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Enterprise Resource Planning Systems and Organizational Sustainability of Major Retail Supermarkets in Nairobi City County, Kenya

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Abstract

Operationally driven ERP modules can directly influence organizational sustainability goals, such as reducing waste, improving efficiency, and engaging stakeholders, and these are especially crucial in retail and supply-chain-heavy organizations. The study's objectives were: to identify the level of ERP systems utilization, and to establish the influence of the ERP systems on organizational sustainability of major supermarkets in Nairobi City County, Kenya. Descriptive research design was employed and primary data was collected. A census was conducted. Descriptive and inferential statistics were used to analyze data. The ERP systems was operationalized by four ERP modules, procurement management, quality management, sales and distribution management, inventory and material management, and customer relationship management. Organizational sustainability was measured by economic, social, and environmental sustainability. From the findings, all the ERP modules were utilized from moderate to a great extent. The results indicated a statistically significant positive effect of the ERP systems on organizational sustainability. The study recommends implementation of ERP systems for greater organizational sustainability.

Keywords: *Enterprise Resource Planning Systems, Organizational Sustainability, Major Retail Supermarkets, Kenya*

1. Introduction

In the face of increasingly frequent and unpredictable global supply chain disruptions, prudent supply chain management has emerged as a critical enabler of organizational sustainability and long-term success. The integration of resilience-focused strategies into supply chain operations is now regarded as essential for maintaining continuity, enhancing adaptability, and achieving sustainable performance outcomes in dynamic business environments (Mathiyazhagan, Majumdar, & Appolloni, 2023; Manurung, Yudoko, & Okdinawati, 2023; Sunmola & Lawrence, 2024). To ensure longevity of operations, organizations continue to adopt management systems that produce socially responsible actions to guarantee future existence (Qutaishat et al., 2023). Enterprise Resource Planning (ERP) is one of the management systems adopted by organizations to streamline planning and operations, provide cost savings and improve organizational growth in general (Mohamed & Farahat, 2020). The ERP systems in retail supermarkets include modules used in procurement management, inventory management, customer relationship management,

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distribution management and quality management (Ali & Miller, 2017; Shatat & Udin, 2012). Alongside the system, sustainability concept has also become a major focus for management across the globe in the last decade. For the support of organizational sustainability, it is also necessary to apply optimized resource allocation models (Olaleye et al., 2024; Cesar, 2017). As stated by Singh et al., (2022) maintaining a balanced equation between the supplies needs and competences is crucial. Thus, the effectiveness of executing purchasing, warehousing, customer experience and inventory functions directly impacts sustainable organizational performance (Firera et al., 2024).

The ERP systems incorporate key operational modules such as procurement, inventory, quality control, sales and distribution, and Customer Relationship Management (CRM) that are instrumental in promoting sustainability, particularly in retail and supply chain-focused industries (Xu, Ou, & Fan, 2017). These modules help organizations minimize waste, optimize resources, and improve customer and supplier engagement. Shatat and Udin (2012) emphasize that ERP systems enhance procurement and inventory efficiency within the retail sector, leading to better supply chain performance. Likewise, Ali and Miller (2017) note that functions like CRM and quality management play a central role in streamlining business operations. Additional research further supports that these ERP capabilities contribute significantly to sustainable business practices through improved integration and responsiveness across supply chains (Molla & Heeks, 2007; Gunasekaran & Ngai, 2004). Organizational sustainability is typically evaluated across three core dimensions: economic, social, and environmental. Economic sustainability addresses long-term profitability and resource optimization; social sustainability involves promoting employee welfare, equity, and community engagement; and environmental sustainability focuses on minimizing ecological harm through sustainable practices. These dimensions form a comprehensive framework for assessing an organization's sustainable impact and are widely adopted in both academic and industry settings (Olaleye et al., 2024; Cesar, 2017; Searcy, 2016; Purvis, Mao, & Robinson, 2019).

The study was anchored on the Resource-Based View (RBV), proposed by Penrose (1959) and Technology-Organization-Environment (TOE) Framework that was formulated by Drazin (1991). The RBV posits that organizations should possess and utilize exceptional internal resources

to achieve a competitive advantage (Kellermanns et al., 2016). This theory was used in the study to illustrate how unique resources owned and controlled by an enterprise can potentially generate competitive advantage when properly and systemically planned and managed. The TOE is a framework that provides an understanding of the degree to which new technologies such as the ERP systems, processes, or practices are adopted by an organization (Oliveira & Martins, 2011). This theory was therefore used to explain the level of ERP adoption among retail supermarkets in Kenya. In the global perspective, implementation of ERP systems has become a crucial and a strategic priority for many organizations that are looking to improve their operational efficiency, streamline operations, and remain competitive in an increasingly complex business environment (Rahman et al., 2022; Laudon & Laudon, 2020). The global retail sector has seen a surge in the adoption of ERP modules to respond to the challenges of managing the complex supply chains, meeting customer demands, and aligning with changing sustainability goals (Sahoo et al., 2022; Elragal et al., 2020).

Most retail supermarkets in Kenya are faced with the ever-present challenges of inventory management, communication challenges, resource utilization planning, among others (Firera et al., 2024). Managers of these firms are constantly looking for strategies to achieve efficiency and guarantee the long-term success of the supermarkets. Implementation of operational ERP modules has been identified to provide benefits such as increased employee productivity, efficient process flows, cost minimization and improved customer service in other organizations (Elly & Wilson, 2022). The ERP systems enable companies to strategically plan and centrally coordinate their operations and service delivery (Ramadan & Hashim, 2023). The ERP systems are comprehensive, configurable information systems that integrate internal and external management information across an entire organization, typically encompassing finance, human resources, supply chain, and operations (Dezdar & Sulaiman, 2009). Implementation of ERP systems enables firms to standardize processes, improve data accuracy, and support operational efficiency, which are key components in achieving sustainable performance (Haddara & Elragal, 2015). According to Vargas and Comuzzi, (2020), ERP is an automated system that ensures centralized control for both internal and external management data across an entire firm. It encompasses functions like finance and accounting, supply chain, sales and service, human capital management, and customer

relationship management. In this study, the definition by Vargas and Comuzzi, (2020) was adopted since it covers both internal and external stakeholders.

Retail supermarkets have played a pivotal role in transforming Kenya's retail sector by expanding modern retail formats and increasing access across income groups in Nairobi. Studies demonstrate that as supermarkets penetrated urban markets, they began serving not just upper-income consumers but also lower-income households, shifting at least one-fifth of food retail from informal to formal channels and influencing food consumption patterns across income strata (Neven, Reardon, Chege, & Wang, 2008). The activities include fostering partnerships with local suppliers, promoting locally sourced products to support the economy, and actively engaging with communities through corporate social responsibility programs. Notably, these supermarkets have been a champion of sustainability practices, focusing on waste reduction, energy conservation, and responsible sourcing of products. These efforts align with global trends towards environmentally conscious business practices and reflect the retailer's commitment to social and environmental responsibility (Gonzalez-Torre & Jorge, 2017). Supermarkets in Kenya are characterized by their convenience, wide product variety, competitive pricing, and emphasis on quality and customer experience (Kiarie, Wanjiku, & Muturi, 2018; Nduguli, 2013). The supermarkets are also classified according to their sizes in terms of number of branches or revenue turnover. Some of the major supermarket chains in Nairobi include Naivas, QuickMart, Cleanshelf, Chandarana, Eastmatt, and Carrefour. The success of these retail giants can be attributed to the commitment to offering affordable yet high-quality products, innovative marketing strategies, efficient supply chain management, and ongoing investment in store infrastructure and technology (Martinez-Garcia et al., 2021). Understanding how adoption of the operational ERP modules by the major supermarkets would influence the sustainability of the chain stores was the focus interest of the researchers.

1.2 Research Problem

The increasing complexity of operations due to rapid expansion, diverse product offerings, and the ever rising need for efficient and effective management of resources and supplies in order to ensure efficiency and sustainability of operations, is a wake-up call for retailers (Galkin et al., 2022). This informs the need for the integrated ERP systems that can eliminate inefficiencies, data silos, and

difficulty in decision-making processes that hinder retail supermarkets the ability to achieve optimal performance and sustainability (Hove-Sibanda et al., 2021). Empirical literature points to the nexus between adoption of ERP and organizational sustainability, both globally and in the region. At the global scene, Elragal et al., (2020) noted that organizations across diverse sectors have recognized the potential of ERP systems to optimize resource utilization, minimize operational risks, and foster sustainable practices. Qutaishat et al., (2023) in Jordan found that ERP systems drive businesses towards growth and sustainability. Similarly, Juma and Sequeira, (2017) found that ERP implementation influenced financial, human resources, supply chain and marketing performance of state corporations in Kenya. Rono, (2020) in a study that assessed the ERP adoption and productivity of leading retail chains in Nairobi County, Kenya found out that firms that implement operational ERP modules tend to experience improved financial results, enhanced organizational learning and development, more efficient internal workflows, and better customer service outcomes. Additionally, Wandera et al., (2018) when focusing on the effect of ERP systems on the performance of supermarkets in Bungoma County, Kenya found that the ERP modules had a strong positive correlation with performance. It is evident therefore, that there exists a contextual gap for operational ERP module and organizational sustainability that needs to be addressed. This points to the existence of a conceptual gap that this study sought to fill by introducing the variable of organizational sustainability of the major supermarket in Nairobi City County.

From the studies reviewed, there is limited focus on the sustainability of major retail supermarkets in Nairobi City County in Kenya. Organizational sustainability within Kenya's FMCG supermarket chains involves adopting long-term strategies that balance profitability, environmental stewardship, and social responsibility to remain competitive in a volatile retail market. These firms are increasingly pressured to align their supply chain practices with sustainability goals due to rising consumer awareness, regulatory demands, and resource constraints (Beske & Seuring, 2014). Achieving sustainability in this sector requires operational efficiency, responsible sourcing, and resilience to disruptions, which collectively enhance long-term performance (Sroufe & Gopalakrishna- Remani, 2019). While some large retail chains in Kenya have adopted ERP systems, the extent to which these systems contribute to sustainable retail practices remains an underexplored terrain (Kiarie, et al. 2018). There is limited research

that exists on how operational ERP modules adoption aligns with and enhances organizational sustainability efforts within the Kenyan retail sector. Factors such as supply chain complexities, technological infrastructure, and regulatory frameworks contribute significantly to the unique operational challenges faced by Kenyan retailers (Kazungu & Nzulwa, 2021; Gatherer & Maina, 2020). The aim of this study was to assess the influence of operational ERP modules implementation on organizational sustainability of major retail supermarkets in Nairobi City County, Kenya. Two specific objectives guided the study: To determine the level of adoption of ERP systems, namely operational ERP modules; and to establish the influence of the ERP Systems on organizational sustainability of major retail supermarkets in Nairobi City County, Kenya.

2. Empirical Literature

Enterprise Resource Planning (ERP) systems have gained prominence as critical enablers of organizational sustainability, particularly in retail sectors such as supermarket chains, where operational efficiency, inventory control, and customer responsiveness are essential. In Kenya, supermarkets have increasingly turned to ERP systems to address persistent challenges related to fragmented supply chains, stock wastage, and manual business processes. Empirical evidence shows that ERP adoption contributes to streamlined operations and improved sustainability outcomes in various contexts. In a study conducted in Nairobi, Rono (2020) established that ERP systems had a strong positive effect on operational performance among large supermarkets. The study reported significant improvements in procurement coordination, inventory accuracy, and financial management, all of which contributed to long-term sustainability by reducing inefficiencies and waste. Similarly, Wandera et al. (2018) assessed ERP implementation among supermarkets in Bungoma County and found a direct linear relationship between ERP uses and enhanced organizational performance, with notable benefits in areas such as resource utilization, inventory management, and reporting. Their findings underscore the role of ERP in driving sustainability by supporting data-informed decision-making and resource optimization.

Expanding within East Africa, Gikonyo and Wanyoike (2016) examined the influence of ERP systems on the performance of manufacturing and retail firms in Kenya and Rwanda. Their study showed that ERP systems significantly improved operational integration and reduced duplication of efforts across departments. These findings highlighted ERP's potential in enhancing not just

efficiency but also environmental and economic sustainability through reduced paper usage, better forecasting, and lean operations. Additionally, Musyoki and Kamau (2021) studied supermarket chains in Nairobi and concluded that ERP adoption facilitated timely stock replenishment and optimized logistics, thereby lowering spoilage and transportation-related emissions—key indicators of sustainability. Regionally, Muteshi and Wekesa (2023) analyzed the role of ERP systems in supporting sustainable procurement practices in Uganda’s retail sector. Their results indicated that ERP systems enabled supermarkets to manage supplier relationships better, ensure timely deliveries, and adhere to sustainability compliance standards. This outcome was particularly important for supermarkets sourcing fresh produce and perishable items, where ERP-enabled supply chain visibility helped reduce waste and align procurement with sustainable sourcing goals. Globally, similar trends have been observed. Tarigan, Siagian, and Jie (2021) found that ERP systems had a significant positive effect on green supply chain management (GSCM) practices among Asian firms. Their study emphasized ERP’s ability to enhance data visibility, improve supplier collaboration, and monitor environmental performance, all of which support sustainability objectives. Qureshi (2022), working with Indonesian firms, reported that ERP systems enabled integration of sustainability indicators into decision-making processes and improved environmental outcomes by enabling energy efficiency, waste reduction, and sustainable inventory control. Moreover, a study by Osama and Kassem (2020) in Egypt revealed that ERP implementation helped supermarket retailers comply with environmental regulations and optimize resource consumption. Their findings showed that ERP-supported decision-making led to reduced electricity consumption, better inventory planning, and enhanced customer service, all contributing to both environmental and social dimensions of sustainability. In another cross-country study by Danese et al. (2018), ERP systems were shown to be instrumental in aligning operational practices with broader corporate sustainability goals, particularly in multinational retail chains, by standardizing reporting, reducing process redundancies, and improving traceability.

These empirical insights collectively suggest that ERP systems serve as both operational and strategic tools for promoting sustainability in supermarket chains. By improving internal processes, enhancing supply chain visibility, and supporting data-driven sustainability reporting, ERP systems create a strong foundation for long-term viability in retail businesses. This is

particularly relevant in Kenya's fast-growing FMCG sector, where competition, regulatory compliance, and environmental stewardship are becoming increasingly intertwined. Despite the documented benefits, some gaps remain. Few studies have been conducted to assess the long-term sustainability impact of ERP systems in the retail sector, especially within African contexts. Moreover, research often focuses on operational performance without adequately linking ERP systems to broader sustainability frameworks. This presents an opportunity for further empirical inquiry into how ERP deployment, specifically, operational ERP modules, influence environmental, social, and economic outcomes of organizations, particularly in the unique operating environments of Kenyan supermarket chains.

2.1 Conceptual Framework

The independent variable of the study was the ERP systems which was operationalized by five operational ERP modules, namely procurement management, quality management, sales and distribution management, inventory and materials management, and customer relationship management. The dependent variable was organizational sustainability and was measured by three sub-constructs namely economic sustainability, social sustainability and environmental sustainability. The relationship among these study variables is depicted in the conceptual model below:

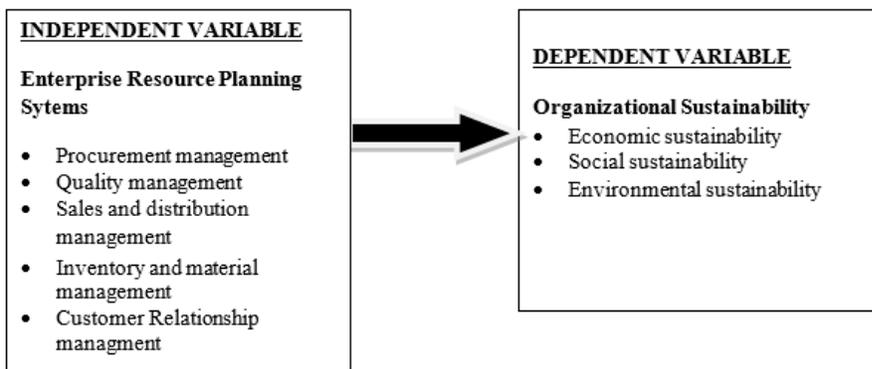


Figure1: Conceptual Model

3. Research Methodology

A descriptive research design was applied as it describes the object of the research, status, actions or the phenomenon rather than the reasons why it occurs (Thomas & Zubkov, 2023). According to the Ministry of Trade, Industry and Investment (2024), there are 6 major supermarkets operating in Nairobi City County. Thus a census was conducted, picking on the general manager, heads of SCM, ICT and Operations, due to study variables, making 24 number of respondents. Primary data was collected using a semi-structured questionnaire. A 75% response rate was achieved. A Response rate of 70% or higher is generally considered very good in survey research and indicate a strong level of data representativeness (Babbie, 2020). The data was analyzed using the descriptive and inferential statistics.

4. Study Findings

4.1 Results of the descriptive analysis are as shown below:

From the first objective on the level of the operational ERP modules utilization among major Supermarkets in Nairobi City County, a summary was achieved as shown in Table 1.

Table 1: Utilizations of Operational ERP Modules

S/no.	ERP Module	Overall Mean	Std. Dev.	Ranking
1.	Procurement management	3.85	0.42	1
2.	Quality management	3.08	0.75	5
3.	Sales and distribution management	3.40	0.76	4
4.	Inventory and material management	3.45	0.73	3
5.	Customer relationship management	3.52	0.53	2

Based on a 5-point Likert scale, where 1 = Strongly Disagree, and 5 = Strongly Agree, the results suggest that the respondents generally agreed or leaned positively on the measured parameters. The ERP module most utilized was therefore procurement management, while quality management was the least utilized operational ERP module by the major supermarkets in Nairobi City County, Kenya.

4.2 Results of the regression analysis are as shown below:

To assess the nature and strength of the relationship between the operational ERP modules implementation and organizational sustainability, multiple regression analysis was conducted. This included examination of the regression model summary, Analysis of Variance (ANOVA) to test the overall significance of the model, and Pearson correlation coefficients to determine the linear associations between ERP practices and sustainability outcomes within supermarket chains.

Table 2: Regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.866	0.750	0.718	0.464

- a. Predictors: Procurement management, quality management, sales and distribution management, inventory and material management, customer relationship management
- b. Dependent Variable: Organizational Sustainability

From Table 2, the data indicates that 75% of variation is organizational sustainability was explained by variation in ERP systems usage, indicating a strong relationship.

Table 3: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig
1 Regression	81.56	5	16.31	7.18	0.000
Residual	27.25	12	2.27		
Total	108.81	17			

- a. Predictors: (constant) procurement management, quality management, sales and distribution management, inventory and material management, customer relationship management
- b. Dependent Variable: Organizational Sustainability

From table 3, the model was a strong model for establishing relationship between ERP systems and organizational sustainability as indicated by a significance value less than 5% ($p < 0.05$).

Table 4: Correlation Coefficients

Model	Unstandardized Coefficients		Standard Coefficients	t	Sig
	B	Std. Error	Beta		
1 (Constant)	1.80	0.78		2.31	0.037
Procurement Management	0.25	0.07	0.31	3.57	0.003
Quality management	0.19	0.08	0.24	2.38	0.032
Sales and distribution management	0.22	0.09	0.28	2.44	0.028
Inventory and material management	0.10	0.10	0.13	1.00	0.337
Customer relationship management	0.32	0.09	0.36	3.56	0.003

a. Dependent Variable: Organizational Sustainability

Source: Authors own

From table 4, except inventory and material management ERP modules, which was positive but not significant, other ERP modules were positive and significant in defining organizational sustainability.

Therefore, the resultant study regression model from the findings is of the form:

$$y=1.80 + 0.25x_1 + 0.19x_2 + 0.22x_3 + 0.32x_5;$$

Where: y = organizational sustainability

x₁ = procurement management

x₂ = quality management

x₃ = sales and distribution management

x₅ = customer relationship management.

4.3 Discussion of Study Findings

The analysis of the ERP systems in the study show that the operational ERP modules were utilized from great to a moderate extent. The most widely utilized ERP module was procurement management while the least utilized was quality management as indicated by their overall means. As for the influence of ERP systems utilization on organizational sustainability, a coefficient of determination, R-Square of 0.750 was identified, revealing ERP usage as a strong predictor of organizational sustainability. This indicated that 75% of variation in organizational sustainability was explained by variation in ERP systems usage, indicating a strong relationship. The study found a positive correlation between the ERP systems and organizational sustainability of major

supermarkets in Nairobi County. Inventory and materials management was positive but not significant. The model was a strong model for establishing relationship between ERP systems and organizational sustainability as indicated by a significance value less than 5% ($p < 0.05$). This finding collaborates with Wandera et al (2018) who established a strong correlation between ERP implementation and performance of supermarkets in Bungoma County, Kenya. Additionally, the results aligns with Mbago and Mogikoyo (2024), whose focus was on East Africa Supermarkets. On the theoretical backing anchored on the RBV, the ERP systems presents an opportunity for investing resources on technologies and activities that can build business capabilities and can give the supermarkets competitive advantages like efficiency and environmental excellence.

5 Conclusions

The findings of this study indicate that major supermarkets in Nairobi City County implement core enterprise resource planning (ERP) functionalities—namely procurement management, quality assurance, sales and distribution management, inventory and materials control, and customer relationship management—at moderate to high levels. These functional modules play a critical role in streamlining operations and enhancing process efficiency across the retail value chain. Moreover, the regression analysis revealed a strong and statistically significant relationship between ERP system utilization and organizational sustainability outcomes, as evidenced by a coefficient of determination (R^2) value of 0.750. This suggests that approximately 75% of the variation in sustainability performance among the surveyed supermarkets can be attributed to their ERP system deployment. These results underscore the strategic value of ERP systems in driving sustainable operational practices within Kenya's retail sector.

5.1 Recommendations

The study recommends that supermarkets should increase the adoption of ERP systems to realize the full benefits of ERP implementation. Since supermarkets face serious challenges with inventory management, managers should consider integrating inventory management with ERP for effective and efficient inventory management which is crucial for sustainability of retail supermarkets. Based on the findings that ERP systems strongly influence organizational sustainability, the study recommends that supermarkets in Nairobi City County should fully implement ERP systems to achieve organizational sustainability of their business activities. The

ERP systems have been empirically shown to support supply chain optimization and waste reduction, leading to enhanced operational efficiency and environmental performance when integrated with green supply chain management practices (Acar, Zaim, Isik, & Calisir, 2017).

5.2 Suggestions for Future Research

The study focused on major supermarkets in Nairobi City County, Kenya. As such, future research should focus on all supermarkets in Kenya, in order to obtain more generalizable results. Besides, the findings revealed that 25% of change in organizational sustainability was explained by factors other than the operational ERP modules utilization. Future research should therefore focus on examining other factors that affect organizational sustainability of major supermarkets in Kenya. A similar study should be conducted in other regions for comparison and further generalization of findings.

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