BIG DATA ANALYTICS CAPABILITIES AND PERFOMANCE OF PRIVATE HOSPITALS IN NAIROBI CITY COUNTY, KENYA.

BY

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D53/CTY/PT/27657/2019.

A RESEARCH PROJECT SUBMITTED TO SCHOOL OF BUSINESS, ECONOMICS AND TOURISM IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER IN BUSINESS ADMINISTRATION (MANAGEMENT INFORMATION SYSTEM) OF KENYATTA UNIVERSITY.

JUNE, 2023

DECLARATION

I Jeremiah Wakhungu Kelvin do declare that this is my original work and it has never been submitted to any institution, college or any university for degree award.

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Declaration by supervisor:

I confirm that the work in this proposal was done by candidate under my supervision

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DEDICATION

This research study is dedicated to my family, lecturer, classmates, and employer in appreciation of their unwavering support during my postgraduate studies.

ACKNOWLEDGEMENT

I give thanks to the Almighty God for allowing me to pay the tuition and for providing me with excellent health throughout my postgraduate studies. I truly appreciate Dr.Morrisson Mutuku, my supervisor, for his leadership and advice on this research proposal . My gratitude also extends to Dr. Kyalo Josphat, Dr. Nzuki M. David, Prof. Musau, and Dr. Kandiri for their assistance with various forms of knowledge study. A special thanks to the MIS class of 2021 for their help and company, which made my research work go more smoothly and without as many obstacles. My 10-year old daughter deserves special thanks for always providing me modest study time and persisting in quiet surroundings throughout this entire process, especially when she needed my attention the most; I owe her a lot for the sacrifice. Many thanks to Tina and Mina Saini, directors at The Nairobi West Hospital Ltd., for constantly reminding me of the value of education and providing the groundwork for my higher education journey. I also want to thank my immediate department head Mr. Sivaprasad and the Chairman of TNWH for allowing me to participate in my research work at the facility and for always pushing for greater results in my work.

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DEFINITION OF TERMS USED

Big data analytics	It is an advanced process of examining vast amount of data with aim of uncovering hidden information
Performance	An organization effectiveness, particularly in relation to the capabilities, productivity, or success of products and services and how they are evaluated in comparison to a standard.
Big Data Technology	Is a type of technology that is primarily used to analyze, process and extract data from vast sets of exceedingly complex structures that are challenging for conventional data process tools to handle
Service Responsiveness	It is how quickly and effectively accompany reacts to customer services, the time it takes for support from staff in regards to service delivery enquiries and fulfilling them in timely manner.
Financial measures	Key metrics organization will use to gauge, monitor and assess their financial health it will apply financial key performance indicators.
Service Quality	Is how well an organization meets its customer expectation compared to how it delivers its services to the same clients.

ABBREVIATIONS AND ACRONYMS

AST	- Adaptive Structuration theory
CT SCAN	-Computed tomography scans
BDA	-Big Data Analytics
BDAC	-Big Data Analytic Capability
DBR	- Daily Business Reports
DC	- Dynamic Capability
DHIS	- District Hospital information system
DOI	-Diffusion of Innovation
EMR	-Electronic Management Records
GOK	-Government of Kenya
ICT	- Information Communication Technology
IS	-Information System
IT	-Information Technology
KPI	-Key Performance Indicator
MOH	-Ministry of Health
MOPHS	-Ministry of Public Health Service
MRI	-Magnetic Resonance image
RBV	-Resource Based View
SPSS	-Statistical Package for the Social Sciences
SERVQUAL	-Service Quality
WHO	-World Health Organization
USA	-United States of America

ABSTACT

Increased dynamism and a shift in the influence of business models in private hospitals are as a results of the global environment's rapid growth, competition, and technological advancement over time. A major factor in the rise of hospitals was the availability of high quality services at reasonable prices. Kenya has been establishing itself as a medical hub in East African nations. With this growth and rise in economy in this region, private hospitals have expanded to cater for the high demand of the quality affordable healthcare services. The research study focused on big data analytics and how it influenced the performance of private hospitals in Nairobi County Kenya. Through use of advanced analytic technological tools and delivery of services to patients which contributed much in the development of private hospital organizations, the researcher looked at the performance of this organizations and strategies incorporated through the use of big data technology, service responsiveness, financial measures and service quality. High performance of private hospitals was attributed to patient satisfaction, high quality, and cost effective patient services therefore private hospitals have employed RBV and dynamic of innovation models in driving this into reality. WHO also suggested that research and best practice models always improved hospital performance given values of different stakeholders such as patients, professionals, insurers, and regulators was considered. The study employed a descriptive research design .It assessed the private hospitals in Nairobi County Kenyan which consists of both for profit and nonprofit institutions. According to the data from ministry of health there are 103 private hospitals in Nairobi. A sample size of 86 was studied from a total 120.The primary data was collected using semi structured questionnaire and refined quantitative data was analyzed using descriptive statistics. By using a multivariate regression analysis, the study looked at the relationship's strength and its causal impact. Data was presented using frequency tables. The researcher also mentioned the research's breadth and certain respondents' non-responsiveness. The study found out that private hospital faces challenges in government laws and institution regulations, while major concerns from patient was the quality service delivered, affordability, availability of hospital facility, technology advancement and services delivery. The study concluded that creation of private hospital policy and identifying the patterns through which new concepts will be adopted and contribution to commercial value, it was also important focus on financial measures, service quality delivery strategies and how it was to be delivered to patients. The study also viewed at ICT-infrastructure and staff training as the backbone of all operation and growth of organization in current world. Additionally hospitals were urged to incorporate consumer and competitor analysis. The study recommended adoption of new technology to tap opportunities in markets also modern machines with new technology would lead to accurate diagnosis. Additionally, research advised collaborating with governmental and non-governmental organizations to raise money and establish trust funds akin to kitty to help disadvantaged people. Continuous staff training was also believed to considerably enhance private hospitals' performance in terms of service delivery.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Increased dynamism and a shift in the influence of business models in private hospitals are as a results of the global environment's rapid growth, competition, and technological advancement over time. A major factor in the rise of hospitals has been the availability of high-quality services at reasonable prices. According to CAROLINE(2016) the quality of the service was evident not only in the finished items in the manufacture and distribution of the product but also in all sphere of business, thus it's critical for organization to reinvent the commitment in the development of the services and products as far as the hospital setup is concerned.

Kenya has been establishing itself in East Africa as a hub of health care in recent years through advertising it’s specialized medical services(The East Africa, 2015).These has been has been made possible through innovation and the willingness of the country to invest in healthcare and core infrastructure setup the country as compared to the neighboring countries .Easy accessibility to various towns and cities has encouraged industrialization .With this growth in industrialization has led to the rise in numbers of workers who needs healthcare facilities .Increase in industrialization in Kenya has also raised growth in economy which directly translates to private hospitals rising to expand and cater for high demand of the quality affordable healthcare services.

Big data analytics is assumed to include applying cutting-edge analytical techniques to very large, diversified big data sets, which can contain organized, semi-structured, and

unstructured data from numerous sources and range in size from terabytes to zettabytes(Misra & Bera, 2018). What has affected how well private organization performs is how well facilities can gather and analyze its data in order to provide insights by efficiently utilizing its resources talent, technology, and data through firm-wide roles, procedures, and structures.

The success of specific objectives, whether medical or managerial, was used to measure the performance of hospitals in Kenya. This was not only the quality of care but also other aspects like the cost of care, access to care, and the relationship between patient satisfaction and expectations (Blustein et al., 2010). Private hospitals functions well when they offer patient-centered, high quality, affordable and cost effective healthcare services. The WHO suggests that in relation to specific targets that reflect organizations; values of different stakeholders such as patients, professionals, insurers, and regulators contribute to performance (Brand et al., 2012) . While (Davis, 2013) argue that scientific research and best practice models has always improved hospital performance.

In Kenya, the private hospital industry comprise of both for profit as well as nonprofit institutions.

Profit hospitals are those that are owned by individuals, corporations, or non-profit organizations. They get private funding from patients, insurers, or some accredited by governments through national health insurance programs, or foreign embassies who pay for medical services. These health institutions has been rapidly growing in Nairobi County, with the majority forming alliances with other businesses or forming consortium with the aim of dispersing throughout East Africa. These facilities generate taxes and income for the government as they operate in vast market and have been

controlling about 70% of doctors' in Kenya (Kioi, S. W., Cowden, R., & Karodia, A. M., 2015).

According to World Bank (2014) report on Kenya's decentralized healthcare system, only a tiny number of private hospitals have been found in rural areas, with a large portion of those spaces being taken by government sponsored hospitals. The paper goes on to demonstrate that this significant disparity has been mostly attributed to increased infrastructure and technology spending, as well as the ability to recruit qualified healthcare workers. Kenya has a significant private healthcare sector. About 47 percent of the poorest quintile of Kenyans household use a private facility when they are sick. Government of Kenya has recently developed strategies to support private healthcare sector to ensure it achieves its Vision 2030 plan on Public Health and Sanitation. This was as a recognition of the important role private hospitals has played in the society especially after the COVIID-19(MOPHS, 2008)

Although the GOK has continued to make reforms its health sector especially on public hospitals; trends still showed that people have continued to prefer Private hospitals for different healthcare services provision .Therefore by understand big data analytics pivotal role in different organs within organization it has been easy to improve quality in service provision, manage equity in organization and make good decision by tapping on an unexploited healthcare areas. Vast knowledge investment by companies on big data analysis has encouraged data analyst to come up with models from various analytic tool that has spearheaded growth in this organization

Provision of good quality healthcare services in Nairobi and Kenya should be apriority and not compromise ; Dr. Sam Ochola (2019) sees management and other important

stakeholders in the health care system sector, particularly private hospitals, as a serious concern. He claimed that inadequate information resulting from unreliable data sources was a major cause of medical staff making poor decisions. He also asserted that the health care industry in Nairobi County had faced challenges from government laws, medical institution regulations and advances in technology. Therefore hospitals must consequently consider systems that comply with the established standards and guidelines.

Private hospitals had relied on a daily, weekly, monthly, or yearly utilization information dashboard to light on the issues that affect hospitals operations. Additionally, it was very easy to comprehend business performance curves and patient management when staff had access to daily business reports (DBR), customer relationship management system reports (CRMS), and electronic management reports (EMR).Gupta, M., & George (2016) on the other hand, examined big data and argued that while all industries had recently invested in big data initiatives, investments alone cannot generate competitive advantage. Instead, firms ought to develop capabilities that would have improved the quality, effectiveness, efficiency, availability, and affordability of services these organization would provide to customers and set them apart from rival companies.

Organization were able to distinguish themselves from other competing perfect match through the service delivery process, financial management and investment process, technological edge capability i.e. modern technology investment and knowledge available to use this tech services ,customer retention models through unique pricing models . It was also discovered that in order to improve the performance of private hospitals in Nairobi County, various research work sturdies on Big Data Analytics and firm performance was much needed with great emphasis on the Resource Based Value theory (RBV) and other

big data analytics (BDA) drivers. Creation of private hospital policy and application of big data analytics was needed too. This model was to assist in identifying the patterns through which new concepts, methods, and procedures inside various company could be adopted(Lethbridge, 2015).

Whereas the use of studies like AST had shown how important technology use is in various healthcare industries, this model also assisted in identifying the patterns through which new ideas and execution of the processes was made and easily adopted. It was very crucial to situate the current study within to a larger research framework in order to comprehend how core artifacts were created with spheres on how they have contributed to economic value in private hospitals in Kenya.(Constantiou, I.D. and Kallinikos, 2015).

1.1.1 Organization Performance

The effectiveness of an organization is measured at several levels of hierarchy and can be evaluated for an individual, a group, or the entire organization (Knies et al., 2016).Organizational performance on the other hand , according to Shabbir & Gardezi (2020), is the capacity connected to the completion of its goals and stakeholders' expectations in addition to market survival .

According to CAROLINE (2016), the output of the organization as contrasted to its aims and goals was what amounted to how a firm works. This was assessed through its finances, returns on shareholder investment, and market performance. She suggested that the strategy planners, legal, financial, and organizational developers were among those who were worried about how the firm performs in the market. It not only this farms which are affected but also hospital more so private suffered the same fate. When measuring processes and procedures and changing them to increase outputs and process efficiency in hospitals,

performance of private hospital organization needed to be taken into consideration as a key topic like financial measure process, service quality, responsiveness and technology advancement through the use of big data.

Performance of was assessed in two dimensions; the financial & market outcomes and operational performance. Operational performance emphasized on metrics like customer happiness and loyalty, social capital of the company, competitive edge generated from resources and capabilities of the firm to thrive in the market . Quality service delivery was also considered to be an important factor in organization growth. Financial and market outcomes was considered to evaluate profits, sales, return on investment for shareholders, and other financial criteria(Knies et al., 2016).According to a research done, Maina, (2015) it was discovered that patient perceptions on a private hospital facility was largely influenced by the quality of care they receive and the medical infrastructure especially diagnostic equipment's available and which in turn had affected how successfully the hospital functions .

The other perspective on patient satisfaction was solely related to service quality characteristics and was reflected by the patients' propensity to return to that facility and or refer others to the same private hospital. This perspective made it crystal evident how hospitals succeeded in the marketplace. Using The Nairobi West Hospital as an illustration among other well-known hospitals. Despite the fact that their costs are significantly greater than those of newer private hospitals, patients continue to come to the organization for care due to loyalty and the reputation it has built in recent years .It was also seen that it has various modern medical technology advancement with new cutting edge service that well established facilities lack i.e. Born Marrow Transplant (BMT)

Hospital industry organizations success was depended on important elements to develop and put into practice strategies like valuable resources, which were seen as resources that helped the organization enhance net revenue or possibilities and reduced costs(J. B. Barney & Hesterly, 2012). It was also realized that operational value cost i.e. technology and resources allocation cost ; client satisfaction through quality service delivery, and profit made and financial position of the organization among other were some of the indicators that had been considered in these organization performance evaluation over time . Also quantitative and qualitative value on the indicators were used to check the guaranteed organization goals. It was important to gauge various resources success, and more so through data analytics on various indicators to ensure guarantee institution's aims and goals were met.

Information like occult patterns, correlations, market trends, and customer preferences that assisted firms in making strategic business decisions; big data analytics was used to investigate huge data available. Organizations was able to examine data sets and obtain new information with aid from data analytics tools and processes. As a result, an extensive array of software tools was used to make it possible through use of big data technology. Also by use of available resources in addition to the practices that existed in the organization it was easy to leverage on labor which in turn helped the business achieve its objective easily. These was accomplished by establishing acceptable corporate procedures and standards that are in line with operational decision-making, actions, and objectives.

1.1.2 Big data Analytics Capabilities

In order to provide customers with valuable information, data driven technologies was required for the storing, processing, and analysis of huge volumes of data. There were no

many research that explained BDA capabilities in a way that advanced our theoretical understanding of applying BDA in the organizational domain. However the key components of businesses' big data analytic capacity has attempted to define in numerous research with no concrete results up to this point. Therefore BDA, complex resource that was necessary to examine large volumes of data and process the information that build upon it(Gupta & George, 2016).

The majority of research used concepts from prior IT publications and payed little attention on how different big data environment was. Studies on data driven thinking are changing, moving away from a technology perspective but toward a management one(Gupta & George, 2016). Today's managers, decision makers, and executive officers were frequently using technology to turn copious amounts of raw data into useful, illuminating information. Decision making was supported by large amounts of stored data or data-related electronic transactions(Misra & Bera, 2018).

Although data analysis was a difficult process and will be complicated in future as systems advances, Big Data Analytics (BDA), was seen as a new business intelligence activity that had employed complex analytical techniques including data mining, statistical analysis, and predictive modeling on massive datasets, and was frequently used as a data handling tool(P, 2011).Therefore, data analytics capabilities was used to explore these complex process by redefining and exploiting the opportunities in private hospitals through predictive analytics where historic facts were analyzed using statistical techniques to predict future.

The value of big data was used to emphasize on technology advancement while also taking into account its human component involvement in the process i.e. the data scientist. As a

result, it was essential for the company to focus on the characteristics of the data itself, its worth for the information available in the organization, the value of the data, and the entire spectrum of resources required to build a system that was difficult to copy as well as the mechanism by which it can generate business value(Gupta & George, 2016) .

1.1.3 Big Data Analytics capabilities and Organization Performance

In order to find patterns and forecast outcomes, BDAC Model used data mining, machine learning, and statistics globally (Tufféry, 2011). Big data are data that are large, dispersed, diverse, and moving quickly, necessitating the use of technical frameworks, analytics, and tools to enable insights that uncover hidden information and add value to businesses. Big data was characterized by its amount, diversity, and pace, among other things. Medical researches, treatment plans and patient care had become a successful in most countries due to volume, velocity and value of data they hold and the ability of tools available that was used to convert it or translate it into meaningful information that was easily interpreted and accessed by the users in those organization.

When large volume of data has mechanism on how quick they can be transformed into valuable information service delivery and strategic decision making become easy. In the United States, President Obama developed a program that aimed to make 10 years' worth of progress toward cancer cure in his second term. Through this program, researchers observed things like how specific mutations and cancer proteins interacted with various treatments which helped them find trends that resulted in better outcomes and treatment. (Calzon, 2022). This programs were carried out through private hospitals due to efficiency and flexibility

In Africa most of government programs was found to be aligned to government hospitals unlike other continents whose priority in healthcare is so distinct in that any organization that shows interest or deemed to be capable is given a chance to support innovation. Recently foundations like Agha khan for children, Karen kidney and heart program as well as Mater hospital heart run project has championed to show the capability of private hospital. In order to make comparison insights to developed countries to be more practical in Kenya, there was need for patient databases availability from different institutions such as hospitals and other healthcare institution. It has become increasingly important to conduct a systematic assessment of big data stream analysis using methodical and rigorous ways in order to identify trends in big data stream tools and examine techniques, technologies, and methods. (Kolajo et al., 2019).

This techniques was seen by many private hospital to share cross platforms systems like Damu Sasa which stores blood pints data which was shared freely among hospital registered across the country. This prevented loss of life by enabling access to blood banks and enhance service delivery for the same across this private hospital. In competitive environment private hospital needed to focus on provision of quality healthcare services and ensure customer satisfaction was on top notch as well as retaining profitable customer's .Therefore introduction of services such as telemedicine to provide primary consultation and initial diagnosis remotely contributed more on expansion and growth of hospital business.

There was a need to enhance quality delivery of service, and by keeping patients away from hospitals, the overcrowding number was reduced especially rush hours as well other expenses like staffing, electricity and some hospitals transport costs that may have incurred

especially for those stable patient who didn't need to be physically present in the hospital facility. Reduction of overhead costs and any other indirect cost also avoided since the number of patient walking in to a facility had reduced but at the same time visits or total count for sales remained the same and some facilities it increased by some margin.

Improving the quality of service in lines with queue management and patient's turnaround time for individuals was enhanced since appointment and schedules for services delivery was managed on patient portal and this reduced number of patients on long queues waiting to see a doctors as a walk in patient in facility wasted time. Also unnecessary consultations and preliminary diagnosis was done online hence resources wastages was avoided. Virtual consultation created good relationship to patient especially those who those who resided from far away or due to logistics issue were still able to get service. Recent research done by MoH showed that 50% of walk-in patient in Kenya hospital were due to minor illness i.e. cough and medicine refill ,therefore such scenario was sorted through advanced telemedicine technology.

Reduction on fraud cases and enhancing security was a major boost to financial performance of these private hospital facilities. It was noted that private hospitals account to about 38% of data security breaches in Kenya compared to 19% in financial services and 14% in retail. (Ronoh, 2016).

Personal information was seen to be so precious and lucrative on the black market and some studies have found out that 93% of healthcare institutions worldwide have had a data breach. (Demchenko Y., Ngo C., de Laat C., Membrey P., 2014) A breach in data security always has serious repercussions to the firm. By detecting changes in network traffic and any other behavior that would indicate a cyberattack; analytics and investing modern

technology has become popular among many enterprises and this has helped to create a great ring not only on private hospital but a global cyber security fence. Hospitals were to be more on the technological end and so that they can mine analyze threat and execute strategy and analyze threat threats that may harm the organization.

There was a need to invest in infrastructure and security tool. So many organization had viewed big data as an inherent to cyber threats and might have thought vulnerability of organization was increased but adoption of big data analytics model .Therefore a timely investment and balance on process of implementation of data analytics played a key roles on the outcome of technology adaption and executions .There was a need for hospitals to use latest advanced technology in security i.e. firewall, antimalware, and other security software will be apriority (Ronoh, 2016) .Security of data is important ,Organization data was seen to be a driver on various major managerial functions of the organization which directly translated to firm growth.

1.1.4 Private Hospitals in Nairobi County

Profits were the goals of private hospitals. Private hospital sector has been quite large in Kenya and has been very important in enhancing people's health. The market in East Africa has been expanding gradually every day as a result of consumer demand and lifestyles, particularly in metropolitan areas. In Kenya, hospitals primarily are located in urban areas. Nairobi is home to the majority of Kenya's hospitals, which are primarily located in the country's urban districts.(Kioi, S. W., Cowden, R., & Karodia, A. M., 2015). Population and industrialization was among key factors that was driving growth of private hospitals expansion in the past two decades.

In Africa, declining public hospital performance and a lack of resources were factors in the private sector's rise. Ministry Of Health (2017) acknowledges around 106 private hospitals in Kenya with more than 20 level 4 hospitals located in Nairobi county alone .According to Ministry of Health Kenya(2016) Kenya was working in ensuring people have access to affordable healthcare service they need and when they need them .Among the vision 2030 pillar was provision of healthcare to all Kenya citizen therefore private hospital was a key player in ensuring this was achieved .

In Nairobi County 47 % of resident use private hospital when they are unwell, medical consultation or any other diagnostics needed by the employers (CAROLINE, 2016) .This has made private hospital as an institution to play an integral part in ensuring the implementation process of government vision 2030 a reality. Given that healthcare system in Nairobi was greatly influenced by private hospital, which are uses mostly insurance company and other and other corporates medical scheme to finance the clients.

It will be evident that services provision and growth of the organization was largely depended on the strategy of the organization, and how they relay the product, how quick they have been modifying existing prices and services to the client and how fast they respond on feedback from clients, even though the GOK through ministry of health have more regulation governing each process. Some of the practices carried out by this private hospital are governed through ministry of health and regulated through Kenya Association of private hospital. In addition private hospital association have rules that also support its operation. This makes it easier for hospitals to work independently.

1.2 Statement of the problem

A private hospital has been extremely important to a nation's economic development. According to Jeff Barnes, Barbar O'Hanlon (2010) the prevention and treatment of disease depended on both for-profit private commercial hospital sector and the nonprofit sector. Despite public hospitals being generally believed to be more equitable and case-based Basu et al., (2012)), found that in middle and low income countries, private hospitals was occasionally seen as more accountable, sustainable, and efficient in the service delivery than public hospitals

Private hospitals frequently put a larger focus on promptness and hospitality, that's why this this comparison was made. Furthermore, it was said that most private hospitals had ignored medical best practices, which yields substandard medical results(Basu et al., 2012) and focused the attention more on revenue generation with aim of making huge profits and maintaining status in the market .Also this was due to robust investments made by various organs in private health industry .Competition has also raised major improvement in this organization hence improving service .

Any private hospital organization's performance was described by its quality and affordability of its services rendered to patients. Most hospital's future clientele had increased as the quality of the treatment improves. The facility's greatest doctors, other employees, and medical diagnostic tools were all seen to have helped build a strong customer base. The cost of running a private hospital has been higher than that of a public hospital. This was because most people hold the opinion that private hospitals provided a better care than public hospitals; the opinion was also supported by these institutions' comfort, cleanliness, and cutting-edge technology.

To control this assumption it required a substantial investment from private hospitals management and investors so that they could finally produce a return on investment. They had to take into account affordability, efficacy, and the caliber of its services compared to the projected objective. All great attributes needed in the hospital required tools that could justify the credibility, quality, efficiency, effectiveness, financial edge and market sustainability. Hence big data analytics was to play a bigger role in determining this aspects with lot of easiness and accuracy. At the end it was resulting from the information available as well as the talent that had the support from tools invested by the organization i.e. intelligent software and man power to manage the same.

In Kenya private hospital has played a great roles in the country's economic state. Despite this organizations being a significant contributor to the economic growth, private hospital sector has not been receiving government assistance, funding, or subsidies in major areas where they incur huge some during investment. Moreover other government services, such as vaccination and immunization programs had fallen within its purview and any data gathered must be shared with the government still this organization incur cost to offer those service to the public at the expense of the private hospital cost. Therefore striking a balance on this activities so that they can sustain the business without affecting core objective required resources that needed not to affects service delivery.

It was vital to take into account cost of products offered based on the goals that private hospitals had set while it developed its services matrix. A big question many will ask was how affordable is affordable? Introduction of successful super specialty units in some private hospitals had caused a decrease in the number of medical cases performed abroad especially in India , i.e. introduction of heart surgery, oncology treatments, kidney

transplants, and bone marrow transplants was seen as a game changer and be of beneficial to the country and continent at large. Therefore with this advancement in specialized care services a sizable investment fund will be required for effectiveness. Additionally, there will be greater options regarding the costs as well as the variety of services provided by this institutions compared to what is offered abroad.

The provision of affordable high quality care had been prioritized by most private hospital administrations in Kenya. Many hospital businesses were dedicated to prime service care because it influenced how well this facilities functioned in the market. By broadening the range and caliber of specialized unit services and encouraging their expansion of hospital facility in Nairobi County's private hospitals sector has helped in increasing access to high quality service that was not accessible within the region. Over time, this growth has fueled an intense healthy competition in the industry noting that competition was one of the factors driving Kenya's private hospitals to improve their delivery of high quality services, claim O'Meara, W. P., Obala, A., Thirumurthy, H., & Khwa-Otsyula,(2013) .

Patients' opinions about a particular hospital subsequently has evolved over time, as a result, patients select hospitals that are within their budget and this undoubtedly had an effect on how well they operate. Medical professionals and other stakeholders could take into consideration the mechanisms through which hospitals actively participated and provided the best service to patients. Information sharing that cuts across both private and public also played a major role in the growth of this business i.e. critical patient information history, radiology images, and communicable diseases was made successful since information was readily available . Attention on financial measures and technology was also factor that influenced how this organization survived in a competitive market.

By utilizing data mining, an interdisciplinary field that combines artificial intelligence, computer science, machine learning, database management, visuals, mathematical algorithms, and statistics, the goal of big data capability was to make it easier and close the gap between the core business and digital edge in process and innovation ambidexterity(Ireri, 2014). Technological advancement like BI, SQL consoles, Python, and focused on information flow and system moderation which helped this organization in scaling up ideas that were used to propagate the smooth running of the organization.

1.3 Objective of study

1.3.1 General objective

The general purpose of this study was to establish big data analytics capabilities and performance of the private hospital in Nairobi County, Kenya.

1.3.2 Specific objectives

i. To establish influence of big data technology capability on performance of private hospitals in Nairobi City County, Kenya.
ii. To examine service responsiveness and performance of private hospital in Nairobi City
iii. To evaluate financial measures and performance of private hospitals in Nairobi City County.
iv. To determine effect of services quality on performance of private hospitals in Nairobi City County.

1.4 Research Questions

i. What is the influence of big data technology capability on performance of private hospitals in Nairobi County?

ii. How service responsiveness affect the performance of private hospitals in Nairobi County?

iii. What effect does financial measures have on private hospitals performance in Nairobi County?

iv. How services quality influence performance of private hospitals in Nairobi County?

1.5 Significance of the study

The survey was conducted in Nairobi County with major level 3b to level 6 hospital management participating .The results of this study was to help clarify the connection between a private hospital's effectiveness and its mastery of big data analytics in Nairobi County, Kenya. The knowledge gained from this study's findings will be useful to organizational managers and other policy makers. The study finding will also support the Kenyan government's (GOK) and, in particular, the Ministry of Health's (MoH) policy making efforts to improve the effectiveness and level of service provided by hospitals throughout the nation.

The research is also an eye opener to proactive managers at private hospitals who understand the crucial quality dimensions that patients use to assess healthcare quality and how they can perform on each level in order to grow and achieve a competitive edge in the sector. The technological services finding will speed up the rate of growth of Kenya's health business sector as well as helping the nation's economy. With the help of data from multiple information systems sources both medical and non-medical personnel would identify areas of weakness and best way on how to strengthen them .Understanding the benefits and

failure factors that are connected to company performance organization's desired goals would be met.

This study also close the knowledge gap on the importance of customer dimensions, service delivery, and big data analytics in Kenya's private hospital sector. A broader understanding of big data analytics and hospital performance will also provide a valuable foundation for future scholarly and research projects.

1.6 Scope of the study

The study concentrated on how well private hospitals in Nairobi County function and how well they can use big data analytics. The study examined the top 25 performing private hospitals in Nairobi County with emphasis on level 3B and above with hospitals whose bed capacity of at least 18 and above based on market share and size of facility. This hospital offering both inpatient and outpatient services compared to level 3A and below which only provided basic primary care and outpatient services. Study also identified variables and aspects that affected each individual hospital's performance and the best ways to address each.

Kenya's has steadily increased the number of private hospitals as competition also increases, this has necessitated the use of more apropos technology, methods for providing services, and innovative ideas. In light with this, the study analyzed the roles of organizational technology and other indicators and related them to big data capabilities and how it can translate to hospital performance. It assessed the quality service delivery, affordability, innovation and finances among many participants.

The research project investigated the effectiveness of private hospitals in Nairobi County throughout a range of time periods from 2018 to 2021 with the goal of achieving positive

performance. Based on the hospital's position in the market and the number of years it has been operational, a variation in occupancy might be anticipated.

1.7 Limitation of The study

A maximum of 25 private hospitals in Nairobi City County, Kenya, were permitted to take part in the projects experience study. The survey included responses from top and intermediate management of the ICT Department at level 3B through to level 6 hospitals. There was financial constraints and unwillingness of participant to give detailed information on finance. There was also a dearth of pertinent literature on how hospital performed in Kenya and Africa prompting the research to use studies from industrialized nations to fill in contextual gaps and provide rationale on performance of 25 level 3B to level 6 private hospitals in Nairobi County, Kenya.

1.8 Organization of the Proposed Study

The proposed research study was structured as follows; chapter one comprises of background of the study, statement of the problem, objective of the study, research questions, and scope of the study, limitation of the study and organization of the study. Chapter two encompass literature review, research gaps and conceptual frame. Chapter three covered methodology which included research designs, sampling techniques, data collection procedure, research instruments and data collection techniques and analysis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The research in this chapter is entailed on the empirical and theoretical literature relevant to big data analytics capabilities and performance of private hospitals in Nairobi, it is discussed in broad term to bring out the aspects influencing this organizations. Theoretical reviews will focus on theories surrounding the study and this will include adaptive structuration theory, diffusion of innovation, dynamic capability theory and resource based view. On the other hand, empirical review will be focusing on big data technology capability, service responsiveness, financial measures and service quality.

2.2 Theoretical review

Business value assessment on information system investment is important and organization should take broader view and consider all the underlying variables that enable successful and efficient use of IT as a differentiator of businesses success (A. Bharadwaj, 2000). Big data analytics have been described in various literatures as a new generation of technologies and architectures that enable high-speed data capture and analysis in order to economically extract values from very large volumes of diverse data.(Close & P. Mikalef, I.O. Pappas, J. Krogstie, 2018).While performance has been all about the basic principles of the organization(Teece, 2007).

It has been a behavior related component, that focuses on what individuals do to live up to core value of the organization, this principles are concerned with quality, and service to both people and organization. Providing poor service damages the relationships between the business and its clients(Davey & Grönroos, 2019). With the definition and business

value assessment the research looked at the theories that made the realization of the business objective and ways in which performance of private hospital was affected.

2.2.1 Adaptive Structuration Theory

AST was developed in 1994 and was motivated by Anthony Giddens' structuration theories, which contend that society should be understood in terms of actions and structure (Hardcastle et al., 2005). Structuration model explains how technological changes influences organization design over time (Muhammad, Imran. Wickramasinghe, 2018).

In the past decade, sophisticated information technologies such as electronic messaging systems, executive information systems, collaborative systems, group decision support systems, and other technologies that leverage sophisticated information management have evolved. Service delivery automation has led to high return and low risk, hence increasing number of hospitals are looking for ways to reduce human participation in order to save costs and improve customer experience. It's imperative to take advantage of your ability as an organization to automate previously laborious operations i.e. human resource, IT and any types of repeatable, definable procedures that can be integrated into a system

Analytical tools has helped in identifying means in correcting, facilitating and offering a proper ways of capturing the complexities and levels of interactions operations. There has been no over-communicating with customers since informed customers has always been happier customers through use of new technologies and tool in this organizations. To be clear, the quantity of communication was crucial and delivery of messages would not be important that its timeliness, context, and capacity that made it obvious to what value it offers to the client. Your capacity to sift through the deluge of inadequate information with accurate and fast responses would go a long way in a world of continual connectivity.

AST looked at the process of change from two perspectives: (1) the kinds of structures supplied by advanced technologies, and (2) the structures that actually form in human interaction with these technologies(Desanctis & Scott, 2015). According to AST, technology increases productivity, efficiency, and satisfaction for people and businesses. It also claimed that failing to bring about the desired change is reflection on the technology, how it was implemented, or how it was provided to the business(Lethbridge, 2015).

One sort of advanced information technology, a group decision support system, combines computer, communication, and decision-making abilities to assist both individuals and groups in coming up with ideas, formulating plans, solving issues, and making decisions more quickly(Desanctis & Scott, 2015). Service management depends on the definition of the service in the organization; In terms of what to expect or not to expect from service offerings. Therefore it was imperative to make sure that both the firm and its consumer are always on the same page.

2.2.2 Diffusion of Innovation Theory

According to Wayne W. LaMorte, MD (2019) Edward M. Rodgers created the Diffusion of Innovation (DOI) hypothesis in 1962 as a way of describing how an idea obtains traction and spreads among a particular population or social system. Hence with time, that part of system adopts the new idea. This notion would also apply to the process by which individuals accept a novel concept, service, or behavior and ideology(Rogers, 2003).

Rogers outlined this process by emphasizing that initially, a small number of people are typically receptive to the new concept and adopt its application(Misra & Bera, 2018).In healthcare industry private hospital learned about innovation that has important

consequence on the organization and that which serves uncertainty to the organization to respond to; hence this leading to further search for information about potential ways to adopt. Further attributes assessed on the innovation warrants future exploration on best methods that will be used to enhance the performance of private hospitals in Kenya.

Most of private hospital engage on cost benefit analysis before they adopt an innovation; therefore, project that seem to be promising and consequential to invest in should be accepted as organization evaluate the possible outcome. Meanwhile other hospital may opt for secondary opinion from other trusted experts to help in the best possible process they can use. And this should be done by benchmarking on current best performing institution and best implemented organization. According to Dearing & Cox(2018),One heuristic that frequently reflects an emotional drive for status is seeking for advice or modeling one's behavior after that of others. This heuristic allows the decision maker to save time while lowering ambiguity.

One core aspect that private hospital institution should focus more is customer satisfaction. Understanding the behavior pattern and information system adds more weight on how business performs. Big data analytics capabilities is acts as a fulcrum in information sharing and decision making process. According to Miriti(2016) he mentioned that it's critical to understand consumer spending patterns, demographic preferences for products, the relationship between these factors and brand perception as well as how they change over time. Hospitals needed to develop ideas into strategies that appeal to the population demand while keeping in mind the risks involved in innovations and developing those ideas.

Customer segmentation and profiling are essential tools for businesses to comprehend. Therefore the process is going to base on analysis of data both internal and external sources when looking for new hospital markets. Stages in adopting an innovation will include the awareness of the needs, decision to adopt and factors that will influence adoption of the innovations i.e., compatibility, complexity, testability of the technology that will provide tangible results as well as the level to which the transformation is seen as superior to the ideas being changed.

2.2.3 Dynamic Capabilities Theory

These theory focused on senior management strategies creations for organizations that can adapted to radical discontinuous change while maintaining the bare minimum standards necessary to assure competitive survival(Teece, 2007) . It was first introduced in 1997 as a supplement to and response to the Resource Based View's (RBV) limitations. Hospitals make extensive use of resources, which are inputs into the production process. Capability was seen as the capacity to use resources effectively with the goal of boosting productivity(Mikalef et al., 2017).

Administrators and decision-makers are always quite concerned about how efficiently they operate. Mikalef et al.,(2019) argued that failing to invest in one type of resource could lead to the value of the other resources collapsing, hence it was very important for private hospitals to allocate each resource fairly to each project. However, and in line with frameworks implemented at the worldwide level, authorities have been increasingly using models that take a variety of factors into account when evaluating the performance of hospitals. And one particular worry has been the ability of hospitals to aggressively pursue efficiently goals that may come at the expense of care quality and or equitable issues.

To address some of the RBV theory's flaws, Dynamic capability theory , appeared as an alternative strategy (Galvin, P., Rice, J. & Liao, 2014) .These concept emerged to be most important in strategic and technology perspective studies. Authorities in several jurisdictions created frameworks that make an effort to evaluate hospitals along several important characteristics at once. More than this, it has been a topic of discussion whether it was feasible to keep operations running at a high level of efficiency while also being able to meet quality and equitable standards.

It would be ideal to have ideas of a balanced scorecard which determines whether hospitals can perform well across a number of parameters, adapted from the strategic management literature as one strategy in which they can incorporate with big data analytics as a tool in this field. A focus on competitive environment should shift from within the organization to the outside world, and essential steps should be taken to reconfigure current means of operation to meet continuously changing demands(Mikalef et al., 2017). This two combinations explains how firms can maintain competitive advantage in changing environment.

Resources owned by organization determines how capable the organization is flexible to sustain changes and willing to have those change made. In context of information system literature studies IT resources infuses organization capabilities and help firms in renewing their existing modes of operation(Mikalef et al., 2020).Therefore the most important part should be how to integrate systems within the organization with the help of BDA capabilities with an aim of attaining a competitive performance in Nairobi county .

2.2.4 Resource Based View

The Resource Bases View (RBV) theory, developed by J. Barney in 1991, explains why certain organizations do better than others and how a company might improve its performance. RBV asserts that some organizations capabilities enable them to create new products, increase market share, and add value to the customer value chain(Pankaj M Madhani, 2010).Private hospital needs to have additional extra income generating avenues like college of nursing which also can supply labor to the organization at a smaller cost in addition to qualified personnel.

Other scholars argued that resources are tradable and nonspecific firm asset, whereas capabilities are non-tradable firms specific skills used for integrating, deploying and utilizing other resources inside the organization. So, in this private hospitals operations processes, resources are used as an input, while competence has always been the ability to use these resources proficiently in order to improve the process. (Mikalef et al., 2017).

According to IT literature, being able to effectively mix organizational resources with those based on IT can give businesses a competitive advantage (J. Benitez, A. Castillo, J. Llorens, 2018). It has also been shown that an in-depth resource analysis, resource allocation, and cross-functional resource utilization is always necessary in organization more so in Nairobi County's private hospital facilities. Performance of these facilities has improved, and quality of the services obtained, when a business fully engages its staff in developing more productive and market-leading paths(The East Africa, 2015).

The research study looked at how the RBV theory contributes to big data analytics affects and how it related to performance of various fields in the organization with the help of intangible and tangible private hospital resources which led into beneficial outcomes. In

private hospitals, expectations of outcome has been assessed based on the knowledge and experience that patients have with a particular quality service given and the numerous elements that affect their decision(Basu et al., 2012). The basis for analyzing this services and determining satisfaction levels to client was its achievements and translation of tools and resources to general growth of the organizations

Additionally, it demonstrated that a business must invest in all essential resources for effective performance for instance when timely service is provided and the personnel shows a willingness to help the patients by being receptive to their numerous needs, this facility becomes responsive. There is clear indicator that human resources effectiveness achievement create a good environment (Basu et al., 2012) .This environment attract more clients to the organization at the same time target and goals are easily met due to a smooth flow of information .

2.3 Empirical Literature Review.

2.3.1 Big Data Technology Capability and Performance

When evaluating an organization's technical capabilities, it is important to consider every technological component, application, program, and physical element that is utilized to enhance operations, processes, and develop a variety of talents (Byrd, T.A.; Turner, 2000). Technological capability of organization allows shift upgrade of organization and support of information systems. The competitive environment in hospitals is always marked by a high degree of change and uncertainty (Cummings, T., & Worley, 2014).

Competition is characterized by innovation, and businesses with technological skills produce innovations by successfully applying new methods (Prajogo, 2016). Current hospital business marketplaces in the world are characterized by rapid technology

advancements(Davey & Grönroos, 2019). In Kenya, hospitals have been avoiding and trying to prevent repeating past mistakes by engaging more on advanced technological fields. Most of them have been involving constantly investing into technology with anticipation of adaption of technological innovation in various developments.

In Nairobi country majority of private hospital have capitalized on market demand by sourcing advanced equipment like Pet Scans for cancer patient, MRI and CT scans in addition to the traditional X-ray machines. With this view, technological advancements has lessen the inherent risk that comes with changes that hospitals adopt .More expertise personnel and introduction of super specialty facilities in these private hospital combined with other organizational capabilities and technological capabilities has enabled hospital and the people working in various department to respond more effectively to challenges that arise.

Most of targets are easily and smoothly achieved through data analytics capability as an enforcer given that most hospitals are always rebuilding strategies. Jenkins, A. S., Wiklund, J., & Brundin (2014) argued that one of the many potential organizational characteristics was being resilience. Resilience, in general, referred to an organization's ability to dynamically reinvent itself when circumstances change or improving a firm's capacity to react to uncertain conditions at the organizational level.

Additionally, there has been a widespread agreement that IT enables businesses to achieve a competitive edge by enhancing intermediate organizational capacities (J. Benitez, A. Castillo, J. Llorens, 2018).The flexibility and connection of ICT infrastructure and medical infrastructure have a significant impact on information sharing and flow to patients and management. Customer input received via instant messages, emails, and complaint portals

has a substantial influence on development of hospitals. As a result, the service seemed pleasant and valuable, at the same time business was able to make decisions at the right time as well as a significant improvements achieved based on the data at hand.

In addition to technological capabilities organization has invested in talent; these are special soft skills and knowledge of employees and managers. Beyond the talent, adoption of big data these hospital considered factors like compatibility and modularity of various systems (how easily a system can be broken down into standardized software). Baumgarten et al.,(2013) view on talent and technology and suggested that when investing in information system one has to note the broad implication while Kaiti Norton (2021) emphasized on the same by advising any company intending to exploit technology to be ready to invest significantly in big data and necessary technology resources that accompany has.

While big data-related technologies remains a hot topic, it's crucial for businesses to concentrate on other resources required too .Therefore interpersonal skills, on the other hand, is equally very vital for private hospital project planning, execution and implementation while embracing technology advancement. Leadership plays key role in addition to decision based on BDA Capability and this is largely depending on the technology aspect (Mikalef et al., 2020).

2.3.2 Service Responsiveness and Performance

Studies shows that private healthcare sector appears to be responsible for a sizable part of outpatient services in countries with low and moderate incomes (Basu et al., 2012). The proportion of total visits, however differ significantly between nations and income levels (Geneva:, 2011). It is viewed that a large percent of about 60 % of all outpatient visits in

south Asia and in specific a majority of around 90 % is found in India private hospital healthcare (Article, 2014).This assumption indicates either there is quality healthcare or people throng this private hospitals due to the products and service offered in addition to delivery of services.

Al-Abri & Al-Balushi (2014) view responsiveness of hospital as employee being ready to assist clients and fast service delivery. In current dynamically changing markets, it is imperative to resolve client concerns and questions quickly. Even when customers are tardy in responding to you, you still need to show your clients that you are interested in their concerns and actively trying to find solutions. Respond quickly so that you may or at the absolute least time, inform them that you are processing their request.

When comparing Kenya to other countries healthcare system ; Majorities of Kenya's private hospital are small in size i.e. Nairobi Hospital being among largest private hospital, can be of same size as one of MAX healthcare a facility branch in India .Therefore there is a great need in Kenya private hospitals to expand its facilities and service and have subsidiaries with high qualified personnel spread across the county to offer outpatient services and other specialized service that can feed the main hospital or act as referral to main hospital so that we can match world hospitals. This process needs huge financial investment and proper market strategy that bring customer attention .Similarly those branches or smaller number in branch referrals should get better attention on customer needs and provide basic enquiries which can help in reducing queues and queries to main hospitals .

Repetition of diagnostic procedures, testing, supply chains, therapeutic delivery, and separation of the crucial components of the healthcare system at the easiest way required

proper response of events. Therefore to cater for this demand hospital needs to have a swift mechanism on how they can act through as well as having a smooth process flow from in major operation i.e. registration, consultation, admission and discharge of patient. Big data analytics tools has been the best way to compile both the customer needs and the organization operation Customer responsiveness includes first response time as well as frequency and consistency of communication up until the issue is resolved(Buchan HA, Duggan A, Hargreaves J, Scott IA, 2016).

Customers were thrilled to speak with an agent right away, but if they don't quickly find answers to their questions, their excitement is always waned quickly. The largest issue that was facing hospital service delivery and staff representative, was finding a balance between speed and quality. However, clients were to be assisted by having realistic expectations by simply upfront expressing the anticipated wait and enquiry resolution times either through mails, phone call and live charts or SMS and social media. When customers trust the brand more it always result to loyalty. Performance of hospitals in Nairobi County, the area with the greatest concentration of private hospitals was largely depended on credible information to expand its market.

The will for hospitals to reach to customers and develop customer based facility depend majorly on how employee communicate to client. Additionally Customers frequently information and feedback about hospital and or other topics through reviews, comments helps hospitals to either rebrand or adjust in response to changing client and markets .Hospitals are encouraged to explore areas that have not been exploited and also improve those areas that needs urgent fixing while looking at areas that creates trust between the client and hospital which eventually grows the brand of the institution.

Customer-based organization looked into the time taken between ordering tests or treatments and actually completing diagnostic and therapeutic procedures(Article, 2014) Therefore staff had to be trained on how to handle client .Buchan HA, Duggan A, Hargreaves J, Scott IA, (2016) suggest that TAT-total amounts spent for a particular indication or service completion always shows how hospital operate and this reflects the future performance of the facility . So for this to happen smoothly there must be data collected from all the medial channel in the hospital and a proper ways to analyze it so that the conclusion reflect the real picture of the organization .

In the broader view of business, information technology is viewed as a great enabler of organization growth capabilities(Gupta & George, 2016) .His view is that, introduction of new process and improving the existing ranges of products and service with better technology delivery of services will be improves how the organization is perceived by client. Hospitals will have to study the market and understand the customer trend and technological challenges and contribution through use of available data ,identify the opportunities and take advantage through initiating procedures, tools and maximize the market needs using information system this is where the big data analytics will be much needed .

As organization grow the search, discovery, experiment and aim in meeting future market demand by hospital. With this new process organization competition will increase, therefore there will be great need for the managers to look into ways to skim through the constant shift of market by using latest technology and this is capable by setting up exploratory strategy. Also, organization will have to invest on resources that will be useful in exploiting opportunities that come with technology growth.

Through refinement and extension of existing knowledge, organization will be able to simultaneously achieve a competitive advantage through coordination of activities within and outside the organization or regional incase of those with satellite clinics. Although this might bring temporary benefits to private hospitals by reducing technology differences and improving operation efficiency through consolidation of existing market and customer as well as expanding market into different regions. It will be expected that organization be flexible, experimental, risk taking and variation in activities during exploration and this should gradually transform activities into performance.

Private hospital in Nairobi will have to reconfigure the innovation portfolio by integrating big data and embedding data analytics into products and services and how they will be handled in order to transition innovation inside companies. They will also need to develop talent. Noting that in implementing all of these changes, organizations need to exercise caution when introducing new processes and products because by doing so they could end up doing more harm on existing performance given that the short-term conversion rate of innovation is always low.

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As organization grow the search, discovery, experiment and aim in meeting future market demand by hospital also increase. With new processes put in place by the organization has led to high competition. Therefore a great need for the managers to look into ways of skimming through the constant shift in market dynamics by using latest technology though exploratory strategy. At the same time it has to invest heavily on resources that are useful in exploiting opportunities which come with technology growth.

Through refinement and extension of existing knowledge, organizations have simultaneously achieved a competitive advantage through coordination of activities within and outside the organization or regional incase of those having satellite clinics. Although

this might have brought temporary benefits to some private hospitals by reducing technology differences and improving operation efficiency through consolidation of existing market and customer as well as expanding market into different regions. Most of the organization have been flexible, experimental, risk taking with variation in activities during exploration as they gradually transform activities into performance.

Private hospital in Nairobi have reconfigured the innovation portfolio by integrating big data and embedding data analytics into products and services. How they handled the transition innovation has been a huddle inside companies. A need to develop talent is required for smooth innovation process. Noting that in implementing all of these changes in organizations need to exercise caution when introducing new processes and products there step by step procedure must be laid down because by hurriedly doing so, they can end up doing more harm on existing performance than thought off given that the short-term conversion rate of innovation is always low in profitability.

2.3.3 Financial Measures and Performance

Financial obstacles to healthcare, in particular user fees and investment cost is common in private hospitals(World Bank, 2014). According to a World Bank study, out-of-pocket expenses for patients in Africa are higher for private non-profit hospitals, lower for public hospitals, and intermediate for private self-financed providers(Basu et al., 2012).Given the increased pressure to reduce healthcare costs, hospital performance has become more and more significant nowadays. People are becoming increasingly involved in their healthcare decisions making and hospitals are compensated according to their ability to offer valuable care to patients(Thomas Craig et al., 2020).

In Kenya, those with higher incomes and less medical requirements typically receive more attention from the private hospital sector's health services than those with more medical requirement and less income. This narrative has led to public hospital to have a big number of patients eventually forced to offer poor services. A group higher income earners are normally covered by health insurance catered by companies where they work from. Recently insurance companies have tried to reach more people but still the process of compensation or indemnifying is also a challenge hence making many needy people to be scare of getting premium .In addition to high premium charged and less compensation to patient cover by insurance; private hospital have been forced to use pay for performance approaches where private hospitals will increasingly tie performance measurements to compensation (Kahn CN 3rd, Ault T, Potetz L, Walke T, Chambers JH, 2015). Other hospital have resulted to use cash as mode of bill settlement then insurance can reimburse its client. Noting that being profitable is typically one of the top priorities for business owners, therefore Sales income must exceed business expenses in order for the organization to earn a profit.

For ease maintaining of operation of the hospital, a positive cash flow is needed i.e. company must ensure that the sales revenue meets the costs .The quality of treatment delivered is never not be accurately reflected to the quality criteria used to assess value of healthcare. Therefore business owners take into account factors other than only monetary profit. By examining important parameters, company leaders has ascertained the health and sustainability of their hospital business and managers determines which area is performing well and which ones require improvement by calculating and comparing

metrics. Consequently, there is always a need to strike a balance between quality efforts and financial viability.

Private hospitals have capitalized on the significant investments of a variety of resources starting from infrastructure to highly skilled medical staff who demand very high fees for the services they provide. Number of patient to doctor, Investment done against the liability that is incurred as well as the service ration provided by the doctor or general service rendered and the cost to run such services has determined the liquidity of this businesses. By engaging various insurance scheme cover and government health insurance funds hospitals are able to cover their obligations.

There is a need for standardization of conclusions drawn from quality assessments that take into account Kenya's changing healthcare landscape and the mandate that private hospitals provide patient centered healthcare facilities. While patient safety, effectiveness, and responsiveness has been often evaluated, private hospitals has a greater focus on frequent usage of equity, efficiency, and timeliness(Buchan HA, Duggan A, Hargreaves J, Scott IA, 2016). Identification of financial metrics and covariate adjustments has been required. Patient-centered outcomes has been taken into consideration when developing quality measurements, and costs while operational margins is being assessed using efficiency measures.

Some measures on substantial impact on a hospital's ability to extend financially based programs and community based initiatives to address health inequities issues that seriously harm private hospitals is always key. Understanding financial metrics has put hospitals in a better position to assess the financial health of their company. Managers in these companies are then entitle to modify hospital departments' or teams' objectives in order to

support important long term strategic goals and work on lucrative projects. Duration of payment by insurance on claims and bill clearance process has been a contributor of hospital growth .Also mechanism on debt collection and follow up on payment has been of great importance especially the lead time. Patient average length of stay showed abroad picture of organization growth this included total number of sales done as it was directly contributing to hospital income.

This organizations needs capital flexibility and autonomy to explore and exploit the market or to compete in an established technical marketplaces where efficiency, control, and incremental progress are valued (Charles A. O'Reilly, 2013). Additionally, management should have internal access to financial metrics and KPIs, and these has to be updated weekly or monthly via emails, dashboards, or reports. With the assistance of a big data analytics tool, it has been possible to prevent losses by use of available data analytics tools. Due to redundancy, investment in assets had to be valued on an absolute basis. Therefore competitive advantage for the expansion of private hospitals was provided by accountability for income creation and resource allocation, information transparency with relevant parties (Vayena. et al., 2018).

Price settings for either services or expenses budget had to be based on actual and it had to take into account the broader objectives of the healthcare system and health outcomes of patients in Nairobi. The incentives in payment schemes had to be readily overshadowed if the price chosen is unreasonably high or low. Big data analytics determined success of private hospital through creation of desired innovation that aids in financial technological control (Brand et al., 2012). According to Charles A. O'Reilly (2013) review of hospital characteristic and contribution of performance he suggested that hospitals will need to

implement architectural innovation, utilizing technological or process advances to fundamentally change some component of the business, based on how well the firm has performed over the last ten years, he points out financial incentives like referral program by hospital, commission to services and allowances to staff in addition leadership to contribute more of how well hospital can be declined, or improve parts that will need much attention.

Reports that provides an overview of the business's activities and financial situation for effective customer demand and financial controls of today's business contributes more on adapting changes in the healthcare markets while being aided by managerial practices and activities that are useful to bring equilibrium in the organization. These include proper financial statement analysis .And also private hospitals needed to measure there liquidity through the break-even analysis, return on asset evaluations, and margin or profitability ratios to determine the performance.

2.3.4 Service Quality and Performance

The time period during which customers' needs are addressed is considered to be a quality service. Once more, the difference between a customer's perception of a service and their expectations of it is referred to as the definition of service quality (Lewis, N. & Mitchell, 2010).When there are higher expectations for the service than what is delivered, the perception of the quality of the service is lower, which causes dissatisfaction to clients .

Nairobi’s private hospital must provide its customers with excellent service. Businesses who don't compete on customer experience, risk losing customers to those that consistently satisfy their needs and provide high quality service in a cutthroat market. Even when companies are conscious of the need to provide great experiences, it can be difficult for

them to evaluate the quality of their service(Article, 2014). In Maina, (2015) and Blustein et al., (2010) pointed out that sometimes it is challenging to evaluate service quality delivery because it is qualitatively measured rather than quantitative.

Most researchers have struggled to determine how to assess service quality and appreciate how hospital actions are affecting patients. Therefore adoption of SERVQUAL model (service quality model) which includes reliability, responsiveness, assurance, empathy and tangibles was used. Tangibles in terms of the availability of modern equipment, qualified personnel to offer services, ICT tools enable communication to clients and management of the hospital. Customers' expectations depend on a range of circumstances, including the company's reputation, client demands, and expertise(Cummings, T. & Worley, 2012).

Patient experiences depend on how well engineered the services are and how well they do their functions. Customer perception gaps are always as a result of the knowledge the employee of an organization have and how they convey their ability to create trust from client. Past client encounters and expectations for the future has led to customer choices of hospitals to attend and this is as a result of the hospital ability to perform on the objectives and provide services dependably and accurately to its clients.

Maina, (2015) in his research quality service delivery in hospitals, seconded on serval metrics and pointed out few components like accuracy ,empathy ,tangibles, reliability as being elements that contributes more on a great service delivery ,he suggested that physical appearance of facilities, equipment available and proper communication leads to customer confidence with the organization. Although this elements change depending on the type of business and products that organization offers; Patient confidence and trust is inspired by

the capacity to provide the promised service accurately and consistently, as well as by staff availability to assist clients and provide prompt service with the requisite knowledge.

In private hospital setup service delivery depends the profit expectation by the organization ability, investment cost and target customer base. In addition, hospital management needed to ensure sustainability of business environment, availability of resources that supports service delivery, timeliness in all its operation and reliability of patient information. Delivery of patient services had to be adaptable to changing user needs. Generally hospitals needed to identify the needs of clients then thoughtful and personalized services given to its clients followed by the company development of strategies that had to meet the demand of the patients.

Most of the organization faced strategic operation and cultural challenges when adopting IT and especially big data and tools used. Therefore, it only worked when the top management accepted and was willing to embrace it as well as investing towards information systems for easy decisions.

Managers had to focus on big data resources as an important elements of the organization and had to willingly support a culture that prioritizes quantitative analysis in decision making. According to Baumgarten, J., Dickstein, M., & Rizk, N. (2013) Companies needed to address talent needs at every level of the organization, including senior management and functional leaders who must assess and define the opportunities where data insight could benefit business. If big data was to live up to its premise; exploiting technology and evaluating of business opportunities through analytics should have been at the center of every leadership in the organization.

2.4 **Summary of Theoretical Literature Review and Research Gaps.**

In order to establish sets of capabilities, the research focused on dynamic, operational, and technological inhibitors of big data capabilities. It also reviewed literature on the performance of private hospitals that was based on theories such as adaptive saturation theory, diffusion of innovation, dynamic capability, and resource based view.

Table 2.1: Summary of Theoretical Literature Review

Theory	Proponent	Argument	Knowledge gap	Contribution to the current study
Adaptive Structuration Theory	Muhammad, Imran. Wickramasinghe, (2018)	Structuration model explains how technological changes influences organization design over time.	Focus more on the technological structure.	Information management systems have enabled many cluster participations in organization.
Diffusion Of Innovation Theory.	Rogers, (2003)	The diffusion of innovation describe how an idea obtains traction and spreads among a particular population or social system over time and how individuals accepts ideology	Idea generation become ideal to the organization growth only if individuals are willing to accept but it doesn't directly translate to performance	Private hospital will learn on innovation and the notion will apply on process which its contribution leads to growth of organization
Dynamic Capabilities Theory	Teece (2007)	These philosophy focused on the creation of senior management strategies for organizations that can adapt to radical discontinuous change while maintaining the bare minimum standards necessary to assure competitive survival	Theory was inclined toward managers and how business operation. It doesn't show sustainability of investment	explained how firms can maintain competitive advantage in changing environment
Resource Based View	J. Barney, (1991)	Defines resources as rare, inimitable and non-sustainable.	Focused more on resources owned by the organization.	Explained how some organizations are performing better and how IT resources in lead to greater performance.

Source: Research (2022)

Table 2.2: Summary of Empirical Review

Author	Topic	Finding	Gap
Prajogo, (2016)	Strategic Fit between innovation and business environment	Competition was characterized by innovation and businesses with technological skills produce innovations by successfully applying new methods.	Current hospital business market places in the world are characterized by rapid technology advancements In Kenya private hospital technology is mostly capitalized on the market demand but not the global factor
Maina, (2015)	Effects Of Customer Perception On Performance Of Private Hospital	Points out few components like accuracy ,empathy ,tangibles, reliability as being elements that contribute more on a great service delivery	How responsiveness of hospital employee were ready to assist clients and deliver fast service is as a result of training or personal attributes what about if customers fail to respond? how will the organization look into that
Thomas Craig et al., (2020)	A Review of the Scope to Identify Possibilities for Bridging the Quality Gap	People are becoming increasingly involved in their healthcare decisions, and hospitals are compensated according to their ability to offer valuable care to patients	In Kenya, those with higher incomes and less medical requirements typically receive more attention from the private hospital sector's health services. These is due to insurance covers company which will directly involve with hospital
Baumgarten, J., Dickstein, M., & Rizk, N. (2013)	Building a Big Data-Enabled Organization: Beyond the Hype	Companies needed to address talent needs at every level of the organization, including senior management and functional leaders who must assess and define the opportunities where data	Customers' expectations was depending on a range of circumstances, including the company's reputation, client demands, and expertise

		insight could benefit business, if big data is to live up to its premise	

Source: Research (2022)

2.5: Conceptual Framework

The conceptual framework explains the connection between the study's dependent and independent variables. Big Data Technology Capability, Service Responsiveness, Services Quality, and Financial Measures is the independent variables that will be included in the many groups of big data analytics determinant on private hospital performance in Nairobi County. Timeliness, diagnostic accuracy, service delivery, assurance, and organizational growth will be the primary performance indicators for private hospitals.

Conceptual framework

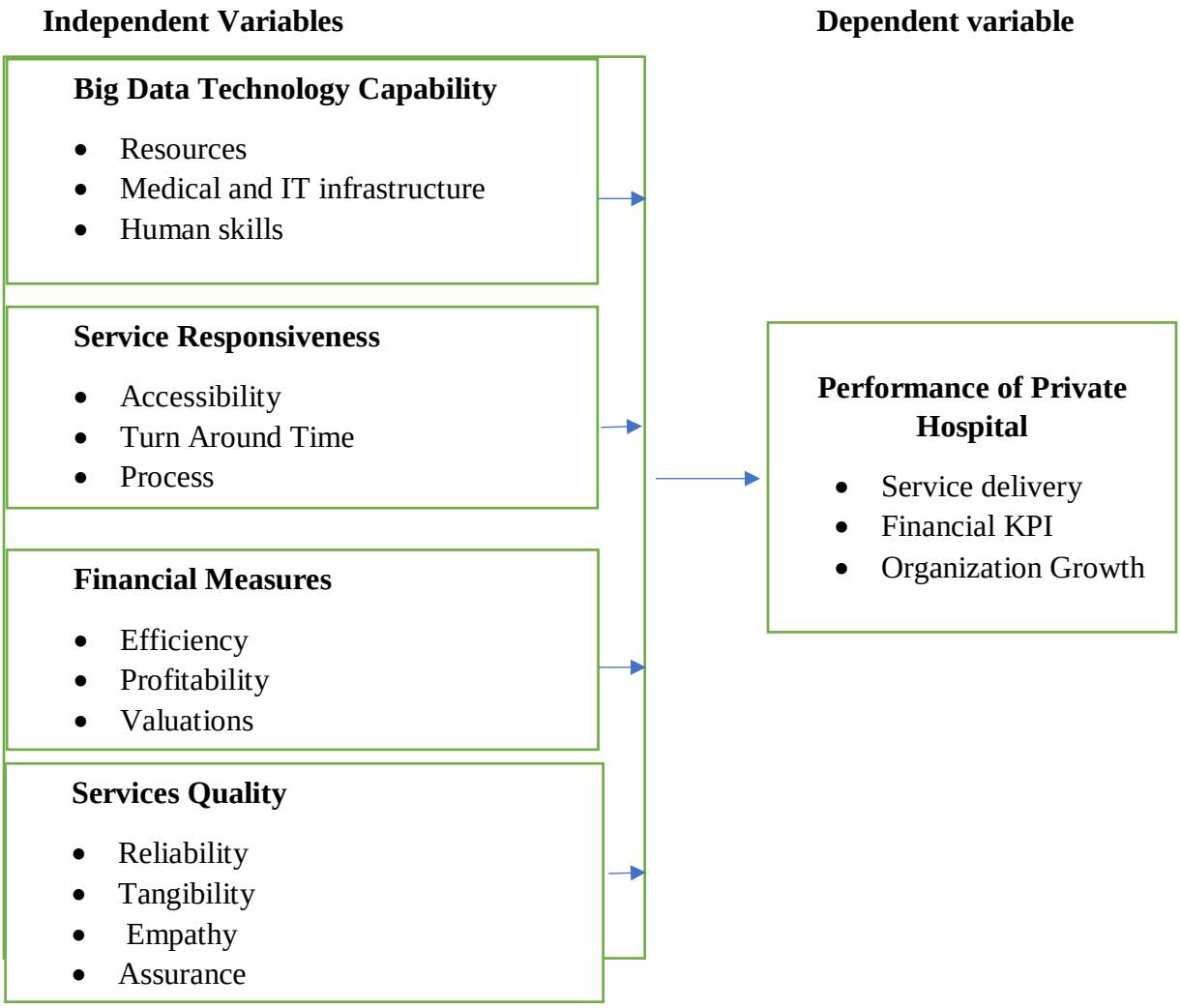

Figure 2.1: Conceptual Framework
Source: Research (2022)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter described the target population of the study, research design, sample methods, techniques used, data collection method, and analysis procedure.

3.2 Research design

The process for gathering, analyzing, interpreting, and reporting data in research investigations is known as a research design (Boru, 2018).It sets the guideline on methods to be applied on sets of data required and answer the question that were needed for researcher to analyze the data .To evaluate the impact of data analytics capabilities in private hospitals in Nairobi City County, this strategy was used to collect data without influencing the research variables or the respondents. It was also noted that a descriptive design was adopted since the research involves both collection of quantitative and qualitative information.

Quantitative research values breadth, statistical descriptions, and generalizability (Leavy, 2017) .In contrast, a qualitative methodology examined individuals, environments, and groups holistically; these elements are not reduced to variables but rather are seen as a whole (McNabb, 2020).It also aimed in describing information pattern within the organization of which some of collected data were tabulated before use . Descriptive study in the other hand aimed at providing accounts of the state of affairs and details about the population and phenomenon under investigation.

3.3 Target population

According to Oteng-Abayie (2017), the term research population referred to a group of people who shared one or more interesting features .The study focused on the best performing, 25 level 3b, level 4, level 5 and level 6 private hospitals in Nairobi County to form a total population of 120. The population interest from this study comprised top and middle level managers who were directly linked or affected by incoming data, processing, disseminating and use of information for decision making in various capacity.

Table 3.1: Sample Size Population

PRIVATE HOSPITALS	**Sample Size**
THE NAIROBI HOSPITAL	7
THE KAREN HOSPITAL	6
THE AGHAKHAN HOSPITAL	8
THE MP SHAH HOSPITAL	7
THE NAIROBI WEST HOSPITAL	5
GERTRUDES CHILDREN HOSPITAL	6
MATER HOSPITAL	5
MARIAKANI COTTAGE HOSPITAL	3
THE NAIROBI WOMENS	4
KOMAROCK MODERN HEALTHCARE	5
RUAI FAMILY HOSPITAL	4
MEDIHEAL HOSPITAL	4
JACARANDA HEALTHCARE	5
ST MARYS HOSPITAL LANGATA	5
COPTIC MISSION HOSPITAL	5
GURU NANAK HOSPITAL	4
SOUTH B HOSPITAL	3
THE NAIROBI SOUTH HOSPITAL	3
LANGATA HOSPITAL	4
MEDANTA AFRICARE	5
JAMAA MISSION HOSPITAL	4
KASARANI MATERNITY AND NURSING HOME	4
FAMILY HEALTH OPTION HOSPITAL	5
AAR HEALTHCARE	5
PENDA HOSPITAL	4
TOTAL SAMPLE SIZE	120

3.4 Sample Size and Sampling Technique

A good sample is one that satisfies the criteria for adaptability, representativeness, efficiency, dependability, and at least 10% of the population considered to be the target population (Mugenda, N. G., Momanyi, G., & Naibei, n.d.). The study used a probabilistic data sampling technique with specific target in twenty five private hospitals within Nairobi being identified for research questionnaire. A research sample focused on specific group and individual with certain characters in private hospitals. The research also chose identified representative from departments within the 25 private hospital who were willing and seemed to suit the needs of the study, bearing in mind the time and cost involved to conclude the study. From a target population, a sample size of 120 from the entire hospital population was generated.

Sample selection

3.5 Data collection

The study used semi-structured questionnaires as the primary data source and divided it into sections with a drop and pick distribution method and collection of data. Use of phone call and mail for follow up on questionnaire collections was also important in this survey to avoid loss of materials. During retrieval of information; contact of individual's persons interviewed were projected to be heads of departments and ICT Staff full involved in the process. Information from questionnaire was tabulated into tables and analyzed using SPSS to give the real outcome of the research.

3.6 Validity of instrument

The researcher used a randomly distributed questionnaire to all top level and middle manager and ICT department staffs in the hospital for easy generalization of the finding. To ensure construct validity was achieved; theoretical evidence relating to theoretical

literature was used with a pilot of 4-5 from each organization taking place. For internal validity, focus was more on time allocation in collecting data.

3.7 Reliability of the instrument

The internal scores for individual items in the questionnaire as well as the consistency of data collected was key while testing and retesting of the methods employed on sub items and subscales on each data collected. Also, a pilot study was conducted on few department data to check on the reliability of the study with a consideration of Cronbach Alpha which is > or = 0.6

3.8 Data Analysis and Presentation

To analysis data was computed using computer software tool; Statistical Package for Social Science (SPSS) to determine ideal yield. The information was broken down to clearly explain dissemination of recurrence, percentiles, means score, and standard deviations. With assumption of quality of resultant factors whether positive or negative, was tried using regression model to quantify the connection between factors and variables.

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

Where Y = performance of Private Hospitals

β_0= Constant

X_1= Big Data Technology Capability

X_2= Service Responsiveness

X_3= Financial Measures

X_4= Services Quality

ε = Random error term

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATIONS

4.1 Introduction

The interpretation and presentation of the results are covered in this chapter. The analysis of data for big data analytics is presented in this chapter. The chapter also presents the case study's key findings and outcomes and contrasts them with those of the chapter on the literature review.

4.2 Response Rate

The study was intended for 120 respondents in total. However, only 86 respondents completed and returned the surveys, resulting in a response rate of 71.67%. A response rate of 50% is sufficient for analysis and reporting, a rate of 60% is good, and a rate of 70% or above is exceptional hence this response rate will be sufficient for analysis and reporting(Mugenda, N. G., Momanyi, G., & Naibei, n.d.). To present data, the researcher used frequency tables.

4.3Background information

This section looked at the respondents' age, gender, education level and years of experience in private hospitals staffs in Nairobi County Kenya.

4.3.1 Demographic information

Gender information was tabulated as in below

Table 4.1 Staff Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	55	64.0	64.0	64.0
	female	31	36.0	36.0	100.0
	Total	86	100.0	100.0	

According to the study, 64% of respondents who worked in private hospitals in Nairobi County were men, compared to 36% who were women.

Table 4.2 Staff Age

	Frequency	Percent	Valid Percent	Cumulative Percent
BETWEEN 18-25	12	14.0	14.0	14.0
BETWEEN 26- 35	20	23.3	23.3	37.2
BETWEEN 36- 45	22	25.6	25.6	62.8
BETWEEN 46-50	16	18.6	18.6	81.4
ABOVE 50	16	18.6	18.6	100.0
Total	86	100.0	100.0	

The study's findings indicated that 25% of the staff members employed by private hospitals in Nairobi County, Kenya, were between the ages of 35 and 45, with a very substantial number being under the age of 25.The study shows that due to the nature it will be rare to have someone working in private hospitals with less experience or without diploma or other higher qualifications which might takes at least more than 3 years as shown in table 4.3 below.

Table 4.3 Education level of employees

EDUCATTION_LEVEL

		Frequency	Percent	Valid Percent	Cumulative Percent
	CERT	12	14.0	14.0	14.0
	DIP	20	23.3	23.3	37.2
	UNDERGRAT	22	25.6	25.6	62.8
	POSTGRAT	16	18.6	18.6	81.4
	WITH OTHER QUALIFICATIONS	16	18.6	18.6	100.0
	Total	86	100.0	100.0	

According to the report, 23.3% of respondents had a diploma while 25.6% of respondents had college degrees. Yet, just 18% of the population had postgraduate degrees or with equivalent credentials. With smaller percentage of certificate holders in private hospital, the finding justify that private hospitals in Nairobi were mostly experts or experienced staff working in various department.

4.3 Descriptive Analysis

The reliability of the data collected is examined in this section. Also, percentages were used to analyze the factor under analysis. The aim was to identify and clarify observable patterns by determining variables in detail.

4.3.1 Reliability Analysis

To assess the validity and dependability of the information gathered using the questionnaire prior to the actual study, the researcher conducted a pilot study. The pre-testing of the research instrument was made possible by the pilot study...

Table 4.4 Reliability Coefficients

Scale	Cronbach's Alpha	Number of Items
Big Data Technology Capability	0.976	10
Service Responsiveness	0.987	11
Financial Measures	0.973	11
Service Quality	0.985	11
Performance of private hospitals in Nairobi	0.941	6

The reliability of the questionnaire was evaluated through Cronbach's Alpha which assesses the internal consistency. By determining whether a specific item measures the same construct, the Alpha examined internal consistency. Cronbach's Alpha was constructed for every objective in order to find out if each scale would yield consistent results. The research would be repeated later on for consistency. The results of the pilot study demonstrated that all four scales were trustworthy because their reliability values were higher than the required cutoff point of 0.7(Lucy Njoki Kathuri-Ogola, n.d.)

Table 4.2 Level of Private Hospital in Nairobi County Kenya

	frequency	Percentage
level 3b	18	20.93
level 4	36	41.86
level 5	15	17.44
level 6	17	19.77
Total	86	100

The research study sought to determine the number of private hospitals in Nairobi County. According to the results, 20.93% of private hospitals were classified as level 3b, 41.86 % were level 4, while 17.44 % and 19.77% level 5, were classified as level 5 and level 6 private hospitals respectively .The study indicated that Nairobi county is dominated by level 4 private hospital while level 5 and 6 hospital commanded a small number.

Table 4.5 Performance of private hospitals

	frequency in percentage				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Do you think big data analytics can bring a big change in hospital	14	12.8	30.2	20.9	22.1
Is your organization in stable financial health	0	0	38.4	27.2	24.4
Employee satisfaction with the organization	16.3	10.5	30.2	30.2	12.8
Is your organization paying creditors in time	15.1	20.9	22.1	22.1	19.8
Is the organization generating more profits than making loses on service delivered per year	0	2.3	31.4	31.4	34.9
Is your organization paying expenses at reasonable time (less than 45 days	4.7	12.8	37.8	27.9	17.4
Is your organization labor force utilized efficiently	19.8	15.1	27.9	22.1	15.1

The study sought to find out the trends in private hospitals performance over the past five years .A Linkert scale was used with five points each where 1 –strongly disagree,2 disagree,3 neutral (neither agree or disagree) 4 agree and 5 strongly agree. From the findings, 22.1% of the responded strongly believed that big data analytics had a big impact in private hospitals performance while 30.2 % neither agreed nor disagreed on the influence of big data analytics had on private hospital performance .These study showed that many organization might have interacted with big data but not fully utilized its capability.

The study report also indicated that 38.4% of respondent were not sure if the organization was in financial stability or not .However 27.2 % of the respondents agreed that private hospitals are always stable financial health. Ideally private hospitals are profit making organization there they cannot survive in the market if they make loses. It was also noted

that 30 % of employee were satisfied with the organization, These shows why the private hospitals have been performing well (Morgan R, Ensor T, 2016).

The study indicated that creditors are either paid on time or sometimes not, 21.1 % of responded felt that the organization neither pays on time or sometimes there is delay in paying its creditors. Moreover 34.9 of responded strongly agreed that private hospitals makes huge profits than loses therefore this huge proceed has encourage private hospital in investing and expanding its operations. The study indicated that 37.8 of private hospital they either pay their expenses on time also 27.9 % believed that private hospitals in Nairobi county neither utilize the labor force fully or work within the labor force

Table 4.6 Big Data technology capability

	FREQUENCY (%) S. Agree	Agree	Neutral	Disagree	Disagree
Familiarity of technology available within the organization	46.5	14.0	16.3	14.3	9.3
User exhaustively utilized technology available	31.4	29.01	19.8	16.3	3.5
Contribution of big data technology in organization growth	25.6	20.9	27.9	17.4	8.1
Need for technology change	47.7	31.4	10.5	3.5	7.0
Do you feel there is need for technology upgrade in all spheres	46.5	27.9	8.1	10.5	7.0
Has the organization management contributed to technology growth	41.9	30.2	18.6	9.3	0
Do you think the hospital has adequate medical and ICT infrastructure	29.1	24.4	15.1	11.6	19.8
Do you think user training can improve technology capability	54.7	11.6	16.3	10.5	7.0
What is you take on service delivery being influenced by technology capability	31.4	20.9	4.7	25.6	17.4
Training capacity and service delivery has contributed in private hospital organization growth	68.8	14.0	4.7	5.8	7.0

The study sought to find out the influence of big data in private hospitals in Nairobi county Kenya. According to the results, 46.5%of respondents strongly agreed to be familiar with technology within the organization , whereas 9.3 % strongly disagreed, An indication that the driving force in many organization today is through innovation and information technology(Davis, 2013). Study showed that 31.4% of respondents strongly agreed that users have capability to use and utilize available technology while 3.5 disagreed on exhaustively utilization of technology by private hospitals in Nairobi .A 27.9% of remained neutral on big data contribution to organization growth as 8.1 strongly disagreed on the narrative. On the other hand research study pointed out that 47.7 of responded thought there was a need for technology change or upgrade as shown by 46.6 % who supported it

According to J. B. Barney & Hesterly(2012) growth of organization in developed is contributed by three pillars, Financial performance, products in the market and the support of technology from management; therefore from the research study it was evident that private hospitals in Nairobi has performed well because of the same as indicated by 41.9% of respondent who confirmed. On the other hand management contribution toward growth cannot be complete without proper infrastructure in place(Thomas Craig et al., 2020) thus the result from the study showed that private hospital had adequate medical and ICT infrastructure which spearheaded its growth.

Ministry Of Health (2017) guidelines shows that all medical and none medical working in hospitals should be subjected to continuous training by the facilities they work to improve on performance of key areas of the patient care .Therefore from the research study, it indicated that user training had improved the growth of private hospital as shown by 54.7 % of responded who strongly agreed compared to a parity 7.0 % who strongly disagreed.

While training goes hand in hand with implementation which eventually results to delivery of services(Davey & Grönroos, 2019), the study research showed that 31.4 % of the respondent agreed on service delivery in private hospital being by training of its staff and technology capabilities. On the other hand 4.7% remained neutral on same matter. The study also indicated that 68.8% of respondent strongly agree that Training capacity and service delivery has contributed largely to private hospital organization growth in Nairobi County.

Table 4.7 Service Responsiveness

Service Responsiveness	Very poor	Poor	Average	Good	Very good
Employee competence level	0	3.5	5.8	58.1	32.6
Employee ability to respond to queries raised by client	8.1	18.6	48.8	11.6	12.8
Availability of most important diagnostic services to patients	7.0	4.7	36.0	32.6	19.8
What is the average TAT for service given	11.6	12.8	51.2	15.1	9.3
How do you rate the information systems in your organization	11.6	20.9	30.2	22.1	15.1
Reliability on technology and its growth in your organization	7.0	16.3	22.1	34.9	19.8
How do you view sharing of knowledge in your organization	20.9	15.1	16.3	22.1	25.6
How is your innovation process in the organization	9.3	16.3	43.0	17.4	14.0
What is your view on management support customer care services	4.7	17.4	15.1	25.6	37.2
How is the feedback from the hospital client	12.8	15.1	40.71	12.8	18.6
General ICT infrastructures investment in the hospital towards customers	15.1	7.0	34.9	16.3	26.7

The purpose of the study was to evaluate private hospitals' customer service. According to CAROLINE (2016) performance of organization is contributed by staff ability to understand process and be able to perform duties efficiently. Therefore from the study finding 58.1% of respondents indicated the hospital's personnel competence level showed

they were good compared to a 3.5 % of respondent who showered staffs were poor, and only 5.8 % showed staffs were average this indicating that private hospitals values service delivery.

A total of 48.8% of respondents indicated that employees could react to client inquiries while 8.1% could not respond to client queries and 12.8 % were very good in responding to clients queries, these attribute had been contributed by having competent staff who can comprehend customer need in time and respond quickly to various organization stimuli . The study also showed that 36.0% of responded indicated that private hospital had an average important diagnostic service to patients while 4.7 % thought it was poor, this evidence showed that most private hospitals in Nairobi have not heavily invested in advanced equipment that why majority are level 3 and 4.However it was shown that this facility offers from basic to complicated medical equipment's, also with injection of financial they quickly transform into bigger hospital either level 5 or six(World Bank, 2014)

The Study indicated that 51.2 % of respondent though that the service TAT in private hospitals was averagely distributed ,where as 9.3 % thought turnaround time was very good these two percentages showed private hospitals ability in maintaining customer satisfaction due to high completion and demand of greater services .Information systems in the healthcare organization is very integral(Alotaibi & Federico, 2017) the study showed that 30.2 % of responded thought use and utilization of IS was average while 11.6 % thought it was very poor .The study also showed that 39.4 % of responded indicated that private hospital reliability on technology for its growth was good while 7.0 % thought

reliability on technology was very poor, this might have been the reason why 30.2 believed it was averagely used .

Good information systems should be easy to deploy implement and manage, it should have storage that can easily be accessible by users and the information should be reliable (Analysis et al., n.d.)The study showed that 25.6 % of respondent indicated very good information sharing in private hospitals while on the contrary 15.1% of responded thought information sharing was poor. On the other hand 43.0 % of responded though innovation process in private hospital was average these might have led to slow growth of some facilities , while 9.3 % thought it was very poor. Researcher report indicated that 37.2 % of responded thought management support on customer services was very good while a parity 4.7% indicated it was very poor this reasons indicated why some private hospitals have been performing very well as compared to others.

Table 4.8 Financial Measures

Financial Measures	Frequency in %				
	very low	low	moderate	high	very high
Financial stability	0	5.8	7.0	31.4	55.8
Financial aid and subsidies	60.5	19.8	12.8	4.7	80.2
Reliability of income in your organization	0	8.1	18.6	37.2	36.0
Any challenges on compliance bodies	18.6	22.1	25.6	16.3	17.3
Seasonality effects on organization	27.9	20.9	24.4	11.6	15.1
Revenue collection turnaround time	30.2	25.6	27.9	7.0	9.3
How are expenses when compared to income your organization	0	0	31.4	36.0	32.6
Are your average sales per month sufficient for organization operations	19.8	12.8	30.2	20.9	16.3
Do you feel there is need for training on financial measures	11.6	5,8	15.1	45.3	22.1
Do you have management support on financial measures	0	2.3	27.9	34.9	34.9

Organization growth rate is on the right direction	3.5	4.7	30.2	33.7	27.9

The study sought to find out the extent that financial measure reflect and impacts on private hospitals in Nairobi county. According to the findings, 55.8% of the respondents indicated that organization financial stability was very high and a small percentage of corresponded (5.8 %)showing low financial stability this has been due to the numbers and various services offered in by this organization that enable them generate huge revenue collection over time . The East Africa(2015) showed that Kenya is a hub of medical services in East African, it has been seen that most investors have been attracted due to stability, quality of resources available and flexibility within the market and return on investment within a short time .A big percentage thresh hold showed the private hospitals enjoys financially stability at 87.2 % combined responded due to amble market environment.

It was viewed that private hospitals received financial aid or subsidies on purchases especially medical equipment's. 80.2 % responded indicated very high financial aids was given while 60.5 % also indicated very low financial aid and subsidies was offered. However financial subsidies or aid is always given to either specialized medical equipment or patient needs i.e. cancer machines, dialysis treatment through National health schemes funds or related medications(Ministry of Health Kenya, 2016) .According to research study 37.2% of responded affirmed that private hospitals rely more on income generated from hospitals while 8.1% had a low reliability on income in addition to other sources ,this might be hospitals under NGO or sponsored by other institutions.

It was also observed that this private hospitals are faced with challenges from compliance bodies. From 25.6 % of respondent in study ,moderate compliance bodies challenges was

observed while 16.3% of respondent experienced high challenges encounter with compliance bodies. There has been various government policies and governing bodies changes in regards to licensing which had always affected both financially and operations of private hospitals ,example, hospitals should have clearance from environment board, medical board, pharmacy and poison, radiology, county council and ministry of health among others(Ministry Of Health, 2017).

The study researcher identified a very low seasonality effect an on private hospital as indicated by a total of 27.9 % respondent. believed there was no need while 27.17% though there was high need for training staffs .On the other hand 42.28 % of responded indicated to have received huge support from top management on financial matters while 0.11% still believed to have received very low support from management .It was observed that the growth of this private hospital has exponentially increased ,43.55% of the responded believed that growth is high this was as a result of private hospitals enjoying financial stability while 2.2% thought there is slow growth of private hospitals in Nairobi county might have been caused by some other factors like government and other medical board restrictions .

Table 4.9 Service Quality

Service Quality	Frequency in %				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Do you think organization has enough talent that can spearhead growth	1.2	11.6	18.6	29.1	39.5
Do you think you service delivery is of great quality to customers	8.1	5.8	40.7	23.3	22.1
Staff training will improve hospital performance	4.7	8.1	30.2	24.4	32.6
All staffs familiar with big data tools and operation process in hospital	24.4	22.1	27.9	15.1	10.5
Organization receives regular complains on poor quality of services from its client	9.3	12.8	5.8	40.7	31.4
technology advancement has impacted the business service delivery	5.8	10.5	30.2	32.6	20.9
Do you think the organization need change in service delivery dynamic	7.0	10.5	24.4	25.6	32.6
Facility turnaround time on services is always appreciated by clients	5.8	16.3	18.6	26.7	32.6
Do you think there is need to improve service delivery process with technology advancement	3.5	5.8	29.1	36.1	25.6
Do you think organization culture has affected the organization performance	4.7	11.6	26.7	30.2	26.7
Do you think big data analytics can bring a big change in hospital performance	14.0	12.8	30.2	20.9	22.1

The purpose of the study was to determine the degree of agreement with quality service and delivery of essential service to patient by private hospitals in Nairobi. Strongly agree; agree; Neutral; disagree; and strongly disagree were the five points on a five point Likert scale. From the findings, 39.5% of the respondents strongly agreed that private hospitals have enough talent that enables private hospital thrive, whereas 1.2% strongly disagreed on enough talent that can spearhead growth. on the other hand private hospitals with developed policy suggestions that enhance value-based, patient-centered care to address identified gaps and improves how service is provided to patients in terms of safety,

timeliness, effectiveness, efficiency, equity, and patient-centeredness leads to high customer satisfaction (Thomas Craig et al., 2020) therefore it was expected that private hospitals should conforms to this however from the study 40.7% of responded remained neutral on high quality services deliveries to its customers while 23.3% of the respondent were on agreement since not all private hospital provided quality services to its clients.

Incentives, market characteristics, structure-network membership, ownership, teaching status, geographical setting, service size, and operational design can all be used to achieve heterogeneity in the use and definition of performance outcomes in private hospitals .innovativeness, leadership, organizational culture, public reporting and patient safety practices, information technology systems and decision support, service activity and planning, workforce design, staff training and education can also lead to how organization remains in the market(Brand et al., 2012).Therefore with emphasis on training was seen as a driving force from all the three variables discussed in this research study.

From the study finding there was 32.6 % of responded who strongly agreed that staff training had improved performance of hospitals, these strong evidence was associated with the overall performance of various private hospitals in Nairobi County. Another indicating opinion of 4.7 % who strongly disagreed training might have been associated with various hospitals having different workforce designs or use of different financial incentives in its operation as seen from 30.2 % of responded who remained neutral on staff training as a factor of performance improvement .

Strangely enough, large data was a significant issue only a few years ago. The current economic recession has pushed significant adjustments into the majority of businesses, particularly those that depend on mass consumers, making big data analytics a crucial duty.

Businesses can use advanced analytics to analyze huge data to comprehend their existing situation and monitor still-evolving features like client behavior(Misra & Bera, 2018).

From the study it was observed that 27.9 % of responded were either familiar or not familiar with big data analytic tools in organization. The study showed that 24.4% still strongly disagreed on data analytics tool familiarity while 10.5 % strongly agreed to have known the tools and its operation in organization this might be due to big data analytics being an emerging practice in various organization

40.7 % of responded were in agreement that private hospital in Nairobi county receives regular complains on poor services offered while 9.3% strongly disagree. 30.2 % of the responded remained neutral on regular service complains .These resulted to high percentage of responded views that private hospitals need to change dynamics on how they delivery services to clients as shown through 32.6 % of the responded who strongly agreed compared to 7.0% who strongly disagreed on change of service delivery dynamics.

From the research study 32.6% of respondent thought technology advancement has greatly impacted business service delivery while 5.8 % strongly disagreed on technology advancement impacting service delivery in private hospitals and 30.2 remained neutral on the same .Therefore this results was corresponding to 36.1 % of respondent who thought that there was a need to improve on service delivery process with the help of technology while 5.5 strongly disagreed on the need .However 29.15% remained either on agreement or disagreement ,this shows that when technology advances also service delivery will be improved.

According to the study 30.2%of the research respondent agreed on organization culture contributing to private hospital performance in Nairobi, 4.7 % responded by strongly disagreeing while 26.7 remained neutral. Therefore it was evident that with big data analytics there was a great change in performance of this facilities .It was observed that 22.1% strongly agreed that big data analytics improved performance of private hospitals while 30.2 remained undecided on the same but 12.8% disagreed on change in private hospitals being orchestrated by big data analytics.

4.4 Correlation analysis

To establish the nature and significance of the relationship between the study's independent and dependent variables. It was determined using Pearson correlation analysis. An alpha level of 0.05 was used for the analysis, as stated in the table below.

Table 5.0 Correlation Matrix

		Performance of Private hospitals in Nairobi	Big data analytics technology	Service Responsiveness	Financial measures	Quality Of service
Big data analytics technology	Pearson Correlation	.939**	1			
	Sig. (2-tailed)	.000				
	N	86	86			
Service Responsiveness	Pearson Correlation	.980**	.919**	1		
	Sig. (2-tailed)	.000	.000			
	N	86	86	86		
Financial Measures	Pearson Correlation	.981**	.938**	.990**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	86	86	86	86	
Quality of Service	Pearson Correlation	.967**	.895**	.990**	980**	1

	Sig. (2-tailed)	.000	.000	.000	.000	
	N	86	86	86	86	86

**. Correlation is significant at the 0.01 level (2-tailed).

There is a significant statistical link between the performance of private hospitals and their ability to use big data analytics, as shown by the findings in Table 4.4 (r=0.939; p0.01). This demonstrates that while improving big data analytics capability it will directly improve private hospital performance, while a decline in big data analytics capability will have a significant adverse effect on private hospitals.

According to the study reports there is a strong statistical correlation between service responsiveness and private hospital performance(r= 0.980; p0.01), Therefore emphasizing on service responsiveness will enhance private hospital performance. On the other hand, lack of focusing on attributes that go along with service responsiveness will have a significant negative impact on private hospital performance.

The study's findings also indicate a strong link between financial measures and private hospital performance in Nairobi County (r=0.981; p0.01). As a result, maintaining financial measures, such as financial KPIs, will enhance private hospital performance. Yet, any fall in financial metrics will result in a decline in the performance of this hospitals in Nairobi County.

Finally, the results demonstrated a correlation between private hospital performance and service quality (r=0.967; p0.01). This shows that accurately simulating service quality could boost company efficiency and eventually leading to growth however on the other hand if service quality metrics is not put in check then this private hospitals will be adversely affected.

4.5 Regression analysis

The influence of the predictor variables was examined in this study using a multiple regression analysis. The multiple regressions in the study were coded, entered, and calculated using the statistical program for social sciences (SPSS V 17.0).

Table 5.1 model summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.986[a]	.972	.970	1.02883

a. Predictors: (Constant) big data a, financial measure, service response

The R-Square (coefficient of determination) statistic is frequently used to assess the model's fit. R-square is equal to 1 minus the residual variability ratio. The percentage of the dependent variable's variance that is jointly or solely explained by the independent variables is known as the adjusted R2, also known as the coefficient of multiple determinations. The combined influence of the predictor variables could be accounted for 97.0% of the changes in the performance of private hospitals in Nairobi county variables.

Table 5.2 ANOVA

Enova

Model		Sum of Squares	do	Mean Square	F	Sig.
1	Regression	2949.658	4	737.414	696.669	.000[b]
	Residual	85.737	81	1.058		
	Total	3035.395	85			

a. Dependent Variable: performance of private hospital

b. Predictors: (Constant), big data analytic, service response, financial measure, service quality

The probability value of.000b shows that the regression connection was very significant in predicting how the performance of private hospitals in Nairobi County was influenced by big data technology capability, service responsiveness, financial measures, and service quality. The F critical significance was 696.669 since F calculated was greater than the F critical hence justifying that the overall model was significant.

Table 5.2 coefficient

Coefficients

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	3.307	.641		5.155	.000
	Big data analytic	.097	.030	.191	3.282	.002
	Service responsiveness	.285	.089	.582	3.192	.002
	Financial measure	.154	.084	.281	1.834	.070
	Quality Service	-.027	.068	-.055	-.397	.693

a. Dependent Variable: performance of private hospital

According to the regression equation shown above, the performance of private hospitals was 3.307 when all variables (big data technology capability, services responsiveness, financial measures, and service quality) are held constant at zero. The results indicated that, if all other independent variables were held to be zero, an increase in big data technologies would result in a 0.641 increase in the performance of private hospitals in Nairobi County. Additionally, the results demonstrate that a unit's improved on service responsiveness would result in an improvement of 0.285 in performance of private hospitals. Also, the results indicate that a rise in profitability measures would result

in a 0.154 improvement in private hospitals' performance. The study also discovered that a private hospital's performance in Nairobi County would improve by -0.027 units for every unit increase in service quality. Overall, big data technology capability had the greatest impact on the performance of private hospitals, while service quality had the least impact.

4.6 Multiple Regression Model

Multiple regression between performance of private hospitals (dependent variable) and combined selected predictors

$$Y = \beta_{0+} \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

$$Y = 3.307 + 0.097 X_1 + 0.285 X_2 + 0.154 X_3 + (-0.027)\ X4 + 0.641$$

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMENDATION

5.0 Introduction

This chapter provides a summary, recommendations, and conclusion of the research on big data analytics and how it affects private hospital performance in Nairobi County, Kenya.

5.1Summary

The study found out that largest issue facing private hospital was government policies and regulations governing hospitals facilities, while major concerns from patient was always the quality service delivery, affordability and a cutting edge technology. There was a high risk on striking balance between speed and ease of service verses the quality of service delivered. Over reliance on insurance companies and government subsidies in facilitating finances for various complicated services delivered in private hospital. Lack of financial resources from government and other stakeholders to support delicate and complex diagnostics procedures done to patient forces patients to move to other countries for same treatment(CAROLINE, 2016) .Evidently this private hospitals faced challenges on specialized treatment forcing many clients to seek treatment in India.

Majority of private hospital client are satisfied with the Turnaround time and pricing on various services however poor quality on some services was affecting vast percentage of private hospital. Therefore it was important for the hospital to look into time taken from one service point to another acquire modern technology and equipment as well as train its staff. The willingness and ability for hospitals to reach to its client and develop customer based facility which majorly depend on how employee ability to communicate to client(Maina, 2015).

Also reconfiguration of innovation process that could aid fast service delivery was very key to the growth of these facilities .Wayne W. LaMorte, MD, (2019) innovation process and technology enhancement in organizations contributes largely on growth of modern business. Therefore from the study finding it showed that private hospitals growth has largely relied on technology advancement for its expansion. Accurate information sharing from one department or satellite clinic to another within the same institution had created customer trust and this could have been aided by the ability and willingness of employee to assist its client on time using available information tool. On the other hand growth of this facilities depended on average sales per month and management of resource available through training its staff on financial management and support from top level management (Knies et al., 2016)

The study also found out that most of the private hospitals have financial obstacles. This came about as a result of lack of standardized financial metrics which has adverse impact on hospital performance. It was viewed that when private hospital need to establish new or expand existing facility that would aid in service delivery the cost incurred were much higher thus forcing this organization to increase the prices of specialized service to accommodate extra operation costs. I.e. licensing processing fees or importation of equipment's .It was also viewed that Private hospitals should invest into modern technology since it impacts largely on the dynamics of service delivery, ICT infrastructure and resources especially capable

5.2 conclusions

The study shows that high performance of private hospitals was attributed to patient satisfaction, high quality, and cost effective patient services therefore this facilities had

continue and can be driven by the influence of dynamics of innovation and the resource-based view models. Creation of private hospital policy and identifying the patterns through which new concepts will be adopted and contribution to commercial value was key for its growth. It was also important to focus on KPIs of financial measures, quality service delivery strategies. Several private hospitals do not feel the need to grow into other consumer modes because they relied heavily on insurance companies as the primary source of patient care bill settlement which was also risky hence they needed to market more on Cash paying and other modes of payments. This business has invest in more in new technologies due to the intricacy of the diseases and the rise in demand for services. Thus, there is a need for appropriate analytic tools that would aid in the identification of illness patterns, financial performance, and market target customers.

Modern ICT infrastructure enhances the delivery of high-quality services, access to timely and useful knowledge, communications, and early detection of diseases. Technology advancements open up new markets and business options. The study's conclusion was that continuous training enabled a business to maximize the potential of its talent acquisition. Also, it aids in learning, which helps most individuals perform their professions more effectively.

Product quality and customer loyalty both had an impact on how calculative commitment to performance were measured (Davey & Grönroos, 2019).The impact of customer loyalty had both positive or negative to the organization . Therefore institutional and affective commitment were claimed to be positively influenced by the social perspective of relationship between quality (in terms of collaboration and confidence), and individual commitment.

5.3 Recommendations

The study recommends private hospital in Nairobi country to adopt new technology that brings change to organizations ,whereas management support and continuous training on individuals as well as change on organization culture through embracing and improving available process .The study also encourages private hospitals in Nairobi county to setup kitty or engaging with government or non-government institution in setting up funds that can support vulnerable needy patients on specialized treatment. To achieve effective performance continuous training and assessment process is need in all department with the help of data available. Change of business strategies and innovation was viewed as game changer in organizations.

The research recommended that private hospitals should start working with foundations or start a trust fund that will enable donors aid and well-wishers contribute finances or channel that government can contribute towards the support of most vulnerable patients and delicate medical treatment requirements to patients i.e. cancer patients ,kidney transplant and heart treatment in various hospitals within Nairobi County .

It was also observed that most private hospital have invested heavily in medical infrastructure to improve service delivery turnaround time; therefore it was important to have continuous staff training which in turn will improve performance. More emphasis should be put on service delivery channels to avoid regular complain from unsatisfied clients. Generally having better ICT- infrastructure that will enable smooth innovation process. Similarly the study recommends that private hospitals need to improve patient diagnosis machines available for quick and ideal solution.

5.5 Recommendations for Further Study

To determine whether the same results would be attained in other counties, a study of this nature may be conducted elsewhere. Another study should be done on the growth of private hospitals in Kenya since the previous one was focused on the performance of private hospitals in Nairobi County.

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APPENDICES

APPENDIX I: LETTER FOR INTRODUCTIONS

JEREMIAH WAKHUNGU KELVIN.

P.O BOX 43375,

Nairobi.

Tel: 0722590332.

03th Feb 2022.

Dear Sir/Madam,

RE: REQUEST FOR DATA COLLETION.

I am a Kenyatta University student pursuing a degree of Masters in Business Administration-Management Information System (MIS). Currently am conducting research proposal on Big Data Capabilities and Performance of Private Hospitals in Nairobi County, Kenya.

You are kindly asked to complete the enclosed questionnaire, as it would be helpful in implementing this research.

This questionnaire's responses will be kept in strict confidentiality and used only for academic purposes.

Thank you for your support

Jeremiah W Kelvin

APPENDIX II: QUESTIONNARE

Section A: Introduction.

Department……designation

…….

The information you will provide in this research questionnaire will be purely for academic purpose and will be treated with utmost confidentiality. Please answer by selecting with tick against provided guide

Section A: Demographic Information

1. Gender

Male [ ]

Female [ ]

2. What is your age brackets? (Tick where appropriate years)

24 and below [ ] 25-30 [ ] 31-35 [ ] 36-40 [ ] 41-45 [ ] 46-50 [ ] 50and above [ ]

3. Indicate your highest education level

Certificate [ ] Diploma [ ] Undergraduate [ ] Postgraduate [ ]

4. Please indicate the years worked in the organization

Below 1 year [ ] below 5years [ ] below 10yrs [ ] 10years and above [ ]

Section B: Big Data technology capability

Please rate how much you agree or disagree with the following claims about big data technology capability.

Key: Use a scale of 1 to 5, where 1 represents strongly disagree, 2 disagreement, 3 neutral, 4 agreement, and 5 highly agreement.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	1	2	3	4	5
Are users in your organization familiar with big data technology					
Do you think organization has exhaustively used available technology					
Are employee capable in using technological tools available in organization					
Do you think technology will contribute to growth and performance of the organization					
Do you think hospital need a change of the technology available					
Do you feel current hospital technology should be improved					
Has the organization management contributed to technology growth					
Do you think the hospital has adequate medical and ICT-infrastructure					
Do you think user training can improve technology capability					
Do you believe hospital service delivery is due to technology capability					

Section C: Service Responsiveness

Please rate how much you agree or disagree with the following claims about responsiveness.

Key :Use a scale of 1 to 5, with 1 representing "very poor," 2 "poor," 3 "average", 4"good" and "very good"

	Very poor	Poor	Average	Good	Very good
Employee competence level of employee					
Employee ability to respond to queries raised by client					
Availability of most important diagnostic services to patients					
Process flow from outpatient to in-patient and TAT					
How do you rate the information systems in your organization					
Technology growth and reliability in your organization					
How do you view sharing of knowledge in your organization					
How is your innovation process in the organization					
What is your view on management support					
How is the feedback from the hospital client					
General infrastructures available in the hospital					

Section D: Financial measures

Please rate your agreement with the following assurance related statements.

Key: Use a scale of 1 to 5, where 1 represents very low, 2 low 3 moderate, 4 high, and 5 very high.

	very low	low	moderate	high	very high
Financial stability					
Financial aid and subsidies					
Reliability of income in your organization					
Any challenges on compliance bodies					
Seasonality effects on organization					
Revenue collection turnaround time					
How are expenses when compared to income your organization					
How are average sales per month					
Do you feel there is need for training on financial measures					
Do you have management support on financial measures					
Organization growth rate					

Section E. Quality Service

Indicate your level of agreement with the following statements relating to assurance. Key Use a scale of 1-5, where (1= strongly disagree, 2= disagree, 3= moderately agree, 4= Agree and 5= strongly Agree)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Do you think organization has enough talent					
Do you think you service delivery is of great quality to customers					
Staff training will improve hospital performance					
All staffs familiar are with tools and operation process in hospital					
Organization receives regular complains on poor quality of services					
technology advancement has impacted the business service delivery					
Do you think the organization need change in service delivery dynamic					
Facility turnaround time on services is always appreciated by clients					
Do you think there is need to improve service delivery process with technology advancement					
Do you think organization culture has affected the organization					
Do you think big data analytics can bring a big change in hospital					

APPENDIX III: WORK PLAN

ACTIVITY	MAR - JUNE 2021	SEP 2021- JAN 2022	FEB 2022- SEP 2022	NOV2022 TO JAN 2023	JAN 2023	MARCH 2023
Concept development						
Proposal writing						
Proposal Submission						
Data Collection						
Data Analysis						
Project Documentation						
Project Submission						

APPENDIX IV:RESEARCH BUDGET

ITEMS	**COST (Ksh)**
Printing and binding	10000
Typesetting and binding	5000
Printing and photocopying	3000
Library and internet	10000
Data collection and analysis	10000
Contingency	8000
Grand Total	**46000**