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ARTIFICIAL INTELLIGENCE AND SERVICE QUALITY IN HEALTHCARE SERVICE PROVIDER: A CATALYST FOR SOCIO-ECONOMIC DEVELOPMENT

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ABSTRACT

The cornerstone of any business in today's market place is the extent to which the business is able to meet the needs and wants of its customers', at reasonable and affordable prices. This is because today's customers are more enlightened, more proactive, more discerning, and very much more critical due to intense completion and the vast developments in technological advancements. Hence, in the service industry and health sector, superior service delivery may likely be the winning strategic option that is available to serious minded organizations. A major strategic option could actually be the adoption of artificial intelligence in the delivery of the much needed services in the health sector. Therefore, the general objective of this paper is to examine the relationship between the adoption of artificial intelligence and quality service delivery in the health sector in Yenagoa Bayelsa state. The study adopts cross-sectional research design, this design was preferred because of the nature of the study which was conducted in multiple tertiary healthcare institutions. This design supports the use of questionnaire for data collection among the different studied organizations. The sample size of this study consists of 357 customers. The sample size for this study was determined using Taro Yamane statistics. Among others the study discovered that there is a positive and significant relationship between artificial intelligence and quality service delivery in the health sector. Hence the study recommended that Healthcare providers should prioritize the adoption of AI tools to improve assurance by enhancing patient confidence through accurate diagnoses and personalized care. Also, efforts should be made to implement AI-driven systems that strengthen reliability by ensuring consistent service delivery and reducing human error.

Keywords: Artificial Intelligence, Service Quality, Empathy, Reliability, Responsiveness, Professionalism, Assurance, Tangibility.

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INTRODUCTION

Udayalakshmi and Sridevi (2023) and Zeithaml (2020) emphasize that service quality is a dynamic construct that evolves alongside technological advancements and changing consumer behavior. Fundamentally rooted in perception, service quality encompasses both tangible and intangible elements, reflecting how effectively a service provider meets the explicit and implicit needs of its customers. This evolution is particularly evident in the healthcare sector, where remarkable improvements have transitioned services from traditional approaches to modern, technologically advanced systems. Innovations such as telemedicine, automated diagnostic tools, and advanced patient management systems have revolutionized healthcare delivery, making services more efficient, accessible, and personalized. These advancements highlight the transformative power of technology in enhancing service quality, specifically insectors where precision and reliability are paramount.

At the core of these advancements lies the transformative potential of Artificial Intelligence (AI). AI has emerged as a pivotal enabler in redefining service quality, helping businesses enhance consistency, responsiveness, and personalization. By automating processes, analyzing vast

amounts of data, and offering tailored solutions, AI has significantly reshaped service delivery processes. According to Ribeiro (2019), AI is a branch of computer science that enables machines to perform tasks requiring human-like intelligence, involving the creation of intelligent agents capable of sensing, comprehending, learning, and acting to extend human capabilities. Alan Turing (2017) further asserts that a machine can be deemed intelligent if it exhibits human-like behaviors such as reasoning, decision-making, vision, language processing, and knowledge representation.

In healthcare, the application of AI techniques has become increasingly evident, transforming medical research and service delivery. For instance, AI-driven data mining techniques have revolutionized clinical care by linking machine learning algorithms to electronic health records. These systems allow clinicians to retrieve accurate, context-relevant patient information, thereby enhancing accuracy and speed while reducing administrative burdens. Furthermore, AI applications such as natural language processing streamline clinical documentation and note-taking, enabling clinicians to dedicate more time to patient care.

Statement of the Problem

The quality of healthcare services remains a critical determinant of patient satisfaction and overall health outcomes. Service quality in healthcare encompasses timely access to care, effective communication, responsiveness, empathy, and the ability to meet patient expectations (Donabedian, 2018). Healthcare providers face significant challenges in ensuring high-quality services, which undermines patient satisfaction and trust. Issues such as long waiting times, inadequate diagnostic accuracy, limited availability of skilled professionals, and a lack of personalized care contribute to dissatisfaction among patients (Twum, 2019).

The challenges of service quality in healthcare are compounded by systemic inefficiencies, such as poor infrastructure, outdated medical equipment and inconsistent staff training. These factors not only affect the timeliness and reliability of services but also hinder the ability of healthcare providers to deliver patient-centered care (Okoli & Mbagwu, 2022). For instance, inadequate record-keeping systems and inefficient appointment scheduling often lead to delays, overcrowding and inability to address patient needs effectively, communication gaps between patients and healthcare professionals exacerbate misunderstandings, reducing the overall quality of care (Sodhi et al., 2022).

Patient complaints regarding healthcare service quality further reflect broader systemic issues in Nigeria's healthcare sector. According to WHO (2023), access to quality healthcare in Nigeria is unevenly distributed, with rural and urban areas like Yenagoa often suffering from limited resources and infrastructure. This disparity affects the quality of care and poses a significant challenge to achieving equitable health outcomes. The lack of timely and accurate diagnosis, coupled with limited follow-up care, has contributed to avoidable medical errors and poor patient experiences (Okoli & Mbagwu, 2022).

In response to the above challenges, this research aims to examine the relationship between Artificial Intelligenceand service quality of healthcare provider in Yenagoa, Bayelsa State to determine whether improve in the use of artificial intelligence could improve service quality in healthcare sector. Thus, this forms the drive of this study.

Objectives of the Study

The general objective of this study is to examine the relationship between artificial intelligence and service quality in healthcare service provider in Yenagoa, Bayelsa State.

The specific objectives aimed are to;

1. Determine the relationship between artificial intelligence and assurance in healthcare service provider in Yenagoa, Bayelsa State
2. Examine the relationship between artificial intelligence and reliabilityin healthcare service provider in Yenagoa, Bayelsa State
3. Investigate the relationship between artificial intelligence and responsivenessin healthcare service provider in Yenagoa, Bayelsa State

4. Examine the relationship between artificial intelligenceand empathyhealthcare service provider in Yenagoa, Bayelsa State
5. Investigate the relationship between artificial intelligenceand tangibilityin healthcare service provider in Yenagoa, Bayelsa State
6. Determine the relationship between artificial intelligence and professionalismin healthcare service provider in Yenagoa, Bayelsa State

Research Questions

The study seeks to provide answers to the following research questions;

1. What is the relationship between artificial intelligence and assurancein healthcare service provider in Yenagoa, Bayelsa State
2. How does artificial intelligenceandempathyhealthcare service provider in Yenagoa, Bayelsa State
3. What is the relationship between artificial intelligence and reliabilityin healthcare service provider in Yenagoa, Bayelsa State
4. How does artificial intelligenceaffect responsivenesshealthcare service provider in Yenagoa, Bayelsa State
5. What is the relationship between artificial intelligenceand tangibilityin healthcare service provider in Yenagoa, Bayelsa State
6. How does artificial intelligence affect professionalismhealthcare service provider in Yenagoa, Bayelsa State

Research Hypotheses

The following null research hypotheses were formulated and tested

H_{01}: There is no significant relationship between artificial intelligence and assurancehealthcare service provider in Yenagoa, Bayelsa State

H_{02}: There is no significant relationship between artificial intelligence and reliabilityin healthcare service provider in Yenagoa, Bayelsa State

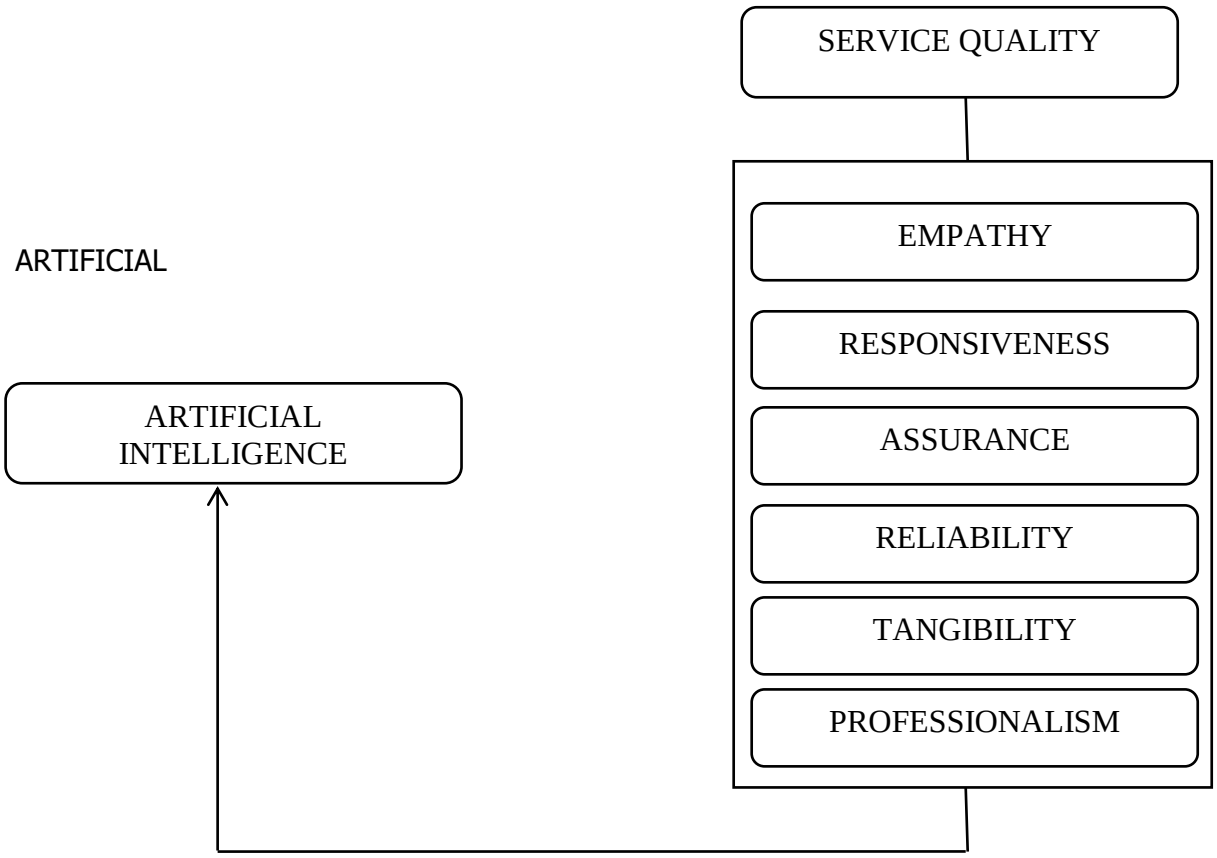
H_{03}: There is no significant relationship between artificial intelligence and responsivenessin healthcare service provider in Yenagoa, Bayelsa State

H_{04}: There is no significant relationship between artificial intelligenceand empathyin healthcare service provider in Yenagoa, Bayelsa State

H_{05}: There is no significant relationship between artificial intelligenceand tangibilityin healthcare service provider in Yenagoa, Bayelsa State

H_{06}: There is no significant relationship between artificial intelligenceand professionalism healthcare service provider in Yenagoa, Bayelsa State

LITERATURE REVIEW
CONCEPTUAL FRAMEWORK



Source:adapted from Parasuraman, Berry, and Zeithaml (1996); Ha and Jang (2010).
Fig 2.1: Conceptual framework showing the relationship artificial intelligence and service quality
From figure 2.1, artificial intelligence is seen as a multi-dimension construct that affect service quality of customers. Service quality was conceptualized to include 6 measures of empathy, responsiveness, assurance, reliability, tangibility and professionalism.

Artificial Intelligence
In the contemporary world, an increasing dependence on artificial intelligent practices exists. Albeit being introduced 60 years ago, it is only recently that we have started to fully appreciate how valuable artificial intelligence, machine learning, and deep learning are in our daily lives. It is evident in our daily lives, and examples of this canbe found all around the business world. Before diving deeper into the depths ofartificial intelligence, it is imperative to understand what the term artificial intelligence entails. Broadly, the term artificial intelligence would apply to any machine with features or characteristics like the human mind, such as critical thinking, learning, problem-solving, and strategic analysis. Narrowly, artificial intelligence refers to algorithms, programs, machines, and systems that demonstrate intelligence (Vivian, 2021).
Burns, (2023) and Mulla, (2021) opined that AI is the science and engineering of making intelligent machines, especially intelligent computer programs. This definition underscores the dual nature of AI as both a scientific discipline and an engineering endeavor aimed at creating

machines capable of intelligent behavior. It highlights the broad applicability of AI across multiple domains, where problem-solving and decision-making are critical.
Russell and Norvig (2020) describe AI as the study of agents that perceive their environment and take actions that maximize their chance of success. This perspective emphasizes the goal-oriented nature of AI systems, where the focus is on achieving desired outcomes based on environmental stimuli. By framing AI as the development of rational agents, this definition bridges the gap between theoretical constructs and practical implementations, making it applicable to various real-world scenarios.Similarly,
The European Commission (2021) defines AI as systems that display intelligent behavior by analyzing their environment and taking actions with some degree of autonomyto achieve specific goals.This definition places emphasis on autonomy, a defining characteristic of AI that distinguishes it from traditional software systems. Autonomy allows AI to operate independently, reducing the need for constant human intervention and making it a valuable tool in automation and robotics.

Service quality
There was a school of thinking in the United States that developed upon this idea and proposed five separate criteria for good service: tangibles (the physical space, tools, and employees' demeanour), reliability (the accuracy and consistency with which a service is delivered), responsiveness (how quickly and willingly a service provider responds to a customer's request), assurance (the ability to know one's stuff, be polite, and inspire trust), and empathy (the ability to treat each customer as an individual) (Parasuraman, 1996).Despite their disagreements, these theoretical traditions agree on one thing: people's attitudes and perceptions determine the quality of the service they get (Palmatier, 2008). The quality of a service, according to this model, is determined by contrasting the customer's expectations prior to and following the provision of the service. A positive impression of service quality is achieved when client expectations are met by how well the service is perceived.

Reliability
Reliability is a crucial aspect of both product and service quality, encompassing the consistency and dependability with which a system, product, or service performs its intended function over time. The importance of reliability cannot be overstated, especially in industries where high stakes are involved, such as healthcare, finance, and technology. In these sectors, even small lapses in reliability can result in significant consequences, such as patient harm, financial loss, or damage to a company's reputation (Parasuraman et al., 1985).

Empathy
Empathy is the ability to understand and share the feelings of others, is a vital component in both interpersonal interactions and service-based industries. In recent years, its importance has been recognized not only in the context of human relationships but also in how organizations interact with their customers. Empathy in customer service, for instance, involves recognizing customers' emotions, concerns, and needs, and responding in a manner that demonstrates understanding and care. It goes beyond simply addressing issues—it is about making customers feel heard, valued, and supported. Research has consistently shown that empathetic interactions lead to higher levels of customer satisfaction, loyalty, and advocacy (Saxe & Weitz, 2006).

Responsiveness
Accordingly, Van, (202) Responsiveness, in the context of service quality, refers to the willingness and ability of a service provider to assist customers promptly and effectively. It is an essential component of the SERVQUAL model, where it is defined as the speed and efficiency with which a service provider addresses customer requests, questions, and complaints. Responsiveness involves more than simply providing an answer or solutionit is about showing a commitment to meeting

customer needs and ensuring that their concerns are addressed as quickly and thoroughly as possible (Chiu et al., 2021 and Huang & Rust, 2021).

Assurance

Assurance, in the context of service quality, refers to the knowledge, courtesy, and ability of employees to instill confidence in customers about the service they receive. It is one of the key dimensions in the SERVQUAL model, alongside tangibles, reliability, responsiveness, empathy, and assurance itself Zhao et al., (2020 ; Koo et al.,(2020); Huang et al. (2023) citing Parasuraman et al., (1985).

Tangibility

Tangibility in artificial intelligence (AI) refers to the degree to which AI systems and their outputs can be perceived, understood, and interacted with in a concrete or physical manner. This concept emphasizes the accessibility and comprehensibility of AI technologies, ensuring that users can effectively engage with and trust these systems. Tangibility has been defined in various ways across disciplines, highlighting different aspects of its application. Smith et al. (2023) and lee and Kim (2022) define tangibility as the physical or visual representation of AI processes, making abstract algorithms and data more accessible to users. According to Zhang et al (2022). and Anderson and Baily (2023), tangibility is the ability of AI systems to present their functions and outputs in a way that users can directly observe or interact with.

Professionalism

Professionalism is a crucial attribute that plays a fundamental role in shaping the reputation, trust, and effectiveness of individuals and organizations. It encompasses a range of behaviors, values, and qualities, including competency, ethical conduct, reliability, and the ability to maintain appropriate boundaries in the workplace (Anderson et al., 2020). In the modern context, professionalism extends beyond technical skills and expertise to include interpersonal communication, emotional intelligence, and a commitment to continuous improvement. For instance, employees who demonstrate professionalism in their interactions with customers, colleagues, and supervisors are more likely to build strong relationships, improve team dynamics, and foster a culture of mutual respect and collaboration (Kellogg et al., 2021).

THEORETICAL FRAMEWORK

This study explores two theories: service scape gap and social exchange theory. However, the study is anchored on service quality gap theory

Social Exchange Theory

George Homans published "social behaviour as exchange" in 1958, which laid the groundwork for the social exchange theory. What he meant by "social exchange" was any kind of interaction between people, whether it was for the benefit of one another or not, and whether it was expensive or not. Referenced in Palmatier (2008), his work placed greater emphasis on the actions of individuals within the context of interdependent relationships. The premise of social exchange theory is that human conduct is a product of a process of exchanging goods and services with the goal of maximizing both the benefits and the costs (Palmatier, 2008).

Service Scape Gaps Theory

Parasuraman, Zeithaml, and Berry's (1985) Service Scape Gaps Theory has provided a foundational framework for understanding the service experience, particularly in relation to the disparity between customer expectations and the actual service delivered. This theory, which identifies gaps both within the service provider's internal operations and between service providers and customers, plays a crucial role in the field of service marketing. The gaps theory highlights the

challenges service firms face in aligning their offerings with customer expectations, particularly in industries like telecommunications, where customers often have high expectations for reliability, responsiveness, and empathy. However, in today's increasingly technological world, there is a need to adapt and expand this theory, particularly in the context of artificial intelligence (AI), to ensure that service quality is maintained or even enhanced.

EMPIRICAL REVIEW

Reem, Hossam,Maha, Elina and Mohammad (2022),examines the relationship Artificial Intelligence (AI) and its applications on the service quality provided by Jordanian banks for their customer satisfaction. Reviews the literature on the numerous emergent applications of artificial intelligence and its impact on the banking sector. A rigorous study of the available literature is conducted to examine AI's uses in banking. Artificial intelligence improves the banking experience for millions of clients and employees by providing credit score checking, system failure prediction, emergency alarm systems, fraud detection, phishing website detection, liquidity risk assessment, customer loyalty evaluation and intelligence systems by reducing the employee workload. A questionnaire gathered data from 270 consumers in Jordans banking sector. The SPSS program used exploratory factor analysis to statistically evaluate the sample data to determine service quality and customer satisfaction. The results show that the updated SERVQUAL Model extracted five subscales instead of the eight in the original model. The extracted subscales were tangibility, assurance, reliability, responsiveness, and empathy. According to this study, artificial intelligence is statistically relevant to service quality and customer satisfaction. The updated SERVQUAL model, according to the authors, helps address customer satisfaction in the banking sector. The research findings suggest that the demand for artificial intelligence in the Jordanian banking sector is equally essential for the customers; thus, there should be an optimal balance between virtual and human agents based on the customers' requirements and preferences. Further, this study found practical implications of using AI in banking, particularly those related to Jordanian customer perception.

Adebayo (2021) examines correlation between service quality and repeat purchases. The study used a descriptive research technique to look at 150 frequent customers from three different businesses in the area. To make sure that everyone was represented fairly, 60 respondents were randomly chosen. Structured questionnaires measuring dependability, responsiveness, and empathy, among other important service quality variables, were used to collect data. A statistically significant positive correlation between service quality and the probability of repeat purchases was found by SPSS regression analysis. Customers' choices to return were most affected by how responsive and reliable you were. Improving service quality is critical for keeping consumers, encouraging loyalty, and making sure a firm can stay in business, according to the survey. To boost client retention and drive repeat purchases, suggestions included ongoing staff training and consistent service enhancements.

Bello and Adeola (2022) studied the relationship between service quality and consumers' propensity to make repeat purchases at restaurants in Ibadan, Nigeria. The study used a cross-sectional survey approach and used convenience sampling to pick 50 respondents out of 100 frequent diners. We used SPSS's Pearson correlation analysis to sift through responses to our structured questionnaires, which measured service quality on aspects like assurance and tangibles. The results demonstrated a robust positive correlation between excellent service quality and intents to repurchase, demonstrating the importance of assurance and tangibles in fostering customer loyalty. According to the authors, restaurants that provide excellent service are more likely to keep their customers coming back. In order to foster deeper connections and increase loyalty, they suggested that restaurant managers prioritise on the ambiance and the calibre of their interactions with customers.

Ojo (2023) studied the relationship between banking clients' willingness to buy from the same bank again and the level of service they received. The study employed a causal-comparative research design and followed 120 account holders from two different commercial banks. Forty customers who had been engaged with their accounts for more than a year were chosen using a purposive sampling process. The data was analysed using multiple regression in SPSS after being obtained using standardised questionnaires that assessed qualities including tangibility, assurance, and responsiveness. While tangibility did not have a major impact on consumers' intentions to make repeat purchases, the results showed that assurance and responsiveness did. Ojo came to the conclusion that banks that prioritise prompt and reassuring customer care are more likely to keep clients coming back for more. Improving responsiveness and assurance methods were suggested as ways to boost client loyalty and retention.

Ifeanyi (2021) looked into the Yenagoa, Nigeria, telephone business to find out how responsiveness relates to client commitment. This descriptive study employed a random sample of 50 people to guarantee objectivity and centred on 120 regular clients of two major telecom companies. Structured questionnaires were used to gather data on responsiveness factors, such as personalised customer service and fast support. Higher levels of responsiveness were linked to increased customer loyalty, according to SPSS Pearson correlation analysis, which showed a significant positive association. Customer loyalty in the telecom industry may be greatly enhanced through responsiveness, according to the study. It suggested better training for employees to increase responsiveness and establish long-term connections with customers.

Adegoke and Adeola (2022) among Lagos, Nigeria, hotel clients. The study used a survey research approach and aimed to gain a better understanding of frequent hotel guests' experiences. Forty participants were chosen by convenience selection to provide a varied sample. Service speed and problem resolution were two responsiveness criteria that were measured using structured questionnaires. Hotel customers were more loyal when they received fast and efficient service, according to an SPSS multiple regression study that found responsiveness to have a major influence on customer commitment. Responding quickly to client needs is one of the most important factors in fostering loyalty among hotel patrons, according to the research. The use of feedback systems was suggested as a way to continually improve responsiveness, which in turn would strengthen ties with guests and encourage them to return.

Okoro (2023) investigated the connection between responsiveness and client commitment in retail banking services. A total of 90 customers from two major banks were the subjects of the correlational research study. For the purpose of obtaining useful insights on consumer behaviour, a random selection of 35 customers who had their accounts active for a minimum of one year was used. Questions about responsiveness, such as how quickly questions were answered and how well problems were resolved, were gathered using structured questionnaires. A robust positive association between responsiveness and client commitment was found by Spearman's Rank correlation analysis in SPSS. This finding emphasises the fact that responsive service cultivates stronger customer loyalty. Okoro said that banks should use digital technologies to speed up and improve the efficiency of service delivery. This would improve the relationship between the bank and its customers and encourage them to stay with the bank for the long haul.

RESEARCH METHODOLOGY

The study adopts a cross-sectional research design; this design was preferred because of the nature of the study which was conducted in multiple tertiary healthcare institutions. The target population of this study consists of customers in Federal Medical Centre (FMC), Niger Delta Teaching Hospital (NDUTH), Glory Land Hospital Yenagoa and Family Care Hospital Yenagoa all in Bayelsa State. The study population is summed up to be three thousand, three hundred and

twenty (3,320) customers. This figure was sourced from the administrative departments and accounting department 2024.

Table 1: Population Distribution

Tertiary Institutions	**No. of Customers**
Federal Medical Centre (FMC)	1112
Niger Delta Teaching Hospital (NDUTH)	962
Glory Land Hospital	654
Family Care Hospital	592
Total	**3,320**

Source: Accounting Departments of the respective Institution (2024).

The sample size of this study consists of 357 customers. The sample size for this study was determined using Taro Yamane statistics.

The Bowley's Statistics was used to determine the sample size for each institution. The simple random sampling technique was then employed to proportionally administer the copies of questionnaire to each institution based on its population.

Table 2: Sample Size Distribution

Tertiary Institutions	**Population**	**Sample Size per Total Population**	**Sample Size per Institution**
Federal Medical Centre (FMC)	1112	357	120
Niger Delta Teaching Hospital (NDUTH)	962	357	103
Glory Land Hospital	654	357	70
Family Care Hospital	592	357	64
Total	**3320**		**357**

From the Bowley Statistics, 120 customers were randomly selected from Federal Medical Centre (FMC), 103 from Niger Delta Teaching Hospital (NDUTH), 70 from Glory Land Hospital and 64Family Care Hospital.

Table 3 Cronbach Alpha Reliability Results

S/N	Dimensions/Measure	No of Items	Cronbach's Alpha
1	Artificial intelligence	5	0.712
2	Empathy	5	0.709
3	Assurance	5	0.718
4.	Responsiveness	5	0.733
5.	Reliability	5	0.726
6.	Tangibility	5	0.786
7.	Professionalism	5	0.772

Source: Survey Data, 2024

The data were coded and entered into the Statistical Package for the Social Sciences (SPSS) version 23 for both descriptive and inferential analysis. Exclusive identities were allocated to the key words in each query of the questionnaire, and numerical designations were assigned to them. Prior to data input, codes were designated to the response categories in the scale. Data analysis employed descriptive statistics, including frequencies, mean scores, and percentages. The Spearman's rank correlation coefficient was employed to examine the relationship between the

variables under investigation in an inferential manner. The Spearman's rank correlation coefficient was chosen because it is a non-parametric measure, suitable for analyzing ordinal data like Likert scale responses, without requiring the data to follow a normal distribution or the variables to be linearly related.

RESULTS AND DISCUSSION

Table 4: Questionnaire Distribution and Collection

No. Distributed	No. Retrieved	Success Rate (%)
357	296	82.9

Source: Survey Data, 2025.

Table 4.1 above shows that a total 357 questionnaires was served to the respondents drawn from the studied healthcare service providers. However, out of 357 questionnaires were distributed, out of which 296 responded. This gives us a succes rate of 82.9% which was considered appropriate for analysis because it is higher than average of the total distribution.

Univariate Analysis

This section addresses the univariate analysis of the study dimensions and measures.

Table 4.6: Descriptive Result of Artificial intelligence(n = 296)

S/N	Items	Mean	Std. Dev.
1	Artificial intelligence enhances the efficiency and effectiveness of business operations	3.2021	1.14214
2	The use of artificial intelligence improves customer satisfaction by providing personalized services	3.3410	1.27216
3	Artificial intelligence has the potential to replace traditional human roles in various industries	3.6604	1.25631
4	The implementation of artificial intelligence in businesses contributes significantly to competitive advantage	3.6170	1.47017
5	Concerns about data privacy and security limit the adoption of artificial intelligence in organizations.	3.3492	1.29474
Grand mean score		**3.3661**	

Source: Survey Research, 2025.

The table presents respondents' perceptions of artificial intelligence (AI) across five items, summarized by mean and standard deviation. The mean scores suggest a moderate agreement with the statements overall, with a grand mean score of 3.3661. Among the items, the highest mean score (3.6604) was observed for the statement "Artificial intelligence has the potential to replace traditional human roles in various industries," indicating stronger agreement. Similarly, "The implementation of artificial intelligence in businesses contributes significantly to competitive advantage" had a relatively high mean score of 3.6170, reflecting its perceived importance. In contrast, the statement "Artificial intelligence enhances the efficiency and effectiveness of

business operations" had the lowest mean score (3.2021), suggesting a slightly lower level of agreement. The standard deviations indicate variability in responses, with the highest (1.47017) observed for competitive advantage, suggesting diverse opinions among respondents on this aspect. Overall, the findings highlight the mixed but generally positive perceptions of AI's impact and challenges.

Table 4.7: Descriptive Result of Tangibility (n = 296)

S/N	Items	Mean	Std. Dev.
1	Artificial intelligence enhances the tangibility of services by providing users with virtual assistants that mimic human interaction	3.3452	1.26337
2	AI-powered tools like chatbots and virtual reality systems make it easier for businesses to deliver tangible and interactive customer experiences	3.3008	1.28103
3	The implementation of artificial intelligence in service delivery reduces the importance of tangible elements in customer satisfaction.	3.6117	1.41064
4	Tangible AI applications, such as self-checkout machines and touchscreens, improve customer perceptions of service quality.	3.3274	1.27912
5	The physical presence of AI-enabled devices in business environments positively impacts customer trust and engagement	3.3547	1.22591
Grand mean score		**3.3879**	

Source: Survey Research, 2025.

The table provides an analysis of respondents' perceptions regarding the role of artificial intelligence (AI) in enhancing tangibility within services, summarized by mean scores and standard deviations. The grand mean score of 3.3879 suggests a moderate level of agreement with the items overall. Among the items, the highest mean score (3.6117) is for the statement "The implementation of artificial intelligence in service delivery reduces the importance of tangible elements in customer satisfaction," indicating a stronger agreement with this perception. The other items, such as the role of AI-powered tools like chatbots (3.3008) and the impact of tangible AI applications like self-checkout machines (3.3274), received moderately positive responses, reflecting recognition of their contributions to service tangibility. The standard deviations range from 1.22591 to 1.41064, showing some variability in respondents' opinions, with the most varied responses on the perceived reduction of tangible elements in customer satisfaction. Overall, the findings highlight that while AI is recognized for enhancing tangible service experiences, there is also acknowledgment of its potential to shift the focus away from traditional tangible elements.

Table 4.8: Descriptive Result of Reliability(n = 296)

S/N	Items	Mean	Std. Dev.

1	Our firm is reliable	3.2121	1.19012
2	We continuously improve our services to meet the expectations of our customer	3.6064	1.22242
3	Our services improve because of our understanding of our customers	3.6332	1.29042
4	Our services are superior relative to our competitors in the industry	3.3251	1.23449
5	Customers subscribe more to our healthcare services	3.3701	1.17311
Grand mean score		**3.4293**	

Source: Survey Research, 2025.

The table summarizes respondents' perceptions of their firm's service reliability and quality, as indicated by the mean scores and standard deviations. The grand mean score of 3.4293 reflects a moderate to high level of agreement with the statements overall. Among the items, the highest mean score (3.6332) is associated with "Our services improve because of our understanding of our customers," suggesting strong agreement that customer understanding drives service improvements. This is closely followed by "We continuously improve our services to meet the expectations of our customer" (3.6064), highlighting the firm's focus on continuous improvement. The statement "Our firm is reliable" received the lowest mean score (3.2121), indicating relatively weaker agreement on reliability compared to other items. The standard deviations, ranging from 1.17311 to 1.29042, suggest some variability in responses, with the most consistent responses seen for customer subscription to healthcare services (3.3701). Overall, the data indicates that while the firm is perceived as reliable and competitive, there is a notable emphasis on understanding and meeting customer expectations to enhance service delivery.

Table 4.9: Descriptive Result of Responsiveness (n = 296)

S/N	Items	Mean	Std. Dev.
1	We are responsive to our customers	3.4120	1.82241
2	We treat customers' complaint promptly	3.3251	1.83372
3	Our customer service contacts are available and accessible to customers at all times	3.2320	1.83124
4	Our customer data base is effectively managed to have constant communication with customers	3.1361	1.61772
5	We always send emails, text messages, social media contacts to always get their comments	3.1083	1.54012
Grand mean score		**3.2427**	

Source: Survey Research, 2025.

The table provides an analysis of respondents' perceptions of customer responsiveness within the organization, as reflected by the mean scores and standard deviations. The grand mean score of 3.2427 indicates a moderate level of agreement with the items overall. Among the items, the highest mean score (3.4120) is attributed to "We are responsive to our customers," suggesting that responsiveness is a key strength of the organization. This is followed by "We treat customers' complaints promptly" (3.3251), indicating a reasonable level of satisfaction with complaint resolution. The lowest mean score (3.1083) is associated with "We always send emails, text messages, social media contacts to always get their comments," suggesting less emphasis on maintaining proactive communication with customers through modern channels. The standard deviations, which range from 1.54012 to 1.83372, indicate significant variability in respondents' perceptions, with the highest variability observed in responses to customer service accessibility and complaint handling. Overall, the findings suggest that while the organization demonstrates a fair degree of responsiveness, there are opportunities to improve proactive communication and database management to strengthen customer engagement

Table 4.10: Descriptive Result of Empathy (n = 296)

S/N	Items	Mean	Std. Dev.
1	We know our customers plights.	3.4421	1.73011
2	We furnish our customers with services in line with their purchase power	3.3263	1.73372
3	We deliver different services to accommodate all our customers regardless of their income level	3.1342	1.63124
4	Our customers are happy with our services	3.4310	1.81341
5	We empathize with our customers	3.1343	1.06721
Grand mean score		**3.2935**	

Source: Survey Research, 2025.

The table highlights respondents' perceptions of the organization's empathy and customer-centric approach, as reflected by the mean scores and standard deviations. The grand mean score of 3.2935 suggests a moderate level of agreement with the items overall. The highest mean score (3.4421) is attributed to "We know our customers' plights," indicating that the organization is perceived as fairly understanding of its customers' needs and challenges. Similarly, "Our customers are happy with our services" (3.4310) also received a high mean score, suggesting general satisfaction among customers. However, items such as "We furnish our customers with services in line with their purchase power" (3.3263) and "We deliver different services to accommodate all our customers regardless of their income level" (3.1342) indicate a moderate emphasis on inclusivity. The lowest mean score (3.1343) was recorded for "We empathize with our customers," reflecting relatively weaker perceptions of the organization's emotional connection with its customers. The standard deviations, ranging from 1.06721 to 1.81341, suggest variability in responses, with the lowest variability in empathy-related perceptions. Overall, the findings suggest that while the organization demonstrates some understanding of and responsiveness to customer needs, there is room for improvement in empathizing and catering inclusively to all customers.

Table 4.11: Descriptive Result of Assurance (n=296)

S/N	Items	Mean	Std. Dev.
1	Artificial intelligence systems enhance customer confidence by providing accurate and reliable service recommendations	3.1354	1.63443
2	AI-powered solutions, such as fraud detection systems, improve assurance by ensuring secure transactions.	3.2352	1.80012
3	The ability of AI systems to learn and adapt increases customers' trust in their service quality.	3.2061	1.72841
4	Artificial intelligence tools provide assurance by offering consistent and error-free responses to customer inquiries.	3.3423	1.61017
5	The use of AI in service delivery helps businesses demonstrate competence and professionalism, thereby boosting customer assurance	3.4125	1.16043
Grand mean score		**3.2663**	

Source: Survey Research, 2025.

The table presents respondents' perceptions of the role of artificial intelligence (AI) in enhancing customer assurance, as reflected by the mean scores and standard deviations. The grand mean score of 3.2663 indicates a moderate level of agreement with the items overall. Among the items, the highest mean score (3.4125) is attributed to "The use of AI in service delivery helps businesses demonstrate competence and professionalism, thereby boosting customer assurance," suggesting that AI's contribution to professionalism is particularly valued. Additionally, "Artificial intelligence tools provide assurance by offering consistent and error-free responses to customer inquiries" (3.3423) also received a relatively high mean score, highlighting the importance of consistency in customer interactions. Conversely, the lowest mean score (3.1354) was recorded for "Artificial intelligence systems enhance customer confidence by providing accurate and reliable service recommendations," reflecting a slightly weaker agreement on AI's role in building confidence through service recommendations. The standard deviations, ranging from 1.16043 to 1.80012, suggest varying levels of agreement among respondents, with the least variability observed in AI's role in professionalism. Overall, the findings indicate that while AI is recognized for its potential to enhance assurance through secure, consistent, and professional service delivery, there is room to strengthen its perceived reliability in boosting customer confidence.

Table 4.12: Descriptive Result of Professionalism (n=296)

S/N	Items	Mean	Std. Dev.
1	AI-powered systems demonstrate professionalism by providing prompt and accurate responses to customer queries.	3.5987	1.63443
2	The integration of artificial intelligence in service delivery enhances the perception of professionalism in business operations.	3.7358	1.80012
3	AI tools improve professionalism by minimizing human errors and maintaining consistent service quality	3.8629	1.72841
4	The ability of AI systems to communicate in a formal and structured manner contributes to a sense of professionalism in customer interactions.	3.6555	1.61017
5	Businesses that leverage AI for service delivery are perceived as more professional due to their adoption of advanced technologies	3.7860	1.11043
Grand mean score		**3.7277**	

Source: Survey Research, 2025.

The table summarizes respondents' perceptions of how artificial intelligence (AI) contributes to professionalism in business operations, as reflected by the mean scores and standard deviations. The grand mean score of 3.7277 indicates a high level of agreement across the items, suggesting that AI is generally viewed as a significant factor in enhancing professionalism. The highest mean score (3.8629) is associated with "AI tools improve professionalism by minimizing human errors and maintaining consistent service quality," highlighting the importance of error reduction and consistency in perceived professionalism. Similarly, "Businesses that leverage AI for service delivery are perceived as more professional due to their adoption of advanced technologies" (3.7860) and "The integration of artificial intelligence in service delivery enhances the perception of professionalism in business operations" (3.7358) reinforce the idea that AI adoption enhances the image of professionalism. The lowest mean score (3.5987) was recorded for "AI-powered systems demonstrate professionalism by providing prompt and accurate responses to customer queries," though this still reflects a relatively strong agreement. The standard deviations, ranging from 1.11043 to 1.80012, indicate variability in responses, with the most consistent perceptions relating to the use of AI in advanced technologies. Overall, the findings suggest that AI is highly regarded for its ability to enhance professionalism by ensuring accuracy, reducing errors, and promoting consistency in service delivery.

Test of Hypothesis

The correlation coefficient ranges from -5 to 5, where a value of 5 indicates a strong positive correlation, 0 indicates no correlation, and -5 indicates a strong negative correlation

H_{01}: There is no significant relationship between artificial intelligence and assurancehealthcare service provider in Yenagoa, Bayelsa State.

Table 4.13: Correlation Outcome on artificial intelligence and assurance

	Artificial Intelligence	Assurance

Spearman's rho	Artificial intelligence	Correlation Coefficient	1.000	.577**
		Sig. (2-tailed)	.	.000
		N	296	296
	Assurance	Correlation Coefficient	.577**	1.000
		Sig. (2-tailed)	.000	.
		N	296	296

**. Correlation is significant at the 0.05 level (2-tailed).
Source: SPSS Computation, 2025

The table presents the Spearman's rank correlation coefficient between artificial intelligence and assurance based on a sample size of 296 respondents. The correlation coefficient (rho) between artificial intelligence and assurance is 0.577, which indicates a moderate positive relationship between the two variables. This suggests that as the use of artificial intelligence increases, the level of assurance perceived by customers also tends to increase. The p-value (Sig. 2-tailed) is 0.000, which is less than the significance level of 0.05, indicating that the correlation is statistically significant.

H_{02}: There is no significant relationship between artificial intelligence and reliabilityhealthcare service provider in Yenagoa, Bayelsa State.

Table 4.14: Correlation Outcome on artificial intelligence and reliability

			Artificial Intelligence	Reliability
Spearman's rho	Artificial intelligence	Correlation Coefficient	1.000	.512**
		Sig. (2-tailed)	.	.000
		N	296	296
	Reliability	Correlation Coefficient	.512**	1.000
		Sig. (2-tailed)	.000	.
		N	296	296

**. Correlation is significant at the 0.05 level (2-tailed).
Source: SPSS Computation, 2025

The table shows the Spearman's rank correlation coefficient between artificial intelligence and reliability, based on a sample size of 296 respondents. The correlation coefficient (rho) is 0.512, indicating a moderate positive relationship between artificial intelligence and reliability. This suggests that an increase in the adoption of artificial intelligence is associated with an improvement in perceived reliability. The p-value (Sig. 2-tailed) is 0.000, which is less than the 0.05 significance threshold, confirming that the correlation is statistically significant. The findings highlight the important role of artificial intelligence in enhancing the reliability of services or systems.

H_{03}: There is no significant relationship between artificial intelligence and responsiveness healthcare service provider in Yenagoa, Bayelsa State.

Table 4.14: Correlation Outcome on artificial intelligence and responsiveness

			Artificial Intelligence	Responsiveness
Spearman's rho	Artificial intelligence	Correlation Coefficient	1.000	.634**

		Sig. (2-tailed)	.	.000
		N	296	296
	Responsiveness	Correlation Coefficient	.634**	1.000
		Sig. (2-tailed)	.000	.
		N	296	296

**. Correlation is significant at the 0.05 level (2-tailed).
Source: SPSS Computation, 2025

The table presents the Spearman's rank correlation coefficient between artificial intelligence and responsiveness, based on a sample size of 296 respondents. The correlation coefficient (rho) is 0.634, indicating a strong positive relationship between artificial intelligence and responsiveness. This suggests that as the use of artificial intelligence increases, the responsiveness of services or systems significantly improves. The p-value (Sig. 2-tailed) is 0.000, which is below the 0.05 significance threshold, confirming that the correlation is statistically significant. The findings highlight the role artificial intelligence plays in enhancing responsiveness by enabling quicker and more efficient reactions to customer needs or inquiries.

H_{04}: There is no significant relationship between artificial intelligence and empathyhealthcare service provider in Yenagoa, Bayelsa State.

Table 4.15: Correlation Outcome on artificial intelligence and Empathy

			Artificial Intelligence	Empathy
Spearman's rho	Artificial intelligence	Correlation Coefficient	1.000	.612**
		Sig. (2-tailed)	.	.000
		N	296	296
	Empathy	Correlation Coefficient	.612**	1.000
		Sig. (2-tailed)	.000	.
		N	296	296

**. Correlation is significant at the 0.05 level (2-tailed).
Source: SPSS Computation, 2025

The table presents the Spearman's rank correlation coefficient between artificial intelligence and empathy, based on a sample size of 296 respondents. The correlation coefficient (rho) is 0.612, indicating a strong positive relationship between artificial intelligence and empathy. This suggests that as the use of artificial intelligence increases, there is a significant improvement in the perception of empathy in service delivery or customer interactions. The p-value (Sig. 2-tailed) is 0.000, which is less than the 0.05 significance threshold, confirming that the correlation is statistically significant. These findings reveals the potential of artificial intelligence to enhance empathetic interactions, likely by understanding and addressing customer needs more effectively.

H_{05}: There is no significant relationship between artificial intelligence and tangibilityhealthcare service provider in Yenagoa, Bayelsa State.

Table 4.16: Correlation Outcome on artificial intelligence and Tangibility

			Artificial Intelligence	Tangibility
Spearman's rho	Artificial intelligence	Correlation Coefficient	1.000	.582**

		Sig. (2-tailed)	.	.000
		N	296	296
	Tangibility	Correlation Coefficient	.582**	1.000
		Sig. (2-tailed)	.000	.
		N	296	296

**. Correlation is significant at the 0.05 level (2-tailed).
Source: SPSS Computation, 2025

The table presents the Spearman's rank correlation coefficient between artificial intelligence and tangibility, based on a sample size of 296 respondents. The correlation coefficient (rho) is 0.582, indicating a moderate positive relationship between artificial intelligence and tangibility. This suggests that as the use of artificial intelligence increases, there is a corresponding improvement in the tangibility of services, such as making abstract or virtual services more concrete and accessible. The p-value (Sig. 2-tailed) is 0.000, which is below the 0.05 significance level, confirming that the correlation is statistically significant. These findings highlight the potential of artificial intelligence to enhance the tangible aspects of services, such as through AI-powered tools and interactive systems that mimic human-like experiences.

H_{06}: There is no significant relationship between artificial intelligence and professionalism healthcare service provider in Yenagoa, Bayelsa State.

Table 4.16: Correlation Outcome on artificial intelligence and Professionalism

			Artificial Intelligence	Professionalism
Spearman's rho	Artificial intelligence	Correlation Coefficient	1.000	.649**
		Sig. (2-tailed)	.	.000
		N	296	296
	Professionalism	Correlation Coefficient	.649**	1.000
		Sig. (2-tailed)	.000	.
		N	296	296

**. Correlation is significant at the 0.05 level (2-tailed).
Source: SPSS Computation, 2025

Table 4.16 shows the Spearman's rank correlation between artificial intelligence and professionalism, based on a sample of 296 respondents. The correlation coefficient (rho) is 0.649, indicating a strong positive relationship between artificial intelligence and professionalism. This suggests that the adoption of artificial intelligence significantly enhances perceptions of professionalism, such as through accurate, consistent, and efficient service delivery. The p-value (Sig. 2-tailed) is 0.000, which is below the 0.05 threshold, confirming that the correlation is statistically significant. These results emphasize the potential of artificial intelligence to foster professionalism in business operations by streamlining processes and demonstrating advanced technological capabilities.

Summary of Findings

The summary of the test results is presented in Table 4.21 below.

Table 4.21: Summary of Test Results

No	Statement of Hypothesis	Rho	Decision

H_{01}:	There is no significant relationship between artificial intelligence and assurance healthcare service provider in Yenagoa, Bayelsa State	0.577	Rejected
H_{02}:	There is no significant relationship between artificial intelligence and reliability in healthcare service provider in Yenagoa, Bayelsa State	0.512	Rejected
H_{03}:	There is no significant relationship between artificial intelligence and responsiveness in healthcare service provider in Yenagoa, Bayelsa State.	0.634	Rejected
H_{04}:	There is no significant relationship between artificial intelligence and empathy in healthcare service provider in Yenagoa, Bayelsa State	0.612	Rejected
H_{05}:	There is no significant relationship between artificial intelligence and tangibility in healthcare service provider in Yenagoa, Bayelsa State	0.582	Rejected
H_{06}:	There is no significant relationship between artificial intelligence and professional healthcare service provider in Yenagoa, Bayelsa State	0.649	Rejected

Source: Researcher's own compilation,2025

Discussions of Finding

Artificial Intelligence and Assurance in Healthcare Services

The study hypothesized that there is no significant relationship between artificial intelligence and assurance in healthcare service providers in Yenagoa, Bayelsa State (H01). However, the analytical findings revealed a significant positive relationship between artificial intelligence and assurance. This suggests that the integration of artificial intelligence enhances the perception of assurance among customers. AI's ability to provide accurate, consistent, and reliable information likely instills confidence in service delivery. This finding implies that healthcare providers can improve customer trust and loyalty by adopting AI-powered solutions that enhance assurance. Aligned Studies: Reem et al. (2022) highlighted the role of AI in improving assurance in customer services, including fraud detection and credit scoring systems. Ojo (2023) emphasized the importance of assurance in retaining banking clients through prompt, reliable customer care, which parallels the importance of AI-driven assurance in healthcare services.

Artificial Intelligence and Reliability in Healthcare Services

The study hypothesized that there is no significant relationship between artificial intelligence and reliability in healthcare service providers in Yenagoa, Bayelsa State (H02). Analytical results contradicted this hypothesis, demonstrating a positive relationship between artificial intelligence and reliability. This indicates that AI adoption contributes to improving the dependability of healthcare services. Through features like predictive analytics and consistent operational efficiency, AI enhances the perception of reliability among service users. The implication is that leveraging AI tools can significantly improve patients' trust in the consistency and accuracy of healthcare services.Aligned Studies: Azman et al. (2016) found that reliability significantly impacts customer loyalty in Malaysian banking services. Similarly, Mohammad and Samsul (2019) noted reliability as a critical factor in mobile services, emphasizing the need for consistent and dependable operations.

Artificial Intelligence and Responsiveness in Healthcare Services

The study hypothesized that there is no significant relationship between artificial intelligence and responsiveness in healthcare service providers in Yenagoa, Bayelsa State (H03). Analytical findings disproved this hypothesis, revealing a strong positive relationship between artificial intelligence and responsiveness. AI technologies enable quicker and more efficient responses to customer needs, improving overall service efficiency. This finding underscores the importance of AI in enhancing the timeliness and quality of interactions in healthcare services. The implication is that adopting AI-driven systems can significantly improve the responsiveness of healthcare providers, making them more adaptive to patient needs. Aligned Studies: Bello and Adeola (2022) emphasized the significance of responsiveness in driving customer loyalty in restaurants. Similarly, Okoro (2023) highlighted responsiveness as a major driver of client commitment in retail banking, suggesting parallels with healthcare services.

Artificial Intelligence and Empathy in Healthcare Services

The study hypothesized that there is no significant relationship between artificial intelligence and empathy in healthcare service providers in Yenagoa, Bayelsa State (H04). The findings revealed a significant positive relationship between artificial intelligence and empathy. AI-powered systems can interpret customer needs and emotions, fostering interactions that appear empathetic. This suggests that AI can enhance personalized care by anticipating and addressing individual concerns effectively. The implication is that healthcare providers could utilize AI tools to improve empathetic engagements, thus increasing customer satisfaction and loyalty. Aligned Studies: Ifeanyi (2021) demonstrated how responsiveness and personalization in telecom services positively impacted customer commitment, which aligns with the empathetic potential of AI in healthcare services.

Artificial Intelligence and Tangibility in Healthcare Services

The study hypothesized that there is no significant relationship between artificial intelligence and tangibility in healthcare service providers in Yenagoa, Bayelsa State (H05). Analytical results showed a significant positive relationship, indicating that AI enhances the tangibility of healthcare services. AI technologies, through user-friendly tools and interfaces, make abstract services more accessible and comprehensible to users. The implication is that healthcare providers can use AI to improve the tangibility of their offerings, thereby creating a more interactive and engaging experience for patients.

Aligned Studies: Mohammad and Samsul (2019) used the SERVQUAL model to show how tangibles influence customer satisfaction, underscoring the importance of accessibility and user-friendliness in service quality.

Artificial Intelligence and Professionalism in Healthcare Services

The study hypothesized that there is no significant relationship between artificial intelligence and professionalism in healthcare service providers in Yenagoa, Bayelsa State (H06). The findings revealed a significant positive relationship between artificial intelligence and professionalism. AI supports professionalism by ensuring accuracy, efficiency, and consistency in service delivery. This indicates that adopting AI can elevate the professional standards of healthcare providers. The implication is that healthcare organizations can achieve higher levels of service excellence and operational effectiveness by integrating AI into their processes. Aligned Studies: Adegoke and Adeola (2022) emphasized professionalism in hotel responsiveness, indicating the role of prompt and efficient service in fostering trust and loyalty. Similarly, Ping and Li-qiong (2017) highlighted how AI-driven tools can improve service efficiency, directly correlating with professional service delivery.

CONCLUSION

The study examined the relationship between artificial intelligence and service quality in healthcare service provider in Yenagoa, Bayelsa State. The analytical results showed significant relationship between the study dimensions and measures, which simply revealed that artificial intelligence and service quality has a significant relationship with assurance, reliability, responsiveness, empathy, tangibility and professionalism. Based on this result, the study concludes that artificial intelligence has significant relationship with service quality in healthcare service provider in Yenagoa, Bayelsa State.

RECOMMENDATION

1. Healthcare providers should prioritize the adoption of AI tools to improve assurance by enhancing patient confidence through accurate diagnoses and personalized care
2. Efforts should be made to implement AI-driven systems that strengthen reliability by ensuring consistent service delivery and reducing human error
3. Managementshould utilize AI technologies to improve responsiveness by streamlining communication and reducing response times to patient needs
4. AI applications should be designed to promote empathy by enabling personalized interactions and understanding patient concerns
5. Management should invest in AI systems that enhance tangibility by improving the physical environment and making healthcare processes more accessible and efficient.
6. Professional training on AI utilization should be emphasized to ensure healthcare workers effectively integrate these technologies into their practices and improving overall service quality.

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