

**ENTERPRISE RESOURCE PLANNING AND BUSINESS  
OPERATIONS OF SMALL AND MEDIUM ENTERPRISES IN  
NAIROBI - KENYA**

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## DECLARATION

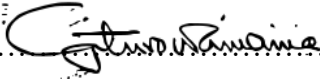
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## **DEDICATION**

This project is dedicated to my son, Taji, the Omino Family and my dedicated colleagues whose unending support and encouragement have been a constant source of strength during this research period.

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## **ABBREVIATIONS AND ACRONYMS**

ANT	Actor Network Theory
CIO	Chief Information Officer
CRM	Customer Relationship Management
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
ICT	Information and Communications Technology
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
NCCG	Nairobi City County Government
SBO	Sustainable Business Operations
SME	Small and Medium Enterprise

## **ABSTRACT**

The Enterprise Resource Planning (ERP) systems have gained significant attention in recent years as a means to enhance business operations and competitiveness, particularly for Small and Medium Enterprises (SMEs). This study aimed to assess the trend and extent of ERP adoption among SMEs, determine the challenges experienced by SMEs, and establish the relationship between these challenges and Sustainable Business Operations (SBOs) benefits derived from ERP implementation. A mixed-methods approach was employed in the study, combining a comprehensive literature review with a structured online questionnaire administered to a sample of SMEs in Nairobi, Kenya. The questionnaire covered various aspects of ERP adoption, including adoption trends, business challenges faced, and benefits experienced by the organizations after ERP adoption. The data collected was analysed using descriptive statistics, correlation analysis, linear regression analysis, and comparative analysis. The findings revealed that ERP adoption among SMEs in Nairobi is steadily increasing, with a significant number of organizations implementing ERP systems to streamline their business operations. The study identified several challenges encountered by SMEs, including regulatory compliance challenges, resource constraints challenges, organizational culture challenges and supply chain complexity challenges. Furthermore, a strong relationship was observed between overcoming these challenges and reaping SBOs through ERP implementation. These findings contribute to the existing body of knowledge on ERP adoption in SMEs by shedding light on the specific challenges faced by SMEs in Nairobi and their impact to business operations derived from ERP implementation. The implications of the research findings are twofold - firstly, they provide valuable insights for SMEs considering ERP adoption, enabling them to anticipate and address potential challenges to enhance the success of their implementation projects. Secondly, the findings offer guidance to policymakers and ERP vendors in developing strategies and support mechanisms to facilitate and optimize ERP adoption among SMEs. Overall, this study contributes to a better understanding of ERP adoption in SMEs in the context of Nairobi, Kenya. The findings provide valuable insights for business practitioners, researchers, and policymakers seeking to harness the potential of ERP systems to drive operational efficiency and competitiveness in the SME sector.

# **CHAPTER ONE: INTRODUCTION**

## **1.1 Background of the Study**

With the advent of Information and Communications Technology (ICT), the landscape of human interaction and business operations has undergone a revolutionary transformation. As highlighted by Al-Mashari (2003), the demand for innovation and sustainability has intensified the need for operational efficiency in enterprises. Small and Medium Enterprises (SMEs) constitute more than 90 percent of private firms in most African countries, generating over 50 percent of employment and contributing significantly to the Gross Domestic Product (GDP) (Luetkenhorst, 2005). The significance of SMEs in developing countries extends to fostering economic growth, poverty reduction, improved income distribution, export expansion, and the development of entrepreneurial industries and rural economies (World Bank, 2019). In Kenya, SMEs account for 80 percent of job creation, leading to the emergence of a burgeoning middle class and an increased new products and services demand. Consequently, this surge in operational functions necessitates a centralized control system to ensure efficient production. One technology tool that empowers businesses to enhance their competitiveness through centralized operations is the Enterprise Resource Planning (ERP) software.

Despite the fundamental roles SMEs play in Kenya's economy, there are challenges that have made SMEs not to operate to their optimum such as regulatory compliance challenges, resource constraints, organizational culture challenges and supply chain challenges, all can be addressed or minimized through adoption of information systems. As stated by Otieno (2008), an ERP system encompasses a cohesive set of programs

designed to support critical organizational activities, including logistics, manufacturing, finance, and marketing. Through the integration of core organizational processes, provision of goods and services of superior quality while fostering robust connections with suppliers and customers has been facilitated by the ERP system. According to Klaus, Rosemann, and Gable (2000), an ERP system is a pre-packaged information technology solution that follows standardization that offers unprecedented opportunity for integration of business processes and functions in real-time to modern establishments.

As indicated by Barker and Frolick (2008), an ERP system encompasses the proficient and streamlined planning and management of an organization's resources, with the aim of maximizing productivity, efficiency, and profitability. By integrating various business processes and relevant data, ERP enables businesses to enhance their overall operations. The term "improved business operations" can refer to both operational advancements within the company and intangible benefits that contribute to better financial outcomes. For this particular study, the focus was on examining adoption of ERP systems and the operational impact to implementing SMEs against challenges faced in the market. This emphasis was motivated by the limited literature available regarding the specific influence of ERP implementation on business operations in Kenya, with existing studies failing to establish a clear relationship between ERP systems and their impact in explicit terms.

Due to SMEs' role in the growth of developing economies, the prerequisite to determine the impact of ERP systems in the business operations of SMEs is necessary. The study

aimed to examine the impact of ERP adoption on the business operations of SMEs in Nairobi, Kenya.

This study was anchored on control theory first described by Maxwell (1868). The theory revolves around control dynamic systems in engineering processes and machines. The control, monitors the business challenges variables and compares it with the set point and this gives an account of the way ERP systems provide the means of the efficient and effective business operations. Sustainability of Business Operations (SBOs) of SMEs was the control in the research. Operational challenges such of resource management constraints, regulatory compliance, organization culture and complexity in supply chain were the controlled process variables that were checked in the case an ERP was adopted by SMEs in their daily operations.

### **1.1.1 Small and Medium Enterprises in Kenya**

SMEs have a critical role in the economy of Kenya, and the specific definitions of SMEs vary within different contexts. In Kenya, SMEs are typically classified based on the size of their workforce, with small enterprises comprising one to 49 employees, and medium-sized enterprises having 50 to 99 employees. According to Mbogo (2018), these SMEs contribute approximately 40 percent to the country's GDP, with a significant portion of them operating within the unorganized sector.

In Kenya, there are around 7.41 million SMEs and a high number of these businesses close shop on a daily basis as they are unable to cope with the harsh business environment.

Despite the significant contribution SMEs make to the expansion of Kenya's economy, studies have indicated that they make little contribution to manufacturing, and many of them focus on low-value addition. In essence, many small firms are a part of a sizable informal sector, which may appear to provide respite for their troubles in the short term but limits their ability to grow, access to more resources, and markets in the end, which ultimately reduces their socio-economic influence.

The SMEs in Kenya are generally characterized by low managerial, technical, financial, technological and industry-relevant skills. Moreover, SMEs have market access challenges as the most serious constraint to their growth and development since the main consumer of SME goods and services in Kenya are individual local consumers with a negligible proportion participating in export markets. According to the 2016 SMEs survey, there is high mortality among SME start-ups. About 2.2 million SMEs closed within five years with 46percent having not made it past the first year of operation (KIPPRA, 2019).

### **1.1.2 Enterprise Resource Planning**

Bernroider and Koch, 2001 define ERP systems as cross-functional system that integrates and automates internal business processes and can be used to handle daily organizational business functions including; accounting, supply chain, human resource, compliance, project management and procurement. The ERP is among the information technology tools that empower organizations to improve their market competitiveness (Abdullahai & Acosta, 2012). Large capital-intensive industries such as manufacturing have traditionally implemented ERPs, but currently, small and medium-sized organizations have embraced

the system. ERP vendors, which include System Applications and Products (SAP), ORACLE, JD Edwards and PeopleSoft, have been coming up with small-scale, cost-effective versions of ERP systems that are suitable to Kenyan enterprises (Abdullahai & Acosta, 2012).

As indicated by Al-Mashari (2003), ERP frameworks are exchange frameworks that permit data to stream consistently across different capacities in an organization. The ERP offers formidable solutions to most business challenges. A study by Hossain, Rashid, and Patrick (2002), established that several organizations have adopted ERP systems and therefore today's organizations are witnessing a growing prevalence of ERP software and it is adopted in anticipation to improve business performance.

Hunton, Lippincott, and Reck (2013) observed that ERP adoption has improved business operation performance by reduction of procurement costs, reducing administration costs, minimizing direct and indirect labor costs and formulation of efficient sales strategies. In addition, ERP planning results in effective and efficient decision-making processes since it facilitates access to real-time data in a user-friendly manner that in turn enables businesses to enhance specific management functions and procedures.

### **1.1.3 Business Operations of Small and Medium Enterprises**

Small businesses hold great significance in numerous economies, particularly in emerging countries. SMEs constitute a huge number of global businesses and are vital for job creation and global economy growth. These enterprises account for over 50 percent of total

employment globally and make up 90 percent of all businesses. Formal SMEs have a hold in emerging economies and can contribute up to 40 percent of the GDP. These numbers dramatically increase when informal SMEs are taken into account (World bank, 2019). Generally, these kinds of enterprises are characterized by more flexibility, close relationships with customers, fast decision-making, and better communication among others. For instance, local restaurants, repair shops and supermarkets that serve very local customers typically fall into the small businesses category because they generate less revenue and operate with fewer employees and assets compared to large businesses.

The operational aspects of SMEs encompass the regular activities carried out to enhance the value and profitability of the enterprise. These activities can be streamlined to generate sufficient revenue, which covers expenses and generates profits for the stakeholders. According to the Corporate Finance Institute (2022), the operations of SMEs can be categorized based on the industry they operate in. This includes the retail industry, where the focus is on stocking desired products at competitive prices. The service industry involves both front-end and back-end operations. In the manufacturing industry, raw materials are transformed into physical goods that are then sold to consumers. Lastly, there is the technology industry, which encompasses businesses involved in developing and providing technological solutions.

## **1.2 Problem Statement**

The lifespan of SMEs in Kenya is relatively short, with the majority of them closing down within the first five years of operation. As per a study undertaken by the Kenya National



Bureau of Statistics (KNBS), merely 20 percent of SMEs manage to sustain their operations beyond the five-year threshold, while the majority are compelled to cease their activities due to factors like financial constraints, competition, and poor management (Mwangi, 2016).

The use of ERP software can help lengthen the lifespan of SMEs in Kenya by streamlining their operations, reducing inefficiencies, and improving their overall productivity. ERP software provides real-time data on business operations, which helps SMEs make informed decisions, improves efficiency and productivity, better inventory management, better customer service, and better financial management. By adopting ERP software, SMEs in Kenya can improve their chances of surviving beyond the five-year mark and grow into successful businesses.

The SMEs in Kenya are facing challenges in their business operations, leading to inefficiencies and limitations in their growth and competitiveness. SMEs are facing challenges such as scarcity of resources, legal and regulatory challenges, organization's work environment challenges and challenges in the organization's supply chain processes. These challenges have implications for their ability to manage their finances, supply chain, customer relationships and could lead to closure of business.

There exists evidence of studies related to the operation value of ERP systems undertaken both locally and globally. A study done by Cotteleer and Bendoly (2005) to establish the value of ERP among manufacturing firms in the US and found that there is a positive

impact on order lead time improvement, particularly when companies prioritize and focus on process improvement during implementation. The study exclusively focused on manufacturing companies within the United States and cannot be generalized to other contexts.

Wanyoike (2017) examined the impact of ERP systems in terms of performance of Kenyan engineering consultancy firms in Kenya. However the study did not explore challenges SMEs face in relation to advantages associated with ERP adoption. Moreover, Kim and Lee (2019) studied the implications concerning ERP implementation on business performance in SMEs in Korea and indicated that ERP implementation has a beneficial influence on business performance, particularly in management of inventory and supply chain. The study fails to consider other business operations in SMEs such as accounting and resource management.

An important distinctive feature of this study was that it explored the trend and extent of adoption of ERP in Nairobi, Kenya, challenges experienced by SMEs, operational benefits of adopting ERP systems and establish the relationship between market challenges and operational benefits encountered by SMEs in Nairobi, Kenya with implementation of ERP systems.

### **1.3 Objectives of Study**

The objective of this study was to analyse the impact of ERP on business operations for SMEs in Nairobi. The specific objectives were to:

- (i) Assess the trend and extent of adoption of ERP by SMEs.
- (ii) Determine the business operations challenges experienced by SMEs.
- (iii) Explore operational benefits experienced by SMEs as a result of ERP adoption in Nairobi, Kenya
- (iv) Establish the relationship between market challenges and operational benefits encountered by SMEs as a result ERP systems implementation.

#### **1.4 Value of the Study**

The findings of the study will hold significant importance to the management of SMEs; academics; and policymakers. The findings will be helpful to the management of SMEs seeking to implement ERP systems, as they will be able to align their operational objectives with their strategic objectives. Moreover, the management will be able to understand how ERP systems contribute to enhancing business outcomes. The SMEs will be able to set realistic expectations based on the experiences of other enterprises that incorporate ERP systems as per this paper. The conclusions drawn from this study will support senior management to know the expected business value from ERP systems and look out for them after system implementation.

The results will be a valuable reference for future researchers investigating similar areas, adding to the existing knowledge in the field. Policymakers can utilize the study's findings to develop policies and guidelines aimed at enhancing the utilization of ERP systems.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

In this chapter, a comprehensive examination of theoretical and empirical literature from various global, regional, and local sources was presented, focusing on the concept of ERP systems and their role in enhancing business operations for SMEs. The chapter also provided an empirical evaluation of the body of literature and pointed out knowledge gaps that could help SMEs run their businesses more effectively and eventually result in well-informed ERP adoption plans. The study discussed the conceptual framework and an empirical analysis outlining relationship between the independent and dependent variables.

### **2.2 Theoretical Review**

This section assessed the fundamental theories supporting ERP implementation for SMEs. The focus of the study was the control theory, Information Systems Success Theory (ISST), and Actor Network Theory (ANT).

#### **2.2.1 Control Theory**

This study was anchored on control theory also referred to as cybernetics, first developed by James Clerk Maxwell in 1868. This theory provides measures enabling quantification of an underlying situation, system or activity, setting standards of performance, providing feedback processes enabling comparison of outcomes against set standards, assessing difference between set goals and performance to make improvements on the system behavior (Elbashir, Collier, & Sutton, 2011). This provides an explanation of how ERP

systems enable executives to utilize non-financial performance indicators efficiently and effectively.

According to Weir and Chao (2007), this theory posits that if an enterprise has to adapt to survive in the environment under which it is operating, then the management needs to receive prompt feedback to detect deviations from set goals and act on them to observe activity responses. Further, control theory posits that ERP systems efficacy relies on its capacity to capture processes, disperse, and analyse performance measures on a timely basis.

This theory has a variety of significance for SMEs that have implemented the ERP systems, since it provides measures facilitate the quantification of a foundational system, establishes performance standards or targets, incorporates feedback processes for evaluating activity outcomes and with set standards able to gauge the variation between goals and achievements and make modifications on the system based on the underlying activities. Therefore, this theory played a key role in this study.

### **2.2.2 Information Systems Success Theory**

The ISST, proposed by Delone and McLean (2003), builds upon previous study in communication with regard to Shannon and Weaver (1948) and Mason's theory on information influence (1978). This theory identifies three critical pillars for achieving success in information systems: data quality, system reliability, and quality of service. The ISST utilizes a causal relationship when examining the effectiveness of information

systems implementation within organizations. It comprises six interconnected aspects that impact the achievement of information systems implementation, including quality of information, system accuracy, and quality of service as independent factors. These factors, in turn, affect the motivation to use the system, consumer fulfillment, and the overall benefits achieved from its application. Delone and McLean (2003) propose that an information system's evaluation can be conducted through the assessment of information system, and excellence of service, which ultimately determines system usage, end-user satisfaction, and the positive impacts obtained as a result of the implementation. Gains achieved, in turn, can either positively or negatively impact users and assist in evaluating the feasibility of the implemented systems.

This theory was useful in this study for evaluating the advantages and challenges accrued from use of ERP systems by SMEs in Kenya. The study objectives were adequately addressed to establish impact of RP adoption experienced by SMEs, trends and extent of ERP adoption by SMEs, significant obstacles encountered by SMEs, operational benefits as a result of implementing ERP systems in business context in Kenya, and the relationship between challenges and benefits encountered by SMEs as a result of implementation of ERP systems. This theory will enable small businesses to understand the interrelationship among the key success factors of information systems success, most notably; the quality of information, service quality, system standard, system usage intention, total system benefits and consumer satisfaction.

### **2.2.3 Actor Network Theory**

The ANT is a theoretical framework that was first developed by Callon, Latour and Law in 1984 and suggests that entities consist of diverse interconnected networks that collaborate harmoniously to ensure their success and helps to understand the process of technological adoption and its impact on organizations (Law, 2008). In the context of ERP adoption, ANT proposes that the achievement of successful implementation relies not only on technical aspects but also on the actors engaged in the process and the relationships among them.

According to ANT, the actors involved in an ERP adoption process can include humans, machines, and other non-human entities such as policies, rules, and regulations. Each of these actors has its own agency or ability to act and influence the adoption process. In an ERP adoption process, different factors such as top management, information technology department, vendors, employees, and external consultants are involved, and actions and interactions of individuals is important in determining the results of the implementation. The relationships between these actors and their inter-dependencies are critical in shaping the process of ERP adoption.

In summary, ANT provides a perspective that facilitates a comprehensive comprehension regarding the complex process involved in the adoption of ERP systems. This gets done through examining the roles and interactions of the different actors involved. By understanding the network of relationships and inter-dependencies, businesses can identify potential barriers and opportunities for successful ERP implementation.

### **2.3 Empirical Literature Review**

This empirical analysis focused on assessing repercussions of ERP systems on the operational aspects of SMEs in Nairobi, Kenya. Multiple studies were available that had explored the implementation of ERP systems in SMEs. For instance, Letting and Kyalo (2022) conducted a study investigating the adoption of ERP systems in performance of telecommunications firms in Nairobi City County along with its implications in terms of business performance. A survey got carried out among telecommunications firms in Nairobi City County to collect data on ERP adoption and its impact on operational efficiency, decision-making, and error reduction. The study found that ERP implementation improves operational efficiency, reduces errors, and enhances decision-making in SMEs. However, the study only focused on Performance of telecommunications firms in Nairobi City County, which may restrict the generalizability of the findings to other contexts. Additionally, the study only considered contribution of ERP implementation on efficiency of operations, decision-making, and error reduction, and did not examine other potential benefits or drawbacks of ERP implementation. Current research adds to this study by looking at the Kenyan market environment.

Another study by Kim and Lee (2019) studied the implications concerning ERP implementation on business growth in SMEs in Korea. A survey was conducted among SMEs in Korea with the goal of gathering data on implications of ERP implementation on inventory management, order processing, and supply chain management. Eventual findings indicated that ERP implementation has a beneficial influence on business growth, particularly in management of inventory and supply chain. However, the study solely



concentrated on consequences of ERP implementation on inventory management, order processing, and supply chain management, and did not consider other business operations in SMEs. Additionally, the study only looked at SMEs in Korea, so the findings may not be generalized to other contexts.

Additionally, Muturi (2016) examined implications of ERP systems in terms of performance of SMEs in Kenya. A survey was conducted among SMEs in Kenya to collect data on resulting outcomes of ERP implementation on business performance, including, cost reduction, customer satisfaction, and financial performance. In line with the study, the introduction of ERP systems had a favorable impact on business performance, specifically by reducing costs, enhancing customer satisfaction, and improving financial outcomes. Nevertheless, it is worth noting that the study solely centered on analyzing ramifications of ERP implementation on the performance of businesses and did not delve into potential obstacles or challenges associated with ERP adoption and implementation within Kenyan SMEs.

Akkermans, Bogerd, Yucesan, and van Wassenhove (2003) explored the impact of ERP systems on supply chain management. A Delphi study was conducted among supply chain experts in Europe to gather their opinions on the influence of ERP systems on supply chain management. Eventual outcomes indicated that the utilization of ERP systems has a beneficial effect on supply chain management, specifically by raising the profile, cutting lead times, and enhancing coordination among supply chain players. However, the study relied on a Delphi study involving supply chain experts, which may not fully encompass

the experiences and perspectives of real organizations. The study, furthermore, was conducted in Europe, thereby the findings cannot be generalized to other regions or contexts.

Cotteleer and Bendoly (2006) examined the impact of enterprise-information technology implementation on order lead time improvement. A survey was conducted among manufacturing companies in the US to gather data on the impact of enterprise-information technology implementation on order lead time improvement. The study found that enterprise-information technology implementation has a positive impact on customer satisfaction, particularly when companies prioritize and focus on process improvement during implementation. Nevertheless, the study only examined the impact of enterprise-information technology implementation on order lead time improvement, and did not consider other potential benefits or drawbacks of ERP systems. Furthermore, the study exclusively focused on manufacturing companies within the United States, which implies that the findings may not be transferable to different industries or contexts.

A study by Kiarie and Wanyama (2017) to assess the challenges facing SMEs during ERP implementation in Nairobi, Kenya with a survey being conducted among SMEs in Nairobi to collect data on the challenges facing them during ERP implementation. The study found that SMEs face challenges such as lack of IT infrastructure, inadequate resources, and resistance to change during ERP implementation. However, the study only examined the challenges facing SMEs during ERP implementation in Nairobi, Kenya, and did not explore potential solutions or strategies to address these challenges.

Moreover, Njuguna, Kariuki, and Waweru (2019) investigated elements that influence the adoption of ERP systems among SMEs in Nairobi, Kenya. A survey was conducted among SMEs in Nairobi with a purpose of obtaining information on the factors influencing their decision to adopt ERP systems. The study found that technical expertise, training, and the cost of ERP systems are some of the key variables that influence SMEs' decision to adopt ERP systems. Nonetheless, the study only examined the factors influencing SMEs' decision to adopt ERP systems and did not consider potential challenges or barriers to ERP implementation.

Maheshwari, Kumar, and Kumar (2010) explored the ERP acquisition process and its effect on organizational effectiveness using a case study approach in the investigation. The study found that the ERP institutionalization process involves several stages, including exploration, adoption, adaptation, standardization, and infusion. The study also found that effective acquisition of ERP systems leads to improved organizational effectiveness, including improved decision-making, increased productivity and improved customer service. The study, however, only examined ERP adoption process in one Indian manufacturing company, as a result, these results could be insignificant to other industries or contexts. Additionally, the study only considered the effect of ERP institutionalization on organizational effectiveness and did not examine other potential outcomes or impacts of ERP implementation, such as employee satisfaction or innovation.

The SMEs in Nairobi, Kenya experience positive outcomes in business operations following integration of ERP systems. A study by Wanyoike (2017) to examine the impact

of ERP systems in terms of performance of Kenyan engineering consultancy firms used a case study approach in examining the impact of ERP implementation on the performance of engineering consultancy firms in Kenya. The findings of the study indicated that the adoption of ERP systems positively influences business performance, specifically by enhancing operational efficiency, reducing costs, and driving revenue growth. However, the study employed a case study methodology, which restricts the generalizability of the findings. Furthermore, the study solely concentrated on evaluating effects of ERP implementation on operational efficiency, cost reduction, and revenue growth, without exploring its relationship to existing market challenges.

Jerotich (2018) examined revenue performance of financial institutions in Kenya that have adopted ERP systems. To examine implications of ERP implementation on the revenue performance of SMEs in Nairobi County, a case study methodology was employed. The findings demonstrated a beneficial connection between ERP implementation and the financial performance of SMEs, specifically in terms of revenue growth and cost reduction. Nonetheless, it is essential to acknowledge that the utilization of a case study approach restricts the generalizability of the findings to a wider population. Moreover, the study solely concentrated on evaluating the financial performance of SMEs and did not examine the impact of ERP implementation on other facets of business operations.

### **2.3.1 Trends in Enterprise Resource Planning in Kenya**

Muturi (2016) observed that incorporation of ERP systems in SMEs in Kenya is increasing, as more organizations recognize the potential benefits of these systems. Ubiquity of Cloud-

based ERP solutions is on the rise among SMEs in Kenya, as they offer lower upfront costs and greater flexibility compared to on premise solutions.

According to Njuguna et al. (2019), there is a growing trend towards the use of mobile ERP solutions in Kenya, as these solutions offer greater accessibility and convenience for employees who are often on the go. Presently, in the Kenyan market, there are variety of ERP software accessible. These include but not limited to, Odoo, SAP, Syspro, Oracle ERP cloud, Dynamics 325, Sage, QuickBooks and Microsoft dynamics

Ileri, Omondi, Chirchir, and Wafula (2015) suggest that while there is an increase of ERP adoption in Kenya, there are still significant challenges to their implementation. However, the potential benefits of these systems make them an attractive option for organizations looking to improve their operations and competitiveness. The study also emphasizes the significance of customizing ERP systems for satisfaction of the specific needs and demands of organizations in Kenya.

According to Oredo and Njihia (2015), the rising adoption of ERP systems in Kenya is accompanied by various challenges that require attention. These challenges include the substantial implementation costs and the scarcity of technical expertise. The study further underscores the significance of customizing ERP systems to align with the unique requirements of Kenyan organizations. Additionally, it emphasizes the need for comprehensive training and support for employees to ensure effective utilization of the ERP systems.

### **2.3.2 Business Operation Challenges Experienced by Business Enterprises in Nairobi**

The SMEs in Nairobi, Kenya face numerous challenges that impact their business operations and hinder their growth. Resource constraints present a significant challenge for SMEs in Nairobi Mira and Ogollah (2013). Limited financial resources, inadequate access to credit, and restricted budgets hinder their operational capabilities and ability to invest in critical areas such as equipment, technology, inventory, and human resources. These constraints often lead to reduced efficiency, limited capacity for innovation, and difficulties in scaling up operations.

Organizational culture plays a crucial role in the operations of SMEs in Nairobi. An innovative and adaptable organizational culture is necessary to overcome challenges and foster growth Macharia (2019). However, SMEs often face cultural challenges such as resistance to change, limited collaboration, and a lack of employee empowerment. These cultural barriers inhibit the adoption of new approaches, hinder effective communication and teamwork, and impede the ability to adapt to changing market conditions.

The SMEs in Nairobi face challenges related to regulatory compliance Kiarie and Wanyama (2017). The complex and evolving regulatory landscape in Kenya often presents hurdles for SMEs to navigate. Compliance with legal requirements, ethical standards, and risk management processes can be demanding, particularly due to limited resources and knowledge. The costs associated with compliance, including legal fees and administrative burdens, can strain the financial capabilities of SMEs.

Supply chain complexity poses challenges for SMEs in Nairobi (Owiti, 2014). Nairobi's dynamic business environment requires SMEs to manage complex supply chains, involving multiple suppliers, diverse product lines, and extended geographical reach. Limited resources, inadequate information systems, and logistics constraints can lead to inefficiencies, delayed deliveries, and increased costs. SMEs must grapple with managing these complexities while maintaining operational effectiveness.

### **2.3.3 Benefits Experienced in Adopting Enterprise Resource Planning Systems**

ERP systems have the capability to enhance the management of resources, including inventory, labor, and equipment. This, in turn, can result in heightened operational efficiency, through optimizing the accuracy of information obtained from interconnected departments, ultimately contributing to organizational productivity Langfield-Smith (2015). He further observed that, the adoption of ERP systems has become integral for businesses that aim at gaining a competitive advantage in the market with companies that have embraced implementing of the ERP systems witnessing improved productivity.

The ERP enables efficient decision making. As per the findings of Baily, Farmer, Crocker, and Jessop (2015), the introduction of an ERP system facilitates the seamless communication of crucial information among the functional units within an organization. This consequently, improves efficiency, increases performance and improves decision making.

Tsai et al. (2015) posits that ERP systems adoption can yield favorable outcomes for

companies' financial performance, specifically by enhancing efficiency and profitability. The financial performance of an enterprise is influenced by factors such as internal processes, customer satisfaction, innovation, and learning. Implementing ERP systems can contribute to improved customer satisfaction through enhanced service quality, reduced service turnaround time, improved service performance, and cost efficiency. These improvements in operational efficiency, reduction of redundant operations, and simplification of work processes achieved through ERP implementation positively impact the overall financial performance of the enterprise.

Cost saving can be realized through ERP integration. In her research, Sullivan (2009) revealed that automating essential organizational processes and adoption of ERP systems result in notable enhancements in core business processes. Specifically, ERP systems facilitated the streamlining of billing, inventory management, and supply chain management processes, leading to improved efficiency and cost savings. Moreover, the study highlighted improvements in the accuracy and timeliness of data thereby enabling more informed decision-making within the organization.

Kostojohn, Johnson, and Paulen (2011) propose that the adoption of Customer Relationship Management (CRM) can optimize the value derived from the customer base by integrating CRM technologies into business processes and leveraging customer interactions and boost competitive advantage. By establishing a robust CRM system built upon ERP systems, organizations can enhance operational efficiency by considering the customer's viewpoint in decision making, refining business processes, and adapting to the



structure of the organization. This can lead to positive influence on customer satisfaction, particularly when it comes to quality of products, delivery speed, and responsiveness to customer needs.

Maccarrone's (2000) revealed notable enhancements in both the usability and results of accounting operations following the implementation of ERP systems. Specifically, ERP systems help streamline processes such as financial reporting, budgeting, and forecasting, which in turn lead to improved accuracy and timeliness of financial information. The ERP systems can improve the integration of financial information across different departments and business units within the company.

#### **2.4 Summary of Empirical Literature Review**

The literature examined offered a comprehensive insight to the effects linked with the adoption and implementation of ERP systems. These studies consistently highlighted the operational challenges and benefits that businesses encounter with implementing ERP systems. It is crucial for business management to be aware of the overall impact of ERP adoption on SME business operations, especially in Kenya where ERP adoption is still relatively low. The current research aimed to address this gap and shed light on the specific implications of ERP adoption in the Kenyan context. Table 1 below summarizes the empirical literature review.

Table 1 Summary of Empirical Literature Review

Author(s)	Study Topic	Objectives	Methodology	Findings
Letting and Kyalo (2022)	Enterprise Resource Planning capability and performance of telecommunications firms in Nairobi City County, Kenya	To investigate the adoption of ERP systems in telecommunications firms and their impact on business performance.	A survey was conducted among telecommunications firms in Nairobi to collect data on ERP adoption and its impact on operational efficiency, decision-making, and error reduction.	The study found that ERP implementation improves operational efficiency, reduces errors, and enhances decision-making in SMEs.
Kim and Lee (2019)	The effects of ERP implementation on business performance: Focused on SMEs in Korea	To investigate the effects of ERP implementation on business performance in SMEs in Korea	A survey was conducted among SMEs in Korea to collect data on the impact of ERP implementation on inventory management, order processing, and supply chain management.	The findings revealed beneficial influence of ERP on business performance, particularly in inventory management and logistics management.
Muturi (2016)	Factors Influencing the Performance of SMEs in Kenya: A Case of Independent Petroleum Dealers in Nairobi	To examine the effect of ERP systems on the performance of Independent Petroleum Dealers in Nairobi	Data on the impact of ERP adoption on business performance, encompassing cost reduction, customer satisfaction, and financial performance, was collected through a survey conducted among Independent Petroleum Dealers in Nairobi.	Results of the study was that ERP has a positive effect on operations performance, through cost reduction, increased customer satisfaction, and improved revenue performance

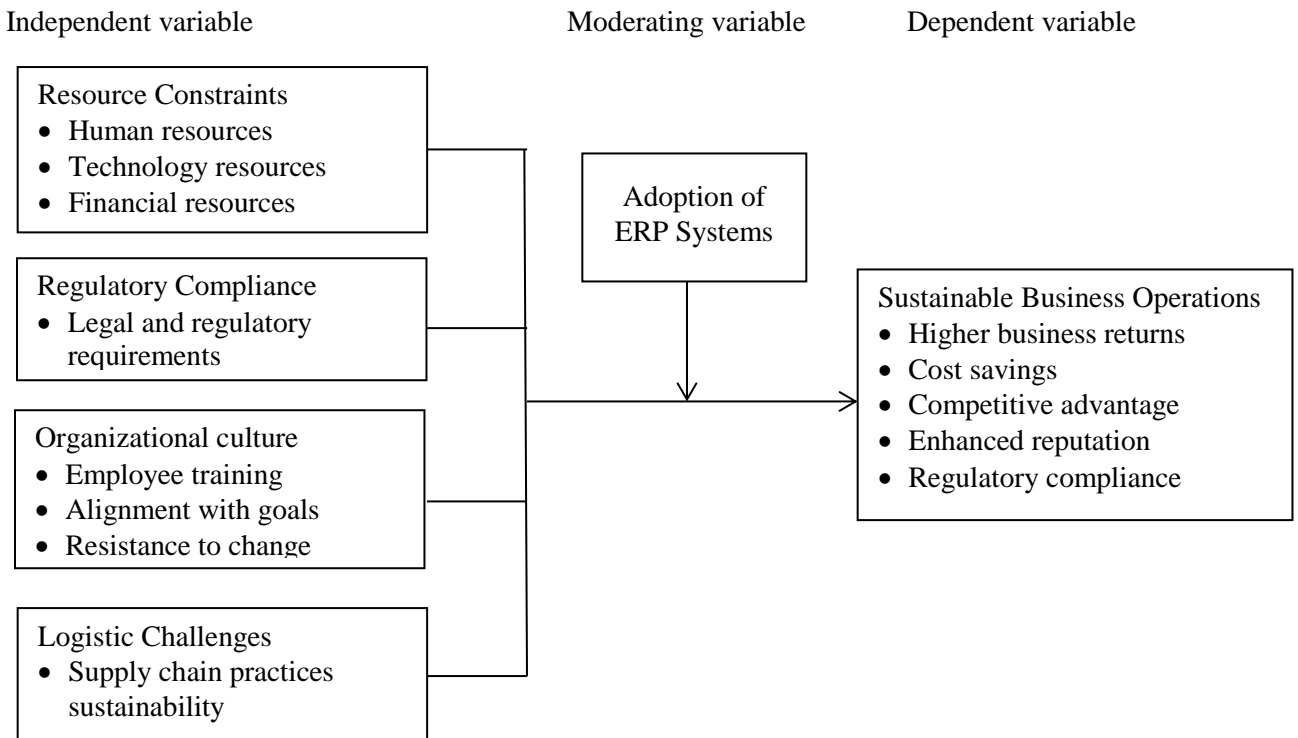
Kiarie and Wanyama (2017)	Factors influencing the adoption and implementation of enterprise resource planning (ERP) system in the SMES sector	To assess the challenges facing SMEs during ERP implementation in Nairobi, Kenya.	A survey was conducted among SMEs in Nairobi to collect data on the challenges facing them during ERP implementation.	The study found that SMEs face barriers such as infrastructure scarcity, inadequate resources, and resistance to change during ERP execution.
Njuguna et al. (2019)	An investigation of the factors affecting the adoption of enterprise resource planning systems among SMEs in Nairobi, Kenya	To investigate the factors affecting the adoption of ERP systems among SMEs in Nairobi, Kenya.	A survey was conducted among SMEs in Nairobi to collect data on the factors influencing their decision to adopt ERP systems	The study found that technical expertise, training, the cost of ERP systems are critical elements that influence SMEs' decision to adopt ERP systems.
Wanyoike (2017)	The influence of enterprise resource planning system on organisational performance: Case study of Kenyan engineering consultancy firms	To examine the impact of ERP systems on the performance of engineering consultancy firms in Kenya.	A case study approach was used to investigate the impact of ERP implementation on the performance of engineering consultancy firms in Kenya.	The study found that ERP implementation has a positive impact on business performance, particularly in terms of operational efficiency, cost reduction, revenue growth.
Akkermans, Bogerd, Yucesan, and Van Wassenhove (2003)	The impact of ERP on supply chain management: exploratory findings from a European Delphi study.	To explore the impact of ERP systems on supply chain management.	A Delphi study was conducted among supply chain experts in Europe to gather their opinions on the impact of ERP systems on supply chain management.	The study found that ERP systems have a positive impact in terms of enhancing visibility, reducing lead times, and improving coordination among supply chain partners.

Cotteleer and Bendoly (2006)	Order lead-time improvement following enterprise-information technology implementation: An empirical study.	To examine the impact of enterprise-information technology implementation on order lead time improvement.	A survey was conducted among manufacturing companies in the US to collect data on the impact of enterprise-information technology implementation on order lead time improvement.	The study found that enterprise-information technology implementation has a positive impact on order lead time improvement, particularly when companies prioritize and focus on process improvement during implementation.
Jerotich (2018)	Effects of enterprise resource planning on financial performance of financial institutions in Kenya	To examine the effect of ERP systems on the financial performance of financial institutions in Kenya.	A case study approach was used to investigate the impact of ERP implementation on the financial performance of financial institutions in Kenya.	The study found that ERP implementation has a positive effect on the financial performance of SMEs in terms of revenue growth and cost reduction.
Maheshwari, Kumar, and Kumar (2010)	Delineating the ERP institutionalization process: Go live to effectiveness.	To explore the ERP institutionalization process and its effect on organizational effectiveness.	A case study approach was used to investigate the ERP institutionalization process in an Indian manufacturing company.	The study found that the ERP institutionalization process involves several stages, including exploration, adoption, adaptation, routinization, and infusion. The study also found that effective institutionalization of ERP systems leads to improved organizational effectiveness.

## 2.5 Conceptual Framework

This study used the conceptual framework shown in Figure 1 below. The challenges in SBOs of SME, which included resource constraints, regulatory compliance, organizational culture and logistic challenges, are the independent variable. The components of resource constraints included challenges associated with limited financial, human, and technological resources for implementing sustainable initiatives. Components of regulatory compliance included challenges related to meeting legal and regulatory requirements for sustainability practices. Challenges arising from resistance to change, lack of employee engagement, and alignment with sustainability goals were all part of organizational culture. Logistic challenges included challenges related to managing and integrating sustainable practices across the supply chain. The sustainability of business operations of SME served as the dependent variable, and it was determined by; cost savings, competitive advantage, enhanced reputation and regulatory compliance.

Figure 1 Conceptual Framework



## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The research methodology utilized to analyse the impact of ERP on enhancing business operations for SMEs was presented in this chapter. It covered various aspects such as the research design, target population, techniques of sample selection, sampling methods, data collection techniques, data analysis, and the modeling approach utilized in the study.

### **3.2 Research Design**

The research design used in the study was descriptive and this allowed the researcher to explore the variables and their interactions with this strategy, reaching more respondents. The information gathered consisted of both primary and secondary sources. The researcher distributed online questionnaires to participants in order to collect primary data. Books, reports, and government sources were used in gathering secondary data. The descriptive research design was economical and allowed the researcher to get comprehensive data about the intended audience. Given the time limitations for this investigation, it was also the most effective approach. The capacity to generalize the results to the entire population was another factor in the choice of this study design.

### **3.3 Population**

Within the scope of our study population, it's pertinent to acknowledge the significant business activity taking place in Nairobi County. According to data provided by the Kenya Association of Manufacturers (KAM) in 2018, the county hosts an impressive count of more than 66,545 actively operating businesses. Notably, this robust business landscape

continues to evolve, as evidenced by the information from the Nairobi City County Government (NCCG) in 2022, which reports a specific subset of these businesses, with 30,282 being registered. This context underscores the dynamic nature of Nairobi County's business environment and provides a compelling foundation for our study's focus. The target population were these 30,282 registered SMEs and therefore the focus of this study.

### 3.4 Sample Size Determination

In the study, the determination of the sample size was guided by the Krejcie and Morgan table (1970), taking into consideration the retail industry, service industry, manufacturing industry, and technology industry and 380 SMEs were the determined representative sample size for the study (see Table 2 below). According to Kenya Institute for Public Policy Research and Analysis (KIPPRA) study on the distribution of SMEs in Nairobi County across sectors revealed that the majority (84.5 percent) of SMEs conduct business in the services sector, while manufacturing accounts for 11.8 percent of the SMEs, agribusiness enterprises accounts for 3.3 percent, and construction, mining, and quarrying account for 0.5 percent (KIPPRA, 2019). This was used to select sample size across industries.

Table 2 Distribution of Sample Size

Industry	Number of Small and Medium Enterprises	Sample Size
Service industry	25,563	321
Manufacturing	3,570	45
Agri-business	998	13
Construction	151	2
Total	30,282	380

### 3.5 Sampling Procedure

The study utilized random sampling as the sampling method. The list of potential respondents was obtained from most recent membership directory of Nairobi City County single business permit registered list for verification. The sampling frame consisted of SMEs that had adopted and implemented ERP systems and are operating within the geographical boundaries of Nairobi County.

### 3.6 Operationalization of the Study Variables

This section explored the indicators of the variables utilized in this study. Resource constraints, regulatory compliance challenges, organizational culture, and logistic challenges are the independent variables. The interval scale of measurement will be used for their indicators. The dependent variable was SBOs, which was indicated by operational efficiency, decision making effectiveness, cost savings, competitive advantage and growth opportunities. Table 3 below displays the operationalization of the variables.

Table 3 Operationalization of the Study Variables

Variables	Operational Definition	Type of Scale
Resource constraints	Limitations or scarcity of resources that an organization may face	
	Limited human resource	Interval
	Limited financial resources	Interval
	Limited technological resources	Interval
Regulatory compliance	Practices that help the organization in controlling or avoiding events and meeting legal and regulatory requirements for sustainability practices.	
	Risk identification	Interval
	Compliance with legal and regulatory requirements	Interval
	Adherence to ethical guidelines	Interval
Organization culture	Reflects the values, beliefs, norms, and practices that characterize the organization's work environment and employee behavior	



	Employee training and extension services	Interval
	Bench-marking	Interval
	Innovation	Interval
Supply chain complexity	Level of intricacy and challenges present in the organization's supply chain processes.	
	Number of suppliers	Interval
	Geographical scope of supply chain	Interval
	Product diversity	Interval
Sustainable business operations	Degree to which the organization's operations are environmentally, socially, and economically sustainable	
	Operational efficiency	Interval
	Decision making effectiveness	Interval
	Cost savings	Ratio
	Competitive advantage	Interval
	Growth opportunities	Interval
	Number of employees	Interval
Adoption of ERP systems	Refers to the degree to which an organization implements and utilizes ERP software to manage its core business processes and integrate various functional areas	
	Level of ERP implementation	Interval
	degree of user acceptance and utilization	Interval
	ERP performance	Interval

### 3.7 Data Collection

The study made use of primary data collection methods using structured Google forms online questionnaires. The questionnaires was carefully designed and aligned with the research questions to make certain that the information collected was relevant and directly addressed the research objectives. Section one of the questionnaire contained questions establishing the relationship with organization; section two had questions related to ERP software; section three captured questions related to challenges and similarly; and section four had questions related to operational on ERP adoption. The questions related to the research question were made mandatory to ensure proper completion of the questionnaire. To obtain further insights, the researcher had an additional open-ended question to capture

thoughts not contained in the closed-ended questions. An interview guide assisted in the collection of data from operation managers. The researcher reviewed literature to obtain secondary data.

### **3.8 Reliability and Validity Tests**

The research aimed at achieving content validity by ensuring tools used appropriately address the research objectives. An authority in business operations and technology management evaluated the research tools to determine this. Additionally, the researcher assessed the study instrument's internal consistency to guarantee reliability. In order to determine if the study tests accurately measured the variables of interest, Cronbach alpha was used. An alpha value of 0.7 and higher is the suggested cutoff for a trustworthy research tool.

### **3.9 Data Analysis**

The study used quantitative data analysis techniques. Statistical Package for the Social Sciences (SPSS-version 25) was used to process the data. Descriptive statistics was employed in order to analyse the data needed for the first objective, which examined trends and extent of ERP implementation; assess the second objective, which was to establish the challenges experienced by SMEs, and to assess the third objective that sought to explore operational benefits experienced by SMEs as a result of ERP adoption.

The fourth objective, which sought to investigate the association between the challenges encountered and operational benefits as a result of implementing ERP, applied linear

regression analysis as shown in Table 4 below. To make data presentation and interpretation easier, frequency distribution tables and percentages were used. Qualitative data was also be presented in categories based on predetermined subjects.

Table 4 Data Analysis

Objectives	Data to be Collected	Questionnaire Items	Analyses
Access trends and extent of adopting ERP by SMEs	Quantitative data	<ul style="list-style-type: none"> <li>• Physical infrastructure</li> <li>• History of SME using ERP</li> <li>• Business activity</li> <li>• Operations and sales patterns over the last five years</li> </ul>	Descriptive analysis
Determine business operations challenges experienced by the SME	Quantitative data	<ul style="list-style-type: none"> <li>• Resource constraints</li> <li>• Regulatory compliance</li> <li>• Organizational culture</li> <li>• Supply chain complexity</li> </ul>	Descriptive analysis
Explore operational benefits and challenges experienced by SMEs as a result of ERP adoption	Quantitative data	<ul style="list-style-type: none"> <li>• Operation efficiency</li> <li>• Cost savings</li> <li>• Competitive advantage</li> <li>• Growth opportunities</li> </ul>	Descriptive analysis
Determine the relationship between challenges and benefits in sustainable business operations with ERP adoption	Quantitative data	<ul style="list-style-type: none"> <li>• ERP adoption</li> <li>• Organization readiness</li> <li>• User training and support</li> <li>• Change management strategy</li> <li>• Size</li> <li>• Industry</li> </ul>	Multiple regression analysis

Regression model was as presented as  $SBO = \beta_0 + \beta_1REGCC + \beta_2RESCC + \beta_3OCC + \beta_4SCCC + \beta_5AERP + \varepsilon$  where SBO is sustainable business operations; REGCC is regulatory compliance challenges; RESCC is resource constraints challenges; OCC is organizational culture challenges; SCCC is supply chain complexity challenges; AERP is adoption of ERP;  $\beta_0, \beta_1, \beta_2, \beta_3$  and  $\beta_4$  are parameters to be estimated; and  $\varepsilon$  is the error term,

### **3.10 Ethical Considerations**

To address ethical considerations, an introduction letter from the University of Nairobi was provided by the researcher as a means of confirming their identity. The researcher sought informed consent from the respondents by clearly outlining the objectives of the study. Participants were guaranteed that any information they provided will be discrete. Additionally, the researcher strived to ensure that participants felt comfortable with the data collection schedule.

## **CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION**

### **4.1 Introduction**

This study investigated ERP and business operations of SMEs in Nairobi, Kenya. This chapter presents primary data collected and outlines outcomes of data analysis.

### **4.2 Response Rate**

380 small businesses were purposefully sampled from SMEs in Nairobi County and included in the study through online questionnaires sent to respective participants or management emails. 285 questionnaires were established to be duly filled, which translates to 75 percent response rate. Collis and Hussey (2013) explain that a higher response rate is generally desirable as it improves the reliability and validity of the study's results therefore 75 percent is acceptable for statistical accuracy. The summary of the response rate is as captured in Table 5 below.

Table 5      Response Rate

Questionnaires	Number	Percent
Filled responses	285	75
No responses	95	15
Total	380	100

### **4.3 Reliability Analysis**

Reliability analysis served as a critical component within the research, aiming to ascertain the consistency and stability of variables employed in a study. The research employed Cronbach's alpha and enhanced the credibility of research findings with an alpha of 0.7, which also helped in refining measurement instruments and identifying sources of potential

error or variability.

#### 4.4 Social Demographics of the Respondents

The research sought understand the social demographics of the participants and therefore analysed geographical location in terms of sub-county, industry type, employee size, length in current businesses, main source of business income, and job title of participant and employment duration of participant. Table 6 below shows this information and data.

Table 6 Social Demographics of the Participants

Variable	Sub-Variable	Frequency	Percent
Nairobi	Dagoretti	42	15
	Embakasi	58	20
	Kamukunji	8	3
	Kasarani	29	10
	Kibra	9	3
	Langata	19	7
	Makadara	17	6
	Mathare	3	1
	Ruaraka	3	1
	Starehe	56	20
	Westlands	41	14
	Total	285	100
SME industry	Service industry	142	50
	Manufacturing	31	11
	Agri-business	5	2
	Construction	15	5
	Retail/wholesale	92	32
	Total	285	100
Length of current business (years)	1- 3	73	26
	3-5	94	33
	More than 5	118	41
	Total	285	100
Organization size (employees)	1-10	113	40
	11-50	103	36
	51-100	48	17

	Above 100	21	7
	Total	285	100
Staff levels	Senior management	193	68
	Middle management	87	31
	General staff	5	2
	Total	285	100
Length of service (years)	1-3	67	24
	3-5	57	20
	More than 5	161	56
	Total	285	100
Source of income	Product development	55	19
	Service delivery	176	62
	Other	55	19
	Total	285	100

From Table 6 above, most of the respondents were from Embakasi and constituted 20 percent, followed by Starehe with 20 percent and Dagoretti at 15 percent. This information indicates the geographical distribution of respondents within Nairobi County.

In regards to Industry type of the SME, the majority of respondents at 50 percent belonged to the service industry, while manufacturing was represented at 11 percent and retail/wholesale were also represented at 32 percent. This provided insights into the predominant industries among the respondents.

From Table 6 above, in terms of the length of years in current business, respondents were fairly evenly distributed across different business ages, with 41 percent having been in operation for more than 5 years, 33 percent for 3-5 years, and 26 percent for 1-3 years. This suggests a diverse range of businesses in terms of age.

As Table 6 above shows, the largest group of respondents at 40 percent were from organizations with 1-10 employees, followed by 11-50 employees with 36 percent, 51-100 employees (17 percent), and above 100 employees (7 percent). This reflects the distribution of organization sizes among the respondents.

From Table 6 above, the hierarchical distribution of staff roles among the respondents was represented with most respondents (68 percent) being in senior management roles, while middle management made up 31 percent, and general staff accounted for 2 percent. Additionally, majority of respondents (56 percent) had more than 5 years of service, followed by 3-5 years (20 percent) and 1-3 years (24 percent). This showed the experience level of the respondents within their organizations.

The primary source of income for the respondents was service delivery (176 respondents or 62 percent), followed by product development (55 respondents or 19 percent), and "Other" sources of income (55 respondents or 19 percent). This information provided the study with insights into the revenue streams of the organizations.

#### **4.5 Trends in Enterprise Resource Planning in Kenya**

The research aimed to investigate the trend of ERP in Kenya, which was analysed by use of frequencies and percentages as shown in Table 7 below. The interaction with ERP system had a high influence on response given and thereby important to the study. The responses were measured based on questions aimed towards, SMEs' ERP adoption status, implementation stage, vendor used, ERP modules the respondent has interacted with and



length of ERP use in the business (see Table 7 below).

Table 7 Trends in Enterprise Resource Planning in Kenya

Variable	Trends	Frequency	Percent
Adoption	Adopted an ERP system	206	72
	Not adopted	79	28
	Total	285	100
Implementation stage	Planning	14	7
	Implementation	61	30
	Post-implementation	131	64
	Total	206	100
Length of use (years)	1-2 years	47	23
	3-5 years	52	25
	More than 5 years	107	52
	Total	206	100

From Table 7 above, the data revealed that a substantial 72 percent of the surveyed SMEs in Nairobi have ERP systems. Out of the total 285 SMEs, 206 have adopted an ERP system, signifying a strong recognition of the advantages it offers. Among the adopting SMEs, 30 percent were in the process of implementing ERP solutions, while 64 percent had moved beyond implementation and were in the post-implementation stage, focusing on optimization. Interestingly, a significant 52 percent of SMEs that had integrated ERP systems have been using them for more than 5 years, indicating a prolonged and fruitful engagement with the technology. This data underscores a promising trend of steady and mature ERP adoption by SMEs in Nairobi, showcasing its enduring value in enhancing operational efficiency and competitiveness.

#### **4.6 Business Operation Challenges Experienced by Business Enterprises in Nairobi**

This study investigated the common challenges that are experienced by SMEs in Nairobi County. The responses from 285 participants were measured on a scale of 1 to 5 with a rating of 1 if the challenge had no significant impact, and a rating of 5 if the challenge had a very high impact. The operational challenges which were the independent variables included regulatory compliance challenges, resource constraints challenges, organizational culture challenges and supply chain complexity challenges. Table 8 below shows analysis of response given in terms of mean and standard deviation.

Table 8 Analysis of Challenges Encountered by Small and Medium Enterprises

Variable	Mean	Standard Deviation	Coefficient of Variation
Regulatory compliance	3.00	0.96	32.00
Resource constraints	1.71	0.56	32.75
Organizational culture	2.78	0.82	29.50
Supply chain complexity	2.08	0.52	25.00

As Table 8 above shows, insights into how SMEs in Nairobi perceive market challenges. The data suggests a moderate overall concern when it comes to regulatory compliance challenges, but with varying degrees of opinions. The distribution of perceptions is symmetric and relatively flat, showcasing diverse viewpoints among SMEs.

Additionally, the data in Table 8 above, indicates that resource constraints were generally viewed as a low concern, but opinions vary among SMEs. The distribution is slightly positively skewed, suggesting a leaning towards perceiving these challenges as relatively

more significant.

The analysis also provides insights into how SMEs perceive organizational culture challenges. The data suggests a moderate overall concern, but opinions vary among SMEs. The distribution is slightly positively skewed, suggesting a leaning towards perceiving these challenges as relatively more significant. Also, insights into how SMEs in Nairobi perceive supply chain complexity challenges suggests a moderate overall concern, with opinions varying among SMEs. Among the four challenges, resource constraints was the most risky with a coefficient variation of 32.75 percent, whereas supply chain complexity had the lowest risk of 25 percent – see Table 8 above.

#### **4.7 Sustainable Business Operations with Adoption of Enterprise Resource Planning Systems**

The SBOs on ERP adoption was the dependent variable and therefore to underscore the relationship between challenges and SBOs with mediation of ERP. The responses from the respondents were analyzed and the results are shown in Table 9 below.

Table 9 Impact of Enterprise Resource Planning on Sustainable Business Operations

Variable	Mean	Standard Deviation	Coefficient of Variation
Cost savings	3.86	0.74	19
Competitive advantage	3.65	0.58	16
Enhanced reputation	3.63	1.19	33
Regulatory compliance benefits	2.96	0.04	1
Growth opportunities	3.72	0.07	2

From Table 9 above, cost Savings with a mean score of 3.86 suggests that, on average,

respondents believe that ERP systems provide a relatively high level of cost savings. This indicates that most respondents see ERP as a cost-effective solution. Moreover, the relatively low standard deviation (0.74) indicates that there is relatively little variability in opinions regarding cost savings. Most respondents seem to agree on the cost-saving benefits of ERP.

Analysis of Table 9 above shows competitive advantage with a mean score of 3.65 indicating that, on average, respondents perceive ERP systems as providing a moderate level of competitive advantage. This means that respondents see ERP as contributing positively to competitiveness, but not extremely so. Moreover with a standard deviation of 0.58 the data indicates that there is relatively low variability in opinions about competitive advantage to a business as a result of ERP adoption.

Enhanced reputation with a mean score of 3.63, as shown in Table 9 above, indicating that respondents perceive a moderate enhancement of reputation due to ERP system adoption. Moreover, the high standard deviation (1.19) suggests a wide range of opinions regarding reputation enhancement. Some respondents believe that ERP significantly enhances reputation, while others do not.

Table 9 above shows, regulatory compliance benefits with a mean score of 2.96 suggesting that, on average, respondents believe that ERP systems provide a relatively low impact on regulatory compliance benefits. However the range of 4 (from 1 to 5) indicates a range of opinions, with some respondents perceiving low benefits while others see higher benefits.

In regards to growth opportunities, the high standard deviation (1.17) indicates a wide range of opinions regarding growth opportunities with some respondents confirming that ERP contributes significantly to growth, while others do not agree.

The data analysis of Table 9 above, suggests that respondents generally perceive ERP systems as beneficial for sustainable business operations, particularly in terms of cost savings and competitive advantage. However, there is more variability in opinions regarding enhanced reputation, regulatory compliance benefits, and growth opportunities, with some respondents having more positive views than others.

#### **4.9 Firm Size and Industry**

The research also aimed to evaluate how industry context and size of SME affected ERP in business operations. Analysis of responses is as shown in Table 4.9 below.

Table 10 Analysis of Influence of Firm Size and Industry

Variable	Mean	Standard Deviation	Coefficient of Variation
Industry context (industry type)	2.77	0.93	33
Firm size (number of employees)	3.65	0.58	16

From Table 10 above, industry type with a mean value of 2.77 suggests that, on average, SMEs in the study sample belong to industries that may not be as conducive to ERP adoption or integration. This mean value is lower than the midpoint, which could indicate that some SMEs in this sample come from industries where ERP adoption might not be as common or straightforward. Moreover, the standard deviation of 0.93 indicates that there is a moderate level of variability among SMEs in different industries. Some SMEs in

Nairobi County might come from industries where ERP adoption is more common, while others may be in industries where it's less prevalent.

Some industries might have specific ERP solutions tailored to their needs, while others may have less complex operations that do not necessitate ERP adoption. Furthermore, a high coefficient of variation of 33 percent indicates that there is a relatively high level of variability in industry types among SMEs in the Nairobi. Therefore, the variability in industry types suggests that the readiness and suitability of ERP adoption can vary significantly among SMEs. SMEs in industries with complex supply chains or high data integration requirements may benefit more from ERP adoption compared to those in simpler industries.

Table 10 above shows, firm size with a mean value of 3.65, indicating that, on average, the SMEs in Nairobi have a moderate number of employees. The standard deviation of 0.58 indicates that there is some variability in the size of SMEs in the sample. Some SMEs may have relatively small workforces, while others might be closer to the upper limit of what's considered an SME. There is a moderate level of variability in firm size among SMEs in Nairobi with a standard deviation of 16 percent. Generally, larger SMEs with more employees might have greater resources and organizational complexity, making them more likely candidates for ERP adoption. Smaller SMEs, on the other hand, may have simpler operations and fewer resources, making ERP adoption less urgent or feasible. In summary, the data on industry context and firm size among SMEs can provide insights into the challenges and opportunities for ERP adoption in the context of SME business operations.

Variability in industry types and firm sizes highlights that ERP adoption decisions should be context-specific and tailored to the unique needs and characteristics of each SME

#### **4.8 Market Challenges and Operational Benefits Encountered by Small and Medium Enterprises as a Result of Enterprise Resource Planning Systems Implementation**

The relationship between market challenges and operational benefits encountered by SMEs as a result ERP systems implementation was analyzed using linear regression analysis. The predictors of the study were market challenges including, resource constraints, regulatory compliance challenges, organization culture challenges, supply chain complexity while the dependent variable was SBOs. The ERP adoption was used as the moderator for the study.

The resulting linear regression equation allowed for the analysis of the relationship between the dependent variable and independent variables and therefore the resulting equation used to predict the outcome variable when the coefficients of independent variables is kept constant. The data analysis involved summary regression statistics, Analysis of Variance (ANOVA) and regression coefficients. Table 11 below shows the model summary and ANOVA statistics.

The R-square for the regression model in Table 11 below was 0.503, approximately 50.3 percent of the variation in SMEs' SBOs was explained by the considered predictor variables regulatory compliance, resource constraints, organizational culture, supply chain complexity challenges and adoption of ERP. This was a moderate explanatory power and

implied that 49.7 percent of the variation in SBOs was explained by other variables not considered in this study.

Table 11 Linear Regression Model Summary

Model	R	R Square	Adjusted R Square			
1	.709	0.503	0.494			
Model		Sum of Squares	Degrees of Freedom	Mean Square	F	Sig.
1	Regression	50.309	5	10.062	56.439	.000 <sup>b</sup>
	Residual	49.74	279	0.178		
	Total	100.049	284			
Model		Unstandardized Coefficients	Standardized Coefficients		t	Sig.
		B	Beta			
1	(Constant)	1.433			6.156	0.000
	Regulatory	0.033		0.053	1.174	0.241
	Resource	0.622		0.591	11.846	0.000
	Organizational	-0.087		-0.121	-2.607	0.010
	Supply chain	0.205		0.179	3.908	0.000
	ERP adoption	0.24		0.175	3.983	0.000

Overall, the model was significant since the p-value (0.000) was less than alpha ( $\alpha$ ) value of 0.05 which meant that all the predictor variables were significant. Regarding individual significance, however, only regulatory compliance challenge was not significant since its p-value (0.241) was greater than ( $\alpha$ ) value of 0.05. The predictive model was, therefore,  $SBOs = 1.433 + 0.622RESCC - 0.087OCC + 0.205SCCC + 0.240AERP$ . Among these predictor variables, the most important was resource constraints challenges (RESCC = 0.591) whereas the least was organizational culture challenges (OCC = 0.121) – see standardized coefficient column in Table 11 above and taking absolute values. In addition, if resource constraints; supply chain complexity challenges and adoption of ERP were increased marginally, SBOs would, on average, go by 0.622; 0.205; and 0.240 units ceteris paribus. On the other hand, if organizational culture challenges were increased by one unit,



SBOs would, on average, go down by 0.087 units holding all the other variables constant.

#### **4.10 Discussions and Findings**

This study aimed to explore the relationship between challenges faced by SMEs in Nairobi and the sustainability of their business operations. The study investigated how the adoption of ERP systems influenced this relationship. The analysis revealed a range of challenges faced by SMEs in Nairobi, including limited financial resources, regulatory complexities, market competition, and workforce constraints.

The study's focus was on understanding how these challenges influenced SBOs, with sustainability encompassing economic, social, and environmental dimensions. The findings demonstrated a degree of interplay between SMEs' challenges and their ability to maintain sustainable operations. The introduction of ERP systems was used as a moderating factor in the relationship between SMEs' challenges and their SBOs.

The SMEs grappling with limited resources found that ERP adoption enabled them to optimize resource utilization, minimize wastage, and enhance cost management. Similarly, regulatory complexities posed a challenge to many SMEs. However, those with ERP systems were better equipped to navigate these complexities. The findings concur with Kiarie and Wanyama (2017) that ERP has the capability to foster their compliance efforts and reduced the risk of penalties. Analysis of responses, however indicated that the relationship between regulatory challenges and business operation was not significant.

Owiti (2014) observed that supply chain complexities can be addressed through ERP-

driven process automation and streamlined workflows. The SMEs with ERP systems have reduced dependency on manual labor, leading to increased productivity and efficiency. Organization culture, another challenge highlighted by SMEs, had an effect on SBOs and this matches to Macharia (2019) to the strategic insights provided by ERP systems.

Data analysis of this study underscored the intricate relationship between challenges faced by SMEs in Nairobi and the sustainability of their business operations. The ERP adoption emerged as a significant factor moderating this relationship, demonstrating its potential to empower SMEs to overcome challenges and promote sustainable practices. The findings emphasized the importance of considering ERP implementation as a strategic approach to addressing challenges and fostering SBOs in the context of SMEs. This insight holds implications for both SMEs and policymakers seeking to bolster the resilience and sustainability of SMEs in Nairobi and similar settings.

## **CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

The journey through this study has led to a comprehensive understanding of the complex interplay between ERP adoption and the operational landscape of SMEs in Nairobi. In this final chapter, we present a synthesis of the findings, draw meaningful conclusions, identify the study's limitations, propose actionable recommendations, discuss the implications of the research, and suggest avenues for future exploration.

### **5.2 Summary of the Findings**

This study delved into the relationship between ERP adoption and the operational dynamics of SMEs in Nairobi. The research aimed to investigate how challenges faced by SMEs were countered by ERP adoption enabling SBOs. The study collected data through questionnaire surveys from 380 representative sample of SMEs. Most of the 285 responses agreed that ERP has a positive impact of SBOs, and the resultant data analysis unveiled insights into the intricate interplay between challenges, ERP adoption, and SBOs.

#### **5.2.1 Trends and Extent of Adoption of Enterprise Resource Planning in Kenya**

The study sought to assess trend and extent of adoption of ERP and from responses data analysis, 72 percent of the surveyed SMEs, had chosen to adopt an ERP system. This demonstrates a notable uptake of technology for optimizing business processes. On the other hand, 28 percent of the surveyed entities have not yet embraced ERP systems.

Regarding the stages of ERP implementation, the findings highlight that a significant portion of the entities 64 percent have reached the post-implementation stage, where the ERP system is already integrated and operational. This suggests a growing maturity in the ERP implementation process within the region. During implementation phase, 30 percent of the entities were actively engaged, signifying ongoing efforts to adopt ERP systems as a part of their operational strategies. Meanwhile, 7 percent of the entities were in the planning stage, indicating a forward-looking approach among a smaller subset of businesses.

Looking at the length of ERP system usage, data illustrates that a majority 52 percent of the entities have been utilizing ERP systems for more than 5 years, showcasing the sustained and enduring adoption of this technology. Moreover, 25 percent of the entities have been using ERP systems for 3-5 years, further demonstrating commitment to integrating this technology over an extended period. Additionally, 23 percent of the entities have been using ERP systems for 1-2 years, suggesting a relatively newer adoption.

These trends collectively reveal a positive picture of ERP adoption in Nairobi, Kenya, with a substantial proportion of businesses embracing the technology, progressing through implementation stages, and maintaining long-term usage. This data could have implications for local businesses, policymakers, and ERP vendors by highlighting the need for continuous support, training, and tailored solutions to cater to various stages of adoption and usage. Notable ERP adopted by SMEs included; Microsoft Dynamics 365 business, Odoo, Quickbooks, Easybooks, Ebizframe, Oracle, Sage 300 cloud, Sage pastel, SAP

business one, Syspro and Tally ERP.

### **5.2.2 Business Operations Challenges Experienced by Business Enterprises**

The analysis of data offers insights into the challenges confronted by SMEs in Nairobi, Kenya, categorized into regulatory compliance challenges, resource constraints challenges, organizational culture challenges, and supply chain complexity challenges. These challenges are quantified through various statistical measures. For example, regulatory compliance challenges was encountered by SMEs on a moderate level of difficulty in adhering to regulations and standards, with a mean score of 3. Resource constraints challenges in terms of managing limited resources is a relatively less pronounced challenge, as indicated by a mean score of 1.71.

Organizational culture challenges in terms of aligning organizational culture with goals presents a moderate challenge, with a mean score of 2.78 while supply chain complexity challenges in terms of dealing with intricate supply chains was moderately challenging, with a mean score of 2.08. The standard deviations show variability in the experiences of SMEs across these challenges. These findings underscore the need for tailored interventions and strategies to address the diverse challenges faced by SMEs in Nairobi, Kenya. Policymakers, business support organizations, and SMEs themselves can leverage this information to formulate effective approaches for promoting sustainable growth and overcoming these hurdles.

### **5.2.3 Sustainable Business Operations Experienced by Small Enterprises**

In terms of the operational benefits that ERP systems provide to SMEs, the data revealed that, SMEs experience a mean score of 3.86 for cost savings, indicating that ERP systems contribute to reducing operational expenses. This benefit can be attributed to streamlined processes, improved resource allocation, and enhanced efficiency in business operations. Also ERP systems offer a competitive edge to SMEs, with a mean score of 3.65. By optimizing various aspects of business management, such as inventory control, order processing, and decision-making, SMEs can position themselves more favorably in the market. Moreover, with a mean score of 3.63 signifies that ERP systems contribute to building a better reputation for SMEs. This benefit is likely a result of improved customer service, accurate order fulfillment, and timely response to business demands.

The SMEs also derive regulatory compliance benefits from ERP systems, with a mean score of 2.96. This suggests that ERP tools aid SMEs in adhering to various industry regulations and standards, ensuring that their operations meet legal requirements. Furthermore, the analysis indicated that ERP systems enable growth opportunities for SMEs, as reflected by a mean score of 3.72. These systems provide the foundation for scalable and efficient operations, allowing SMEs to expand their market reach and accommodate increased demand.

Across these operational benefits, the standard deviations indicate some variability in how SMEs experience these advantages. For instance, enhanced reputation and regulatory compliance benefits show relatively higher variability compared to the other benefits.

The ranges highlight the spread between the minimum and maximum scores for each benefit, indicating the extent of diversity in experiences. The mode, representing the most frequently occurring score, underscores the common perceptions of these benefits. For example, competitive advantage, enhanced reputation, and growth opportunities have modes of 4 and 5, indicating that many SMEs recognize these benefits as significant.

Overall, the data underscores how ERP systems offer SMEs a range of operational advantages, from cost savings and competitive advantage to regulatory compliance benefits and growth opportunities. These benefits collectively contribute to enhancing SMEs' efficiency, effectiveness, and overall success.

#### **5.2.4 Market Challenges and Business Operations**

The linear regression analysis indicated that ERP adoption enhances SBOs with an increase of 0.24. The interpretation indicates that an increase in resource constraints and supply chain complexity challenges is associated with notable SBO improvements, while higher organizational culture challenges correspond to reduced SBO. The study established that ERP has the capability to counter challenges faced by SMEs in Nairobi and lead to sustainable operations.

Influence of both industry types and firm size to ERPs overall input to SBOs was also observed as an important catalyst. In terms of size, resource constraints is a major challenge. Smaller SMEs often have limited financial resources, technology expertise, and manpower compared to larger organizations. Implementing an ERP system can be

expensive in terms of software licensing, customization, training, and ongoing maintenance. Smaller SMEs might find it challenging to allocate the necessary budget and human resources for successful ERP adoption. Also, the scalability of an ERP system is crucial for growing SMEs. Small businesses may prefer ERP solutions that can start with basic functionalities and expand gradually as the business grows. The ability of the ERP system to accommodate changing needs without extensive overhauls is an important consideration. Moreover, implementing an ERP system involves significant changes in business processes and workflows. In smaller SMEs, where roles might be more fluid and employees wear multiple hats, resistance to change can be more pronounced therefore, proper change management strategies need to be in place to mitigate potential disruptions and ensure a smooth transition.

In terms of industry size, the complexity of an industry's operations can influence the ERP adoption decision. Industries with intricate supply chains, intricate manufacturing processes, and numerous stakeholders might require more comprehensive ERP systems. SMEs in such industries might be more motivated to adopt ERP solutions to streamline operations, improve coordination, and enhance efficiency. Also, Industries that are heavily regulated, such as healthcare, finance, and food production, require stringent record-keeping, reporting, and data security. ERP systems with built-in compliance features are more appealing to SMEs in such industries. The need to meet regulatory standards can drive ERP adoption. Moreover, in industries where competition is intense, SMEs might adopt ERP systems to gain a competitive edge. ERP systems provide real-time insights, data-driven decision-making, and improved customer service, all of which can contribute



to better positioning in a competitive market. Furthermore, some industries have established industry-specific ERP solutions that cater to their unique needs. SMEs in these industries might lean towards adopting these specialized ERP systems rather than generic solutions. It was also noted that industries that require strong collaboration among different stakeholders, such as suppliers, distributors, and retailers, may benefit from ERP systems that facilitate seamless communication and information sharing. SMEs in such industries might be more inclined to adopt ERPs to enhance collaboration.

### **5.3 Conclusion**

The findings of this study indicate a multifaceted connection between challenges, ERP adoption, and SBOs within SMEs in Nairobi. Successfully ERP adoption leads to overcoming these market challenges and lead to various positives, such as improved operational efficiency, better decision-making capabilities, as well as heightened competitiveness in the market. By recognizing the intricate relationships among ERP systems, challenges, and sustainable operations, SMEs can make more informed decisions during technological transitions, thereby enhancing their operational efficiency while advancing their sustainability objectives.

### **5.4 Recommendations**

The study has established that ERP is an important technology tool that can improve business operations of SMEs with its unit increasing SBO by 0.24. Albeit operational challenges SMEs face in the market such as resource constraints and supply chain complexity, introduction of ERP can help counter these challenges and lead to an efficient

lean system. ERP systems however are not cheaply sourced. It is therefore important for Government and financial institutions to provide tailored financial support to SMEs undergoing ERP implementation to mitigate financial constraints that come with its adoption.

Also, incompatibility of the ERP system and the organization's business and operations can impede successful implementation. ERP vendors should focus on user-friendly interfaces and comprehensive technical support to help SMEs navigate technical complexities from integration, customization to data migration.

It is also prudent that SMEs prioritize change management strategies to overcome resistance to change during ERP adoption and thereby fostering resource efficiency. SMEs should also invest in thorough training programs to empower employees to harness ERP systems effectively, ensuring long-term viability. Moreover, underlying issue of mistrust in the system's effectiveness, can lead to users to find workarounds and bypass elements they do not trust. To mitigate this, management should ensure that the software aligns with the organization's business processes, fostering trust and encouraging user engagement.

## **5.5 Implications of Study**

The study's findings have practical implications for management of SMEs, policymakers, and ERP vendors. Understanding the operational challenges and their impact on SBOs can guide effective decision-making during ERP implementation, ensuring the alignment of technology with sustainability goals.

## **5.6 Limitations of the Study**

This study is not without limitations. The sample size was constrained by resource limitations, which might impact the generalizability of the findings. The study's focus on Nairobi might limit the applicability of the results to other regions. Additionally, the study's cross-sectional nature prevents the establishment of causal relationships with challenges faced in ERP adoption process.

## **5.7 Suggestions for Future Research**

This study focused of the relationship between challenges faced by SMEs and operational sustainability with implementation of ERP, longitudinal studies could explore the long-term effects of ERP adoption on SMEs' sustainable operations. Moreover, the study population of this study was Nairobi, Kenya, therefore, comparative studies across different regions could reveal variations in challenges and ERP impact to SBOs.

Additionally, since this study used only quantitate research, in-depth qualitative research could be important to uncover variations in challenges faced by SMEs during ERP implementation in Kenya. The study area also, did not cover much on ERP systems specifically and future research could delve into strategies for streamlining ERP customization processes for SMEs.

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# APPENDICES

## Appendix I Introduction Letter



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**UNIVERSITY OF NAIROBI**  
**FACULTY OF BUSINESS AND MANAGEMENT SCIENCES**  
**OFFICE OF THE DEAN**

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Our Ref: **D68/34210/2019**

September 5, 2023

National Commission for Science, Technology and Innovation  
NACOSTI Headquarters  
Upper Kabete, Off Waiyaki Way  
P. O. Box 30623- 00100  
**NAIROBI**

Dear Sir/Madam

**INTRODUCTION LETTER: JEFF AKELLO OMINO**

The above named is a registered Master of Business Administration candidate at the Faculty of Business and Management Sciences, University of Nairobi.

The student is conducting research on "**Enterprise Resource Planning and Business Operations of Small and Medium Enterprises in Nairobi, Kenya**"

The purpose of this letter is to kindly request you to assist and facilitate the student with necessary data which forms an integral part of the Project.

The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your co-operation will be highly appreciated.

  
**PROF. JOSHUA WANJARE**  
**ASSOCIATE DEAN, GBS & R**  
**FACULTY OF BUSINESS AND MANAGEMENT SCIENCES**



JW/pgr

## Appendix II Questionnaire

### INTRODUCTION

This questionnaire is intended for SMEs operating in Nairobi County. Its purpose is to gather data for the study titled "Enterprise Resource Planning and Business Operations of Small and Medium Enterprises in Nairobi County." Please select the appropriate checkboxes and provide information in the provided spaces as necessary. Rest assured that your responses will remain discrete and is only to be used for purposes of research. Thank you for answering the questions below to the best of your ability and expertise. It might require you about 15 minutes to completion. Your participation is highly valued.

#### Section A: Characteristics of Respondents

1. Geographic information  
Sub-county .....
2. What is the name of the SME?
3. What is the Industry of your SME?
4. For how long has the organization been in its current business  
Less than 1 year  1-3 years  3-5 years  above 5 years
5. What is the total size of your organization?  
1-10 Employees  10-50 Employees  51-100 Employees  Above 100 Employees
6. Please indicate the appropriate option for your employment duration:  
 Less than 1 year  1 – 3 years  3 - 5 years  More than 5 years
7. Kindly indicate your job title in the organization
8. What is the company's main source of income?  
Product Development  Service Delivery  Other (specify)

#### Section B: Trend and Extent of ERP Adoption

9. Has your SME adopted an ERP system? [Yes / No]
10. If yes, kindly select stage of ERP implementation stage  
(Planning) (Implementation) (Post-implementation)
11. What ERP vendor do you use?  
(Specify) \_\_\_\_\_
12. If you have adopted an ERP system, please indicate ERP modules used  
Finance   
Human Resources (HR)   
Manufacturing and logistics   
Supply Chain Management (SCM)   
Customer Relationship Management (CRM)
13. If yes, how long have you been using the ERP system in the organization?  
 Less than 1 year  1-2 years  3-5 years  More than 5 years
14. If no, is your SME considering adopting an ERP system in the near future?

[Yes / No / Unsure]

15. If yes, what are the main reasons for considering ERP adoption?

**Section C: Challenges in Sustainable Business Operations**

16. Please assess the extent of challenges faced by your organization in implementing sustainable business operations on a scale of 1 to 5. Assign a rating of 1 if the challenge has no significant impact, and a rating of 5 if the challenge has a very high impact.

NO	INDICATOR	1	2	3	4	5
1	Regulatory compliance challenges (Meeting legal and regulatory requirements for sustainability practices.)					
2	Resource constraints challenges (Limited financial, human, and technological resources for implementing sustainable initiatives.)					
3	Organizational culture challenges (Resistance to change, lack of employee engagement, and alignment with sustainability goals.)					
4	Supply chain complexity challenges (Managing and integrating sustainable practices across the supply chain)					

17. Please provide specific examples or descriptions of the challenges you have faced in sustainable business operations

**SECTION D: Operational Benefits and outcomes to Sustainable Business Operations as a result of ERP adoption.**

18. Please rate the following benefits to sustainable business operations on a scale of 1 to 5, with 1 being "Not experienced" and 5 being "Highly experienced"

NO	INDICATOR	1	2	3	4	5
1	Cost savings (reduced energy consumption, waste management, and operational efficiencies)					
2	Competitive advantage (differentiation in the market, improved brand image, and customer loyalty)					
3	Enhanced reputation (positive perception from stakeholders, increased trust, and improved relationships)					
4	Regulatory compliance benefits (meeting and exceeding regulatory requirements, avoiding penalties, and legal risks)					
5	Growth Opportunities (increasing revenue, market share, customer base, and overall organizational success)					

19. Please rate extent to which ERP can lead to sustainable business operations of an SME on a scale of 1 to 5, with 1 being "Strongly disagree" and 5 being "Strongly agree"

1[]                      2[]                      3[]                      4[]                      5[]

20. Please provide specific examples or descriptions of the benefits you have experienced in sustainable business operations

**SECTION E: Level of impact of the ERP adoption on sustainable business operations of**

SMEs

21. Please rate the following mediating factors on a scale of 1 to 5, with 1 being " Strongly disagree" and 5 being " Strongly agree"

NO	INDICATOR	1	2	3	4	5
1	ERP adoption has led to sustainable practices that enable more efficient and effective operations.					

SECTION F: Level of impact of Moderating factors to sustainable business operations of SMEs implementing ERP systems

22. Assign a rating of 1 if the factor has no significant impact, and a rating of 5 if the factor has a very high impact.

How would you rate the impact of the following factors to challenges and benefits of ERP adoption in your organization?

- a) Firm size (Number of Employees)                      1 ()    2()    3()    4()    5()
- b) Industry context (Industry Type)                      1 ()    2()    3()    4()    5()

SECTION G: Additional Comments

Please share any additional comments or insights you have regarding the trends, challenges, and benefits associated with ERP adoption in SMEs

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Thank you for your participation in this questionnaire. Your input is greatly appreciated for this research study. Please submit your email address below if you have any more comments or would want to receive the research findings. If you prefer not to share your email, you may leave this field blank.

Email Address: