follows:

$$\mathbf{Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\epsilon}$$

Where:

- Y = Loan Performance (Dependent Variable)
- β_0 = Intercept (Constant) = **-0.036**
- β_1 = Coefficient for **Electronic Loan Origination System** = **0.109**
- β_2 = Coefficient for **Electronic Loan Disbursement System** = **0.357**
- β_3 = Coefficient for **Electronic Loan Monitoring System** = **-0.425**

- β_4 = Coefficient for **Electronic Loan Servicing System** = **0.302**
- β_5 = Coefficient for **Electronic Loan Repayment System** = **0.656**
- ϵ = Error term

Thus, the **regression equation** is:

Loan Performance$=-0.036+0.109X_1+0.357X_2-0.425X_3+0.302X_4+0.656X_5+\epsilon$

Table 22: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
	(Constant)	-.036	.286		-.127	.899
	electronic loan origination system	.109	.048	.148	2.275	.027
	electronic loan disbursement system	.357	.115	.328	3.101	.003
	electronic loan monitoring system	-.425	.156	-.367	-2.723	.009
	electronic loan servicing system	.302	.154	.304	1.968	.054
	electronic loan repayment system	.656	.123	.590	5.346	.000

a. Dependent Variable: loan performance

CONCLUSION AND RECOMMENDATION

The current study stemmed from the realization of the research problem in the literature role of the electronic loan management system on loan performance amongst microfinance institutions in Kenya. Empirically, most of the studies on the role of electronic loan management systems have been skewed towards the use of primary data and only a specific electronic loan management system has been evaluated. Among the several studies which had been done in a Kenyan perspective majority have not examined the causal joint effect of the electronic loan management system on the loan performance amongst microfinance institutions in Kenya. Consequently, the researcher's primary purpose was to examine the relationship between the electronic loan management system and loan performance amongst microfinance institutions in Kenya. Further, the study sought to test four hypotheses: there is no significant effect of electronic loan origination systems, electronic loan disbursement systems, electronic loan monitoring systems, electronic loan servicing systems, and electronic loan repayment systems on loan performance amongst microfinance institutions in Kenya. To meet the overall objective and test the study hypotheses, the study adopted a mixed research design approach. The population of the study consisted of 68 MFIs operating in Nairobi as of 31st December 2023, who are members of the Association of Microfinance Institutions (AMFI). The study used a qualitative sampling technique, namely purposive sampling, to select a sample of 60 MFIs operating in Kenya. Primary data was collected from 60 MFIs operating in Kenya, yielding a response rate of 88.2%. The independent variables examined in the study were the electronic loan origination system, the electronic loan disbursement systems, the electronic loan monitoring system, the electronic loan servicing system, electronic loan repayment system. Descriptive analyses such as frequency, percentage, mean, and standard deviation were used to analyze the data, which was summarized using figures and tables. Correlation analysis was used to examine the strength of the relationship between the electronic loan

management system and loan performance amongst microfinance institutions, and regression analysis was used to examine the nature of the relationship between the electronic loan management system and loan performance amongst microfinance institutions. Before regression analysis tests for various assumptions were carried out, for example, a normality test was carried out using skewness and kurtosis. Overall, 92.5% of the variation in loan performance can be explained by the electronic loan origination system, the electronic loan disbursement systems, the electronic loan monitoring system, the electronic loan servicing system, electronic loan repayment system, while the remaining percentage can be explained by other factors excluded in the model. The findings of the study demonstrated that the electronic loan management system affects loan performance

The study aimed to evaluate the influence of electronic loan management systems on loan performance in Kenyan Microfinance Institutions (MFIs). The findings revealed a significant positive correlation between the adoption of electronic loan systems and loan performance. This suggests that MFIs that have effectively implemented these systems have experienced improved loan portfolios. The regression analysis further demonstrated that electronic loan systems, including origination, disbursement, monitoring, servicing, and repayment, are significant predictors of loan performance. This highlights the importance of these systems in enhancing the efficiency and effectiveness of loan management processes. The study contributes to the growing body of knowledge on the role of technology in microfinance and provides practical insights for MFIs seeking to improve their loan performance. The findings emphasize the need for MFIs to invest in and effectively implement electronic loan systems to remain competitive and achieve their social and financial objectives.

MFIs should prioritize the implementation and optimization of electronic loan repayment systems. The study found that this system had the most substantial impact on loan performance. Therefore, MFIs should invest in robust and user-friendly electronic loan repayment systems to streamline the repayment process and reduce default rates. This could involve the use of mobile money platforms, online banking, and other digital payment solutions.

MFIs should also focus on enhancing their electronic loan disbursement systems. The study revealed that efficient loan disbursement processes were crucial for improving loan performance. MFIs should leverage technology to automate and expedite the disbursement process, ensuring that clients receive their loans promptly. This could involve the use of electronic fund transfers, mobile wallets, and other digital disbursement methods. While electronic loan monitoring is essential, MFIs should ensure that their monitoring processes are not overly stringent or inefficient. The study found a negative relationship between electronic loan monitoring and loan performance, suggesting that excessive or poorly implemented monitoring could be counterproductive. MFIs should strike a balance between effective monitoring and maintaining a positive client relationship. This could involve the use of data analytics and risk assessment tools to identify potential risks and tailor monitoring efforts accordingly.

Policymakers and regulators should create an enabling environment for the adoption of electronic loan systems in the microfinance sector. This could involve developing supportive policies, providing technical assistance, and promoting collaboration between MFIs and technology providers.

Areas for Further Study

While this study has provided valuable insights into the influence of electronic loan management systems on loan performance in Kenyan MFIs, there are several areas for further study. Firstly, the study focused on five specific electronic loan systems. Future research could explore the impact of other emerging technologies, such as artificial intelligence, blockchain, and biometrics, on loan

performance. Secondly, the study was conducted in Kenya. Future research could examine the influence of electronic loan systems in other developing countries, particularly in Africa, to provide a comparative perspective. Thirdly, the study used a quantitative approach. Future research could adopt a mixed-methods approach, combining quantitative and qualitative data, to provide a more comprehensive understanding of the phenomenon. This could involve conducting interviews and focus group discussions with MFI staff and clients to gather insights into their experiences and perceptions of electronic loan systems. Finally, the study did not explore the potential unintended consequences of electronic loan systems, such as the exclusion of certain client groups or the exacerbation of existing inequalities. Future research could examine these issues to provide a more nuanced understanding of the impact of electronic loan systems

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