

Challenges Associated with the Use of Technology in Supermarkets in Livingstone District, Zambia

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Article Info

Volume 7, Issue 4

Publication history:

Accepted on 28 May 2026;
Published: 25 July 2026

Key Words:

Employees, Challenges, Policymakers' Environments and Technology

Article Doi:

10.59413/ajocs/v7.i4.18

Abstract

The increasing adoption of technology in supermarket operations has improved transaction processing, stock management, communication and customer service. However, the effective use of these technologies remains constrained by several organisational, technical and infrastructural challenges. This study aimed to identify the challenges associated with the use of technology in selected supermarkets in Livingstone District, Zambia. A qualitative case-study design was employed involving 25 purposively selected participants comprising supermarket managers, supervisors, cashiers, inventory and stock-management personnel, and information technology support staff. Data were collected through in-depth interviews and non-participant observations and analysed using thematic analysis. The findings identified five major challenges: inadequate employee training and technological skills, system failures and technical problems, poor internet connectivity, employee resistance to technological change, and the high cost of maintaining technological systems. These challenges reduced employee confidence, delayed customer transactions, interrupted stock-management activities, increased operational pressure and limited the extent to which supermarkets benefited from technology. The study concluded that installing technological systems alone does not automatically improve supermarket productivity. Effective technology use requires adequately trained employees, dependable internet infrastructure, accessible technical support, regular system maintenance and effective change-management practices. The study recommends continuous practical training, preventive system maintenance, reliable backup internet connections, adequate budgeting for technological support and greater employee involvement when introducing or upgrading workplace technologies. These findings provide practical evidence for supermarket managers, technology providers and policymakers seeking to strengthen digital retail operations in Zambia.

1. Introduction

Technology has become central to modern supermarket operations by improving transaction processing, inventory control, communication, record-keeping and customer service. Systems such as point-of-sale machines, barcode scanners, inventory-management software and digital-payment platforms enable employees to perform tasks more quickly and accurately. When properly implemented, these technologies can reduce manual work, minimise errors and improve organisational productivity (Laudon & Laudon, 2020).

However, the adoption of technology does not automatically produce improved performance. Employees require adequate training, reliable internet connectivity, technical support and access to functional equipment. Brynjolfsson and McAfee (2017) note that digital technologies change the nature of work and require employees to continuously develop new skills. Where employees lack the necessary knowledge or confidence, technology may create operational delays rather than improve efficiency.

In many African retail environments, technological adoption is affected by poor infrastructure, system failures, high implementation costs and resistance to change. Network interruptions may delay electronic payments, while breakdowns in point-of-sale and inventory systems can interrupt customer service and stock-management activities. Inadequate technical support may further increase the time required to restore normal operations.

Supermarkets in Zambia are increasingly adopting digital technologies to improve service delivery and remain competitive. Livingstone District, as an important commercial and tourist centre, has experienced growth in supermarket operations and the use of digital systems. Nevertheless, supermarkets in the district continue to face challenges that may limit the effective use of technology, including inadequate employee training, unreliable internet connectivity, technical failures, resistance to technological change and high maintenance costs.

Although previous studies have examined technology adoption and business performance, limited research has focused specifically on the challenges experienced by supermarket employees and managers in Livingstone District. This study therefore sought to identify the challenges associated with the use of technology in supermarkets and to provide practical recommendations for improving technological implementation and operational performance.

1.2 Statement of the Problem

Supermarkets increasingly rely on technology to process sales, monitor stock, maintain records and facilitate digital payments. Despite the expected benefits, the effective use of these systems in Livingstone District is affected by inadequate employee training, system failures, poor internet connectivity, resistance to technological change and high maintenance costs. These challenges can delay transactions, interrupt stock-management activities, reduce employee confidence and contribute to customer dissatisfaction. While previous Zambian studies have largely focused on technology adoption and general business performance, limited empirical evidence exists on the specific technological challenges experienced in supermarkets at district level. Therefore, this study was conducted to identify the major challenges associated with the use of technology in supermarkets in Livingstone District, Zambia.

2 Literature Review

2.1 Technology Use in Supermarkets

Technology has transformed supermarket operations through point-of-sale systems, barcode scanners, inventory-management software, digital-payment platforms and communication technologies. These systems improve transaction speed, stock control, operational accuracy and customer service by reducing manual processes and human error (Brynjolfsson & McAfee, 2017; Fernie & Sparks, 2019). However, the benefits depend on employee skills, reliable infrastructure and effective technical support.

2.2 Technology Acceptance Model

This study was guided by the Technology Acceptance Model developed by Davis (1989). The model explains that technology adoption is influenced mainly by perceived usefulness and perceived ease of use. Employees are more likely to use technology when they believe it improves their performance and is easy to operate.

In supermarket operations, inadequate training, system failures and poor connectivity may reduce employees' perceptions of ease of use. Management support, practical training and reliable systems can strengthen employee confidence and willingness to use technologies such as point-of-sale systems, digital payments and inventory-management software (Venkatesh & Davis, 2000).

2.3 Employee Training and Technological Skills

Employee training is important for the successful use of technology. Brynjolfsson and McAfee (2017) observed that technological changes require employees to develop new skills and adapt to changing work processes. Where training is inadequate, employees may make mistakes, depend heavily on technical personnel or resist using unfamiliar systems.

African studies have similarly identified inadequate employee training as a major barrier to technology adoption. Osei and Boateng (2020) found that insufficient training limited the benefits of computerised systems in Ghana's retail sector. In Zambia, Phiri et al. (2020) also identified limited employee skills as a constraint affecting the effective use of point-of-sale and inventory-management systems.

2.4 System Reliability and Internet Connectivity

The effectiveness of supermarket technology depends on reliable systems, electricity and internet connectivity. Network interruptions can delay mobile-money and card payments, while software failures may interrupt checkout and stock-management activities. Njoroge and Waema (2019) identified network failures and system downtime as major challenges affecting digital-payment systems in Kenya.

In Zambia, Mwila and Chanda (2021) found that unreliable internet connectivity and power interruptions reduced the effectiveness of digital systems in retail businesses. Banda and Tembo (2022) also reported transaction failures and system downtime as challenges affecting electronic payments. These difficulties can create longer queues, incomplete transactions and customer dissatisfaction.

2.5 Resistance to Change and Maintenance Costs

Resistance to technological change may occur when employees lack confidence, fear making mistakes or believe technology threatens their jobs. Smith and Anderson (2021) identified employee resistance and system-upgrade costs as barriers to digital transformation in supermarkets. Increased automation may also create job-security concerns among employees (Nakamura & Yamamoto, 2020).

The cost of acquiring, repairing and upgrading technology also affects its continued use. Supermarkets must pay for software licences, internet services, equipment replacement and technical support. Oladele and Adeyemi (2021) found that high implementation costs and poor infrastructure limited technology adoption in Nigerian supermarkets. Similarly, Zulu et al. (2019) identified financial constraints and limited technical expertise as significant

barriers among Zambian businesses.

2.6 Research Gap

Existing studies show that technology can improve supermarket productivity, but its effectiveness is limited by inadequate training, poor connectivity, system failures, resistance to change and high maintenance costs. However, much of the available research focuses on general retail businesses, large cities or more technologically advanced environments.

Limited empirical research has examined these challenges specifically from the perspectives of supermarket managers, supervisors, cashiers, inventory personnel and information-technology support staff in Livingstone District. There is also insufficient evidence explaining how these interconnected challenges affect employees' confidence, quality of work and actual technology use. This study addressed the gap by providing district-level evidence on the challenges associated with technology use in supermarkets in Livingstone District, Zambia.

3 Methodology

Research Design

The study adopted a qualitative case-study design. This design enabled an in-depth examination of the challenges experienced by supermarket employees and managers when using technology in their daily operations.

Study Area

The study was conducted in selected supermarkets in Livingstone District, Southern Province, Zambia. Livingstone was selected because it is an important commercial and tourist centre where supermarkets increasingly use digital technologies to support customer service, stock management and internal operations.

Target Population and Sample

The target population consisted of supermarket employees and management personnel who directly interacted with technological systems. A total of 25 participants were purposively selected, comprising five managers, five supervisors, five cashiers, five inventory and stock-management personnel, and five information-technology or support staff.

Purposive sampling was used because the selected participants had direct knowledge and experience of technologies such as point-of-sale systems, barcode scanners, digital-payment platforms and inventory-management software.

Data Collection

Data were collected through in-depth interviews and non-participant observations. Interviews provided information about participants' experiences, perceptions and challenges associated with technology use. Observations enabled the researcher to examine how employees interacted with technological systems during customer transactions, stock management and other supermarket activities.

Using both methods strengthened the study by allowing the researcher to compare participants' responses with the activities observed in the workplace.

Data Analysis

The data were analysed using thematic analysis based on the six-phase process developed by Braun and Clarke (2006). Interview responses and observation notes were transcribed and reviewed several times. Relevant statements were coded and similar codes were grouped into themes.

The analysis identified five main themes: inadequate training and technological skills, system failures and technical problems, poor internet connectivity, resistance to technological change, and high technological maintenance costs. Direct participant quotations were used to support the findings.

Ethical Considerations

Permission to conduct the study was obtained from the relevant university and supermarket management. Participants were informed about the purpose of the research and provided informed consent before taking part. Participation was voluntary, and respondents were informed that they could withdraw at any stage without penalty.

Confidentiality and anonymity were maintained by using participant codes instead of personal names. The collected information was securely stored and used only for academic purposes.

This methodology follows the brief subsection structure used in the sample journal article.

4 Results

The findings revealed five major challenges affecting the effective use of technology in supermarkets in Livingstone District: inadequate employee training, system failures, poor internet connectivity, resistance to technological change and high maintenance costs. These challenges disrupted transactions, stock management, communication and customer service.

4.1 Inadequate Training and Skills

Some employees lacked sufficient knowledge and confidence to operate technological systems effectively. Participants indicated that formal training was limited and that some workers learned through experience or depended on assistance from colleagues and IT personnel. This slowed operations, increased mistakes and reduced employee confidence.

One cashier explained, "*Some workers struggle to use the system because they were not properly trained.*" An inventory employee similarly stated, "*At times we learn through experience because formal training is limited.*"

4.2 System Failures and Technical Problems

Participants reported that POS systems, inventory software and digital-payment platforms occasionally froze, shut down or malfunctioned. These failures

interrupted customer transactions and stock updates, particularly during busy periods. Employees sometimes reverted to manual procedures, which increased waiting times and reduced productivity.

A cashier stated, “When the system shuts down, customers become frustrated because transactions stop.” IT personnel also reported that software errors and power interruptions affected system performance.

4.3 Poor Internet Connectivity

Poor internet connectivity affected card payments, mobile-money transactions, communication and online stock updates. Participants explained that unstable networks caused customers to wait longer and made it difficult for employees to complete technology-dependent activities.

One participant stated, “When the network is poor, card payments take too long to process.” Managers further indicated that many supermarket systems depended on internet access and became less effective when connectivity failed.

4.4 Resistance to Technological Change

Some employees were reluctant to adopt unfamiliar systems because of fear of making mistakes, limited confidence and preference for manual working methods. Participants observed that employees who were uncomfortable with new technologies often required additional assistance and took longer to adjust.

A supervisor explained, “Some workers are uncomfortable with new technology because they are used to manual systems.” Resistance therefore slowed technology adoption and limited the full use of available systems.

4.5 High Costs of Technological Maintenance

Managers and IT personnel identified the cost of purchasing, repairing and upgrading technological systems as a major challenge. Software licences, spare parts, system updates and replacement equipment placed additional pressure on supermarket budgets. In some cases, repairs were delayed because of limited financial resources.

A manager stated, “Technology is expensive because systems need regular updates and repairs.” IT staff also indicated that costly software licences and spare parts affected the timely maintenance of systems.

Table 1: Summary of Technology-Use Challenges

Challenge	Main effect on supermarket operations
Inadequate training and skills	Employee errors, low confidence and slower task completion
System failures	Interrupted transactions, stock updates and customer service
Poor internet connectivity	Delayed digital payments and communication
Resistance to change	Slow adoption and continued dependence on manual procedures
High maintenance costs	Delayed repairs, upgrades and equipment replacement

Overall, the findings showed that these challenges were interconnected. Inadequate training increased resistance to change, poor connectivity contributed to transaction delays, system failures reduced employee confidence, and high maintenance costs prevented supermarkets from resolving technical problems promptly.

The findings revealed that inadequate training, system failures, poor internet connectivity, resistance to change and high maintenance costs limited the effective use of technology in supermarkets in Livingstone District. This indicates that technology does not automatically improve productivity; its benefits depend on employee competence, reliable infrastructure, management support and effective maintenance.

Inadequate training reduced employees’ confidence and ability to use point-of-sale systems, inventory software and digital-payment platforms effectively. This finding supports Osei and Boateng (2020) and Phiri et al. (2020), who identified limited technological skills and insufficient training as barriers to successful technology adoption. Continuous practical training is therefore necessary whenever new systems are introduced or upgraded.

System failures and technical problems interrupted transactions, stock updates and customer service. Similar findings were reported by Banda and Tembo (2022), who observed that system downtime and transaction failures reduced the reliability of electronic-payment systems. Regular maintenance, backup equipment and readily available technical support are therefore essential for maintaining supermarket operations.

Poor internet connectivity also delayed digital payments, communication and online stock-management activities. This finding agrees with Njoroge and Waema (2019) and Mwila and Chanda (2021), who found that network failures and unreliable connectivity restricted technology use in African retail businesses. Supermarkets should therefore invest in dependable internet services and backup network connections.

Employee resistance to technological change was associated with limited confidence, fear of making mistakes and preference for familiar manual systems. This supports Smith and Anderson (2021), who identified resistance to change as a barrier to digital transformation. Employee participation, training and clear communication may reduce resistance and encourage acceptance of new systems.

High maintenance costs affected the timely repair, replacement and upgrading of technological systems. This finding is consistent with Zulu et al. (2019), who identified financial constraints and limited technical expertise as obstacles to technology adoption among Zambian businesses. Supermarkets therefore require adequate technology budgets and preventive-maintenance plans.

The findings also support the Technology Acceptance Model. Inadequate training, unreliable systems and poor connectivity reduce perceived ease of use, while repeated system failures may weaken employees’ perceptions of technology’s usefulness. Technology acceptance in supermarkets is therefore influenced by both employee attitudes and wider organisational and infrastructural conditions.

5 Conclusion and Recommendations

This study identified the major challenges associated with the use of technology in supermarkets in Livingstone District, Zambia. The findings showed that inadequate employee training, system failures, poor internet connectivity, resistance to technological change and high maintenance costs limited the effective use of supermarket technologies. These challenges delayed transactions, interrupted stock-management activities, reduced employee confidence and affected customer service. The study concludes that technology alone cannot improve productivity unless it is supported by skilled employees, reliable infrastructure, effective technical support and adequate financial planning.

Supermarket managers should provide regular practical training whenever employees are recruited or technological systems are introduced or upgraded. They should strengthen technical support, conduct preventive maintenance and maintain backup procedures for system failures. Supermarkets should also invest in reliable internet services and, where possible, use backup network providers to minimise interruptions to electronic payments and stock updates. Employees should be involved in the introduction of new technologies to reduce resistance and improve acceptance. Management should further allocate sufficient budgets for software licences, repairs, system upgrades and equipment replacement. Government agencies and technology providers should support affordable internet access, digital-skills development and reliable technological infrastructure for retail businesses in Livingstone District.

Declaration of Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the research reported in this article.

Funding

This research received no specific grant from any public, commercial or not-for-profit funding organisation.

Acknowledgements

The authors sincerely acknowledge the supermarket managers, supervisors, cashiers, inventory personnel and information-technology support staff who participated in the study. Appreciation is also extended to the management of Shoprite and SPAR supermarkets for permitting the research to be conducted. Special gratitude is expressed to Mrs Mary Lubinda for her academic guidance and supervision throughout the study.

Ethical considerations

The study followed the ethical requirements applicable to academic research. Permission was obtained from the relevant university authorities and participating supermarket management before data collection. All participants were informed about the purpose and procedures of the study and provided informed consent. Participation was voluntary, and respondents were informed of their right to withdraw without penalty. Confidentiality and anonymity were maintained by using participant codes instead of personal names, and the collected data were used strictly for academic purposes.

Disclaimer

This article is based on the master's dissertation entitled "Exploring the Impact of Technology on Quality of Work and Productivity in Supermarkets: A Case Study of Livingstone District, Zambia." The article has been developed specifically from the third study objective, which focused on identifying the challenges associated with the use of technology in supermarkets. The interpretations, findings and conclusions expressed in this article are those of the authors and do not necessarily represent the official views of Mulungushi University or the participating supermarkets.

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