FACILITY SECURITY MANAGEMENT AND PERFORMANCE OF MINISTRY OF ROADS AND TRANSPORT IN KENYA

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ABSTRACT

Despite the creation of KeHNA, KURA and KERRA road infrastructure projects constructed by local firms, Kenya continued to face several challenges that led to poor performance of the projects in that on average only 39.4 percent of the road infrastructure projects constructed by local firms in Kenya were completed within the budgeted cost and scheduled time. This study sought to establish the influence of facility security management on supply chain performance of Ministry of Roads and Transport in Kenya. The study was guided by Resource Based View Theory. The research used a cross-sectional survey design. This study adopted a positivism research philosophy. The unit of observation in this study was the three road construction agencies which are the Kenya National Highways Authority, Kenya Urban Roads Authority and Kenya Rural Roads Authority. On the other hand, the unit of analysis was management employees working with the three agencies. The study mainly focused on Procurement and supply chain Officers as they play a critical role in providing the requisite data and information for the finalization of the research. Therefore, the target population for this study was 280 Procurement and supply chain Officers. Using Mugenda and Mugenda (2017) formula, the sample size for the study was 136 Procurement Officers. Quantitative data collected was analyzed using descriptive statistical techniques which are frequencies, mean, standard deviation. Inferential statistics which include Pearson correlation and the Regression Analysis Model was used to test the relationship between study variables. To test moderating effect the study used hierarchical regression model. The significance of the model was tested at 5% level of significance. Data was analysed using Statistical Package for Social Sciences (SPSS) software version 26. The study found that facility security management is statistically significant in explaining supply chain performance of Ministry of Roads and Transport in Kenya. Based on the findings, the study concluded that facility security management positively and significantly influences supply chain performance of Ministry of Roads and Transport in Kenya'. The study recommends that the management should conduct a thorough security assessment of all facilities and locations within the supply chain. Identify vulnerabilities, potential threats, and weaknesses in the current security infrastructure. This assessment will serve as the foundation for targeted improvements

Key Words: Facility Security Management, Ministry of Roads and Transport and Resource Based View Theory

Background of the Study

Facility security management involves the comprehensive oversight and implementation of strategies, policies, and procedures aimed at safeguarding physical assets, personnel, and information within a facility or organization (O'Regan, & Ghobadian, 2017). It encompasses various aspects of security, including access control, surveillance, risk assessment, emergency response planning, and security personnel training (Mbogo, 2017).

According to Loss and McGarrell (2016) facility security management on the supply chain is the use of methodology and innovations to safeguard inventory resources (items, offices, gear, information, and staff) from theft, harm, or intimidation, and to prevent the presentation of unapproved stash, individuals, or weapons of mass annihilation into the production network. In accordance with Martin *et al.* (2018) inventory network security is now seen as a critical space in overseeing business risk. Associations are giving a lot of consideration to security by designating additional cash, time, and assets to affirm that security exists in their store network as abrupt episodes result to unmistakable and theoretical injury as far as property, items, framework, individuals, notoriety, market position, generosity and entirety (Securitex, 2018). Though most organizations are devoting accumulated resources and a focus to security efforts, very little data is accessible to corporations seeking to reduce their exposure to sudden and doubtless damaging or troubled occurrences touching their supply chains.

Supply chain security is part of supply chain risk management and aims to stop man-made attacks, like stealing, harm or destruction of product and assets (Robinson, & Pearce 2017). Therefore, the thought of supply chain security isn't an isolated plan and may be enforced across the supply chain and borders (countries, departments, competitors, customers and transportation modes), whereas awareness ought to be integrated at each stage of interaction (Vel, Creed, & Narayan, 2018). Supply chain security ought to be a high priority for corporations as a result of a breach, at intervals the system may harm or disrupt operations. Vulnerabilities of supply chains may lead to extra prices, inefficient delivery schedules and a loss of belongings. Delivering products that are tampered with or are unauthorized can be harmful to customers and result in unwanted lawsuits. Security management systems will facilitate supply chains from physical and cyber threats. Physical threats include risks with internal and external sources, like stealing, sabotage and terrorist act, whereas cyber threats vulnerabilities in IT and package systems include malware attacks, piracy and unauthorized system access. Whereas threats cannot be eliminated fully, supply chain security will work towards achieving a safer, economical movement of products that may recover quickly from disruptions. Multiple forms of responses and actions are undertaken by completely different governmental organizations, international organizations and businesses to reinforce humanitarian supply chain security. These reactions vary from country specific operational laws to world research programs. As an example, methods associated with contract management, quality management, risk management, network reengineering and create or obtain selections are a unit wide acknowledge by researchers as techniques to enhance performance of supply chains whereas minimizing prices and negative environmental impacts (Badenhorst-Weiss, & Waugh, 2016). Likewise, adding production lines to quickly shift volume will facilitate corporations to take care of their competitive edge up the marketplace (Caplice, & Sheffi, 2016).

The recent concerns on security in the road and transport supply chains have led to the introduction of new security initiatives, standards and measures to such an extent that they have become an integral part of supply chain management. Although management in many organizations are concerned about SCS, they may have challenges dedicating resources to implement or bolster SCS initiatives. This is understandable because of the heavy cost

implication involved in developing or enhancing SCS. As a consequence, supply chain security is now a fundamental requirement in an organization and should be coordinated with supply chain management (Securitex, 2018). Security measures often help organizations to protect organizations against unexpected supply incidents and hence work as detection system for supply chain players in case of a disaster. O'Regan, and Ghobadian, (2017) distinguished the security measures into four categories; cargo/freight management, facility management and information management which form the independent variables of this study. The fourth category is human resource management which is merged with organizational security culture to form the variable organizational culture which supposedly moderates the relationship between supply chain security management and supply chain performance.

Statement of the Problem

In Kenya, the Ministry of Transport, Infrastructure, Housing Urban Development and Public Works plays a critical role in the country's economy. The success of the manufacturing sector is particularly dependent on efficient and reliable infrastructure that would facilitate low-cost production, transportation and distribution of manufactured goods (Sarathy, 2016). For Kenyan manufacturers to thrive in an open and global economy, they must be able to reliably manufacture world-class goods at a competitive cost (Okok & Mboya, 2021). To facilitate this, the government of Kenya continues to invest in high-quality infrastructure and implement transport policies aimed at enhancing efficiency and reducing the cost of doing business.

However, statistical evidence suggests that there is a problem with the performance of road infrastructure projects in Kenya. According to a report by Mwandali (2018), despite the creation of the Kenya National Highways Authority, Kenya Urban Roads Authority, and Kenya Rural Roads Authority, Kenya continues to face several challenges that lead to poor performance of the projects. On average, only 39.4% of the road infrastructure projects constructed by local firms in Kenya were completed within the budgeted cost and scheduled time. This is significantly lower than the performance ratings of other countries in the region, such as Uganda (40.5%) and Tanzania (43.7%). Furthermore, a study by the World Bank found that among the countries rated, Kenya scored the lowest in performance of road construction projects. Also, a study by the World Bank (2020) found that Kenya ranks poorly in terms of logistics performance, with a score of 2.9 out of 5. This is lower than the average for Sub-Saharan Africa and indicates that the country faces significant challenges in terms of supply chain efficiency. Additionally, a study by the Kenya National Bureau of Statistics (KNBS) (2018) found that the transport and logistics sector in Kenya is characterized by high costs, lack of standardization, and inadequate infrastructure, which negatively affects the country's competitiveness.

Empirical studies have shown that the efficacy and efficiency of a supply chain are dependent on internal factors such as progressiveness, collaboration, inter-firm relations, company culture, and management skills (Badenhorst-Weiss & Waugh, 2018). Disruptions in the supply chain can occur due to security threats at any given time (Urciuoli et al., 2017). Research has shown that effective implementation of supply chain security initiatives can be achieved through the coordination of personnel, processes and technology, and the development of technical, formal and informal controls of the security system (Akram, 2018). Schiele (2018) argues that the main challenge for businesses is to invest wisely in security in such a way that they comply with regulations and at the same time attain potential additional benefits that contribute towards achieving efficiency along the supply chain.

Despite the government's efforts to address the performance of road infrastructure projects, empirical studies have shown that the performance of these projects in Kenya is still lacking. Given the above-mentioned statistics and the importance of supply chain security management, it

is crucial to establish the relationship between supply chain security management and supply chain performance in the context of the Ministry of Roads and Transport in Kenya. The current study sought to fill this gap in the literature by investigating the role of facility security management and its interacting effect with legal structure on Performance of the Ministry of Roads and Transport in Kenya.

General Objective of the Study

The general objective of the study is to establish the influence of facility security management on performance of Ministry of Roads and Transport in Kenya.

Theoretical Framework

Resource Based View Theory

Resource-Based View (RBV) theory was developed by Barney's in 1991. According to Barney (1991) the resource based view examines the link between a firm's internal characteristics and performance'. Building the resource based view enable firms to determine their core competences which are also critical for the creation of the latter (Espino-Rodríguez & Padrón-Robaina, 2016). This theory will be adopted since suppliers are considered resources to the institutions. RBV believes that a firm's resources and capabilities are its most important assets. So the primary concern of RBV is about obtaining access to another firm's core competencies to gain competitive advantage.

According to Steinle and Schiele (2018) suppliers can be regarded as resources in case they are "sufficiently bound to a firm". With these assumptions they clearly follow the extended resource based view, e.g. the relational view as mentioned in Dyer & Singh (2017), implying, resources can also be obtained through inter-firm connection from the external environment. They proceed by setting suppliers in context with the four resource attributes, mentioned in Barney (1991), and required to achieve a competitive advantage. Following his logic, suppliers can be argued to contribute to a competitive advantage in case they offer valuable products (Steinle & Schiele, 2018). It is argued, that within an industry only few suppliers exist which offer valuable resources, being a preferred customer of them can have a contribution to a competitive advantage of the firm, which supports the focus of the resource based view (Steinle & Schiele, 2018).
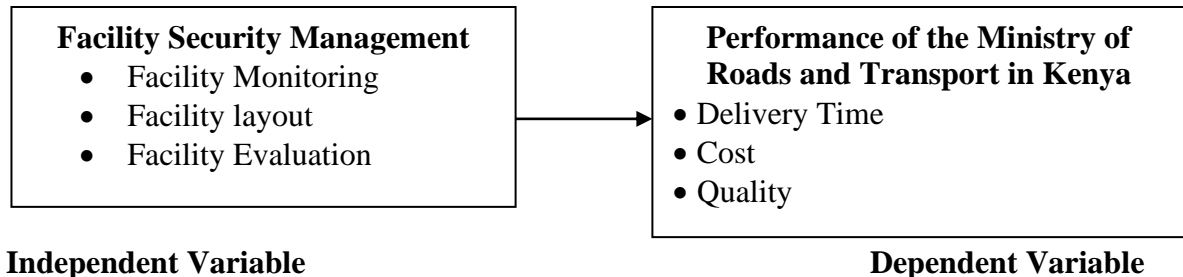
Therefore, the resource based contributes to the decision about the supplier portfolio by considering the relationship between buyer and supplier as the mean to achieve a competitive advantage. Suppliers are seen as valuable resources themselves or as the source to access them, and by becoming their preferred customer, firms do not only gain preferential treatment but also the ability to distance competitors which do not have the same status, that eventually can lead to a superior competitive position. The Resource Based View Theory is important as it establishes the relationship between the abilities of organizations and how it has influence on their performance (Barney *et al*., 2001). In the RBV theory, resources are all the tangible and intangible assets that organizations use to conceive and implement their strategies. The theory has three significant constructs –, that is, resources, capability, and competencies (Yang *et al*., 2019).

The performance of organizations is contributed to a firm's resources such as facilities, humans, cargo and information. Competitive advantage is gained by organizations that are able to manage their resources effectively (Dangayach and Deshmukh, 2017). Security along the supply chain is attributed to the capabilities that are heterogeneously dispersed in the organizations and would have cost implication on the organizations for their transfer. Hence, effective supply chain

security administration needs adaptation of the RBV as the resources and capabilities are two valuable factors for supply chain security management and performance (Martens *et al*., 2018). Resource Based View Theory was used to assess the influence of facility security management on performance of Ministry of Roads and Transport in Kenya.

Conceptual Framework

According to Hammond and Wellington (2012), the conceptual framework is a description of the basic link amongst variables in research. This allows the researcher to see the projected relationship clearly. This study explored the influence of facility security management as independent variables and performance of Ministry of Roads and Transport in Kenya as dependent variable. This is illustrated in figure 2.1.

Facility Security Management • Facility Monitoring • Facility layout • Facility Evaluation	→	**Performance of the Ministry of Roads and Transport in Kenya** • Delivery Time • Cost • Quality
Independent Variable		**Dependent Variable**

Figure 2.1: Conceptual Framework

Facility Security Management

Facility management or facilities management (FM) is a professional management discipline focused on the efficient and effective delivery of logistics and other support services related to real property and buildings. It encompasses multiple disciplines to ensure functionality, comfort, safety and efficiency of the built environment by integrating people, place, process and technology. According to Wang (2017) facility management (FM) focuses on how these facilities are being managed. It can be defined as a management discipline that ensures effective and efficient support services for different organizations. It is a function within an organization that integrates people, process, place and technology within the existing environment and focuses on improving the productivity of the organization and the quality of people's life.

The integrated planning of the workplace to improve the performance of the organization is referred to facility management (Wang, *et al* 2016). Facility management ensures the security of the amenities where goods are stored and issued (Sanchez, Harris, & Mason, 2015). Optimum warehouse layout designing (e.g., entry/exit controllability; clearly marked control areas; adequate lighting conditions) and efficient facility monitoring (e.g., 24-hour surveillance, security guards and taping activities of loading containers) are the commonly used practices in facility management (Hintsa *et al*., 2019). Safeguarding the facilities in an organization is critical because the most valuable assets such as goods and critical information that will have a negative impact on the performance of the organization are stored there.

Facility security management entails; facility monitoring, facility layout and facility evaluation. Facility Monitoring Systems, also known as Environmental Monitoring Systems (EMS) are used to monitor key manufacturing processes, ensure regulatory compliance and increase product yield. Effective FMS solutions provide essential continuous monitoring of facilities in various industries requiring critical cleanroom management including the aseptic and controlled environments of pharmaceutical, biotechnology, clinical, defense and microelectronics manufacturing (Li & co, 2016). The FMS monitors the status of a facility through the use of a combination of fixed and portable instruments for viable and non-viable particles, as well as

other environmental sensors for pressure, temperature, relative humidity etc. An industrial architecture design, combining robust IT hardware and processors with a range of software options ensures compliance, data security and system availability (Sillekens, Koberstein, & Suhl 2016).

Empirical Review

Facility Security Management and Performance

Physical security initiatives are the top priorities of organizations. Many organizations are concerned with formal and aesthetic aspects at the expense of attention to security aspects and standards, which may result in a lack of attention to security procedures when designing physical facilities and environments (Harris, 2019). Long-term relationships achieve stability in operations, make companies more focused on their core competencies while outsourcing to meet their remaining needs, and improve customer relationships by providing the ability to anticipate, track customer demand and respond to their reactions. Customers are encouraged to identify their needs and requests, to provide efficiency and to track delivery through the ability to provide better customer service. Lancaster et al. (2016) noted that supply chain collaboration is a significant means of increasing sales, reducing supply time, achieving smaller batches, reducing stock levels, rapidly designing new products, and collaborating and coordinating supply chain members, improve corporate performance and shorten the cycle of satisfaction (Fawcett and co., 2017). The results of the Ramesh and co., (2018) study indicate that collaboration among supply chain partners has many benefits, including meeting customer needs more effectively.

Li and co (2016) sought to identify the impact of supply chain management processes on achieving competitive advantage and improving organizational performance. Study aimed to develop five dimensions related to supply chain management practices (strategic partnership with suppliers - customer relationship - level of information exchange - quality exchange - Information Security Management) and test the relationship between supply chain management practice and competitive advantage and to improve the performance of the organization turned competition from competition between organizations to Competition between supply chains.

Physical assets are directly exposed to security risks, particularly because cargo is the main target of criminals, especially a high value cargo. Next, transport assets and machinery used in the supply chain can also be stolen or used to facilitate criminal activities. If criminals are not able to open a trailer or container to steal its contents, they might prefer to steal the whole conveyance (Urciuoli 2019). Personnel forms also a fundamental part of a supply chain. Without well-trained and motivated personnel, many activities devoted to assets optimization could not be performed efficiently. Some authors suggest that up to 50% of costs along the entire supply chain are labor costs (Sillekens, Koberstein, & Suhl 2016).

Physical security is commonly one of the first security initiatives that organizations undertake to improve system security. Physically preventing access and controlling access keeps out unauthorized personnel, protecting site intellectual property, capital equipment, personnel, inventory, work in progress, finished goods, and product integrity. Traditional approaches to security have focused on theft reduction, which entails protecting against the unauthorized removal of items from the process (Li & co, 2016).

RESEARCH METHODOLOGY

Research Design

The research used a cross-sectional survey design. Within a cross-sectional survey, the study measures the results and experiences of the sample subjects at the same time (Setia, 2016). Cross-sectional survey design gives a clear image of the patterns and is useful at a particular point in time to monitor current research population circumstances, characteristics and their opinion. A cross-sectional survey also describes the prevalence of a given attribute in a specified population at a particular time point. The choice of this design is suitable for this study since it makes use of a questionnaire as a data collection tool. It is also suitable for this research, as it thoroughly tests the relationship among variables. Other researchers who have successfully utilized a cross-sectional survey design include (Wambua, 2017; Somba, 2017; Nyambura, 2018).

Research Philosophy

This study adopted a positivism research philosophy. The positivism research technique is defined as a philosophical approach of identifying and recognizing items or elements in a particular social construct that have scientific proof and are based on logical as well as factual proof (Metsamuuronen, 2017). Positivism tends to have a strong belief that development of research hypothesis based on theoretical aspects can be tested through observing social realities, and as such, positivism is a scientific technique (Hewson, Vogel & Laurent, 2016). Depending on the observation made, the positivism research philosophy can be used to explain the existing relationship or realities between elements under investigation, and thus can be used to make predictions. The positivism research philosophy was used in this study to establish the influence of supply chain security management on performance of Ministry of Roads and Transport in Kenya, and the moderating effect of legal structure.

Target Population

The Kenya government has put several measures to address performance of road infrastructure projects which included the enactment of Kenya Roads act which established the Kenya National Highways Authority, Kenya Urban Roads Authority and Kenya Rural Roads Authority (Kenya roads authority, 2020). The unit of analysis in this study was the three road construction agencies which are the Kenya National Highways Authority, Kenya Urban Roads Authority and Kenya Rural Roads Authority. On the other hand, the unit of observation was Procurement and supply chain management employees working with the three agencies. The study mainly focused on Procurement and supply chain Officers as they play a critical role in supply chain of their respective organizations and was in apposition to provide the requisite data and information for the finalization of the research. Therefore, the target population for this study was 420 Procurement and supply chain Officers as shown in Table 3.1 below.

Table 3.1: Target Population

Agency	Population (No.)	Proportion (%)
KeRRA	166	39.52
KeNHA	154	36.67
KURA	100	23.80
Total	**420**	**100.00**

Source: Kenya roads authority (2020)

Sampling Frame

A sampling frame is a list of all the items from which a representative sample is taken for research purposes (Sekaran, & Bougie, 2010). It's a list of people in the study's population from whom a random sample can be taken (Kothari, 2014). The sample frame for this study was created from a list of Procurement Officers from all the three road agencies in Kenya; that is KeNHA, KeRRA, and KURA. As a result, the sampling frame consisted of 420 Procurement and supply chain Officers.

Sample Size

Kothari (2014) explains that a sample size refers to the number of items to be selected from the universe to constitute a sample while sampling procedures refers to the technique used in selecting the items of the sample. The overall sample size for this study was determined using Nassiuma (2000) formula as indicated below.

$$n = \frac{NC^2}{C^2 + (N-1)e^2}$$

Where n is the sample size, N is the population, C is the coefficient of variation (0.5) and e is the precision level of (0.05). The samples sizes were computed as follows for each agency. The study adopted a sample size of 83, 75 and 43 for KeNHA, KeRRA, and KURA respectively.

Therefore, using Nassiuma (2000) formula, the sample size for the study was 201 Procurement Officers.

Data Collection Instruments

In this study, primary data was collected using a semi structured questionnaire because they are cost effective and convenient to collect and summarise responses (Zikmond, 2013). Kothari (2014) indicates that a questionnaire is a cost efficient method to collecting information particularly from a huge group of respondents and it facilitates anonymity. Questionnaires consist of a series of specific, short questions that are asked verbally by the interviewer or answered by the respondents on their own (Bryman, 2016). According to Sekaran (2013), the questionnaire is advantageous since it covers a population in a short amount of time and at a low cost, and it increases the independence and accuracy of responses from respondents. In addition, respondents are given a structured questionnaire, which was chosen since it provides a more thorough picture than any other research instrument. The questionnaire is developed in a systematic manner in accordance with the study objectives.

Data Collection Procedure

Before embarking on data collection, relevant approvals were obtained. An introductory letter from the JKUAT Nairobi campus introducing the researcher to relevant authorities for field data collection was first obtained. This letter was used to obtain the permit for research from the National Commission for Science, Technology, and Innovation (NACOSTI). In addition, the researcher sought permission from the respective agency to collect data. Follow-up calls and emails were then made to book an appointment.

Pilot Test

For the purpose of this study, the pilot study was conducted by purposively selecting 14 respondents from the target population. These Officers were not be part of the sample while collecting data on a large scale. The questions that have errors, omissions, ambiguous and

irrelevant were re-defined and the questionnaire content, structure, and sequence were structured restructured to enhance the content validity and reliability. These improvements made the data collection instruments precise.

Data Analysis and Presentation

The researcher collected questionnaires, code them, and enter them into the Software Package for Social Sciences (SPSS version 26) for analysis. The sort function were used to perform the initial screening. The data was based on the study's objectives and research hypothesis. The descriptive statistical techniques of frequency, mean, and standard deviation was used to analyze the quantitative data acquired. The results were displayed using frequency distribution tables, which keeps track of how many times a score or response appears. Qualitative data collected was analysed using content analysis and presented in prose form.

Inferential statistics including regression and correlation analysis was used in the study. According to Saunders *et al.* (2017), correlation is a statistical tool that helps to determine the relationships between two or more variables. Cooper and Schindler (2017) indicate that correlation, as measured by a correlation coefficient, is the degree to which a linear predictive relationship exists between random variables. Pearson correlation coefficient was used for testing associations between the independent and the dependent variables. According to Wagana (2017), a correlation coefficient (r) has two characteristics, strength and direction. The strength of the relationship is indicated by how r tends toward 1, the maximum value possible. r is interpreted as follows; when r = +1 it means there is perfect positive correlation between the variables, when r = 0 it means there is no correlation between the variables, that is the variables are uncorrelated, when r = -1 it means there is perfect inverse correlation between the variables.

A multiple regression model was used to test the significance of the influence of the independent variables on the dependent variable. Multiple regression analysis was used to determine how supply chain security management influence the performance of Ministry of Roads and Transport in Kenya. Regression analysis attempts to determine whether a group of variables together predict a given dependent variable and, in this way, attempts to increase the accuracy of the estimate (Mugenda & Mugenda, 2003). The use of regression model is ideal due to its ability to show whether a positive or a negative relationship exists between independent and dependent variables (Mason, Lind, & Marchal, 1999).

RESEARCH FINDINGS AND DISCUSSIONS

Descriptive Analysis

The purpose of descriptive analysis is to give background to the study before carrying out analysis. In this section the study presents findings on Likert scale questions where respondents were asked to indicate their level of agreement with various statements to the influence of supply chain security management on supply chain performance of Ministry of Roads and Transport in Kenya. They used a 5-point Likert scale where 1-strongly disagree, 2-disagree, 3-moderate, 4-agree, 5-strongly agree.

Facility Security Management and Supply Chain Performance

The objective of the study was to determine the influence of facility security management on Supply Chain performance of Ministry of Roads and Transport in Kenya. On Liker scale questions, respondents were asked to indicate how far they agree or disagree with the statement by ranking your answer in the scale of 1-5. Table 4.1 presents summary of the findings. The findings show that the Ministry of Roads and Transport in Kenya has an effective system in

place for monitoring the security of their facilities (M=3.955, SD= 0.872); that the Ministry's facility evaluation process is thorough and effective in identifying and addressing any operational or security issues (M= 3.945, SD= 0.839); and that the Ministry of Roads and Transport in Kenya regularly evaluates the security of their facilities (M=3.932, SD= 0.898). They were also in agreement that the layout of facilities managed by the Ministry of Roads and Transport in Kenya is designed to promote security (M= 3.915, SD= 0.712); and that the layout of the facilities used by the Ministry of Roads and Transport in Kenya is conducive to the efficient movement of goods and materials (M= 3.858, SD= 0.969). In addition the layout of the facilities used by the Ministry of Roads and Transport in Kenya is well-organized and efficient in its use of space (M= 3.823, SD= 0.732); that the facility monitoring practices contribute to the overall efficiency of the supply chain process (M= 3.814, SD= 0.666); and that the Ministry of Roads and Transport in Kenya has an effective system in place for monitoring the security of their facilities (M= 3.781, SD= 0.797). The respondents also agreed that the Ministry of Roads and Transport in Kenya has an effective system in place for monitoring the security of their facilities (M= 3.765, SD= 0.872).

Based on the findings as supported by majority of the respondents, it was evident that facility security management influence the performance of Ministry of Roads and Transport in Kenya as supported by an aggregate mean of 3.828 (SD= 0.898). The study findings agree with those of Harris, (2019) that physical security initiatives are the top priorities of supply chain operations. Many supply chain operations are concerned with formal and aesthetic aspects at the expense of attention to security aspects and standards, which may result in a lack of attention to security procedures when designing physical facilities and environments. Also, Li and co, (2016) observed that physical security is commonly one of the first security initiatives that Supply Chain s undertake to improve system security. Physically preventing access and controlling access keeps out unauthorized personnel, protecting site intellectual property, capital equipment, personnel, inventory, work in progress, finished goods, and product integrity.

Table 4. 1: Facility Security Management and Supply Chain Performance

Statements	Mean	Std. Dev.
The Ministry of Roads and Transport in Kenya has an effective system in place for monitoring the security of their facilities.	3.955	0.872
Ministry's facility evaluation process is thorough and effective in identifying and addressing any operational or security issues	3.945	0.839
The Ministry of Roads and Transport in Kenya regularly evaluates the security of their facilities.	3.932	0.898
The layout of facilities managed by the Ministry of Roads and Transport in Kenya is designed to promote security.	3.915	0.712
The layout of the facilities used by the Ministry of Roads and Transport in Kenya is conducive to the efficient movement of goods and materials.	3.858	0.969
The layout of the facilities used by the Ministry of Roads and Transport in Kenya is well-organized and efficient in its use of space.	3.823	0.732
Facility monitoring practices contribute to the overall efficiency of the supply chain process	3.814	0.666
The Ministry of Roads and Transport in Kenya has an effective system in place for monitoring the security of their facilities	3.781	0.797
The Ministry of Roads and Transport in Kenya has an effective system in place for machitoring the security of their facilities	3.765	0.872
Aggregate Score	**3.828**	**0.898**

Performance of Ministry of Roads and Transport

The dependent variable of the study was Performance of Ministry of Roads and Transport in Kenya. The respondents were further requested to rate their level of agreement with various statements on performance of Ministry of Roads and Transport in Kenya. Table 4.2 presents summary of the findings.

The findings show that the Ministry of Roads and Transport in Kenya consistently delivers on time. (M= 3.988, SD= 1.064); that the on-time delivery is a priority for the Ministry of Roads and Transport in Kenya (M= 3.980, SD= 0.876); and that there are few complaints concerning on-time delivery (M=3.979, SD= 1.158). They were also in agreement that the Ministry of Roads and Transport in Kenya effectively controls costs within the supply chain (M= 3.855, SD= 0.902); and that the Ministry of Roads and Transport in Kenya's supply chain is cost-efficient (M= 3.848, SD= 1.010). Respondents further agreed that they are satisfied with the cost control measures put in place (M= 3.841, SD= 0.983); that the Ministry of Roads and Transport in Kenya maintains a high level of quality assurance throughout the supply chain (M= 3.830, SD= 0.935); and that they are satisfied with the quality control measures put in place (M= 3.765, SD= 0.876). The respondents also agreed that the Ministry of Roads and Transport in Kenya's supply chain consistently meets or exceeds quality standards (M= 3.752, SD= 0.932).

Krause, Handfield and Scannell, (2017) argues that supply chain performance is concerned with the effectiveness and efficiency of supply chain operations in meeting the needs of its customers and other stakeholders. It encompasses a wide range of factors, including on-time delivery, cost control, and quality assurance, all of which are critical to the success of supply chain operations. A number of studies have highlighted the importance of supply chain performance in achieving Supply Chain success. According to a study by Li, Wang, and Liang (2019), supply chain performance is positively associated with firm performance and Supply Chain's with better supply chain performance are more likely to achieve higher levels of financial performance and customer satisfaction. The study argues that supply chain performance can improve the efficiency and effectiveness of supply chain 's operations, and can help to reduce costs and improve customer service

Table 4.2: Descriptive Statistics on Supply Chain Performance

	Mean	Std. Deviation
The Ministry of Roads and Transport in Kenya consistently delivers on time.	3.988	1.064
On-time delivery is a priority for the Ministry of Roads and Transport in Kenya.	3.980	0.876
There are few complaints concerning on-time delivery	3.979	1.158
The Ministry of Roads and Transport in Kenya effectively controls costs within the supply chain.	3.855	0.902
The Ministry of Roads and Transport in Kenya's supply chain is cost-efficient.	3.848	1.010
Am satisfied with the cost control measures put in place	3.841	0.983
The Ministry of Roads and Transport in Kenya maintains a high level of quality assurance throughout the supply chain.	3.830	0.935
Am satisfied with the quality control measures put in place	3.765	0.876
The Ministry of Roads and Transport in Kenya's supply chain consistently meets or exceeds quality standards.	3.752	0.932
Aggregate	**3.854**	**0.913**

Test for Hypothesis One

The objective of the study was to determine the influence of facility security management on performance of Ministry of Roads and Transport in Kenya. The corresponding hypothesis was:

Ho_1: Facility security management has no significant influence on the performance of Ministry of Roads and Transport in Kenya.

A univariate analysis was therefore conducted to test the null hypothesis. From the model summary findings in Table 4.3, the r-squared for the relationship between facility security management and Performance of Ministry of Roads and Transport in Kenya was 0.269; this is an indication that at 95% confidence interval, 26.9% variation in the Performance of Ministry of Roads and Transport in Kenya can be attributed to changes in facility security management. Therefore, facility security management can be used to explain 26.9% change in Performance of Ministry of Roads and Transport in Kenya. However, the remaining 73.1% variation in performance of Ministry of Roads and Transport in Kenya suggests that there are other factors other than facility security management that explain the Performance of Ministry of Roads and Transport in Kenya.

Table 4.3: Model Summary for Facility Security management

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.519[a]	.269	.267	.68365

a. Predictors: (Constant), Facility Security management

The analysis of variance was used to determine whether the regression model is a good fit for the data. From the analysis of variance (ANOVA) findings in Table 4.4, the study found out that that Prob>$F_{1,51}$= 0.000 was less than the selected 0.05 level of significance. This suggests that the model as constituted was fit to predict the performance of Ministry of Roads and Transport in Kenya. Further, the F-calculated, from the table (396.58) was greater than the F-critical, from f-distribution tables (3.892) supporting the findings that facility security management can be used to predict the performance of Ministry of Roads and Transport in Kenya.

Table 4.4: ANOVA for Facility Security management

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	51.159	1	51.159	396.58	.000[b]
1	Residual	23.817	184	0.129		
	Total	74.976	185			

a. Dependent Variable: Supply Chain Performance
b. Predictors: (Constant), facility security management

From the results in table 4.5, the following regression model was fitted.

$$Y = 1.792 + 0.497 X_2$$

(X_2 is facility security management)

The coefficient results showed that the constant had a coefficient of 1.792 suggesting that if facility security management was held constant at zero, performance of Ministry of Roads and

Transport in Kenya would be at 1.792 units. In addition, results showed that facility security management coefficient was 0.497 indicating that a unit increase in facility security management would result in a 0.497 increase in Supply Chain Performance of Ministry of Roads and Transport in Kenya. It was also noted that the P-value for information flow coefficient was 0.000 which is less than the set 0.05 significance level indicating that facility security management was significant. Based on these results, the study rejected the null hypothesis and accepted the alternative that facility security management has negative significant influence on performance of Ministry of Roads and Transport in Kenya.

Table 4.5: Beta Coefficients for Facility Security management

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.792	.188		9.523	.000
	Facility Security management	.479	.046	.519	10.462	.000
a. Dependent Variable: supply chain performance						

Conclusions

The null hypothesis test was 'facility security management has no significant influence on supply chain performance of Ministry of Roads and Transport in Kenya'. The study found that facility security management is statistically significant in explaining performance of Ministry of Roads and Transport in Kenya'. The influence was found to be positive. This means that unit improvement in facility security management would lead to an increase in performance of Ministry of Roads and Transport in Kenya'. Based on the findings, the study concluded that facility security management positively and significantly influences performance of Ministry of Roads and Transport in Kenya'.

Recommendations

The study recommends that the management should conduct a thorough security assessment of all facilities and locations within the supply chain. Identify vulnerabilities, potential threats, and weaknesses in the current security infrastructure. This assessment will serve as the foundation for targeted improvements. The management should also enhance surveillance systems within facilities using advanced technology such as CCTV cameras, motion sensors, and alarms. Real-time monitoring can deter security breaches and provide valuable evidence in case of incidents.

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