ENTERPRISE RESOURCE PLANNING SYSTEM AND PERFORMANCE OF RAIL FREIGHT OPERATIONS IN KENYA: A CASE OF KENYA RAILWAYS CORPORATION

BY

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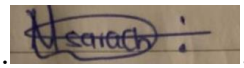
2022

DECLARATION

This research project is my original work and has never been presented for the award of any Degree in any other university.

Signature ……  … **Date** ……20th November…2022……

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This research project has been submitted for examination with my approval as the University Supervisor

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DEDICATION

I dedicate this work to my supportive parents, Joshua and Agnes Oseko, who for believed in my ability to achieve in academia. You have been a rock in my life, and may God continue blessing you abundantly.

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ABBREVIATIONS AND ACRONYMS

ERP:	Enterprise Resource Planning systems
IS:	Information Systems
ROI:	Return on Investment
THSR:	Taiwan High Speed Rail
SGR:	Standard Gauge Railway
ITS:	Intelligent Transportation Systems
TAM:	Technology Acceptance Model
RBV:	Resource-based View
IT:	Information Technology
KRC:	Kenya Railways Corporation
CRM:	Customer Relationship Management

ABSTRACT

Many companies now use ERP systems to boost their efficiency. ERP installation, on the other hand, is difficult and expensive, and research on the impact of ERP investments on operational performance has so far been equivocal. This research aims at understanding the impact of ERP systems on the performance of freight operations in Kenya with an emphasis on the Kenya Railways Corporation. The study goals were to explore the extent of ERP usage at KRC and to explore the effect of four ERP modules (customer relationship management, financial management, order management, and human resource management) influence the performance of Kenya Railways Corporation rail freight operations in Kenya. Stakeholder theory, technological acceptance model, resource-based view, and constraints theory are the four theories that underpinned this research. Descriptive research design was adopted and the Kenya Railways Corporation employees who utilize ERP targeted. A stratified random sampling method was adopted in choosing the respondents from the target demographic and the resultant sample size was 172 employees. A questionnaire was used for collecting responses and the amassed data was analyzed using SPSS. According to the findings, ERP modules were employed at KRC to a moderately. The study output further indicate that all the four ERP modules under consideration has a statistically significant effect on the performance of rail freight operations at KR ($p<0.05$). The order management had the largest influence on rail freight operations followed by the human resources management module. Thus, this study is one among the studies that have established a positive influence of ERP on operational performance. The study ascertains that KRC's management should further encourage the adoption of ERP modules among its employees to further enhance the performance of its rail freight operations. This could be done through training on the usability and usefulness of the ERP system and channeling more resources towards ERP implementation.

CHAPTER ONE: INTRODUCTION

1.1. Background to the study

The growth of information and communication technology and information systems, along with the demand for innovation and sustainability, has accelerated the pace at which businesses must provide high-quality, efficient results (Al-Mashari, 2008). As a result, businesses have substantial amounts of resources putting IS in place. Enterprise Resource Planning systems (ERPs) are used to connect these ISs. These systems are implemented in the organization in the hope that they will improve performance (Compton, 2012) by facilitating organizational operations and providing support for a variety of organizational goals in order to achieve greater levels of efficiency and effectiveness.

ERP software is becoming increasingly popular in many modern businesses. Many businesses utilize it to try to improve their performance. Business performance might include monetary benefits, operational improvements, or intangible benefits for an entity. This study will pay more attention on the practical and subtle benefits of ERP adoption This decision was made because financial advantages have been thoroughly researched but lacks an elaborate contribution of the ERP system's influence. The research by Hitt *et al*. (2012) is an excellent example of this.

ERP, as defined by Olson (2014), is comprehensive application software that helps entities to manage critical day-to-day operations such as product planning, inventory maintenance, purchasing parts, customer service, tracking orders, and interacting with suppliers. ERP also helps businesses manage important long-term operations such as product planning, inventory maintenance, and purchasing parts. According to Waxer (2016), ERP is a generic word that refers

to any software solution that integrates all data and activities related to a business into a single system (Dery *et al*., 2015; Shanks *et al*., 2010).

A significant number of companies have opted for and implemented enterprise-wide information systems, also known as ERP systems. These systems cover an entire company's operations. An ERP is a type of information system that is made up of a variety of modules, each of which provides support for the activities of a firm. All of the information is stored in a centralized database, and the modules are connected to one another (Aernoudts *et al*., 2015). Since all of the data is kept in a centralized location, it is quite simple to transform the data into information.

1.1.1 Enterprise resource planning

ERP is the management software that includes various modules which enable firms to plan their products and services. ERP systems integrate information for management both internally and externally throughout a whole enterprise (Chung *et al*., 2008). ERP systems can encompass different business functionalities, including finance, accounting and order management, among others. ERP systems use an integrated software program to perform this task in an automated manner.

Gefen & Ragowsky (2005) proposed that next-generation ERP systems ought to be designed on the basis of the concept of efficient operation. In recent years, ERP software has expanded its application to nearly every industry, including production, services, finance, transportation, and public utility companies. ERP system's primary goal is to manage the organization's relationships to external stakeholders and to boost the flow of information among the organization's five core

business areas. This software, which is utilized by a wide variety of businesses, most notably multinational firms, plays an essential part in ensuring that enhanced efficiency is achieved.

According to Kumar & Keshan (2009), businesses, particularly manufacturers, struggle to compete and grow when they do not have an ERP solution because the applications they use are functionally lacking, out of date, and isolated from the data and applications of other businesses. Asemi & Jazi (2010) note that even if the cost of prewritten software is relatively low in comparison to the cost of developing the program in-house, the overall cost of implementing the software might be anywhere from three to five times the cost of purchasing the software. In recent years, companies have been making efforts to implement standardized and consistent ERP systems. These systems serve as the informational backbone of organizations and integrate flows throughout the entire supply chain in a seamless manner.

1.1.2 Operational performance

Operational performance is the synergy that exists between the various company units and their capacity to deliver a bigger output while working together. Therefore, the purpose of operational performance management, also known as OPM, is to coordinate the activities of these departments so that all of the employees may collaborate as a team to protect the interests of the firm and steer the ship in the direction of its primary business objectives (Slack, Chambers, & Johnston, 2010). As a result, operational performance is a concept used to describe everything a company does to maximize the efficiency of every single department and the synergy between them.

In previous literature, operational management has been defined to include measures inventory turn, cost, unit manufacturing, quality, delivery dependability, and flexibility (Squire *et al*., 2006;

Trattner *et al*., 2019). In the opinion of Slack, Chambers, & Johnston (2010), five operations namely cost, speed, flexibility, dependability, and quality are linked to performance. Kaydos (2020) argued that a particular task or goal requires identification for operations. As such, firms need to select the performance objectives to prioritize. According to Battesini *et al*. (2021), an organization's operational performance can be enhanced through the promotion of a culture of operational excellence, the provision of appropriate tools and techniques for process improvement, the establishment of appropriate controls and measures, and the implementation of process management technology with real-time visibility.

1.1.3 Rail Freight Transport

Rail freight transportation can aid economic integration by connecting landlocked countries and providing access to regional and international markets. Railway transport is also beneficial when it comes to safety and the environmental sustainability, making it a feasible approach for satisfying sustainable development targets (Aritua, 2019). When it comes to a balanced transportation system with optimal freight flow, countries with well-developed railway freight networks gain a competitive advantage and additional benefits (Amos, 2009). The railway network in Africa is fairly limited.131.09 billion tonne-kilometres of freight were handled on railways in Africa in 2017, according to a report done by Statista.com. This is in comparison to global rail freight traffic was roughly 8.72 trillion tonne-kilometers in 2017. According to the African Development Bank, Africa's economy is presently undergoing an unparalleled rebound and is expected to develop significantly over the next three to four decades.

The Standard Gauge Railway's (SGR) existence in Kenya is heavily reliant on the company's technical approach. In comparison to railways in sophisticated countries such as Germany, Japan, and the United States, Kenya's rail sector has limited technical methods. Japan has a well-developed rail sector. Japan's rail business has thrived because to technological advancements. Speed, safety, passenger comfort and convenience, and environmental friendliness are among the categories. New technology, such as signaling and communication, dominates the German rail sector, and other IT technologies can significantly aid in the modernization of Europe's railroads. In Kenya, just the most basic technology solutions have been implemented in railway transportation. In this context, Kenya's rail industry technology methods are immature when compared to those of industrialized nations (Karim, 2016).

Rail must be able to comprehend all types of data resulting from the use of new technologies, as well as enable the development of standard frameworks engineering and the linking of data frameworks. Continuously connected information and administrations disseminated by everyone and everything on the internet should be used to develop smart solutions for both passenger and freight flexibility challenges (Tolley & Turton, 2014). Information and business insight will play an important role in client exchanges, not only for broadcasting critical operational data to clients, such as schedule delays, but also for providing targeted offers and administrations to all clients (Profillidis, 2016).

1.1.4 Kenya Railways Corporation

The construction of SGR from Mombasa to Nairobi was intended to improve transportation services by making them more efficient, safe, accessible, and long-lasting. Kenya Vision 2030 envisions a nation with a well-connected and integrated transportation infrastructure, including railways. After the colonial railway, the SGR is the second railway to be built. The new railway network complements the old railway network, enhancing efficiency and greatly decreasing damage to highways caused by big vehicles transporting merchandise. The majority of firms are now using the SGR to move their merchandise from Mombasa to Nairobi, alleviating traffic congestion on the roadways. Prior to the introduction of standard gauge rail in 2017, Kenya's rail network was reliant on an older rail infrastructure constructed during the colonial era. The previous rail system was plagued by inefficiencies, such as delays in cargo delivery owing to slow speeds and frequent failures. This has resulted in a large number of individuals electing to carry their products via the road system, which negatively impacted economic growth due to the rapid deterioration of roads, as well as traffic jams produced by trucks hauling merchandise from Mombasa to Nairobi and other locations (Jedwab, Kerby & Moradi, 2017).

Benefits were apparent almost immediately after the standard gauge was introduced, as many passengers chose to travel between Mombasa and Nairobi through the SGR because to its speed and comfort over road transit. Furthermore, the SGR considerably decreased the cost of travel, which was a boom to persons who travel regularly for work. The expansion of the SGR from Nairobi to Mombasa is anticipated to considerably strengthen the country's transportation system (Jedwab, Kerby, & Moradi, 2017). Rail technology has improved passenger and freight transportation efficiency in the transportation industry (Thaduri, Galar & Kumar, 2015).

1.2. Problem statement

The association between ERP and performance of companies has been explored by various researchers. According to the research done by Parto *et al*. (2016), the influence of ERP on financial performance in a developing country were assessed. The findings indicated that each ERP system module had a distinct effect on the financial performance pointers. Liu & Miao (2010) studied the impacts of ERP systems on the performance of Chinese chemical organizations. However, the outcomes revealed the lack of a significant improvement during ERP adoption. Koh, Saad, & Arunachalam (2006) also established that the deployment of ERP systems did not lead to improved organizational ability to achieve flexibility of supply systems and demand forecasting capacity. Locally, the study by Wanyoike (2017) established that ERP positively impacted almost all the performance aspects considered. Conversely, the outcomes Karimi (2017)'s study revealed no statistically significant relationship between the adoption of ERP and the performance of companies in Kenya's transport sector. From these international and local studies, it is evident that there is no consensus concerning the nature of the association between ERP and institutional or operational outcomes; while some pieces of research depict a positive relationship, others indicate no relationship at all. Furthermore, there is a limited breadth of literature on the link between ERP implementation and performance of freight operations. As such, to address these gaps, this study explored the influence of ERP systems on the performance of Rail freight operations in Kenya with emphasis on Kenya Railways Corporation (KRC).

1.3 Objectives of the Study

The overall objective was to determine the influence of ERP systems on the performance of rail freight operations in Kenya with a focus on Kenya Railways Corporation. The explicit objectives were:

1. To determine the extent of usage of ERP system at KRC freight operations
2. To observe the connection between ERP system and outcomes of Kenya Railways Corporation freight operations.

1.4 Significance of the study

The railway industry employs a wide range of technology. Some train technology, on the other hand, is exclusively present in technologically sophisticated countries. The findings might be crucial to the Kenya Railways Authority's management. The study's findings might be utilized to advise Kenya Railways Corporation on how to use ERP more effectively in freight services.

The outcomes of this study will aid in identifying the obstacles that businesses experience when adopting new technology. This knowledge will assist stakeholders in the business in developing plans and policies that will maximize the benefits that a new technology can provide.

The research would act as a basis for later discussion of best practices for ERP implementation. This would assist firms in viewing ERP as a strategic instrument that would assist them in improving their performance and competing effectively in the competitive environment, rather than simply as another technical adoption. This would essentially offer a company a competitive advantage over its competitors.

Scholars who want to learn more about ERP and how it is used in the rail sector or any other business in Kenya will benefit from this research. This study may be useful to researchers and

academics in the realms of strategic management, corporate management, engineering, and computer science. The output may serve as a foundation for future study into railway transportation technology.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The contents of this section include the theories that underpin this investigation, as well as, the empirical study based on its objectives. A conceptual framework is also included in this chapter.

2.2 Theoretical Foundation of the Study

This research was underpinned by three theories. These are the stakeholder theory, the resource-based view theory, as well as, the theory of constraints. A discussion of each of these theories follows in the subsections that follow.

2.2.1 Stakeholder Theory

This theory centers on the mutually dependent links that association between an entity and its various constituents, including its suppliers, customers, investors, workers, and other stakeholders. According to the thinking behind this theory, a firm is obliged to provide value for both its stakeholders and shareholders. All stakeholders with legitimate interests, work together to achieve some benefits. Furthermore, profits and other advantages are given equal weight (Donaldson & Preston, 1995). Varied interconnected stakeholders' expectations must be met, and organizations must adapt to many stakeholders' converging impacts (Rowley, 1997).People, corporations, agencies, and organizations that are affected in some manner by the movement of goods are referred to as freight stakeholders. Stakeholder analysis is especially useful for freight transportation analysis due to the conflicting aims of the many freight stakeholders involved (Erjavec, Trkman & Groznik, 2014). The analysis of stakeholders assists in understanding the many tactics and reactions that businesses may use to address transportation change.

When the stakeholder theory is applied to business, it results in increased collaboration and willingness among the numerous stakeholders who are allocated to a project as you work to satisfy the various requirements of those stakeholders (Harrison & Wicks, 2013). In accordance with the tenets of the Stakeholder Theory, managers are obligated to give some thought to the professional relationships inside the organization that they have to cultivate in order to successfully deliver the end result. These commercial partnerships between Kenya Revenue Authority, Kenya ports Authority and Shipping lines are crucial in deciding the organization's long-term success or failure. As a result, the study aimed to build on the theory by investigating how logistics businesses employ rail freight transit to safeguard their shareholders' interests.

2.2.2 Technology Acceptance Model (TAM)

This theory was proposed by Davis proposed (1989). TAM saw value, and saw usability are the most important predictors of framework use, and they predict client attitudes toward using the framework, or the client's willingness to use the framework. "The amount to which one agrees that adopting a given system would enhance the performance of his work," according to perceived helpfulness, and "the level to which one accepts that embracing a certain system would be effortless ," according to perceived simplicity of use (Davis, 1989).

The TAM developed by Davis (1989) is often used to assess client recognition of innovation. According to this model, perceived usefulness (PU) as well as perceived usability (PEOU) determine one's disposition toward framework use, which influences one's behaviour expectation to use a framework, and so determines actual use of a recommender framework. Area, for example, is a statistical feature that acts as a precursor to perceived value and saw convenience. As a result, TAM is reliant on both critical elements such as seeming convenience and saw usefulness. This

may be demonstrated in the research done by (Mohammad, 2009), That acknowledged that TAM is a widely accepted model for elucidation and anticipating framework use. The Technology Acceptance Model was relevant to the research since it informs the Kenya Railways Corporation's decision to adopt a certain technical approach in order to improve its commercial operations.

2.2.3 Resource-Based View (RBV)

This line of thought places emphasis on the importance of an entity’s resources in determining its competitive advantage, as well as, its performance (Barney, 2001). The theory states that if a business wishes to maintain an edge in the market, it must get and maintain control of resources that are scarce, valued, non-substitutable, and unique (Barney, 1991). RBV, may be thought of as an "inside-out" strategy development process (Grant, 1991); according to him, the process begins with identifying the business's resources, then evaluating the potential for yielding value, and lastly defining a plan that helps an organization to sustainably manage the optimal value.

RBV has mostly been utilized in the business sector to assess an organization's market share in comparison to its competitors (Burton & Malone, 2014). In the hypercompetitive environment that characterizes today’s market, it is commonly understood that looking at operations strategy from a resource-based viewpoint may help companies make more money (Gagnon, 1999). Managers that employ resource-based thinking ensure that the company's resources, which are the foundation of its existing competitive advantages, are nurtured and protected. As a result, this research aimed at determining how Kenya Railways Corporation can use ERP in its freight services, which would help the company, reach SCA and enhance operational performance.

2.2.4 Constraint theory

The constraint theory or theory of constraints (TOC) was the brainchild of Dr. Eliyahu Goldratt (Cox III, Cirm, & Schleier Jr, 2010). Since that time, TOC has seen consistent growth and development, and now it is recognized as an important consideration within the realm of management best practices. The theory provides a framework for identifying the primary restriction standing in the way of success and then carefully addressing it until it is no longer an issue. This can be accomplished by identifying the most important obstacle that stands in the way of accomplishing the goal. The fact that TOC naturally prioritizes actions that lead to improvements is one of the reasons that it is an appealing concept. This is because according to the theory, the most important thing to focus on is always the current limitation. TOC offers a highly concentrated methodology for the creation of rapid improvement that can be utilized in circumstances in which there is an immediate need to improve (Spector, 2011). As such, this theory was useful in aiding the location of the limiting issues that stand in the way of the execution of crucial ERP modules at KRC in a bid to boost the performance of rail operations.

2.3 Enterprise Resource Planning systems

ERP developed with the intention of integrating all of business functions, although MRP did not cover all of them (such as finance). Lack of use, inadequate utilization, and a lack of dedication and permanent improvement ambitions diminish the system's potential, preventing a firm from accomplishing its goals and strategic objectives, as stated by Iacub (2015).

ERP systems have emerged as a crucial business tool during the past few decades. An ERP system automates crucial business processes and stores all relevant financial and operational data in one place. This data is collected through a number of modules developed to aid in the operations of

different divisions, such as accounting, supply chain, and human resources. Thanks to an ERP solution, all employees can access the data they need regarding improvement areas for their respective departments (Iacub, 2015).

One of the reasons for ERP's success is that it can be easily customized to meet the unique requirements of any business. A company needs to acquire those modules that pertain to their particular business strategy, operations, and important challenges. Additional ERP modules can be implemented as needed to deal with changing business needs and problems. Modular ERP software has the advantage of letting a company expand by adding features without having to completely overhaul the system. Choosing an experienced ERP provider with a wide selection of modules can save a business the time and effort of developing a brand new ERP system whenever requirements change (Ian McCue, 2022).

2.3.1 Customer relationship management module

The ERP software's standard functionality can be extended by including the CRM module. This will enable firms to better their various components, such as supply chain, finance, projects, human resources, and so on. These components ensure that an organization runs smoothly, and enhancing them is likely to benefit other parts of the business. Most significantly, it will provide a clearer image of the clients, allowing for more efficient service. As a result, the rate of client retention is expected to rise, as more lasting relationships can be formed (Ian McCue, 2022).

Customer loyalty and happiness can be improved by implementing CRM effectively. CRM's goal is to extract value from customers while simultaneously delivering value to them in the most

efficient way possible. The aim of the approach is to achieve a long-term competitive edge through a focus on customer retention and ultimately increasing sales (Kumar, 2012).

According to Kostojohn (2011), a robust CRM system enhances operational efficiency by focusing on the customer in decision-making, process design, and organizational restructuring. CRM systems take use of a company's client-facing functions by centralizing data, automating marketing, giving business analytics, tracking sales prospects, analyzing data, and enabling responsive customer care. A CRM system is a platform that stores all of the above-mentioned vital information for developing, improving, and maintaining customer relationships (Microsoft, 2017).

2.3.2 Human resource management module

A HRM module typically incorporates all the elements of a workforce management program, plus those that aren't found in the former. HRM is like customer relationship management but for workers. This widely used component stores detailed information on all employees, including their performance reviews, job descriptions, and offer letters. It records not just working hours but also vacation days, sick days, and other benefits. Since the HRM module keeps track of so much data about every employee in the company, it eliminates the need for many companies to keep this information in disparate spreadsheets, which can lead to errors (Ian McCue, 2022).

The sub-modules of the ERP HR module are as follows: Organizational Management: This supports in people planning and application development. It allows you to look at the complete structure of the company. This allows for the organization and production of personnel summaries. E-Recruitment: This sub-module is used to hire candidates from both inside and outside the company. This entails being able to access talent regardless of their location. Employees can use

this function to keep track of their attendance and absences. It can be used to evaluate attendance, absenteeism, overtime, bonuses, and pay, among other things. Personnel Administration is in charge of keeping track of a vast number of different data sets. This information is saved, updated, and controlled for each employee. The department in charge of an organization's payroll is known as payroll. Other modules, such as accounting and time tracking, can be connected to payroll. Specifically, it includes all of the contributions and withholdings that are made on behalf of each worker. The user can record the daily attendance of all employees on the payroll in the transactions section of the payroll module. Employee attendance can be tracked and recorded in its entirety by the user. Furthermore, the software user can enter data relating to the operators' overtime, and reporting includes both individual employee reports and consolidated information across departments, demographics, and more.

In a study published in 2012, Aggarwal & Kapoor stressed the significance and strategic function of HRIS in boosting business competitiveness. The study also concluded that HRIS has the ability to provide broad decision assistance to organizations and can assist them in achieving both strategic and operational goals. When Information System skills are channeled to generate distinctive company competencies, Ravichandran & Lertwongsatein (2013) revealed that IS has the ability to boost business performance. Furthermore, Eris and Galani *et al* (2010) stated that in the information age, IT advances in business processes are critical.

2.3.3 Order Management Module

There is a system in place to monitor orders from the time they are placed until they are delivered. This ERP feature notifies the relevant departments, such as the warehouse, distribution center, or retail outlet, of newly placed orders from customers. The order management component ensures

that no orders are lost in transit and boosts the percentage of orders delivered on time, which in turn keeps customers happy and cuts down on expensive rush delivery. More sophisticated order management software can enable a business decide between a storefront, a warehouse, and a third-party fulfillment partner, among other options, to fulfill an order based on inventory levels and the buyer's location (Ian McCue, 2022).

Order management systems (OMSs) aid businesses in streamlining and automating critical facets of their purchasing and fulfillment procedures, which benefits both the business and its clients. After an order is placed and a delivery mode is chosen, an automatic fulfillment procedure is started. Fast order fulfillment is made possible by OMS platforms, which determine the most efficient and/or convenient shipping location and/or prepare items for in-store pickup. It helps with customer lifecycle management in general, including return processing, and with inventory control to prevent stock-outs and backorders. Retailers and distributors may track critical performance indicators using the most capable OMS platforms, which can provide fulfillment reporting and insights (KPIs). Advanced OMS platforms, for example, can track order fill time, fulfillment costs such as picking, packaging, and shipping, and even product failure and return rates. The first step in finding inefficiencies and building a plan to remedy them is to track these and other KPIs (Jenkins, 2022).

2.3.4 Financial Management Module

Because it gives insight into both the present and the future of an organization's fiscal health, the finance and accounting module is the most crucial component of an enterprise resource planning system. Important aspects of this section include keeping tabs on AP and AR and updating the general ledger. Additionally, it includes the data needed by financial planning and analysis experts

to produce reports such as P&L statements and board reports, and to conduct what-if analyses (McCue, 2022).

ReadSoft (2015) argues that by removing bank fees, allocating funds faster, increasing transparency, and providing better reporting, automated financial operations are more efficient, cost-effective, and customer-service oriented. Additionally, an ERP system can help eliminate DOS, unallocated cash, and open items by automating the entire data gathering, cash application, and exception management processes.

2.4.1.1Customer relationship management and operational performance

Baiyewu (2022) aimed to establish the impact of customer relationship management on operational outcomes of Dangote flour mill in Kano state. The outcomes of the research identified a positive link between the two research variables at the flour mill. Similarly, Waweru & Karihe (2021) established that customer relationship management strategies such as customer retention, and technology infrastructure positively and expressively affected the performance of the enterprises.

Haislip & Richardson (2017) investigated the associated between customer relationship and firm performance. Using multivariate analyses, these researchers established that companies that invest in customer relationship management systems are better able to increase sales to both new and returning customers. Generally, their findings uncovered a direct and considerable influence of customer relationship management systems and performance. Also, while discussing the issue of customer relationship management, Boulding *et al*. (2005) established that it affects a firm's operations and overall performance positively. While none of these studies focused on freight

operations, they reveal that customer relationship management, a ERP module, is integral to the operational and overall firm performance.

2.4.1.2 Human resources management systems and operational performance

ERPs, as noted by Dery & Wailes (2005), enable the automation of human resources management procedures, delegating many traditionally serviced functions to business and management units of an organization. This reduces the amount of time that human resource managers need to spend on administrative and compliance duties, thereby improving the performance of human resource operations. It should also be underlined that ERPs facilitate the incorporation of human resources procedures into business strategy. This indicates that ERP systems are being used in human resource departments on a massive scale (Dorel & Bradic-Martinovic, 2011), and HR functions are moving closer and closer toward being completely linked with the operational parts of businesses (Tadinen, 2005).

According to Bansal & Narula (2014), ERPs aided in ensuring that human resource management procedures are easier, more proficient, and smarter, with swiftdata availability for decision making. ERPs also made decision making data more readily available. According to Jackson (2010), the enterprise-wide linkage of operational human resource management tasks achieved through the application of ERP systems results in quick flow of information, decreased cycle times, and increased levels of productivity. These are indications of improved operational performance for firms.

Also, according to Sadrzadehrafiei *et al*. (2013), the human resource management systems under ERP offer a variety of advantages for human resources management procedures across a number

of different aspects including records and compliance, forecasting and planning, communication and integration, and human resources analysis. These authors depict that human resource management systems module affects operational performance positively.

2.4.1.3 Order management and operational performance

There is a widespread agreement among a large number of authors regarding the significance of order management systems under ERP in the enhancement of the performance of supply chains. A good example is in the research by Wieder *et al*. (2006) that discovered that there are favorable effects of the order management module system on the performance of the supply chain. According to Zeng & Pathak (2003), numerous records of achievement indicate that the incorporation of order management systems can reinforce and boost supply chain performance. In addition, Hitt *et al*. (2002) found that making an investment in an ERP system led to an increase in corporate performance as well as productivity. Also according to the findings of Cotteleer (2002), an ERP system where the order management module has been implemented has the ability to advance the operational performance of a supply chain.

Dumitru *et al*. (2013) noted various considerable characteristics based on the influence of ERP systems on a business entity's operational performance and one of the mentioned aspects was order and inventory management efficiency. Anđelković & Radosavljević (2018) also noted that order management improves operational management by offering a centralized system that can handle all of a company's sales channels, in addition to improving overall productivity and the quality of the client experience.

2.4.1.4 Financial management system and operational performance

As noted by Uddin *et al*. (2019), an organization can expedite its financial operations effectively with the assistance of the ERP finance module, which also provides auditable control of revenue and expenses. Additionally, it makes it possible for a corporation to convey financial information to third parties, such as customers and suppliers, in a more understandable manner. The study by Ungureanu (2022) established a direct link between the deployment of the financial management module of ERP and operational performance and noted that it is much simpler to integrate important financial and accounting operations, manage and spend resources, and fulfill the criteria for financial reporting when one makes use of a financial management module that is built into an ERP system.

Similarly, as per the outcomes in Kim (2013)'s study, a company that makes use of the finance module of an ERP system is inversely related with an audit report lag. The inverse relationship becomes significant, however, only after a certain amount of time has passed—more specifically, three years after the initial ERP deployment. This indicates that the utilization of ERP inside a business may assist contribute to a reduction in the audit report lag. This advantage, however, does not materialize instantly; rather, it is going to take some time before the entire impact of the company's accounting systems can be apparent. Also, in a recent study conducted by Andrieș & Ungureanu (2022) to ascertain the impacts of ERP modules on the performance of organizations in Romania, it was established that most, over 80 percent, of organizations had implemented the financial management module and it affected their operational performance positively.

2.4.2 ERP Systems Adoption

Effects on end users from improperly deployed enterprise resource planning systems were studied by Kerr & Houghton (2014). The research outcomes indicated that when firms implemented ERP, they saw some unintended consequences, like a decrease in confidence in the system's reliability. Users also learned to circumvent the system in order to avoid potentially harmful content. Several of the software requirements did not mesh with standard operating procedures.

After implementing ERP systems, Al-Eqab & Ismail (2011) analyzed the changes in four financial variables at 50 companies in the United States. Their findings are ambiguous because they found a decrease in the staff count relative to sales within three years of implementation but no decrease in the cost of goods sold during that time. There were no noticeable shifts in the ratio of administrative and general expenses to sales or in residual revenue after the method was implemented. Hunton (2013) questioned the influence of ERP on the well-being of an organisation. ERP users and non-users had their asset turnover, investment returns, and total asset recoupment compared. There was no statistically significant improvement for the first group. In contrast to the non-ERP users, the first group did not experience a decline in the analyzed ratios within the aforementioned time frame.

Knowledge management and resource development controls, as well as the role of absorptive capacity, were examined by Elbashir, Collier, & Sutton (2011), who found that they affect the rate of BI adoption in Australia. In light of the results, the authors believe that better BI assimilation by managers is related to more advanced BI system infrastructure. The results also showed a correlation between operational absorptive capacity and management team absorptive capacity, underscoring the significance of cultural controls associated with knowledge management and

resource development. Evidence for a possible diffusion effect on the MA function was also discovered by Elbashir *et al*. (2011), who also discovered that organizations with a higher absorptive ability integrate BI into all aspects of their business.

Kallunki, Laitinen, &Silvola (2011) state that formal and informal MC systems serve as measures that reduce the impact of ERP implementation on Italian businesses' bottom lines. Even though their research found no direct connection between ERP and non-financial performance, it does provide evidence that formal techniques of MC control mediate the direct link between ERP and non-financial success. Results show a positive correlation between non-financial and monetary success. Further, the idea that informal controls buffer the role of ERP systems on future performance is supported by scant evidence.

For their 2018 study on ERP system adoption success in Russian businesses, Demyanova *et al*. opted for a case study research approach. According to the outcome of this study, it appears that Pharm standard-implementation Ufavita's of an ERP system has led to observable cost savings, improved efficiency, and increased profitability.

Garg & Agarwal (2014) studied vital positive indicators for ERP implementation in an Indian hospital and found that it helped reduce operating expenses, enhance management and customer service, and keep tabs on inventories and the supply chain. Using a qualitative research method, Chiarini *et al*. (2018) investigated the opportunities and threats that Italian hospitals confront. Patient satisfaction, stakeholder satisfaction, and operational efficiency are the broad categories into which coded data from semi-structured interviews describing ERP benefits were sorted.

Based on their research into the effects of ERP on Tunisian enterprises, Ziadi & Knufie (2012) concluded that local companies are hesitant to completely embrace the digital age. Businesses in Tunisia aren't taking the initiative to adopt new technology because doing so requires financial inputs, especially in the form of training and education for employees. In addition, Prasad (2013) investigated the non-monetary outcomes of IT spending in Fiji. The research shows that investing in IT in developing countries generates intangible benefits, especially at the process level, which boosts the value of businesses in those countries.

Case study research was employed by Berihun (2019) to identify critical factors contributing to the ERP implementation's effectiveness at the Ethiopia Postal Service Enterprise. Problems with ERP adoption were found to stem from a lack of support from upper management, poor project management, and discord across different user departments, as determined by a questionnaire. Another issue with ERP implementation was staff resistance to change and a lack of clear strategic direction and vision for ERP use.

Ssweanyana & Busler (2012) investigated the amount of ERP system adoption and utilization in a hundred and ten Ugandan enterprises according to ERP's value to the organisation. According to the study’s outcomes, most respondents strongly agree that if a business invests in IT systems, ERP can boost its market performance, efficiency, savings, service delivery, and transaction costs.The findings also revealed that developing-country firms adopt and use ERP in the same way that developed-country firms do, with the only difference being the level of adoption and usage. This is because governments are unable to establish legislation to address them due to a number of factors that influence their success.

Hunton *et al*. (2013) looked at 60 organizations from whose performance data could be obtained prio and after ERP deployment for a significant period. In order to evaluate and contrast results, the sample included enterprises that had not implemented ERP. There is no discernible variation in ROA between ERP companies' performance prior to and after implementation. Koske (2015) surveyed 16 manufacturing enterprises in Kenya to determine the influence of ERP implementation. The outcomes of the study revealed that finance and ERP had a significant positive influence on the performance of Kenyan enterprises.

Onyinkwa's (2012) descriptive research in Kenyan government hospitals revealed that the application of ERP systems aided in reducing cycle time, improving organization strategy formulation, improving information flow, and improving operational efficiency. In regards to the outcomes of the research, the ERP system aided in the efficient supply of important pharmaceuticals in Kenyan government hospitals.

Since most businesses encounter resistance from potential users during the implementation process, Ireri *et al*. (2015) did a study to comprehend the issues of ERP adoption at Kenya Ordinance Factories Corporation (KOFC). Through surveys and in-depth interviews, the researchers learned that the majority of ERP implementation approaches on the market are lacking in depth, which in turn causes user dissatisfaction.

2.5 Summary of Literature Review

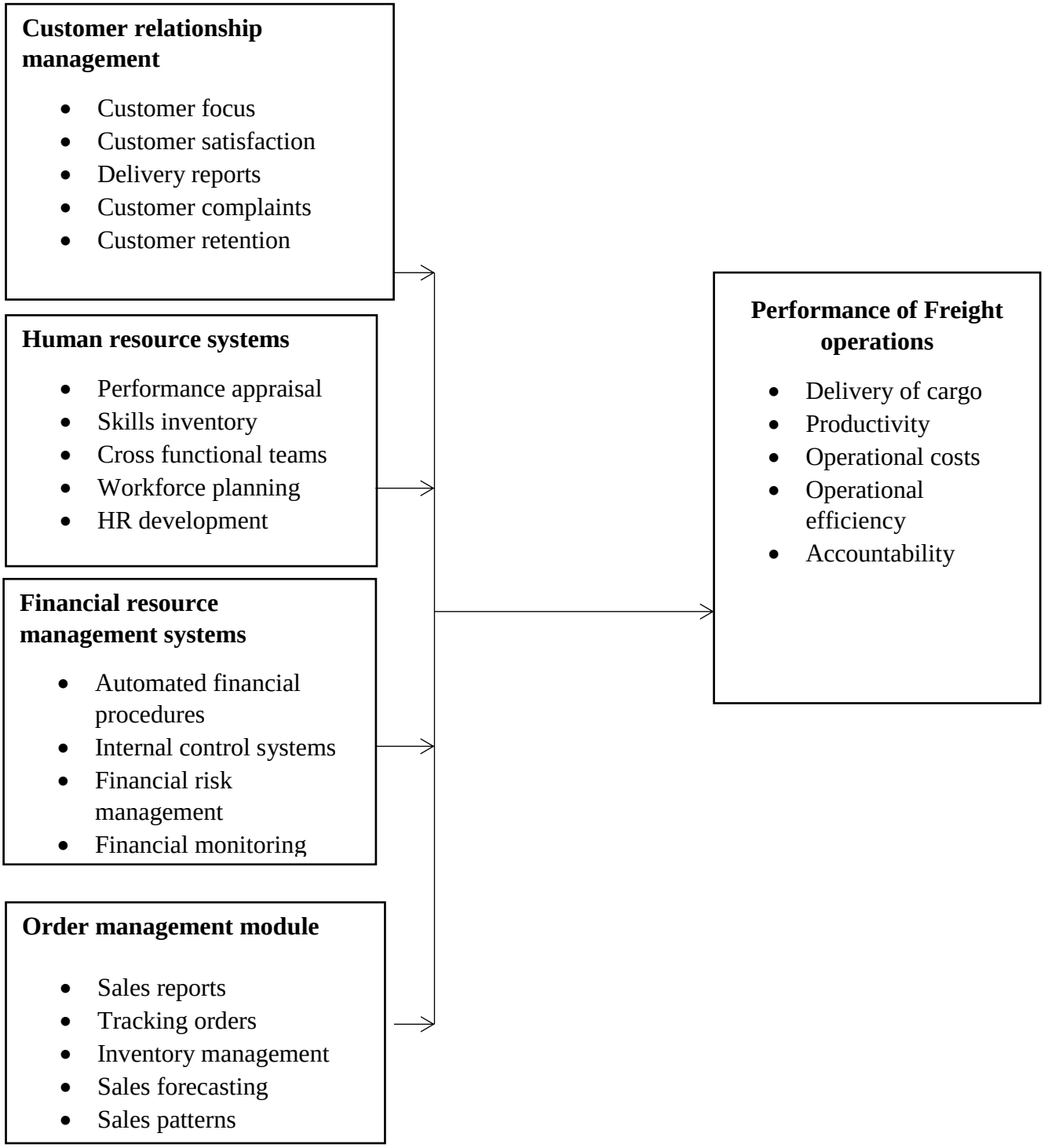
The summary of the empirical literature review are summarized in Table 2.1. It includes the study's aims, methodology, main results/conclusions, and areas where further research is needed.

Table 2.2: Summary of literature gaps

Author(s)	Focus of the study	Methodology	Major findings/conclusions	Knowledge gaps
Nicolaou & Bhattacharya (2014)	How ERP usage affects the performance of entities	Descriptive research design	There were desirable long-term changes for entities that adopted ERPs	Done in a different organization
Onyinkwa (2012)	Influence of ERP on the effectiveness of medical supply in Kenyan government hospitals using the Kenya Medical Supplies Agency (KEMSA)	Descriptive research design	Use of ERP systems minimized cycle time and facilitated development of organization operational techniques, enhanced the flow of information, and operational efficiency	Done in KEMSA
Ssweanyana&Busler (2012)	Adoption and usage of ERP systems in Ugandan firms	Descriptive research design	ERP boosts the overall performance of organizations that invest in IT systems	Conducted in Uganda

Berihun (2019)	The success factors that are vital for prosperous ERP execution with a focus on an Ethiopian firm	Descriptive	Challenges of ERP incorporation included lack of top management support as well as conflicts between user departments	Examined the success factors that are vital for prosperous ERP execution
Kozak (2015)	ICT evolution on the profit and cost effectiveness of the Organizations	Survey research design	There was a notable association between the implemented ICT, productivity and cost savings	Study was on one module of the ERP-ICT.

2.6 Conceptual framework



Source: Researcher 2022

CHAPTER THREE: RESEARCH METHODLOGY

3.1 Introduction

The contents of this chapter describe the procedures and methods used in conducting this research. These included the way that respondents were sampled, the way that data was obtained and scrutinized, and the way that the study variables were operationalized.

3.2 Research Design

A research design is the logic technique adopted in research to ensure that a research question is well-answered (Gorard, 2013). This study used a descriptive research design. By use of this design, the researcher reached more and diverse study participants and comprehensively explored the variables and their relationships. By detailing the features of a single person or group, descriptive studies aid the researcher in data collection, analysis, presentation, and analysis for clarity (Kothari & Garg, 2014). The study collected primary and secondary data. The researcher utilized questionnaires to collect primary data and obtain quantitative data. Published reports and books aided in getting secondary data.

3.3 Target Population

Kothari & Garg (2014) assert that a population comprises all items under investigation in any subject. Kenya Railways Corporation staff were the study's target group. According to KRC, there are 300 employees distributed in five departments namely Business & Operations, Finance, Human resources, Supply chain management and Research, planning compliance who use the ERP system.

3.4 Sample Size and Sampling Procedure

3.4.1 Sample Size

A sample is preferred by researchers in studies where the population is large, as a way of saving on resources (Kothari & Garg, 2014). This study employed a stratified random sampling method to recruit respondents from the described population from the different departments to have sufficient representation. Since this sampling technique is probability-based, the researcher hoped to acquire an impartial sample through it.

3.4.2 Sampling Procedure

To provide a pragmatic presentation of the sample, a 95% confidence level was adopted in this study. Besides, a 5% margin of error was allowed in this study. The formula for sample size determination by Yamane (1967) was employed to compute the desirable sample for this research. The formula is:

$$\mathbf{n} = \frac{\mathbf{N}}{\mathbf{1} + \mathbf{N}(\boldsymbol{e}^{\mathbf{2}})}$$

Where;

n = size

N= Population

e =margin of error,

1 =constant.

Therefore, the sample size was calculated as;

$$\mathbf{n} = \frac{\mathbf{300}}{\mathbf{1} + \mathbf{300}(\mathbf{0.05}^{\mathbf{2}})}$$

=172

Thus, the sample size for the research was 172 respondents.

3.5 Research Instruments

Data collection equipment is referred to as a research instrument or tool (Kothari & Garg, 2014). This study utilized close ended questionnaires to obtain information from Kenya Railways Corporation staff from different departments. Questionnaires were deemed appropriate for use in this research as they are time saving, can be self-administered, and are easy to design (Oyolla, 2019). The questionnaire for this study contained a section for respondent's general information including their demographic characteristics, and a section containing statements rated using a five-point Likert scale.

3.5.1 Pilot Study

A pilot test is one that is carried out before the main study. Despite being miniature replicas of full-size research, pilot studies should be carried out exactly as planned for the original study, but on a smaller scale, according to the guidelines (Payne, 2016). Pilot studies are used to pre-test research tools such as questionnaires and interview schedules/guides.A pilot study was undertaken on a limited selection of 10% of the target population to assess different indicators of either the variables, methodological adjustments to instrument deployment or administration, and the efficacy of research instruments and procedures.

3.5.2 Validity of Instruments

Validity entails the measuring of how well the tool examines what it is supposed to examine (Biddix, 2016). Because surveys are largely standardized, some participants may misinterpret some aspects. As a result, a small sample of participants participated in a pilot research to tackle

this problem and to pre-test items in the questionnaire. A pilot study can assist assess if research instruments can be trusted to produce reliable results. It also identifies flaws in the tool, making it possible for the investigator to enhance the tool's usefulness in gathering essential data. The investigator also applied the knowledge of the supervisor in ensuring that the research instrument met the construct validity, content and criterion validity.

3.5.3 Reliability of Instruments

The dependability of study equipment was determined using a test-retest procedure. The test-retest technique evaluates a test's external consistency (McLeod, 2013). The same people are provided equipment at two different times in a considerably short period in this technique. To evaluate how closely the participants' replies on the subsequent visit matched their responses on the first occurrence, a correlation analysis is generated. The pilot study group was given research instruments for a five-day period to see if they produced a similar or nearly related answer to the previous one. The data was then loaded into SPSS for analysis of the correlation coefficient(r). A coefficient larger than 0.7 was accepted and indicated high reliability.

3.6 Data Collection Procedure

The investigator applied a mix of primary and secondary data collection procedures. Questionnaires were used in primary data collection which was quantitative in nature. The research reviewed past literature in journals, magazines, reports and newspapers to gather the necessary secondary data. The study tool was categorized in three parts based on the objectives of this research. Section A on traits of the respondents, section B corresponds to the first objective of the study and section C corresponds to the second objective.

3.7 Data Analysis Techniques

SPSS software was adopted in analysis of the collected data. A frequency distribution table was used for tabulating the calculated statistic for each variable. The researcher adopted correlation and regression analyses explore the significance of the model and variables that were used as follows:

The regression equation:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Whereby Y= Performance of freight operations in Kenya Railways Corporation

X_1= Customer relationship systems

X_2= Human Resource Management systems

X_3= Financial management systems

X_4 = Order management module

β_1, β_2, β_3 and β_4 are coefficients of determination

ε is the error term.

3.8 Operationalization of Variables

Table 3.1 illustrates the relationships among the variables as well as their respective indicators.

Table 3.1: Operational definition of variables

Objective	Variable	Indicators	Measurement Scale	Data Collection Method	Type of Statistic
Independent Variable					
To determine how ERP customer relationship managements influence	Communication	Customer retention Customer focus	-nominal -ordinal	Interview schedule	Percentages Frequencies

the performance of Kenya Railways Corporation freight operations in Kenya.		Customer satisfaction Delivery reports Customer complaints			Means Standard deviation Correlation Regression
To establish how Human resource systems influence the performance of Kenya Railways Corporation freight operations in Kenya.	HRM systems	Performance appraisal Skills inventory Cross functional teams Workforce planning HR development	-nominal -ordinal	Questionnaire	Percentages Frequencies Means Standard deviation Correlation Regression
To determine how order management module influences the performance of Kenya Railways Corporation freight operations in Kenya.	Top management support	Sales forecasts Sales patterns Inventory management Sales reports Tracking orders	-nominal -ordinal	Questionnaire	Percentages Frequencies Means Standard deviation Correlation Regression
To establish how financial management systems influence the performance of Kenya Railways Corporation freight operations in Kenya.	Financial management systems	Automated financial procedures Internal control systems Financial risk management Financial monitoring	-nominal -ordinal	Questionnaire	Percentages Frequencies Means Standard deviation Correlation Regression
Dependent Variable					

Performance of Kenya Railways Corporation freight operations in Kenya.		Faster delivery of cargo Increased productivity Low transaction costs Increased number of deliveries Flexible services Quick information retrieval Improved work performance		Questionnaire Interview guide	**Descriptive** Percentages Frequencies Means Standard deviation

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This section gives an analysis and interpretations of the outcomes of the research as directed in the methodology section. The outcome given are on ERP system and performance of rail freight operations at KRC. The chapter focuses on the rate of response to the questionnaire, reliability analysis, the respondents' demographic information, descriptive statistics representing the respondents' opinions about the influence of each ERP module on performance of rail freight operations, and correlation analyses exploring the impact of each module on the performance of rail freight operations at KRC. A regression analysis was also performed to examine the significance of each of the variables as well as overall significance of the model.

4.2 Response rate

During data collection for this research project, 172 questionnaires were distributed to the employees at KRC who utilize the ERP system. By the time the data collection timeframe was closing, a total of 152 questionnaires had been filled. This achieved a response rate of 88.4 percent. In the opinion of Mugenda & Mugenda (2003), a response rate that exceeds 70 percent is satisfactory in research. Therefore, the response rate of 88.4 percent in this study was sufficient.

4.3 Reliability analysis

A reliability analysis was conducted to ascertain the internal consistency of the primary data collection tool and the output is provided in table 4.1.

Table 4.1: Reliability analysis output

Reliability Statistics	
Cronbach's Alpha	N of Items
.770	34

According to the output in table 4.1, the Cronbach alpha coefficient was 0.77, which represents a high internal consistency of the questionnaire. As such, the researcher utilized the questionnaire as it was to gather primary data that is presented in subsequent sections.

4.4 Demographic findings

To confirm that the collected primary data adhered to the study objectives, the researcher decided to relate them with the study participants' demographic traits. These traits were ascertained according to age, gender, education, level, department, length of ERP use, and most frequently used ERP modules. The findings are presented in the following tables.

4.4.1 Distribution of respondents by age

The study participants were requested to point out their age in the questionnaire, and their responses were analyzed. The results were presented in Table 4.2.

Table 4.2: Age of the respondents

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	8	5.3	5.3	5.3
	25-35	64	42.1	42.1	47.4

	36-50	59	38.8	38.8	86.2
	Above 50	21	13.8	13.8	100.0
	Total	152	100.0	100.0	

The output above output indicates that most of them had an age of between 25 and 35, which was 42.1 percent of the sample. They were closely followed by 38.8 percent who were aged between 36 and 50. 13.8 percent were aged above 50 while 5.3 percent were aged between 18 and 24. These results were an indication that the respondents were spread across different age brackets. Therefore, no age group was likely to influence the study's outcomes.

4.4.2 Distribution of respondents by gender

The study participants were also requested to give their gender and the output is given in Table 4.3.

Table 4.3: Gender of the respondents

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	87	57.2	57.2	57.2
	Female	65	42.8	42.8	100.0
	Total	152	100.0	100.0	

The output above confirms that most of this study's respondents were male at 57.2 percent. The female respondents accounted for 42.8 percent of the sample. Nonetheless, the difference in the number of males and females in this study was not significant enough to influence the study's outcomes towards any gender.

4.4.3 Distribution of respondents by education level

Education level attained was another demographic of interest in this study. The results of the exploration is as in table 4.4 below.

Table 4.4: Level of education achieved

Highest education qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	8	5.3	5.3	5.3
	Degree	104	68.4	68.4	73.7
	Postgraduate	40	26.3	26.3	100.0
	Total	152	100.0	100.0	

The output above indicates that 68.4 percent of the sample was made up of respondents who have acquired a bachelor's degree. 26.3 percent, however, had studied up to the postgraduate level. Notably, 5.3 percent had studied up to the diploma level. These results signified that most respondents were knowledgeable to fill in the questionnaires.

4.4.4 Distribution of respondents by department

The study participants were also requested to give the department in which they work at KRC. The results were presented in Table 4.5.

Department of work					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Business and operations	44	28.9	28.9	28.9
	Finance	41	27.0	27.0	55.9
	Human resources	18	11.8	11.8	67.8
	Supply chain management	23	15.1	15.1	82.9
	Research and planning	26	17.1	17.1	100.0
	Total	152	100.0	100.0	

The outcome above shows that the respondents who work in the business and operations department formed the majority sample group, at 28.9 percent. 27 percent was comprised of those who work in the finance department. 17.1 percent work in the research and planning department while 15.1 percent work in supply chain management. 11.8 percent work in the human resources department. This was a confirmation that the study participants were spread across various departments at KRC and that most of them would be knowledgeable about ERP related operations at the department.

4.4.5 Distribution of respondents by length of ERP use

The study participants were also required to state how long they had been using ERP. The output is given in table 4.6.

Table 4.5: Length of ERP usage

How long have you been using ERP?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 2 years	23	15.1	15.1	15.1
	3-5 years	63	41.4	41.4	56.6
	Over 5 years	66	43.4	43.4	100.0
	Total	152	100.0	100.0	

As per the output in Table 4.5, 43.4 percent of the study participants claimed to have been using ERP for over 5 years; they formed the majority of the sample group. 41.44 percent, in contrast, said that they have been using ERP for between 3 and 5 years. 15.1 percent stated that have been using ERP for less than 2 years. These results were an indication that the ERP system has been adapted to some extent in various KRC departments

4.4.6 Distribution of respondents by most regularly used ERP modules

The researcher also sought to know the most regularly used ERP modules by the employees in various KRC departments. Table 4.6 represents the outcomes.

Table 4.6: Most used ERP modules

Which among these ERP modules do you regularly use?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Customer relationship management	40	26.3	26.3	26.3
	Human resources management system	48	31.6	31.6	57.9
	Order management	31	20.4	20.4	78.3
	Financial management system	29	19.1	19.1	97.4
	Other	4	2.6	2.6	100.0
	Total	152	100.0	100.0	

As shown in table 4.6, the human resources management system was the most regularly used ERP module by the majority of respondents, at 31.6 percent. This was followed by 26.3 percent of respondents who claimed to use the customer relationship management module most regularly and 20.4 percent who mostly use the order management module. 19.1 percent of the sample mostly use the financial management system module, while 2.6 percent fell under the 'other' category, meaning that they mostly rely on other ERP modules.

4.5 Extent of usage of ERO system at KRC freight operations

As per the first research objective, the researcher sought to investigate the extent of use of ERP modules at KRC and table 4.7 represents the responses to this question.

Table 4.7: Extent of ERP use at KRC

To what extent do you use ERP modules?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low extent	9	5.9	5.9	5.9
	Moderate extent	86	56.6	56.6	62.5
	High extent	50	32.9	32.9	95.4
	5	7	4.6	4.6	100.0
	Total	152	100.0	100.0	

According to the study output above, most respondents claimed to use ERP to a moderate extent and these accounted for 56.6 percent of the sample. 32.9 percent, on the other hand, claimed to use ERP modules to a high extent. The remaining 5.9 percent accounted for those who said that they use ERP modules to a low extent. As such, it is evident from these findings that ERP modules' usage is not a new concept to KRC employees.

4.6 Customer relationship management using ERP

Customer relationship management using IFMIS was analyzed to know how it impacted the performance of rail freight operations at KRC. The respondents' level of agreeableness about the indicators of customer relationship management was measured on a Likert scale and the outcomes presented in table 4.8.

Table 4.8: Customer relationship management using ERP

Descriptive Statistics			
	N	Mean	Std. Deviation
A primary concern in our department is for our clients' complete happiness, and we do this by establishing connections between their wants and their needs.	152	4.37	1.072
In KRC customer relation programs influence customer retention rates	152	4.43	.981
The organization follows up with clients to see if they are happy	152	4.14	1.004
The company provides customized services according to existing customer needs	152	4.54	.883
The company is concerned about responding to clients' grievances	152	3.88	1.271
The organization takes preventative measures to address causes of customer complaints	152	4.74	.678
Valid N (listwise)	152		

The output in table 4.8 indicates that the majority group, agreed with the fact that a primary concern in their department is for their clients' complete happiness, and this is done by establishing connections between their wants and their needs (Mean=4.37, SD=1.072). Similarly, the majority of respondents agreed that in KRC customer relation programs influence customer retention rates (Mean=4.43, SD=0.981). Additionally, most of the study participants, agreed that the organization follows up with clients to see if they are happy (Mean=4.14, SD=1.004). Similar sentiments were echoed by a large number of respondents who also agreed that the company provides customized services according to existing customer needs (Mean=4.54, SD=0.883). Moreover, the majority of respondents responded by agreeing that the company is concerned about responding to clients' grievances (Mean=3.88, SD=1.271). Also, most respondents were in agreement that the organization takes preventative measures to address causes of customer complaints (Mean=4.74, SD=0.678). These results indicated that most respondents generally agreed that ERP use at KRC aids in customer relationship management.

4.6.1 Customer relationship management and performance of KRC rail freight operations

One of the objectives of this study was to ascertain the effect of customer relationship management module on the operations of rail freight operations at KRC. This was expressed based on a correlation coefficient.

Table 4.9: Customer relationship management and the performance of rail freight operations

Correlations			
		CRM	OP
CRM	Pearson Correlation	1	.139
	Sig. (2-tailed)		.088
	N	152	152
OP	Pearson Correlation	.139	1
	Sig. (2-tailed)	.088	
	N	152	152

The results above indicate that the correlation between the customer relationship management and operational performance of rail freight at KRC was represented by a coefficient r =0.139. This coefficient is positive but weak. Nonetheless, an increase in the customer relationship management results in a slight positive increase in operational performance of rail freight operations at KRC.

4.7 Financial management using ERP

Financial management using ERP was analyzed to examine its influence on the performance of rail freight operations at KRC. The rate at which financial management indicators impacted the performance of rail freight operations was also measured on a Likert scale

Table 4.10: Financial management using ERP

Descriptive Statistics			
	N	Mean	Std. Deviation
ERP system increases the correctness of data	152	4.24	.859
ERP system supports automated financial procedures	152	4.28	.952
ERP system supports internal financial control systems	152	4.11	1.004
ERP System supports financial risk management	152	4.03	1.151
ERP System gives a level of liquidity to schedule expenditure and commitments	152	4.16	1.013
Valid N (listwise)	152		

The output above reveals that most study participants agreed that ERP system increases the correctness of data (Mean=4.24, SD=0.859) and that ERP system supports automated financial procedures (Mean=4.28, SD=0.952). Furthermore, most respondents were in agreement that ERP system supports internal financial control systems (Mean=4.11, SD=1.004). Also, most respondents agreed that ERP System supports financial risk management (Mean=4.03, SD=1.151) and that ERP System gives a level of liquidity to schedule expenditure and commitments

((Mean=4.16, SD=1.013). Overall, the numbers on the agreement side of the scale were higher than those on the disagreement side; ERP helps users at KRC with better financial management.

4.7.1 Financial management system and performance of KRC rail freight operations

This research also examined the effect of the financial management system of ERP on the performance of rail freight operations at KRC. The association between these two variables was analyzed through a correlation approach. The analysis is presented in Table 4.11.

Table 4.11: Financial management system and performance of rail freight operations

Correlations			
		OP	FMS
OP	Pearson Correlation	1	.167*
	Sig. (2-tailed)		.040
	N	152	152
FMS	Pearson Correlation	.167*	1
	Sig. (2-tailed)	.040	
	N	152	152
*. Correlation is significant at the 0.05 level (2-tailed).			

The outcome above shows that the link between financial management system and operational performance of rail freight operations at KRC was represented by a coefficient r=0.167. This coefficient depicts a positive but weak correlation. Nonetheless, the results depict that an upsurge

in financial management system leads to an increase in operational performance of rail freight operations at KRC.

4.8 Order management using ERP

Order management using ERP was another important variable in this research. The level of agreeableness among respondents regarding its impact on the performance of rail freight operations at KRC was analyzed and the output is summarized in table 4.12.

Table 4.12: Order management using ERP

Descriptive Statistics			
	N	Mean	Std. Deviation
ERP order management system allows for generation of sales reports for decision making	152	4.98	.140
ERP Order management system helps track orders	152	4.43	1.021
ERP order management system helps in inventory management	152	4.82	.494
The order management system helps in sales forecasting	152	4.74	.581
The order management system helps in verification of duplicate orders	152	4.86	.475

The order management system helps in processing of payments	152	4.71	.697
Valid N (listwise)	152		

The results show that the majority sample proportion was comprised of those who agreed with this claim; ERP order management system allows for generation of sales reports for decision making (Mean=4.98, SD=0.14). Similarly, most were in agreement that ERP Order management system helps track orders (Mean=4.43, SD=1.021). According to the results, most respondents also agreed with the claims that ERP order management system helps in inventory management (Mean=4.82, SD=0.494) and that the order management system helps in sales forecasting (Mean=4.74, SD=0.581). The output also show that most participants were in agreement that the order management system helps in verification of duplicate orders (Mean=4.86, SD=0.475) and also that the order management system helps in processing of payments (Mean=4.71, SD=0.697). Thus, most respondents were in a consensus about the usefulness of order management in rail freight operations.

4.8.1 Order management and performance of KRC rail freight operations

Influence of order management on the performance of rail freight operations at KRC analyzed through a correlation analysis. The output is as shown in Table 4.13.

Table 4.13: Order management and operational performance of rail freight

Correlations			
		OP	OM
OP	Pearson Correlation	1	.328**
	Sig. (2-tailed)		.000
	N	152	152
OM	Pearson Correlation	.328**	1
	Sig. (2-tailed)	.000	
	N	152	152
**. Correlation is significant at the 0.01 level (2-tailed).			

As per the findings in table 4.13, the relationship between order management and operational performance of rail freight operations at KRC was represented by a coefficient r=0.328. This coefficient depicts a positive but relatively weak correlation. Nonetheless, the results depict that an rise in financial management system leads to the largest rise in operational performance of rail freight operations at KRC compared to other ERP modules under consideration.

4.9 Human resources management using ERP

The influence of human resources management using ERP was also analyzed in this study, and the respondents' level of agreeableness about some claims about this ERP and the performance of rail freight operations was measured using descriptive statistics. The output is given in table 4.14.

Table 4.14: Human resources management using ERP

Descriptive Statistics			
	N	Mean	Std. Deviation
ERP systems organize teams to deliver on specific goals	152	4.74	.812
ERP System facilitates competency-based hiring	152	4.46	1.085
ERP System facilitates the growth of cross-departmental teams	152	4.65	.915
The ERP system aids in the education and growth of staff members	152	4.25	1.439
The ERP system aids in assessing employee performance	152	4.31	1.328
Valid N (listwise)	152		

Table 4.14 indicates that most respondents agreed that ERP systems organize teams to deliver on specific goals (Mean=4.74, SD=0.812). Besides, there was an agreement among most of them that ERP System facilitates competency-based hiring (Mean=4.46, SD=1.085). Also, most respondents agreed that ERP System facilitates the growth of cross-departmental teams (Mean=4.65, SD=0.915) and that the ERP system aids in the education and growth of staff members (Mean=4.25, SD=1.439). Moreover, most of the sampled respondents said that the ERP system aids in assessing employee performance (Mean=4.31, SD=1.328). These findings are an indication

that most respondents agreed with the claims that the ERP system generally improves human resources management.

4.9.1 Human resources management systems and performance of KRC rail freight operations

The relationship between human resources management using ERP and the performance of KRC freight operations was examined using a correlation analysis and the output is given in table 4.15.

Table 4.15: Human resources management systems and rail freight operations

Correlations			
		OP	HRMS
OP	Pearson Correlation	1	.306**
	Sig. (2-tailed)		.000
	N	152	152
HRMS	Pearson Correlation	.306**	1
	Sig. (2-tailed)	.000	
	N	152	152
**. Correlation is significant at the 0.01 level (2-tailed).			

According to table 4.15, the relationship between human resources management ERP system and rail freight operations was represented by a correlation coefficient r=0.306. This was the second largest coefficient from that representing the relationship between order management and rail freight operations. Nevertheless, it depicted a positive but relatively weak association, which

translates to a corresponding increase in operational performance of rail freight operations at KRC when human resource management ERP system is used.

4.10 Performance of KRC rail freight operations

The performance of KRC rail freight operations was the study's dependent variable and the investigator was interested in ascertaining the level of agreeableness with claims about it among the study participants. The descriptive output is provided in table 4.16.

Table 4.16: Performance of KRC rail freight operations

Descriptive Statistics			
	N	Mean	Std. Deviation
ERP system enables faster delivery of cargo to the customers	152	4.70	.875
ERP system has boosted overall productivity at this organization	152	4.66	.877
ERP system enables the company to satisfy client's orders promptly	152	4.75	.683
ERP has improved the work performance of employees	152	4.89	.424
ERP system enables our firm to increase overall number of deliveries	152	4.82	.621
Valid N (listwise)	152		

Table 4.16 affirms that most of the study participants were in agreement that ERP system fastens the delivery of cargo to the consumers (Mean=4.7, SD=0.875), that ERP system has boosted overall productivity at this organization (Mean=4.66, SD=0.877), that ERP system enables the company to satisfy client's orders promptly (Mean=4.75, SD=0.683), that ERP has improved the work performance of employees (Mean=4.89, SD=0.424), and that ERP system enables our firm to increase overall number of deliveries (Mean=4.82, SD=0.621). As such, the findings indicate an overall level of agreeableness regarding better performance of KRC rail freight operations, which is enabled by ERP use.

4.11 Regression analysis

Additional inferential investigation was conducted to examine the impact of the independent variables on the dependent variable of the study. This was done through a regression analysis of performance of rail freight operations at KRC on use of ERP. The outputs of is as shown in these tables.

Table 4.17: Model summary table

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.445[a]	.198	.176	.277
a. Predictors: (Constant), HRMS, FMS, CRM, OM				

Table 4.17 confirms that the R value for the model was 0.445, confirming that the ERP modules had a considerable correlation with the performance of rail freight operations at KRC. This

confirmed that an increase in the predictors for using ERP by KRC, the better the performance of rail freight activities. It also affirms that 17.6 percent of the variations in the performance of rail freight operations at KRC can be explained by this study's explanatory variables.

Table 4.18: ANOVA Table

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.785	4	.696	9.056	.000[b]
	Residual	11.303	147	.077		
	Total	14.088	151			
a. Dependent Variable: OP						
b. Predictors: (Constant), HRMS, FMS, CRM, OM						

Based on the outcomes shownin Table 4.18, the significance value (0.000) was below 0.05. This confirms that this model was significant at a 95 percent level of confidence. Hence, ERP modules considered in this study were adequate in measuring the performance of rail freight operations at KRC.

Table 4.19: Coefficients table

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	2.258	.483		4.673	.000
	CRM	.096	.047	.152	2.052	.042
	FMS	.122	.052	.174	2.356	.020
	OM	.257	.088	.237	2.928	.004
	HRMS	.079	.028	.228	2.806	.006
a. Dependent Variable: OP						

Table 4.19 shows that the association between customer relationship management and performance of rail freight operations at KRC was statistically significant (p=0.042). This relationship was represented by a coefficient of 0.096, meaning that a unit increase in the use of the customer relationship management ERP module causes an improvement in the performance of KRC rail freight operations by 0.096 units. The association between financial management system and the performance of rail freight operations at KRC was also statistically significant (p=0.02). This relationship was represented by a coefficient of 0.122, meaning that a rise by 1 unit in the use of the financial management ERP module causes an improvement in the performance of KRC rail freight operations by 0.122 units. Similarly, the link between order management and the performance of rail freight operations at KRC was also statistically significant (p=0.04). This relationship was represented by a coefficient of 0.257, meaning that a 1 unit rise in the use of the order management ERP module causes an improvement in the performance of KRC rail freight operations by 0.257 units. Furthermore, the relationship between human resources management system and the performance of rail freight operations at KRC was also statistically significant (p=0.06). This relationship was represented by a coefficient of 0.079, meaning that a unit increase in the use of the human resources management ERP module causes an improvement in the

performance of KRC rail freight operations by 0.079 units. The resulting regression model from this analysis was:

$$Y = 2.258+0.096X_1+0.122X_2+0.257X_3+0.079X_4+\varepsilon$$

Where: Y is performance of KRC rail freight operations, X_1 is customer relationship management, X_2 is financial management system, X_3 is order management, X_4 is human resources management, and ε is the error term.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter advanced the study's purpose by providing a summary of its findings in line with the objectives, highlighting the conclusions made from the findings, recommendations, limitations, and suggestions for further research. The study's purpose was to examine the influence of four ERP modules on the performance of rail freight operations at KRC.

5.2 Summary of findings

One of the research objectives was to explore the extent to which the ERP is used in KRC freight operations. The outcome indicates that most respondents, represented by 56.6 percent, claimed that ERP is used at KRC to a moderate extent. 32.9 percent, on the other hand, claimed to use ERP modules to a high extent. Only 5.9 percent said that they use ERP to a low extent. This indicates that most employees at KRC use ERP to a decent extent.

This research also aimed to assess the association between ERP system and performance of KRC rail freight operations, with a consideration of four ERP modules: customer relationship management, financial management system, order management, and human resources management system.

With regard to customer relationship management using ERP, the study outcome shows that most study participants agreed that customer relationship management is better and easier using ERP. The correlation analysis indicates that the association between customer relationship management

using ERP and the performance of KRC rail freight operations, is positive but weak (r=0.139); notably, this was the weakest coefficient in comparison to the correlation coefficients established for the other three ERP modules. Nevertheless, when further tested using a regression analysis, the findings revealed that this relationship was statistically significant (p=0.042) and that a unit increase in the use of the customer relationship management ERP module causes an improvement in the performance of KRC rail freight operations by 0.096 units. These outcomes were consistent with those by Baiyewu (2022), Waweru & Karihe (2021), Haislip & Richardson (2017), and Boulding *et al*. (2005) all who agreed that organizations which invest in customer relationship management ERP modules tend to perform better than those that do not.

The descriptive findings on the level of respondents' agreeableness with several statements about the financial management system ERP module revealed that most respondents agreed that this module improved rail freight operations at KRC. Furthermore, the analysis of the nature of the relationship between the use of the financial management ERP module through a correlation analysis established that the link between the two variables was positive but weak (r=1.67). In order of rank from the strongest to weakest correlation coefficients, this relationship ranked third out of the four ERP modules considered in this research. The regression analysis nevertheless, indicated that the relationship between the use of the financial management ERP module and performance of KRC rail freight operations was statistically significant (p=0.02) and that a 1 unit rise in the use of the financial management ERP module causes an improvement in the performance of KRC rail freight operations by 0.122 units. These findings echo those reported in studies by Andrieș & Ungureanu (2022), Ungureanu (2022), and Kim (2013) which established a

direct relationship between the deployment of the financial management ERP module and operational performance of various firms.

Similarly, the descriptive analysis findings indicate that overall, most respondents were in agreement that order management using ERP improves the general process and rail freight operations. These claims were tested statistically using a correlation analysis that revealed a relatively weak relationship between order management and the performance of rail freight operations at KRC (r=0.328). Notably, this was the strongest correlation with rail freight operations in comparison with the other three ERP modules. Further, the regression analysis of performance of KRC rail freight operations on the use of the order management ERP module indicated that the relationship between the two variables was statistically significant (p=0.04) and that a unit increase in the use of the order management ERP module causes an improvement in the performance of KRC rail freight operations by 0.257 units, the largest coefficient of the four modules. In other words, the order management ERP module had the highest influence on the performance of KRC rail freight operations. In relation to previous literature, these outcomes are coherent with those done by Cotteleer (2002), Zeng & Pathak (2003), Dumitru *et al*. (2013), and Anđelković & Radosavljević (2018) all who noted that the incorporation of the order management ERP module in organizational activities had a positive impact on operational performance, in addition to improving supply chain performance.

The human resources management ERP module was also under consideration in this study and the descriptive findings confirms that many people agreed that human resources management using ERP had a general positive impact on rail freight operations. The researcher further explored the nature of the link between the use of the human resources management ERP module and

performance of KRC rail freight operations using a correlation analysis and established a positive but relatively weak association (r=0.306). However, this was the second strongest correlation with rail freight operations among the four considered ERP modules. The regression analysis further cemented the association between the two variables by establishing that it was statistically significant (p=0.06). Furthermore, the regression analysis proved that a unit increase in the use of the human resources management ERP module causes an improvement in the performance of KRC rail freight operations by 0.079 units. In addition, these findings were consistent with those documented by Jackson (2010), Sadrzadehrafiei *et al*. (2013), and Bansal & Narula (2014), all who established that the use of the human resources management ERP module affects the operational performance of firms positively.

5.3 Conclusion

This paper has identified that ERP modules are used to a moderate extent at KRC. As per the claims of the technology acceptance model, the employees at KRC have moderately accepted the use of the ERP technology in advancing their operations. Besides, they have a moderate perception of the usefulness and usability of the ERP system, in line with the logic behind the technology acceptance model. Also, based on the constraint theory, it means that there could be some factors that stand in the way of the utilization of ERP modules to a high extent by all employees.

The research study also concludes that the four ERP modules of focus in this study have a positive effect on the performance of rail freight operations at KRC. These ERP modules have improved customer relationship management, financial management, order management, and they have facilitated better human resources management. In regards to the second research objective, the study concludes that all the four ERP modules had a positive but weak influence on the

performance of KRC rail freight operations. However, the relationship between the four ERP modules and KRC rail freight operations was statistically significant ($p<0.05$). This shows that by adopting ERP modules that enhance operational performance, KRC acts in the best interest of its stakeholders, as stipulated in the stakeholder theory. Besides, based on the resource-based theory, it is evident that KRC management employs resource-based thinking in the deployment of ERP modules that boost operational management of rail freight. Thus, this study is consistent with the findings by Wanyoike (2017) but counters those by Koh, Saad, & Arunachalam (2006), Liu & Miao (2010), and Karimi (2017), which established no considerable impact of ERP adoption on operational performance of firms.

5.4 Recommendations

According to the study outcomes, this paper recommends that;

1. KRC's management should engage in the ascertaining of the limiting issues that stand in the way of the applying of crucial ERP modules in a bid to boost the performance of rail operations. This is because the findings indicate that ERP modules are used only to a moderate extent in the organization, despite their significant positive influence on rail freight operations.
2. Given the established positive and significant influence of the four ERP modules on KRC's rail freight operations, the company's management should invest more in the use of such and more modules to further enhance the performance of its rail freight operations. For example, they could train employees more on the usefulness and usability of the ERP system to improve their acceptance and use of it. In addition, they could channel more

resources to the implementation of more ERP modules to further boost operational performance of rail freight.

5.5 Limitations of the study

The limitations to this research do not indicate that it was flawed but rather, they represent opportunities for imminent studies. A notable limitation is that it only considered four ERP modules; customer relationship management, financial management system, order management, and human resources management. Secondly, this study only considered KRC employees who use ERP modules. Thirdly, the study only considered operational performance of KRC and not any other kind of performance. As such, these findings can only be generalized to the use of the four ERP modules and operational performance.

5.6 Areas for continual study

The following are the recommendations for future exploration:

i. The drivers that determine the adoption of ERP modules in various institutions.
ii. The influence of other ERP modules on different types of organizational performance such as financial performance.

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APPENDICES

Appendix 1: Introduction Letter

MIRIAM SARANGE OSEKO
D61/27180/2019
University of Nairobi

Dear Sir/ Madam,

REF: REQUEST FOR FILLING OF THE QUESTIONNAIRE

I am writing to request for your support in filling my questionnaire. I am a master of business Administration, school of business' student at the University of Nairobi. Attached herein, have the questionnaire. The topic for my study is; "enterprise resource planning and the performance of freight operations in Kenya. A case of Kenya RailwaysCorporation." Your answers will be Subject to utmost confidentiality. I will be grateful for your consideration in enabling me complete my study. You are required to

Fill and have the questionnaire returned at an appropriate time. Be blessed.

Yours faithfully,
MIRIAM SARANGE OSEKO
D61/27180/2019

Appendix 2: Questionnaire

Dear respondent, this questionnaire is about institutional capacity. Please respond objectively and truthfully to all questions. Your information will be kept private and confidential.

A. General Information

Demographic Information

1. Age
    a) 18-24
    b) 25-35
    c) 36-50
    d) Above 50
2. Gender
    a) M [ ]
    b) F [ ]

3. Highest Educational qualifications attained:

Secondary ( ) Certificate ( ) Diploma ( ) Degree ( ) Postgraduate ( )

4. Department of work …….

5. How long have you been using ERP?
    a) Less than 2 years
    b) 3-5 years
    c) Over 5 years
6. Which among these ERP modules do you regularly use?
    a) Customer relationship management
    b) Human resources management system
    c) Order management
    d) Financial management system
    e) List any other ……

B.ERP SYSTEM

7. To what extent do you use ERP modules?
    a) To a low extent
    b) To a moderate extent
    c) To a high extent

Kindly show the the extent to which you concur to the following statements
Tick appropriately using a on a scale of 1 to 5, as follows: 5. I completely agree (SA) 4. Consensus (A) 3. Balanced (N) 2. Contrary to popular belief (D) 1. Disagree strongly (SD)

S/No.	**Customer relationship management**	**5**	**4**	**3**	**2**	**1**
1.	A primary concern in our department is for our clients' complete happiness, and we do this by establishing connections between their wants and their needs.					
2.	In KRC customer relation programs influence customer retention rates					
3.	The organization follows up with clients to see if they are happy.					
4.	The company provides customized services according to existing customer needs					
5.	The company is concerned about responding to clients'grievances					
6.	The organization takes preventative measures to address causes of customer complaints					
Financial Management System		**5**	**4**	**3**	**2**	**1**
1.	ERP system increases the correctness of data					
2.	ERP system supports automated financial procedures					
3.	ERP system supports internal financial control systems					
4.	ERP System supports financial risk management					
5.	ERP System gives a level of liquidity to schedule expenditure and commitments					
Order Management		**5**	**4**	**3**	**2**	**1**
1.	ERP order management system allows for generation of sales reports for decision making					
2.	ERP Order management system helps track orders					
3.	ERP order management system helps in inventory management					
4.	The order management system helps in sales forecasting					

5.	The order management system helps in verification of duplicate orders					
6.	The order management system helps in processing of payments					
Human resources management systems		**5**	**4**	**3**	**2**	**1**
1.	ERP systems organize teams to deliver on specific goals					
2.	ERP System facilitates competency-based hiring					
3.	ERP System facilitates the growth of cross-departmental teams					
4.	The ERP system aids in the education and growth of staff members					
5.	The ERP system aids in assessing employee performance.					

PART C: OPERATIONAL PERFORMANCE

Kindly indicate to what extent you concur to the following statements

Tick appropriately using a on a scale of 1 to 5, as follows: 5. I completely agree (SA) 4. Consensus

(A) 3. Balanced (N) 2. Contrary to popular belief (D) 1. Disagree strongly (SD)

Performance of freight services		**5**	**4**	**3**	**2**	**1**
1.	ERP system enables faster delivery of cargo to the customers					
2.	ERP system has boosted overall productivity at this organization					
3.	ERP system enables the company to satisfy client's orders promptly					
4.	ERP has improved the work performance of employees					
5.	ERP system enables our firm to increase overall number of deliveries					