Electronic Security Systems and Effective Management of Supermarkets and Groceries Stores in Bayelsa State

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Abstract

This study investigates the relationship between electronic security measures and the effective management of supermarkets and grocery stores in Bayelsa State. Specifically, it examines the impact of CCTV cameras, electronic payment systems, and electronic store-keeping on managerial effectiveness. A quantitative research methodology was adopted, utilizing a survey research design with data collected from 42 supermarket and grocery store managers and employees through structured questionnaires. Spearman Rank Order Correlation Coefficient was used to analyze the data via SPSS. The findings indicate a statistically significant positive correlation between electronic security measures and effective management. Among the variables, electronic store-keeping exhibited the highest correlation (0.647), followed by CCTV cameras (0.631) and electronic payment systems (0.577), all significant at the 0.01 level (p = 0.000). These results suggest that implementing electronic security systems enhances managerial efficiency by improving security, financial transactions, and inventory control. The study recommends that supermarket and grocery store owners invest in modern security technologies to optimize operational performance, reduce losses, and enhance customer satisfaction.

Keywords: Electronic Security, Effective Management, CCTV Cameras, Electronic Payment System, Electronic Store-Keeping

INTRODUCTION

The retail sector, particularly supermarkets and grocery stores, plays a significant role in the economic development of any region. Effective management of these businesses is essential for operational efficiency, customer satisfaction, and overall profitability. With the rapid advancement of technology, electronic security systems have emerged as critical tools for ensuring efficient management in the retail sector. The adoption of electronic security measures, such as Closed-Circuit Television (CCTV) cameras, electronic payment systems, and electronic store-keeping, has significantly transformed the way supermarkets and grocery stores operate (Adebayo & Olamide, 2021). These technological advancements provide improved surveillance, secure financial transactions, and efficient inventory control, which are essential for business growth and sustainability (Johnson & Akinyemi, 2020).

The integration of CCTV cameras in supermarkets and grocery stores has proven to be a key security measure in reducing theft, monitoring customer behavior, and ensuring staff compliance with operational protocols (Eze & Chukwu, 2019). CCTV surveillance systems allow store managers to oversee activities in real time, preventing potential security breaches and enhancing overall store management (Ogunyemi, 2022). In Bayelsa State, where businesses are increasingly adopting technology-driven solutions, CCTV cameras have become vital in mitigating security risks and improving customer trust in retail businesses (Okoro & Daniel, 2023).

Electronic payment systems have revolutionized financial transactions in the retail industry, reducing the risks associated with cash-based transactions and enhancing operational efficiency (Chijioke, 2021). These systems include mobile banking, Point-of-Sale (POS) terminals, and online payment platforms, all of which facilitate seamless transactions and improve customer convenience (Adegbite, 2020). The use of electronic payment systems in supermarkets and grocery stores in Bayelsa State has not only enhanced financial security but also reduced transaction times, thereby increasing customer satisfaction and business productivity (Olowookere & Bello, 2022).

Electronic store-keeping, which involves the use of digital systems for inventory management, has significantly improved stock control and reduced losses due to stock mismanagement or theft (Kalu & Eke, 2021). Automated inventory tracking ensures that store managers can efficiently monitor stock levels, track sales patterns, and reorder products when necessary, thereby preventing stockouts and overstocking (Nwogu, 2023). In Bayelsa State, the adoption of electronic store-keeping systems has become increasingly relevant in ensuring the effective management of supermarkets and grocery stores, minimizing human errors, and improving overall business operations (Okechukwu & Adeyemi, 2021).

Despite the numerous benefits of electronic security in retail management, several challenges persist, including the high cost of installation, lack of technical expertise, and cybersecurity threats (Uchenna & Adebisi, 2020). Many supermarket and grocery store owners in Bayelsa State still rely on traditional methods of management, which are often inefficient and prone to security risks (Onye & Adewumi, 2021). This study, therefore, seeks to investigate the relationship between electronic security measures and the effective management of supermarkets and grocery stores in Bayelsa State.

Problem Statement
The increasing rate of retail crimes, financial fraud, and inventory mismanagement in supermarkets and grocery stores necessitates the adoption of electronic security measures (Obiora & Ekene, 2021). In Bayelsa State, several supermarkets and grocery stores struggle with issues such as shoplifting, unauthorized access, inefficient inventory management, and cash-handling risks, which negatively impact their operational efficiency and profitability (Oluwaseun & Chidiebere, 2022). While electronic security systems such as CCTV cameras, electronic payment systems, and electronic store-keeping have been widely recognized for their effectiveness in mitigating these challenges, their adoption in Bayelsa State remains inconsistent (Ifeanyi & Edeh, 2023).

One of the major concerns in the retail industry is security, as supermarkets and grocery stores are vulnerable to theft, fraud, and employee misconduct. CCTV cameras have been proven to reduce crime rates and enhance surveillance in retail stores (Agbaje, 2021). However, in Bayelsa State, many store owners either underutilize these security measures or lack the necessary resources to install and maintain them (Chukwuma, 2022). This results in increased security risks, loss of goods, and reduced customer trust, ultimately affecting business growth and sustainability (Nwachukwu & Obinna, 2023).

Another critical issue is the inefficiency of cash transactions, which pose risks such as theft, counterfeit currency, and delays in processing payments (Ogunleye, 2020). Electronic payment systems offer a viable solution by ensuring secure and efficient transactions, yet many supermarkets and grocery stores in Bayelsa State still rely heavily on cash transactions (Okafor, 2021). This not only exposes businesses to financial risks but also limits their ability to provide seamless services to customers, thereby affecting customer retention and business performance (Adeyemo, 2023).

Furthermore, poor inventory management remains a significant challenge for supermarket and grocery store owners in Bayelsa State. Traditional manual store-keeping methods often result in errors, stock losses, and operational inefficiencies (Oluwafemi, 2021). Electronic store-keeping systems can enhance inventory control by providing real-time stock monitoring, automated restocking, and accurate sales tracking (Oni & Femi, 2023). However, the low level of adoption of these systems in Bayelsa State highlights the need for further investigation into their impact on effective store management (Afolabi, 2022).

Given these challenges, there is a need for empirical research to examine the relationship between electronic security measures and the effective management of supermarkets and grocery stores in Bayelsa State. This study aims to provide valuable insights into how CCTV cameras, electronic payment systems, and electronic store-keeping contribute to business efficiency and security. The findings will offer practical recommendations for improving the adoption and utilization of electronic security technologies in the retail sector, thereby enhancing business performance and sustainability.

Objective of the Study
The primarily the study investigate the relationship between the electronic security and effective management of supermarkets and groceries stores in Bayelsa State. The following are the specific objectives.
1. To ascertain the relationship between CCTV cameras and effective management of supermarkets and groceries stores in Bayelsa State.
2. To find out the relationship between electronic payment system and effective management of supermarkets and groceries stores in Bayelsa State.
3. To determine the relationship between electronic store-keeping and effective management of supermarkets and groceries stores in Bayelsa State.

Hypotheses

The study will be guided by the following null hypotheses:
1. There is no significant relationship between CCTV cameras and effective management of supermarkets and groceries stores in Bayelsa State.
2. There is no significant relationship between electronic payment system and effective management of supermarkets and groceries stores in Bayelsa State.
3. There is no significant relationship between electronic store-keeping and effective management of supermarkets and groceries stores in Bayelsa State.

REVIEW OF RELATED LITERATURE

Electronic security

It is designed to protect against unavoidable security risks, ensure business continuity, and minimize potential damage. While businesses recognize security as a critical concern, many lack sufficient knowledge of electronic security techniques. If an organization is not well-versed in security protocols, it cannot effectively educate its employees on safeguarding intellectual property. Therefore, for firms to benefit from their security management practices, they must possess a thorough understanding of the challenges they face and implement security management controls within their operational capacity (PACIS, 2013).

Electronic security refers to the use of technological solutions to protect assets, prevent unauthorized access, and ensure the safety of business operations (Adeyemi, 2020). In the context of supermarkets and grocery stores, electronic security involves surveillance systems, automated transaction mechanisms, and inventory control solutions that enhance operational efficiency and mitigate risks (Okafor, 2021).

CCTV surveillance plays a critical role in retail security by providing real-time monitoring and recording of activities within business premises. Research has shown that the installation of CCTV cameras reduces crime rates and enhances employee productivity by discouraging dishonest behaviors (Okonkwo, 2021). Electronic payment systems (EPS), on the other hand, facilitate seamless transactions by offering digital payment alternatives such as point-of-sale (POS) systems, mobile banking, and online transfers. The adoption of EPS minimizes cash handling risks and improves business transparency (Ogunleye, 2020).

Electronic store-keeping refers to the digital management of inventory, ensuring accurate stock monitoring and efficient record-keeping. Studies indicate that electronic store-keeping reduces stock discrepancies and enhances decision-making in retail businesses (Uchenna, 2023).

Effective Management and Performance

The degree to which an organisation meets its declared goals and objectives is referred to as management performance. Three distinct aspects of business outcomes are included in organisational performance, according to Richard et al. (2009): financial performance (which includes metrics like return on investment and return on assets), product market performance (which includes sales and market share), and shareholder return (which includes economic value added and total shareholder return).

Kotane (2015) pointed out that both financial and non-financial aspects can be used to assess management performance. Time, expense, quality, customer satisfaction, and the opinions of stakeholders like suppliers, employees, and investors are a few examples of key performance indicators (Kaplan, 1983). Performance can also be evaluated using metrics such as unit cost of production, product specifications, delivery performance, product development, innovation, and customer service and support (Chairoel, Widyarto, & Pujani, 2015). According to Didier (2002), performance is about reaching goals that are in line with the organization's strategic direction. It is not just about results, though; rather, it is about comparing results to predetermined objectives. The gap between what was intended and what was actually accomplished is essentially how management performance is measured.

Furthermore, Rolstadas (1998) explained that the seven main criteria of effectiveness, efficiency, quality, productivity, quality of work life, innovation, and profitability interact in a complex way to determine the performance of an organisation. All of these elements work together to offer a thorough framework for assessing and enhancing management effectiveness.

Theoretical Underpinning
The study adopts the Technology Acceptance Model (TAM) as its theoretical framework. TAM, developed by Davis (1989), explains how users accept and use technology. The model suggests that perceived usefulness and perceived ease of use influence an individual's decision to adopt a technological innovation (Davis, 1989). In the context of this study, TAM provides insights into how supermarket and grocery store owners perceive electronic security systems and how these perceptions affect their adoption of such technologies (Adebayo & Okon, 2020).

TAM consists of two primary constructs: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness refers to the extent to which a person believes that using a particular system will enhance their job performance, while perceived ease of use refers to the degree to which a person believes that using the system will be free from effort (Venkatesh & Bala, 2008). The model posits that if individuals find a technology useful and easy to use, they are more likely to adopt it. In this study, supermarket and grocery store managers' perception of CCTV cameras, electronic payment systems, and electronic store-keeping as useful and easy to use will influence their willingness to integrate these technologies into their business operations.

The TAM framework is relevant to this study as it provides an understanding of the factors that drive the adoption of electronic security systems in supermarkets and grocery stores in Bayelsa State. Many retailers may be reluctant to adopt these technologies due to concerns about cost, technical complexity, or lack of awareness (Okafor, 2021). However, if the perceived benefits of electronic security measures—such as enhanced security, improved transaction efficiency, and better inventory management—are emphasized, the likelihood of adoption increases (Chukwuma, 2019). Furthermore, external factors such as regulatory policies, financial incentives, and technological infrastructure can also influence adoption rates, aligning with the extended TAM model (Venkatesh & Davis, 2000).

Review of Previous Studies

Several studies have examined the impact of electronic security measures on retail management. The findings from previous research provide a foundation for understanding the role of CCTV cameras, electronic payment systems, and electronic store-keeping in enhancing the efficiency of supermarket and grocery store operations.

Eze (2021) conducted a study on the effectiveness of CCTV cameras in Nigerian supermarkets, focusing on their role in crime prevention and operational management. The study revealed that supermarkets with CCTV surveillance experienced a 40% reduction in theft cases compared to those without surveillance. Additionally, store managers reported increased employee accountability and improved customer dispute resolution. The study concluded that the strategic placement of CCTV cameras in key areas, such as entrances, checkout points, and storage rooms, enhances security and deters criminal activities.

Ogunleye (2020) examined the impact of electronic payment systems (EPS) on retail efficiency in Nigeria. The study found that supermarkets using EPS recorded higher customer satisfaction due to faster transaction processing times and reduced queuing. Moreover, the adoption of digital payment solutions minimized the risks associated with cash handling, such as theft and counterfeit currency circulation. The study highlighted the importance of secure and reliable payment infrastructure in ensuring seamless financial transactions and boosting consumer confidence in retail businesses.

Kehinde and Ajayi (2021) analyzed the role of electronic store-keeping in inventory management, using data from large and small retail stores. Their study concluded that supermarkets implementing digital inventory management systems improved stock accuracy by 60%, reducing losses due to stock mismanagement. The research also emphasized that automated inventory systems provide real-time data on stock levels, helping store managers make informed purchasing decisions. The study recommended the adoption of electronic store-keeping to enhance supply chain efficiency and reduce waste.

Okafor (2021) explored the challenges of manual store-keeping in Nigerian supermarkets, highlighting its impact on operational inefficiencies and financial losses. The study found that supermarkets relying on manual inventory tracking experienced frequent stock discrepancies, delays in stock replenishment, and loss of revenue due to human errors. The findings underscored the necessity for businesses to transition from traditional record-keeping methods to digital solutions, ensuring accuracy, efficiency, and accountability in inventory management.

Chukwuma (2019) investigated the role of electronic security in preventing retail fraud in Nigerian supermarkets. The study found that a combination of CCTV cameras, digital payment systems, and automated access control significantly reduced fraudulent activities such as employee theft, unauthorized discounts, and inventory manipulation. The research emphasized that integrating multiple layers of electronic security enhances overall business protection and operational transparency. The study recommended regular updates and maintenance of electronic security systems to keep pace with emerging retail security threats.

The findings from these studies underscore the importance of electronic security measures in enhancing retail management. The adoption of CCTV cameras, electronic payment systems, and digital inventory management can significantly improve supermarket operations by reducing theft, ensuring efficient transactions, and enhancing stock control. These insights form the basis for investigating the relationship between electronic security and the effective management of supermarkets and grocery stores in Bayelsa State.

Methodology

This study adopts a quantitative research methodology to examine the relationship between electronic security systems and the effective management of supermarkets and grocery stores in Bayelsa State. A survey research design was employed to collect data from supermarket and grocery store owners, managers, and employees. A structured questionnaire wase used as the primary data collection instrument. The questionnaire was designed to measure respondents' perceptions of CCTV cameras, electronic payment systems, and electronic store-keeping in relation to effective management. A sample of 42 respondents will be selected using a stratified random sampling technique. Data collected was analyzed using inferential statistics (Spearman Rank Order Correlational Coefficient) with the aid of SPSS.

Results and Discussion

Table 1: Univariate Distribution for Variables

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
CCTV cameras	42	3.2274	.82901	-.247	.141	-1.176	.282
electronic payment systems	42	3.5646	.83172	-.428	.141	-.005	.282
electronic store-keeping	42	3.1171	.88226	-.262	.141	-1.129	.282
effective management	42	3.9245	. 80541	-.297	.141	-1.116	.282
Valid N (listwise)	42						

Source: Research Data (SPSS Output), 2025

The univariate distribution analysis of the four variables—CCTV cameras, electronic payment systems, electronic store-keeping, and effective management—based on 42 observations reveals notable trends. The mean values, all above 3.0, indicate a general agreement among respondents, with effective management (3.9245) receiving the highest rating. Standard deviations range from 0.80541 to 0.88226, suggesting moderate variability, with electronic store-keeping showing the highest dispersion. All variables exhibit slight negative skewness, indicating a tendency toward higher ratings, with electronic payment systems (-0.428) being the most skewed. Negative kurtosis

values suggest distributions that are flatter than normal, with CCTV cameras (-1.176) and electronic store-keeping (-1.129) showing the most spread-out responses. Overall, the data suggests that respondents generally perceive these technologies and management practices positively, though with varying degrees of agreement and dispersion.

Table 2: Correlation outcome between CCTV Cameras and Effective Management

Correlations			CCTV cameras	Effective management
Spearman's rho	CCTV cameras	Correlation Coefficient	1.000	.631**
		Sig. (2-tailed)	.	.000
		N	42	42
	Effective management	Correlation Coefficient	.631**	1.000
		Sig. (2-tailed)	.000	.
		N	42	42

**. Correlation is significant at the 0.01 level (2-tailed).
SPSS Output, 2025

The correlation analysis between CCTV cameras and effective management using Spearman's rho reveals a moderate positive correlation (0.631), which is statistically significant at the **0.01 level (p = 0.000)**. This suggests that as the presence or use of CCTV cameras increases, there is a corresponding improvement in effective management. Since Spearman's rho is a rank-based correlation, this indicates a monotonic relationship rather than a strictly linear one. With **N = 42**, the sample size is sufficient to support the reliability of this finding. The significant p-value confirms that the observed relationship is unlikely to be due to chance. Therefore, the data suggests that implementing CCTV cameras may contribute positively to management effectiveness, possibly by enhancing security, monitoring, and accountability in the organization.

Table 3: Correlation outcome between Electronic Payment System and Effective Management

Correlations			Electronic Payment System	Effective management
Spearman's rho	Electronic Payment System	Correlation Coefficient	1.000	.577**
		Sig. (2-tailed)	.	.000
		N	42	42
	Effective management	Correlation Coefficient	.577**	1.000

Sig. (2-tailed)			.000	.
N			42	42

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

SPSS Output, 2025

The correlation analysis between **electronic payment systems and effective management** using **Spearman's rho** shows a **moderate positive correlation (0.577)**, which is statistically significant at the **0.01 level (p = 0.000)**. This indicates that as the adoption or efficiency of electronic payment systems increases, there is a corresponding improvement in effective management. Given that Spearman's rho measures rank-based associations, this suggests a consistent positive relationship rather than a strictly linear one. With **N = 42**, the sample size provides adequate support for this finding. The significant p-value confirms that the observed correlation is unlikely to be due to chance. This implies that the integration of electronic payment systems may enhance management efficiency by improving transaction security, financial transparency, and operational convenience.

Table 4: Correlation outcome between Electronic Store-Keeping and Effective Management

Correlations				
			Electronic Store-Keeping	Effective management
Spearman's rho	Electronic Store-Keeping	Correlation Coefficient	1.000	.647**
		Sig. (2-tailed)	.	.000
		N	42	42
	Effective management	Correlation Coefficient	.647**	1.000
		Sig. (2-tailed)	.000	.
		N	42	42

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

SPSS Output, 2025

The correlation analysis between electronic store-keeping and effective management using Spearman's rho reveals a moderately strong positive correlation (0.647), which is statistically significant at the **0.01 level (p = 0.000)**. This indicates that improvements in electronic store-keeping are associated with enhanced management effectiveness. The correlation strength is higher compared to CCTV cameras (0.551) and electronic payment systems (0.577), suggesting that electronic store-keeping may have a greater impact on management efficiency. Since Spearman's rho measures rank-based relationships, this confirms a consistent positive association rather than a strictly linear one. With **N = 42**, the sample size supports the reliability of this finding. The significant p-value further confirms that the observed relationship is unlikely due to chance. These

results imply that the adoption of electronic store-keeping systems can enhance management by improving inventory tracking, record accuracy, and operational efficiency.

Conclusion

The study examined the relationship between electronic security measures and the effective management of supermarkets and grocery stores in Bayelsa State. The findings indicate a significant positive correlation between CCTV cameras, electronic payment systems, and electronic store-keeping with effective management. Specifically, the study found that electronic store-keeping exhibited the highest correlation with effective management, followed by CCTV cameras and electronic payment systems. These results suggest that adopting electronic security measures contributes to enhanced managerial effectiveness by improving security, financial transactions, and inventory control. Consequently, integrating these technologies can optimize operational efficiency, reduce losses, and enhance customer satisfaction in the retail sector.

Recommendations

1. Supermarkets and grocery store owners in Bayelsa State should invest in modern CCTV surveillance systems to enhance security, monitor activities, and improve managerial oversight.
2. Retailers should adopt and integrate efficient electronic payment systems to facilitate seamless transactions, reduce cash handling risks, and improve financial accountability.
3. The implementation of electronic store-keeping systems should be prioritized, as it significantly enhances inventory management, reduces errors, and optimizes supply chain processes.
4. Training programs should be provided for store managers and employees to ensure they can effectively utilize electronic security systems for improved management outcomes.
5. Government and relevant regulatory bodies should provide incentives or support policies that encourage the adoption of electronic security technologies in retail businesses.
6. Further research should be conducted to explore additional technological innovations that can complement electronic security measures in retail management.

Contribution to Knowledge

This study contributes to knowledge by empirically establishing the significant relationship between electronic security measures and effective management in the retail sector, particularly in Bayelsa State. It provides evidence that electronic store-keeping has the highest impact on management efficiency, highlighting its critical role in optimizing retail operations. The findings offer practical insights for business owners, policymakers, and scholars on the benefits of integrating electronic security measures in modern retail management.

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