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DEMAND FORECASTING AND PERFORMANCE OF KENYA MEDICAL SUPPLIES AUTHORITY

[1] Longilae Paul Ereng, [2] Dr. Wachiuri Elizabeth

[1]Masters Student, Jomo Kenyatta University of Agriculture and Technology
[2]Lecturer, Jomo Kenyatta University of Agriculture and Technology

ABSTRACT

The Kenya Medical Supplies Authority (KEMSA) plays a pivotal role in the healthcare system of Kenya by ensuring the timely and efficient supply of medical commodities to public health facilities across the country. In recent years, KEMSA has faced significant challenges that have impacted its performance and operational efficiency. Statistics from various reports underscore these challenges. For instance, a 2023 audit report by the Auditor General of Kenya highlighted irregularities in procurement processes at KEMSA, leading to inefficiencies and delays in supply delivery. The report also noted instances of overpricing and mismanagement of resources, which have strained KEMSA's financial sustainability and eroded public trust in its operations. The general objective of the study was to establish the influence of demand forecasting on performance of Kenya medical supplies authority. Specifically, the study sought to establish the effect of past demand on performance of Kenya medical supplies authority and to determine the effect of trend projection on performance of Kenya medical supplies authority. This study adopted a descriptive research design. The unit of analysis in this study was Kenya medical supplies authority. According to Auditor general's report (2023), KEMSA has a total of 912 employees. The study targeted employees in the logistics and procurement departments. The unit of observation was therefore 80 employees working in logistics and procurement departments in KEMSA. The study adopted a census and rules out application of any specific sampling technique. The study used a census since the population of 80 is small and the study aims to reach all the respondents. The study conducted a pilot test on 10% of the sample size to test the validity and reliability of the data collection instrument. This study used primary data collected using a semi- structured questionnaire. Statistical Package for Social Sciences (SPSS) was used to analyze the data. Descriptive and inferential statistics was computed and findings presented in tables and figures. The study concludes that past demand has a positive and significant effect on performance of Kenya medical supplies authority. The study also concludes that trend projection has a positive and significant effect on performance of Kenya medical supplies authority. Based on the findings, the study recommends that the management of Kenya medical supplies authority in Kenya should develop a robust demand forecasting system that leverages historical demand data.

Key Words: Demand Forecasting, Past Demand, Trend Projection, Performance of Kenya Medical Supplies Authority

Background of the Study

The health sector plays a fundamental role in society by addressing the healthcare needs of individuals and populations, promoting well-being, and contributing to economic development (Chilshe, & Phiri, 2022). In Kenya, as in many countries, the health sector encompasses a diverse range of services, institutions, and stakeholders dedicated to maintaining and improving public health outcomes (Bongei, Ngachu & Kibet, 2020). Organizational performance is a concept that reflects the effectiveness and efficiency with which an organization achieves its objectives and fulfills its mission. It encompasses various dimensions, including financial health, operational efficiency, customer satisfaction, and stakeholder value creation (Jawda, 2022). High organizational performance indicates robust management practices, strategic alignment, and the ability to adapt to external and internal dynamics effectively (Altaf, & Ali, 2023).

Demand forecasting is a systematic process of predicting future demand for goods or services based on historical data, market trends, and other relevant factors. It involves analyzing past sales patterns, consumer behavior, economic indicators, and external influences to estimate the quantity and timing of future customer demand (Ammar, Dilber, & Khald, 2023). The goal of demand forecasting is to enable organizations to plan production, inventory levels, resource allocation, and overall business strategies effectively. By anticipating future demand, businesses can optimize operations, minimize costs, manage inventory efficiently, and meet customer expectations more accurately. Incorporating lead times, past demand analysis, inventory cost considerations, and trend projection into demand forecasting processes enhances organizational agility, improves supply chain efficiency, and supports strategic decision-making (Debala, Khan, & Bhat, 2022). By leveraging these components effectively, organizations can optimize inventory management, reduce operational costs, and enhance customer satisfaction by ensuring product availability. Continuous refinement and integration of these forecasting components enable organizations to navigate uncertainties, respond to market demands, and achieve sustainable growth in competitive markets (Chilshe, & Phiri, 2022).

Globally, Ammar, Dilber and Khaled (2023) found a positive and significant association between demand forecasting and organizational performance and supply chain integration partially mediated the impact of organizational performance. The study concluded that there is a significant influence of demand forecasting on both supply chain integration and organizational performance. In Malaysia, Younus, Zaidan and Mahmood (2020) assessed on the effects of demand forecasting on organizational performance in Malaysian small and medium sized enterprises (SMEs). The study found that demand forecasting had a positive effect on organizational performance in SMEs. The study concluded that demand forecasting is important to an organization's success.

In Africa, Needorn (2020) examined on demand forecasting and organizational performance: the Nigerian manufacturing sector experience. The study found that a significant relationship exists between all measures of demand forecasting and dimension of organizational performance. The study concluded that there is a significant relationship between demand forecasting and organizational performance. Maniraguha and Nkechi (2022) researched on demand forecasting and operational performance of manufacturing companies in Rwanda: a case of Bralirwa Plc. The study found that demand forecasting affect operational performance of manufacturing companies in Rwanda. The study concluded that there was a significant statistical effect of demand forecasting on operational performance of Bralirwa Plc, Kigali.

Locally, Osoro, Noor and Nyang'au (2024) researched on demand forecasting and performance of horticulture exporting firms in Kenya. The study found that demand forecasting is statistically significant in explaining performance of horticulture exporting firms in Kenya and regulatory framework compliance is statistically significant in explaining performance of horticulture exporting firms in Kenya. The study concluded that that demand forecasting

positively and significantly relates with performance of horticulture exporting firms in Kenya and regulatory framework compliance had significant moderating effect on the relationship between demand forecasting and performance of horticulture exporting firms in Kenya.

Statement of the Problem

The Kenya Medical Supplies Authority (KEMSA) plays a pivotal role in the healthcare system of Kenya by ensuring the timely and efficient supply of medical commodities to public health facilities across the country (Wamoto, Kaswira, & Ndolo, 2023). Established to streamline procurement and distribution, KEMSA serves as a critical link between suppliers and healthcare providers, aiming to improve access to quality healthcare services for all Kenyans. The authority's mandate includes procuring, warehousing, and distributing pharmaceuticals, medical supplies, and equipment to public health facilities, thereby supporting the government's efforts to enhance healthcare delivery nationwide (Bongei, Ngachu & Kibet, 2020).

In recent years, KEMSA has faced significant challenges that have impacted its performance and operational efficiency (Kurgat & Deya, 2023). Statistics from various reports underscore these challenges. For instance, a 2023 audit report by the Auditor General of Kenya highlighted irregularities in procurement processes at KEMSA, leading to inefficiencies and delays in supply delivery. The report also noted instances of overpricing and mismanagement of resources, which have strained KEMSA's financial sustainability and eroded public trust in its operations. Moreover, operational issues such as stockouts and discrepancies in inventory management have plagued KEMSA (Wamoto, Kaswira & Ndolo, 2023). According to data from the Ministry of Health, stockouts of essential medicines in public health facilities reached alarming levels, with some regions reporting rates as high as 40%. These shortages have directly impacted patient care, leading to treatment interruptions and compromising healthcare service delivery (Seroney, Wanyoike & Langat, 2020).

Demand forecasting stands out as a critical factor in addressing the challenges faced by KEMSA. Effective forecasting techniques can help predict the quantity and timing of medical supplies needed by healthcare facilities, thereby optimizing inventory levels and reducing stockouts (Kurgat & Deya, 2023). By analyzing historical data and trends, demand forecasting enables KEMSA to anticipate fluctuations in demand, adjust procurement plans accordingly, and ensure the availability of essential medicines and supplies across the country (Wamoto, Kaswira & Ndolo, 2023). Improving demand forecasting at KEMSA is essential not only for enhancing operational efficiency but also for minimizing costs associated with excess inventory and wastage. A robust forecasting system can lead to better resource allocation, improved procurement decisions, and ultimately, enhanced healthcare service delivery outcomes for the Kenyan population (Osoro, Noor & Nyang'au, 2024).

Various studies have been conducted on demand forecasting and organization performance. For instance Munna and Oon (2019) conducted a study on the effects of demand forecasting on performance of manufacturing firms in Kenya. Rono (2019) conducted a study on the factors that influence demand forecasting at the standard group limited. Mungania, Waiganjo and Kihoro (2016) conducted a study on the influence of demand forecasting on Organizational Performance in the Banking Industry in Kenya. Makhanya, (2021) conducted a study on the influence of demand forecasting on firm performance. Nevertheless, none of these studies established the influence of demand forecasting on performance of Kenya medical supplies authority. To fill the highlighted gaps, the current study sought to establish the influence of demand forecasting on performance of Kenya medical supplies authority.

General Objective

The general objective of the study was to establish the influence of demand forecasting on performance of Kenya medical supplies authority

Specific Objectives

i. To establish the effect of past demand on performance of Kenya medical supplies authority
ii. To determine the effect of trend projection on performance of Kenya medical supplies authority

Theoretical Review

Economic Order Quantity (EOQ) Model

The Economic Order Quantity (EOQ) model is a fundamental principle in inventory management and supply chain management that seeks to determine the optimal order quantity that minimizes the total cost of inventory. Developed by Frederick W. Harris in 1913, this model balances the trade-off between ordering costs and holding costs to find the most cost-effective amount of inventory to order (Arshad, Asif & Baloch, 2020). At its core, the EOQ model is based on several key assumptions: the demand for inventory is constant and known; the ordering cost is fixed per order regardless of the quantity ordered; and the holding cost, or carrying cost, is proportional to the amount of inventory held. The model calculates the EOQ by using a formula that incorporates these costs to minimize the total cost of inventory management, which includes the costs of ordering, holding, and stockouts (Omulisa & Ogbe, 2022).

Implementing the EOQ model helps companies avoid the pitfalls of overstocking, which ties up capital and incurs higher holding costs, as well as understocking, which can lead to stockouts and lost sales. While the EOQ model provides a valuable framework for inventory management, it's important to consider that it assumes a steady demand and constant costs, which may not always reflect real-world complexities. As such, businesses may need to adapt the EOQ model or integrate it with other inventory management techniques to address fluctuations in demand and changes in costs (Chizomam & Umar, 2021). This theory was relevant in establishing the effect of past demand on performance of Kenya medical supplies authority.

Conservation of Resources (COR) Theory

Conservation of Resources (COR) Theory, developed by Stevan Hobfoll in the 1980s, is a psychological framework that focuses on how individuals manage and protect their resources in response to stressors. Central to COR Theory is the premise that individuals strive to acquire, retain, and protect resources that are valued and deemed necessary for their well-being. These resources can be tangible, such as money and property, or intangible, such as time, energy, self-esteem, and social support (Muhammad, *et al*, 2022). The theory posits that stress occurs when there is a threat of resource loss, actual resource loss, or when there is insufficient gain of resources following investment. According to COR Theory, resources are not only valued for their direct utility but also for their role in facilitating other valuable outcomes. For example, having a strong social support network (a resource) can help an individual navigate job stress (a stressor) more effectively, thereby preserving both personal well-being and job performance (Umuhire & Irechukwu, 2023).

A key concept within COR Theory is the "resource caravan" model, which suggests that individuals accumulate resources in clusters or "caravans" rather than in isolation. The theory proposes that possessing a greater number of resources or a robust resource caravan helps buffer against stress and improves the ability to cope with adverse situations. Conversely, resource loss can trigger a cascading effect where the loss of one resource leads to further losses in other areas, exacerbating stress and diminishing overall well-being (Chemirmir & Ndeto, 2021). COR Theory also emphasizes the role of resource investment in mitigating stress. It suggests that investing resources wisely can lead to resource gain, which can in turn build resilience and promote psychological recovery. For instance, investing time in building

supportive relationships may lead to greater social support, which enhances an individual's ability to cope with future stressors (Kurgat & Deya, 2023). This theory was relevant in determining the effect of trend projection on performance of Kenya medical supplies authority.

Conceptual Framework

A conceptual framework is a virtual or written concept that explains either graphically or in narrative form the main objectives to be studied and the presumed relationships among them (Mathieson, Peacock, & Chin, 2019).

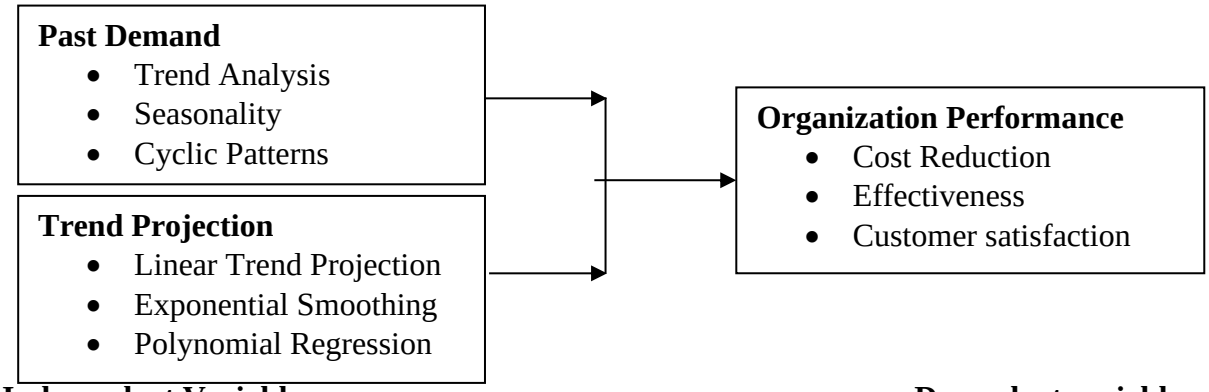

Figure 2. 1: Conceptual Framework

Past Demand

Past demand refers to the historical record of the quantity of a product or service that was requested or purchased by customers over a specific period. It provides insight into how much of a product was sold or how many services were utilized in the past. This information is typically used for various purposes, such as forecasting future demand, analysing trends, and planning inventory (Chizomam & Umar, 2021).

Trend analysis involves examining historical data to identify consistent movements or patterns over time. This analysis helps businesses and analysts understand the general direction in which key metrics, such as sales or demand, are moving. Trends can be upward, downward, or flat, and they provide valuable insights into long-term changes. For example, an upward trend in sales might indicate growing market acceptance or increased demand for a product, while a downward trend could suggest declining interest or emerging competition. By identifying and analyzing these trends, businesses can make informed decisions about future strategies, such as adjusting marketing efforts, developing new products, or entering new markets. Trend analysis typically involves plotting historical data on graphs and using statistical methods to smooth out short-term fluctuations and highlight long-term movements (Ndegwa & Odollo, 2024).

Seasonality refers to predictable and recurring fluctuations in demand or activity that occur at regular intervals within a specific period, such as daily, weekly, monthly, or annually. These patterns are often influenced by seasonal factors, including weather, holidays, or specific events. For instance, retail stores frequently experience increased sales during the holiday season, while demand for certain products like air conditioners or winter clothing peaks during specific times of the year. Understanding seasonality is crucial for effective inventory management, marketing planning, and financial forecasting. Businesses can prepare for seasonal variations by adjusting their production schedules, promotional strategies, and staffing levels to align with expected changes in demand (Nyang'au & Muturi, 2021).

Cyclic patterns are recurring fluctuations in demand or activity that follow a longer-term cycle, often influenced by economic conditions, business cycles, or broader market trends. Unlike seasonality, which is tied to specific times of the year, cyclic patterns are typically associated

with broader economic or industry-specific cycles that can last several years. For example, economic expansions and recessions create cyclic patterns in consumer spending and business investment. Identifying and understanding these cycles allows businesses to anticipate and prepare for periods of growth and contraction. This can inform strategic decisions such as scaling operations up or down, adjusting financial forecasts, or diversifying product lines to mitigate risks associated with economic fluctuations. Cyclic analysis often involves examining economic indicators, industry reports, and long-term historical data to identify recurring patterns and predict future cycles (Arshad, Asif & Baloch, 2020).

Trend Projection

Trend projection is a forecasting method used to estimate future values based on the analysis of historical data trends. It involves analyzing past data to identify patterns or trends and then extending these patterns into the future to predict upcoming values. This approach assumes that historical trends will continue into the future, allowing businesses or analysts to make informed decisions based on expected future outcomes (Kurgat & Deya, 2023).

Linear Trend Projection is a straightforward forecasting method used to predict future values based on historical data by fitting a straight line through past observations. This approach assumes that data points follow a linear trend, meaning that changes in the data occur at a constant rate over time. The method involves determining the slope and intercept of the best-fit line using statistical techniques such as least squares regression. Once the linear relationship is established, future values can be projected by extending the line beyond the historical data range. Linear Trend Projection is particularly useful when the data exhibit a consistent upward or downward trend. However, its simplicity comes with limitations. It may not accurately capture complex patterns or seasonal variations in the data, and its reliance on the assumption of linearity can lead to inaccurate forecasts if the true relationship is non-linear or affected by external factors (Bongei, Ngacho & Kibet, 2020).

Exponential Smoothing is a forecasting technique that gives more weight to recent observations while gradually decreasing the weight assigned to older data points. This approach aims to smooth out fluctuations in time series data by applying a smoothing factor or alpha (α), which determines the extent of weighting given to the most recent data. The basic form of exponential smoothing produces forecasts by combining the most recent actual value with the previous forecast, with more emphasis placed on the most recent observations. More advanced forms, such as Holt's linear exponential smoothing and Holt-Winters seasonal smoothing, incorporate trend and seasonal components to enhance forecast accuracy. Exponential Smoothing is particularly effective in capturing short-term trends and adjusting for recent changes in data patterns. However, it may struggle with long-term trends and structural changes in the data, as it primarily focuses on recent observations and may not fully account for significant shifts in historical patterns (Muhammad, *et al*, 2022).

Polynomial Regression extends the concept of linear regression by fitting a polynomial equation to the data, rather than a straight line. This method involves using polynomial functions (e.g., quadratic, cubic) to model relationships that are not adequately described by a linear trend. By incorporating higher-order terms (squared, cubed, etc.), Polynomial Regression can capture more complex, non-linear patterns in the data. For example, a quadratic polynomial can model U-shaped trends, while cubic polynomials can accommodate more intricate curvatures. This flexibility allows Polynomial Regression to better fit data with varying trends and cyclical behaviors. However, the model's increased complexity can also lead to overfitting, where the polynomial fits the historical data too closely and performs poorly on new, unseen data. Moreover, selecting the appropriate degree for the polynomial requires careful consideration, as overly complex models may introduce noise and reduce forecast reliability (Umuhire & Irechukwu, 2023).

Empirical Review

Past Demand and Organization Performance

Arshad, Asif and Baloch (2020) researched on the impact of past demand on organizational performance in Pakistan Telecommunication Company, limited, Islamabad. A very thorough survey has been conducted in all the offices and customer support centers in Islamabad. The sample size of 200 is taken from Islamabad city. The study found that there exists a relationship between past demand and organizational performance. The study concluded that there is a positive impact of past demand on organizational performance.

Omulisa and Ogbe (2022) assessed on past demand and organizational performance at Guaranty Trust Bank Kigali, Rwanda. The research used both descriptive and correlation research designs. The study's population was made up of 260 employees at Guaranty Trust Bank Rwanda whereas the sample size was 158 in which stratified random sampling technique was used. The study found that past demand has significant effect on the organization performance. The study concluded that past demand strongly affects the organizational performance of commercial banks.

Nyang'au and Muturi (2021) investigated on the influence of past demand on organizational performance in retail sector in Kenya: a survey of large retail stores in Kisii Town. The survey design methodology was adopted for the study with a target population of 810 large retail stores drawn from different segments of the retail sector. The study found that there was a significant positive influence of past demand on organizational performance in retail sector in Kenya. The study concluded that past demand influences performance of retail outlets in Kenya positively.

Trend Projection and Organization Performance

Muhammad, *et al* (2022) researched on trend projection and organizational performance in Pakistan. This study is a cross-sectional that utilized purposive sampling and the sample size for the current study was 514. The study found that trend projection has a positive and significant direct impact on organizational performance. The study concluded that there is a positive association between trend projection and organizational performance.

Umuhire and Irechukwu (2023) assessed on trend projection and organizational performance of media organizations in Rwanda. a case of Igihe Limited. The research used a descriptive research design and targeted a population of 128 employees from Igihe Limited. The study found a positive correlation between trend projection and the performance outcomes of Igihe Rwanda Limited in Rwanda. The study concluded that trend projection has a positive effect on performance of Igihe Rwanda Limited in Rwanda.

Chemirmir and Ndeto (2021) investigated on the effect of trend projection on performance of milk processing firms in Kenya. The on-going research utilized a descriptive research design. The study population was therefore 138 respondents in the 23 Kenyan milk processing firms. The study found that trend projection has a positive and significant effect on performance of milk processing firms in Kenya. The study concluded that trend projection had an effect on the performance of milk processing firms in Kenya.

RESEARCH METHODOLOGY

Research Design

This study adopted a descriptive research design. This design was preferable for this study because it enables the researcher to undertake a breadth of observations on phenomenon under study. Besides, it provides accurate descriptive analysis of the characteristics of the population from which the study sample is drawn to make inferences about it .

Target Population

The unit of analysis in this study was Kenya medical supplies authority. According to Auditor general's report (2023), KEMSA has a total of 912 employees. The study targeted employees in the logistics and procurement departments. The unit of observation was therefore 80 employees working in logistics and procurement departments in KEMSA

Sample and Sampling technique

The study adopted a census and rules out application of any specific sampling technique. The study used a census since the population of 80 is small and the study aims to reach all the respondents

Data Collection Instruments

The study employed both the questionnaires and interview as the main collection instrument that contains both open ended and close ended questions. Questionnaires tend to be effective data collection instruments which allows respondents to give much of their opinions pertaining to the research problem (Dempsey, 2019).The study also collected both primary and secondary data based on the objectives of the study. Primary data is defined as an information which is first hand obtained (Sekaran, 2019). The most preferred tool for the study is questionnaire which ensured that respondents responses were confidential.

Pilot Study

A pilot study was conducted to determine the levels of independent variables that are appropriate, the validity and reliability of methods of observation (Bodens, 2019). A pilot test is important since it helps in ensuring that the respondents can understand the questions clearer as well as the grammar and the wording. The study also gave out questionnaires to 8 employees who were not counted in the final sample. This was for the sake of questionnaires validation to help attain accuracy on the questionnaire's intention (Mugenda & Mugenda, 2019).

Data Analysis and Presentation

Quantitative data collected was analysed by the use of descriptive statistics using SPSS (Version, 25) and presented through percentages, means, standard deviations and frequencies. The information was displayed by use of bar charts, graphs and pie charts and in prose-form. This was done by tallying up responses, computing percentages of variations in response as well as describing and interpreting the data in line with the study objectives and assumptions through use of SPSS (Version 25) to communicate research findings. Correlation analysis is the statistical tool that can be used to determine the level of association of two variables (Levin & Rubin, 2019). The study conducted a correlation analysis to establish the strength of the relationship between the independent and the dependent variable.

DATA ANALYSIS AND FINDINGS

Descriptive statistics

Past Demand and Organization Performance

The first specific objective of the study was to establish the effect of past demand on performance of Kenya medical supplies authority. The respondents were requested to indicate their level of agreement on the statements relating to past demand and performance of Kenya medical supplies authority. The results were as shown in Table 4.1.

From the results, the respondents agreed that they regularly analyze past demand trends to make informed business decisions (M=3.964, SD= 0.997). In addition, the respondents agreed that historical demand data provides valuable insights for forecasting future needs (M=3.917,

SD= 0.831). Further, the respondents agreed that they recognize seasonal patterns in past demand and adjust planning accordingly (M=3.858, SD=0.563).

From the results, the respondents agreed that seasonal fluctuations are consistently factored into their demand forecasting models (M= 3.831, SD= 0.851). In addition, the respondents agreed that they use insights from past cyclic patterns to plan for periods of high and low demand (M=3.751, SD= 0.935). Further, the respondents agreed that cyclic patterns from historical demand data are effectively used to adjust operational strategies (M=3.742, SD=0.692).

Table 4. 1: Past Demand and Organization Performance

	Mean	Std. Deviation
I regularly analyze past demand trends to make informed business decisions.	3.964	0.997
Historical demand data provides valuable insights for forecasting future needs.	3.917	0.831
I recognize seasonal patterns in past demand and adjust planning accordingly.	3.858	0.563
Seasonal fluctuations are consistently factored into our demand forecasting models.	3.831	0.851
I use insights from past cyclic patterns to plan for periods of high and low demand.	3.751	0.935
Cyclic patterns from historical demand data are effectively used to adjust operational strategies	3.742	0.692
Aggregate	**3.844**	**0.812**

Trend Projection and Organization Performance

The second specific objective of the study was to determine the effect of trend projection on performance of Kenya medical supplies authority. The respondents were requested to indicate their level of agreement on various statements relating to trend projection and performance of Kenya medical supplies authority. The results were as presented in Table 4.2.

From the results, the respondents agreed that they find linear trend projection to be a straightforward method for forecasting future values (M=3.943, SD= 0.981). In addition, the respondents agreed that the linear trend projection model effectively captures long-term trends in their data (M=3.866, SD= 0.850). Further, the respondents agreed that exponential smoothing offers a reliable method for forecasting data with recent trends (M=3.731, SD= 0.914).

The respondents also agreed that they are satisfied with the accuracy of forecasts produced by exponential smoothing techniques (M=3.696, SD= 0.947). In addition, the respondents agreed that polynomial regression provides a good fit for data with complex, non-linear trends (M=3.689, SD= 0.856). Further the respondents agreed that they are confident in using polynomial regression for forecasting when data shows curvature (M=3.671, SD=0.621).

Table 4. 2: Trend Projection and Organization Performance

	Mean	Std. Deviation
I find linear trend projection to be a straightforward method for forecasting future values.	3.943	0.981
The linear trend projection model effectively captures long-term trends in our data.	3.866	0.850
Exponential smoothing offers a reliable method for forecasting data with recent trends.	3.731	0.914
I am satisfied with the accuracy of forecasts produced by exponential smoothing techniques.	3.696	0.947
Polynomial regression provides a good fit for data with complex, non-linear trends.	3.689	0.856
I am confident in using polynomial regression for forecasting when data shows curvature.	3.671	0.621
Aggregate	**3.766**	**0.862**

Correlation Analysis

The present study used Pearson correlation analysis to determine the strength of association between independent variables (past demand and trend projection) and the dependent variable (performance of Kenya medical supplies authority). Pearson correlation coefficient range between zero and one, where by the strength of association increase with increase in the value of the correlation coefficients.

Table 4. 3: Correlation Coefficients

		Organization Performance	Past Demand	Trend Projection
Organization Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	60		
Past Demand	Pearson Correlation	.842**	1	
	Sig. (2-tailed)	.002		
	N	60	60	
Trend Projection	Pearson Correlation	.910**	.179	1
	Sig. (2-tailed)	.000	.081	
	N	60	60	60

From the results, there was a very strong relationship between past demand and performance of Kenya medical supplies authority (r = 0.842, p value =0.002). The relationship was significant since the p value 0.002 was less than 0.05 (significant level). The findings conform to the findings of Arshad, Asif and Baloch (2020) that there is a very strong relationship between past demand and organization performance.

The results also revealed that there was a very strong relationship between trend projection and performance of Kenya medical supplies authority (r = 0.910, p value =0.000). The relationship was significant since the p value 0.000 was less than 0.05 (significant level). The findings are in line with the results of Kurgat and Deya (2023) who revealed that there is a very strong relationship between trend projection and organization performance

Regression Analysis

Multivariate regression analysis was used to assess the relationship between independent variables (past demand and trend projection) and the dependent variable (performance of Kenya medical supplies authority)

Table 4. 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.868	.753	.754	.10120

a. Predictors: (Constant), past demand and trend projection

The model summary was used to explain the variation in the dependent variable that could be explained by the independent variables. The r-squared for the relationship between the independent variables and the dependent variable was 0.753. This implied that 75.3% of the variation in the dependent variable (performance of Kenya medical supplies authority) could be explained by independent variables (past demand and trend projection).

Table 4. 5: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.035	2	4.018	16.88	.000[b]
	Residual	6.568	57	.115		
	Total	14.603	59			

a. Dependent Variable: performance of Kenya medical supplies authority
b. Predictors: (Constant), past demand and trend projection

The ANOVA was used to determine whether the model was a good fit for the data. F calculated was 16.88 while the F critical was 2.540. The p value was 0.000. Since the F-calculated was greater than the F-critical and the p value 0.000 was less than 0.05, the model was considered as a good fit for the data. Therefore, the model can be used to predict the influence of past demand and trend projection on performance of Kenya medical supplies authority.

Table 4. 1: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.205	0.053		3.867	0.000
	past demand	0.486	0.123	0.487	3.951	0.000
	trend projection	0.430	0.113	0.431	3.805	0.001

a Dependent Variable: performance of Kenya medical supplies authority

The regression model was as follows:

$$Y = 0.205 + 0.486X_1 + 0.430X_2 + \varepsilon$$

According to the results, past demand has significant effect on performance of Kenya medical supplies authority, β1=0.486, p value= 0.000). The relationship was considered significant since the p value 0.000 was less than the significant level of 0.05. The findings conform to the findings of Arshad, Asif and Baloch (2020) that there is a very strong relationship between past demand and organization performance.

In addition, the results revealed that trend projection has significant effect on performance of Kenya medical supplies authority β1=0.430, p value= 0.001). The relationship was considered significant since the p value 0.001 was less than the significant level of 0.05. The findings are

in line with the results of Kurgat and Deya (2023) who revealed that there is a very strong relationship between trend projection and organization performance.

Conclusions

The study concludes that past demand has a positive and significant effect on performance of Kenya medical supplies authority. Findings revealed that trend analysis, seasonality and cyclic patterns influences performance of Kenya medical supplies authority.

The study also concludes that trend projection has a positive and significant effect on performance of Kenya medical supplies authority. Findings revealed that linear trend projection, exponential smoothing and polynomial regression influence performance of Kenya medical supplies authority.

Recommendations

The study recommends that the management of Kenya medical supplies authority in Kenya should develop a robust demand forecasting system that leverages historical demand data. By analysing past consumption patterns and trends, KEMSA can better anticipate future needs and adjust inventory levels accordingly. Implementing predictive analytics tools can enhance accuracy in forecasting, enabling KEMSA to maintain optimal stock levels and minimize shortages or excess inventory.

The study also recommends that the management of Kenya medical supplies authority in Kenya should implement a robust trend projection analysis that utilizes advanced data analytics and forecasting techniques. By systematically analysing historical data on medical supply usage, seasonal fluctuations, and emerging healthcare needs, KEMSA can develop accurate projections that inform procurement and inventory decisions. Investing in tools such as predictive analytics software can help identify patterns and anticipate future demand more effectively.

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