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Order Visibility and Performance of Level 4 Private Hospitals in Kenya

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ABSTRACT

Purpose: The main focus of this study was to establish the role of order visibility on performance of level 4 private hospitals in Kenya.

Methodology: The study was anchored on General Systems Theory. The study adopted cross-sectional research design and positivist research paradigm. The unit of analysis was the 368 level 4 private hospitals in Kenya while the unit of observation was heads of procurement, quality assurance, finance, risk and compliance and audit. Therefore, the target population was 1840 heads of departments in level 4 private hospitals in Kenya. Krejcie and Morgan (1970) formula was adopted in calculating appropriate sample size. From the formula, the sample size for the study was 320 respondents. The sample was selected using stratified random sampling. The study used primary data collected using semi-structured questionnaires. The study collected both qualitative and quantitative data, Qualitative data was analysed using content analysis a presented in prose form. Quantitative data was analysed using SPSS version 28. Descriptive statistics including means, percentages, frequencies and standard deviations were used to analyse quantitative data. Inferential statistics using Pearson R correlation, simple regression and multiple regressions were also computed.

Findings: The study found that order visibility is statistically significant in explaining performance of private hospitals in Kenya. The influence was found to be positive. This means that unit improvement in order visibility would lead to an increase in performance of private hospitals in Kenya.

Unique Contribution to Theory, Practice and Policy: Based on the findings, the study concluded that order visibility positively and significantly influences with performance of private hospitals in Kenya. The study recommends management of Private Hospitals to Implementing a comprehensive EHR system that will help hospitals digitize patient records, treatment plans, and medication orders. It enables real-time access to patient information, test results, and treatment histories, making it easier for healthcare professionals to coordinate patient care effectively. This leads to improved order visibility within the hospital.

Key Words: *Order Visibility, General Systems Theory, Performance of Level 4 Private Hospitals*

Background of the Study

In the age of competition, no industry can survive without pondering much about reducing expenditures wherever possible (Shiau, Dwivedi, & Tsai, 2020). The same is true for health care industry, which is witnessing sharp rise in price in almost all its products and services. The alarmingly high pace of upward movement of cost is making the produce of the industry beyond the reach of the mass (Christopher, 2021). Supply chain in this industry being a significant driver of cost is therefore grabbing all the attention from industry stakeholders.

It is therefore substantial for health care industries to enforce and seek out new strategies regarding supply chain management to endure within the current competitive and capricious business climate which is critical (Paulraj, Chen, & Lado, 2019). A concept of visibility represents a beneficial role among business partners such as manufacturers, supplier, and customers. The categorization of several types for uncertainties in the supply chain such as demand, quality, broader variety, time, and customization of a product are related to the decision-maker. Management of uncertainties applicable with the help of sharing the information creates visibility among supply chain partners (Shi & Yu, 2020). Supply chain visibility therefore helps with equipping more accurate, precise, faithful, and rigorous real-time portrait of demand, quality, and price indications or information about supplier's inventory levels (Tan, 2021).

In recent years, the concept of supply chain visibility (SCV) has been gaining the attention of practitioners and researchers (Catalayud et al., 2019). Many sources draw on the definition of SCV by Barratt and Oke (2017) as "the extent to which actors within a supply chain have access to or share information which they consider as key or useful to their operations and which they consider will be of mutual benefit". An important part of full supply chain visibility is making sure the business data that is being tracked is available to all stakeholders in the chain, including the customer.

Events such as Covid-19 pandemic have revealed some vulnerabilities that companies face due to low visibility (Sharma et al., 2020). The visibility upstream toward suppliers and downstream toward customers has been limited. Beyond the visible range, companies have no choice but to accept what happens (Carter et al., 2019). Lower-tier suppliers are much less visible and may not even be known to the focal firms (Choi et al., 2021). Consequently, companies experience supply chain disruptions concerning material supply, deliveries, productivity, and revenue (Caridi et al., 2020; Yu & Goh, 2019; Swift et al., 2019). In addition to affecting business performance, low visibility causes restricted ability to achieve supply chain resilience (Bregman et al., 2019). Thus, the management of supply chain disruptions in a network of global suppliers, operations, and markets has increased attention to SCV in order to attain sustainable and competitive business performance (Suh and Lee, 2020). In fact, visibility has become one of the most highlighted concerns conveyed by health care companies (Sodhi & Tang, 2019).

Firms are increasingly held accountable for their suppliers' transgressions (Swift et al., 2019). Therefore, firms need to develop upstream visibility to exercise control over their supply

chains (Somapa et al., 2020). Patterns and trends identified through the analysis of supply chain allow the company to make informed decisions about how to optimize operations (Calatayud et al., 2019). The insight gained from supply chain analytics enables the company to better understand the performance of each activity within the supply chain and identify processes that require improvement to create more value for business and customers (Swift et al., 2019).

Presently hospitals are looking for new sources of competitive advantage and cost cutting measures wherever possible. It is imperative to look into the supply chain management aspects and identify areas in which they can improve the quality of service for efficient patient care. Supply Chain Management in healthcare should ensure complete end to-end visibility of information among suppliers, manufacturers, distributors and customers. This study therefore seeks to establish the influence of order visibility on performance of level 4 private hospitals in Kenya.

Private Hospitals in Kenya

Private hospitals have been clearly distinguished from the public hospitals by their ability to admit and take care of the inpatients. A treating facility owned by a for-profit or a non-for-profit organization and is privately funded through payment for medical or healthcare services by patients themselves, by insurers, or by foreign embassies is what is termed as a private hospital. The Private healthcare hospitals have grown by wide margin for the past years due to absence of quality health care systems in the public health sector and introduction of user fees in 1989 (Kimani et al., 2019).

According to Kimani et al., (2019) a private healthcare sectors make high contribution to delivery of healthcare services in Kenya. Ability to improve efficiency and quality of care through promotion of competitiveness and complementing the public sector has facilitated the ability of private hospitals in the filling of the resource gasps in existence. Lowering down of prices and quality in the health care has been facilitated by presence of many suppliers in the market place. Government has limited capacity to monitor and enforce quality standards. Inspection of facilities and issuance of operating license is carried out by The Pharmacy and Poisons Control Board (PPB) which has a large mandate for carrying out that task.

In Kenya, there are three major categories of hospitals i.e. category A,B and C as per the NHIF classification where category A are the government hospitals, category B are the private and mission hospitals while category C are the private hospitals. There are 103 private hospitals according to National Hospital Insurance Fund (NHIF). This study will be based on level 4 private hospitals which provide both inpatient and outpatient services. The private sector contributes more that 40% of health services in the country, which is a significant proportion, providing mainly curative health services (Kenya Facts & figures 2019).

Due low quality of Kenyan manufactured drugs and other healthcare commodities, private hospitals source the items from different continents. The global sourcing from multinational

pharmaceutical companies lengthens and complicates Kenyan healthcare supply chain (UNIDO, 2019). As such, exhaustive research on the medical supply system among private hospitals in Kenya needed to be pursued with haste. Such research will avail local data to bring out a clearer picture and relevant information on how supply chain visibility practices can grant level 4 private hospitals competitive advantage and improve performance without compromising the urge to fix the healthcare needs in Kenya. This study was aim at adding knowledge on the sector by finding out how supply chain visibility integration would guarantee improved performance among Kenyan private hospitals.

Statement of the Problem

Healthcare system in Kenya is still a national challenge, five decades after independence. For instance, Kenya has very few doctors compared to developed countries. Kenya with a total population of 46 million citizens, currently has 0.2 physicians per 1000 population. Comparatively, Sweden with a population of only 8 6 million citizens, has a physician density of 3.93 physicians per 1000 population (CIA, 2019). Consequently, Kenya has high morbidity and mortality rates affecting the population of all ages, especially children under five years. The infant mortality rate is about 58.1 per 1,000 live births, maternal mortality rate is about 414 per 1,000 and the overall under five child mortality rate is about 121 per 1,000 live births, which are all double of the global average (ROK, 2020).

Accountability and transparency on the utilization of health resources is also a major issue in Kenya (Mohajan, 2019). Ministry of health is the second most corrupt ministry in Kenya and the health department in the county governments is the department most perceived to be prone to corruption (EACC, 2020). Lack of basic infrastructure, poor health care policies and prevalent misappropriation of public funds has compromised the quality of health care in public healthcare sectors (Kenyanya, 2021). The study postulates that improvements in hospital SCM through application of supply chain visibility may directly improve performance of hospitals in Kenya. Since 45% of the hospital operating budget is allocated to supply chain, improvements and innovations in supply chain management may provide significant impact on cost and quality of heathcare (Chen, Preston, & Xia, 2019).

There has been limited academic interest in recent years in order visibility. Aberdeen (2019) did a study on the effect of order visibility on supply chain costs and service levels. The study found that order visibility if implemented will have positive influence on operational performance of the firm. Gustarsson (2019) carried out on how order visibility can be applied in a case of Pulp Company in Sweden. The study concluded that information sharing was well implemented at the firm leading to visibility. In Kenya little related research had been done and there is need to conduct a study to deepen understanding of the role of order visibility. The study answered the following question; what is the role of supply chain visibility integration on performance of level 4 private hospitals in Kenya?

General Objective

The main focus of this study is to establish the role of order visibility on performance of level 4 private hospitals in Kenya.

Theoretical review

According to Kombo and Tromp (2020), theoretical framework refers to a collection of interrelated ideas based on theories attempting to clarify why things are the way they are based on theories, introducing new view of the research problem, allowing understanding realm of the problem, helping to conceptualize topic in its entirety and to acknowledge problem from a wider perspective for objectivity. Theoretical framework provides the researcher the lens to view the world. The study was anchored on General Systems Theory.

General Systems Theory

General systems theory was founded by the biologist Ludwig von Bertalanffy (General Systems Theory, 1962), and furthered by Ross Ashby (Introduction to Cybernetics, 1956). Boulding (1956) defines general systems theory as the main body of science that anchors and relate to certain disciplines in a comprehensible manner. An entity can be described by its organization structure and how the various structures relate with one another through information sharing minimizing ambiguity (Weick, 2019). The systems consist of routine patterns of entities that are linked together bringing out relationships that can express the entire organization (Katz, 2019).

Furthermore, systems theory seeks to understand the organization holistically. Therefore, it follows several steps in order to achieve this (Farace, 1977). This theory puts emphasis on both vertical and horizontal organization orientation to get a more accurate view point of the organization. In the organizational context, communication networks are defined in terms of management roles or casual roles which emerge through interactions.

The open systems model was purposefully created for organizations to communicate with another exchange messages in the form of information and receive feedback from the external environment. The model takes into account all aspects of the organization and can be used to measure the stability of the same (Hickson, 1973). Realistically, this was tasked with identifying organization challenges and tackling them through interaction with other entities. It was implemented to single out any difficulties and prescribe solutions on the same Understanding the organization as a whole could help decipher where actual problems lie. Lai (2019) urged businesses to remove all communication complexities with all stakeholders. These include inner, outward, and inter-organizational communication, with employees, customers, suppliers, and organized stakeholders in general.

This theory is crucial for implementing SCV because it advocates for interaction among supply chain members. Similar to this theory, SCV proposes interaction and collaboration of members through sharing of information. This theory is crucial for implementing SCV

because it advocates for interaction among supply chain members. Similar to this theory, SCV proposes interaction and collaboration of members through sharing of information.

Conceptual Framework

According to Yin (2019), a conceptual framework refers to a diagrammatical representation showing the relationship between dependent and independent variables. In this study, the conceptual framework looks at order visibility and its effect on performance of level 4 private hospitals in Kenya. Figure 2.1 below shows the independent variable is order visibility while dependent variable is performance of level 4 private hospitals in Kenya.

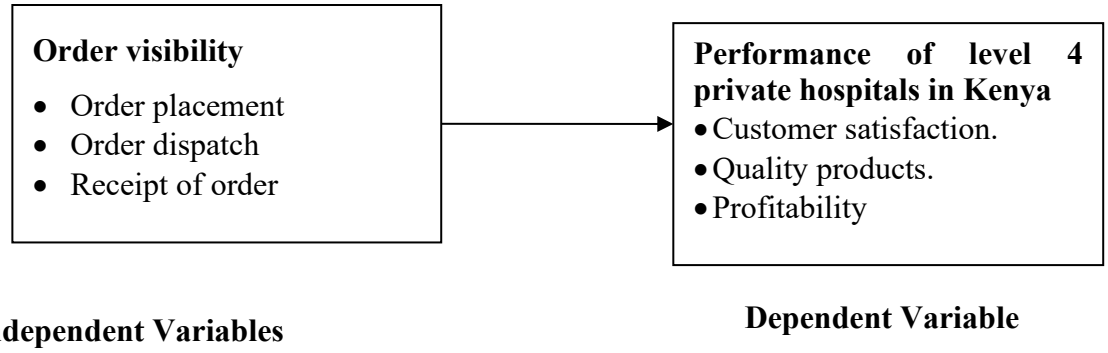

Figure 2. 1: Conceptual Framework

Source: Researcher (2024)

Order Visibility

End-to-end visibility is critical for any supply chain, whether they are dealing with cold chain transportation or bulk order freight (Cristopher, 2020). When it comes to handling orders and inventory management, especially when balancing e-commerce shops and brick-and-mortar stores, visibility and up-to-date tracking are essential. Order visibility allows management to see a clear picture of where items are at any given time, how much inventory is in the warehouse, on the trucks, in the store, being held for shipment, and due to arrive (Aberdeen, 2022). Collaboration between all steps and components of the supply chain is critical. Easy sharing of data and analytics helps keep everyone on the same page. Innovative and collaborative dashboards and platforms can help improve end-to-end visibility and management across networks (Simchi-Levi, 2019).

Order visibility is a critical part of supply chain management and operations (Murphy, 2019). Without this essential component locked down, it will be challenging to maintain the continued alignment of business goals. This is why accurate inventory tracking is so critical. According to Kihara (2019) supply chain logistics lives or dies based on the ability to be versatile and adapt. Changes in market trends, customer demands, inventory availability, supply chain deliveries, and local or global disruptions are unavoidable. However, they can be prepared with the correct planning and logistical approach to keep order visibility front and center by following a few simple tips (Katuse, 2019). Some of the tips according to

Gustarsson (2020) are: Provide adequate training during the on-boarding process; Maintain a collaborative and cooperative perspective; Embrace big data, predictive analytics, and automated platforms; Keep open lines of communication going between team members; Partner with vendors and 3PLs to help improve network strength; and Listen to feedback, concerns, and comments from consumers.

Empirical Literature Review

Order Visibility

Gustarsson (2019) carried out research on how SCV can be applied in a case of Pulp Company in Sweden. The objective was to find out how SCV can be used to mitigate warehousing complexities. The research employed a systems approach to find out areas where SCV was low and can be improved in order to manage inventory better. The study concluded that information sharing was well implemented at the firm leading to visibility. In addition, it further asserts that increased visibility leads to better inventory management. The study also found out that information sharing is just a tip of the ice berg when it comes to inventory management. The researchers recommend that managerial support is crucial to ensure sustained collaboration among partners so that there is better inventory control.

Pause and Blum, (2019) researched to analyze the impact of different order policies on the supply chain performance. Influenced by the high dynamic of the markets and the steadily increasing demand for short delivery times the importance of supply chain optimization is growing. In particular, the order process plays a central role in achieving short delivery times and constantly needs to evaluate the trade-off between high inventory and the risk of stock-outs. However, analyzing different order strategies and the influence of various production parameters is difficult to achieve in industrial practice. Therefore, simulations of supply chains are used in order to improve processes in the whole value chain. The objective of this research is to evaluate two different order strategies (t, q, t, S) in a four-stage supply chain. In order to measure the performance of the supply chain the quantity of the backlog will be considered. A Design of Experiments approach is supposed to enhance the significance of the simulation results.

Chiplunkar (2020) in his paper on real-time inventory and order visibility: key for successful supply chain management. He found that Inventory and order visibility provides internal operational efficiency and, when shared with the customer, can help cut costs and free up capital. This transparency can also increase customer retention and reach, helping companies achieve successful and profitable omni-channel ordering capabilities. With advancements in technology such as Internet of Things (IoT), cloud, and big data, demands and expectations for supply chain management have continuously grown over the past few decades — with some key changes in the business landscape: Distribution networks are expanding, with products and orders being spread out over a variety of locations; Customers expect visibility into product availability and order status; E-commerce and social media channels push companies toward omnichannel offerings and fulfilment capabilities to remain competitive and capture demand.

Nasr (2020) purposed to explore the impact of supply chain visibility on supply chain performance in Del Monte Foods (UAE). The research strategy followed was interpretivism in paradigm with inductive approach and qualitative method in data collection and analysis. Set of interviews were conducted with junior and senior employees involved in supply chain operation in a single case study company. The research proofed that current supply chain visibility has number of positive impacts on supply chain performance and supply chain strategies in Del Monte Foods (UAE). It also addressed new definition of visibility that can enrich future studies in this topic. Due to limited duration time of the research, information were collected only from the perspective of one focal company, named as limited triadic approach, and investigation didn't cover the other partners in supply chain. Finally, similar studies were found in the literature, however, this study considered to be the first in its kind that conducted in UAE or MENA region.

RESEARCH METHODOLOGY

Research Design

The study adopted a cross-sectional research design. Cross sectional surveys are versatile in nature and therefore give accurate means of evaluating information while enabling the researcher to confirm whether there are significant causalities among the variables (Harlow, 2019). Research philosophy is the foundation of knowledge and the nature of that knowledge contains important assumptions about the way in which researchers view the world (Saunders, Lewis, & Thornhill, 2017). Research methods are influenced by philosophical orientations such as epistemology, which attempts to answer the basic question of what distinguishes true (adequate) knowledge from false (inadequate) knowledge. Epistemology is concerned with determining the nature of knowledge and the extent of human knowledge (Burrell & Morgan, 1979).

Target Population

According to National Hospital Insurance Fund (2022) there are 368 level 4 private hospitals in Kenya. The unit of analysis was therefore the 368 private hospitals in Kenya while the unit of observation was heads of procurement, quality assurance, finance, risk and compliance and audit. Therefore, the target population was 1,840 heads of departments in level 4 private hospitals in Kenya. The distribution of target population is presented in Table 3.1.

Table 3. 1: Target Population

Head of Department	Population
Procurement	368
Quality assurance	368
Finance	368
Risk and compliance	368
Audit	368
Total	**1,840**

The sample frame for this study was compiled from list of heads of procurement, quality assurance, finance, risk and compliance and audit. Therefore, the sampling frame was 1840 level 4 heads of departments in private hospitals in Kenya.

The overall sample size for this study was determined using a formula by Krejcie and Morgan (1970). The sample size for this study was determined as follows;

Required sample size **(s)** = $\frac{X^2NP\,(1-P)}{d^2\,(N-1) + X^2P\,(1-P)}$

X^2=the table value of chi-square for 1 degree of freedom at the desired confidence level 1.96 x 1.96 = 3.8416. (for 0.05 confidence level)

N = the population size.

P = the Population proportion (assumed to be 0.50 since this would provide maximum sample size).

d = the degree of accuracy expressed as a proportion (0.05).

$$= \frac{3.8416*1840*0.5*0.5}{0.05^2(1840)+3.8416*0.5*0.5} = \frac{1767.136}{5.5604}$$

$$= 319.807$$

$$\approx 320$$

Therefore, using the Krejcie and Morgan formula, the sample size for the study was 320 respondents.

This study will employ stratified random sampling. Babbie (2019) posit that stratified random sampling is appropriate when the population is not homogeneous. Stratified sampling is regarded as the most efficient system of sampling as there is little possibility of any essential group of population being completely excluded (Gupta & Gupta, 2019).

The study then used simple random sampling in selecting a sample from each strata. The sample size for each department was as shown in Table 3.2

Table 1: Sample size

Head of Department	**Population**	
Procurement	368	64
Quality assurance	368	64
Finance	368	64
Risk and compliance	368	64
Audit	368	64
Total	**1,840**	**320**

Data Collection Instruments

In this study, primary data was used and was collected using a semi structured questionnaire because they are cost effective and convenient to collect and summarise responses (Kothari, 2019).

This study used both closed-ended questions and open ended questions to collect the data. Closed-ended questions were used where respondents were restricted to direct their answers without further explanation while the open-ended questions sought respondent's views on variables being studied.

The questionnaire includes Likert scale psychometric constructs with a scale ranging from 1-5 where each respondent will be required to rate each and every statement given describing a given variable. The scale ranges from 5=Strongly Agree, 4=Agree, 3=No Opinion, 2= Disagree and 1=Strongly Disagree.

Data Analysis and Presentation

Data was analysed using the Statistical Package for Social Sciences (SPSS) version 28 software. The study performed descriptive analysis. Descriptive statistics enable the researcher to meaningfully describe a distribution of measurements and summarize data (Kothari, 2019; Mugenda & Mugenda, 2021).

Qualitative data collected (through the open ended section of the questionnaire) was coded, and repeated themes (responses) or concepts recorded until saturation is achieved (Jennings, 2019). Quantitative data was analysed using descriptive statistics including frequency, percentages and means, summary graphs, pie charts and frequency distribution tables were employed to portray the sets of categories formed from the data.

Pearson correlation coefficient was used for testing associations between the independent and the dependent variables.

This study also conducted inferential statistics through bivariate regression analysis and multiple regression analysis. Using SPSS software, the data was subjected to regression analysis. Simple linear regression analyses for (H_{01}, H_{02}, H_{03}, and H_{04}) and multiple regression analysis was used to establish the nature and the magnitude of the relationship between the dependent and the independent variables and to test the hypothesized relationships.

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

This study used multiple regressions analysis (stepwise method) to establish the moderating effect of technology adoption (M) on relationship between inventory visibility and performance of level 4 private hospitals in Kenya. The moderating regression model was formed on a three steps approach

$$Y = \beta_{30} + \beta_{31} X + \beta 32 Me + \varepsilon_3$$

Regress the dependent variable (Performance of level 4 private hospitals in Kenya) on both the mediator (technology adoption) and independent variable (order visibility).

RESEARCH FINDINGS AND DISCUSSIONS

Descriptive Analysis

Performance of level 4 Private Hospitals in Kenya

The respondents were requested to indicate their level of agreement on various statements relating to performance of level 4 private hospitals in Kenya. A 5 point Likert scale was used where 1 symbolized strongly disagree, 2 symbolized disagree, 3 symbolized neutral, 4 symbolized agree and 5 symbolized strongly agree. The results were as presented in Table 2.

From the results, the respondents agreed that their organization has recorded a reduction in costs of operations. This is supported by a mean of 3.965 (std. dv = 0.776). In addition, as shown by a mean of 3.958 (std. dv = 0.636), the respondents agreed that there has been an increased customer satisfaction in their company. Further, the respondents agreed that the company has improved quality of products and services. This is shown by a mean of 3.910 (std. dv = 0.972). The respondents also agreed that their company has recorded an increase in company's market share. This is shown by a mean of 3.872 (std. dv = 1.005).

With a mean of 3.852 (std. dv = 0.608), the respondents agreed that there has been a significant reduction in customer complaints. In addition, the respondents agreed that efficiency and effectiveness in operations has improved. This is supported by a mean of 3.832 (std. dv = 0.897). In addition, as shown by a mean of 3.798 (std. dv = 0.871), the respondents agreed that they are satisfied with the general performance of their organization. Further, the respondents agreed that their company is in a position to cater for its bills as they become due. This is shown by a mean of 3.776 (std. dv = 0.783). The respondents also agreed that the number of referral has been increasing due to quality services offered. This is shown by a mean of 3.743 (std. dv = 0.931).

Table 2: Performance of level 4 Private Hospitals in Kenya

	Mean	Std. Deviation
Our organization has recorded a reduction in costs of operations	3.965	0.776
There has been an increased customer satisfaction in our company	3.958	0.636
The company has improved quality of products and services	3.910	0.972
Our company has recorded an increase in company's market share	3.872	1.005
There has been a significant reduction in customer complaints	3.852	0.608
Efficiency and effectiveness in operations has improved	3.832	0.897
Am satisfied with the general performance of our organization	3.798	0.871
Our company is in a position to cater for its bills as they become due	3.776	0.783
The number of referral has been increasing due to quality services offered	3.743	0.931
Aggregate	**3.794**	**0.886**

In addition, the respondents were requested to suggest ways to improve performance of level 4 Private Hospitals in Kenya. From the results, the respondents indicated that improving the performance of Level 4 private hospitals in Kenya requires a multifaceted approach that addresses both operational efficiency and quality of care. First, enhancing supply chain management is crucial to ensure the timely availability of medical supplies and equipment. This can be achieved through supply chain visibility tools, streamlined procurement processes, and supplier diversification to minimize risks of stockouts. Additionally, investing in technology, such as electronic health records (EHR) systems and telemedicine platforms, can improve record-keeping, patient data management, and accessibility to care, especially for remote populations. Hospitals can also benefit from upgrading their infrastructure, including modernizing facilities, expanding capacity, and adopting energy-efficient systems to reduce operational costs.

In addition, the respondents indicated that, workforce development and patient-centered care are critical for sustained performance improvement. Regular training programs for healthcare workers and recruitment of specialized personnel can ensure that hospitals maintain high standards of service delivery. Employee motivation through performance-based incentives and a positive work environment can boost productivity and reduce staff turnover. Patient-centered approaches, such as personalized treatment plans, reduced waiting times, and feedback-driven service improvements, can enhance patient satisfaction and loyalty.

Order Visibility and Performance of level 4 Private Hospitals

The first specific objective of the study was to establish the effect of order visibility on performance of level 4 private hospitals in Kenya. The respondents were requested to indicate their level of agreement on various statements relating to order visibility and performance of level 4 private hospitals in Kenya. A 5 point Likert scale was used where 1 symbolized strongly disagree, 2 symbolized disagree, 3 symbolized neutral, 4 symbolized agree and 5 symbolized strongly agree. The results were as presented in Table 3.

From the results, the respondents agreed that orders placed by customers are the only factual demand information they have access to. This is supported by a mean of 3.968 (std. dv = 0.636). In addition, as shown by a mean of 3.940 (std. dv = 0.972), the respondents agreed that order information often gives a distorted picture of end customer demand. Further, the respondents agreed that distortion of information tends to increase upstream in the supply chain. This is shown by a mean of 3.912 (std. dv = 0.905). The respondents also agreed that information distortion makes demand look variable and unpredictable. This is shown by a mean of 3.910 (std. dv = 0.808).

The respondents agreed that basing production and inventories on distorted information leads to high stock levels. This is supported by a mean of 3.872 (std. dv = 0.897). In addition, as shown by a mean of 3.843 (std. dv = 0.786), the respondents agreed that downstream demand information sharing increases efficiency. Further, the respondents agreed that poor product availability results from demand information distortion. This is shown by a mean of 3.823 (std. dv = 0.834). The respondents also agreed that to improve efficiency, we always base

demand forecasts and production plans on point-of-sale data. This is shown by a mean of 3.797 (std. dv = 0.786). The respondents agreed that volatility, uncertainty, complexity and ambiguity results in demand variability. This is supported by a mean of 3.743 (std. dv = 0.897).

Table 3: Order Visibility and Performance of level 4 Private Hospitals

	Mean	Std. Deviation
Orders placed by customers are the only factual demand information we have access to	3.968	0.636
Order information often gives a distorted picture of end customer demand	3.940	0.972
Distortion of information tends to increase upstream in the supply chain	3.912	0.905
Information distortion makes demand look variable and unpredictable	3.910	0.808
Basing production and inventories on distorted information leads to high stock levels	3.872	0.897
Downstream demand information sharing increases efficiency	3.843	0.786
Poor product availability results from demand information distortion	3.823	0.834
To improve efficiency, we always base demand forecasts and production plans on point-of-sale data	3.797	0.786
Volatility, uncertainty, complexity and ambiguity results in demand variability	3.743	0.897
Aggregate	**3.798**	**0.873**

The respondents were also requested to indicate how order visibility affected performance of level 4 private hospitals in Kenya. From the results, the respondents indicated that order visibility has significantly influenced the performance of Level 4 private hospitals in Kenya by enhancing efficiency and operational effectiveness. With improved order visibility, hospitals are now able to track their medical supplies and equipment in real time, ensuring that stock levels are maintained and critical items are available when needed. This has minimized instances of stockouts, reduced delays in service delivery, and improved overall patient care. Respondents also highlighted that order visibility has enabled better planning and forecasting, allowing hospital administrators to make informed procurement decisions based on actual demand trends, which has reduced wastage and optimized resource allocation.

Furthermore, respondents noted that order visibility has strengthened supplier relationships and enhanced accountability within the supply chain. By having real-time insights into the status of orders, hospitals can identify potential delays early and take corrective actions, thereby avoiding disruptions in service delivery. This has also contributed to cost savings, as hospitals can reduce the need for emergency procurements or overstocking. Additionally, respondents emphasized that improved order visibility has boosted transparency and trust

within the healthcare system, leading to greater confidence from patients and stakeholders. Overall, respondents agreed that order visibility has played a pivotal role in improving service quality, operational efficiency, and patient satisfaction in Level 4 private hospitals.

Correlation Analysis

The present study used Pearson correlation analysis to determine the strength of association between independent variables (order visibility) and the dependent variable (performance of level 4 private hospitals in Kenya) dependent variable. Pearson correlation coefficient range between zero and one, where by the strength of association increase with increase in the value of the correlation coefficients. The current study employed Taylor (2018) correlation coefficient ratings where by 0.80 to 1.00 depicts a very strong relationship, 0.60 to 0.79 depicts strong, 0.40 to 0.59 depicts moderate, 0.20 to 0.39 depicts weak.

Table 4: Correlation Coefficients

		Organization Performance	Order Visibility
Organization Performance	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	251	
Order Visibility	Pearson Correlation	.880**	1
	Sig. (2-tailed)	.001	
	N	251	251

From the results, there was a very strong relationship between order visibility and performance of private hospitals in Kenya (r = 0.880, p value =0.001). The relationship was significant since the p value 0.001 was less than 0.05 (significant level). The findings are in line with the findings of Gustarsson (2019) who indicated that there is a very strong relationship between order visibility and organization performance.

Test for Hypothesis One

The first specific objective of the study was to establish the effect of order visibility on performance of level 4 private hospitals in Kenya. The associated null hypothesis was that order visibility has no significant effect on performance of level 4 private hospitals in Kenya. A univariate analysis was conducted in which performance of level 4 private hospitals in Kenya was regressed on order visibility.

The R-Squared depicted the variation in the dependent variable that can be explained by the independent variables. The greater the value of R-squared the greater the effect of independent variable. The R Squared can range from 0.000 to 1.000, with 1.000 showing a perfect fit that indicates that each point is on the line. As indicated in Table 5, the R-squared for the relationship between order visibility and performance of level 4 private hospitals in

Kenya was 0.231; this is an indication that at 95% confidence interval, 23.1% of variation in performance of level 4 private hospitals in Kenya can be attributed to changes in order visibility. Therefore, order visibility can be used to explain 23.1% of changes in performance of level 4 private hospitals in Kenya but there are other factors that can be attributed to 76.9% change in performance of level 4 private hospitals in Kenya.

Table 5: Model Summary for Order Visibility

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.481[a]	.231	.232	.67231

a. Predictors: (Constant), order visibility

The analysis of variance was used to determine whether the regression model is a good fit for the data. It also gave the F-test statistic; the linear regression's F-test has the null hypothesis that there is no linear relationship between the two variables. From the analysis of variance (ANOVA) findings in Table 6, the study found out that that Prob>$F_{1, 249}$= 0.000 was less than the selected 0.05 level of significance. This suggests that the model as constituted was fit to predict performance of level 4 private hospitals in Kenya. Further, the F-calculated, from the table (232.034) was greater than the F-critical, from f-distribution tables (3.879) supporting the findings that order visibility can be used to predict performance of level 4 private hospitals in Kenya.

Table 6: ANOVA for Order Visibility

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.91	1	39.91	232.034	.000[b]
	Residual	42.78	249	0.172		
	Total	82.69	250			

a. Dependent Variable: performance of level 4 private hospitals in Kenya

b. Predictors: (Constant), order visibility

From the results in Table 7, the following regression model was fitted.

$$Y = 0.222 + 0.331X_1$$

(X_1 is Order Visibility)

The coefficient results showed that the constant had a coefficient of 0.222 suggesting that if order visibility was held constant at zero, performance of level 4 private hospitals in Kenya would be 0.222 units. In addition, results showed that order visibility coefficient was 0.331 indicating that a unit increase in order visibility would result in a 0.331 improvement in performance of level 4 private hospitals in Kenya. It was also noted that the P-value for order visibility coefficient was 0.000 which is less than the set 0.05 significance level indicating

that order visibility was significant. Based on these results, the study rejected the null hypothesis and accepted the alternative that order visibility has positive significant influence on performance of level 4 private hospitals in Kenya.

Table 7: Beta Coefficients for Order Visibility

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.222	.058		3.828	.000
	order visibility	0.331	0.085	0.332	3.894	0.000

a. Dependent Variable: performance of level 4 private hospitals in Kenya

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The first null hypothesis test was 'Order visibility has no significant effect on performance of private hospitals in Kenya. The study found that order visibility is statistically significant in explaining performance of private hospitals in Kenya. The influence was found to be positive. This means that unit improvement in order visibility would lead to an increase in performance of private hospitals in Kenya'. Based on the findings, the study concluded that order visibility positively and significantly influences with performance of private hospitals in Kenya.

Recommendations

The study recommends management of Private Hospitals to Implementing a comprehensive EHR system that will help hospitals digitize patient records, treatment plans, and medication orders. It enables real-time access to patient information, test results, and treatment histories, making it easier for healthcare professionals to coordinate patient care effectively. This leads to improved order visibility within the hospital.

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