Artificial Intelligence Technology as a Sustainable Strategy for Transforming Customer Service in the Telecommunication Industry: A Scoping Literature Review

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Abstract

The emergence of digital transformation has led to a revolutionary change in the business paradigm in the last few years. Artificial Intelligence (AI) plays a significant role in the current technological dive by provisioning better data extraction, exploration, and utilisation, resulting in more accurate predictions and performance in the market scenario. Artificial intelligence in the telecommunication sector in Nigeria is just emerging, and the awareness level generally is extremely low. Essentially, investing in artificial intelligence is necessary in the telecommunication sector to solve service delivery, analytics, and customer automation problems. Hence, this study provides a scoping literature review that attempts to explain the role of artificial intelligence technology as a sustainable strategy for improving and transforming customer service in the telecommunication industry. Thus, the study analysis synthesises current literature and found that the level of awareness of artificial intelligence has a huge impact on customer service; the level of application of artificial intelligence is key to customer service promotion, and artificial intelligence-enabled service quality has immensely contributed to customer service in the telecommunication industry. Last of all, artificial intelligence plays a significant role in ensuring quality customer service and satisfaction in the telecommunication industry; it is therefore recommended that telecom providers should invest and intensify the adoption of artificial intelligence technology so as to allow for proactive steps in fixing problems and preventing outages.

Keywords: Artificial intelligence; Customer service; Strategy; Technology; Telecommunication.

Introduction

The industrialisation of artificial intelligence (AI) has progressed in recent years in line with the growth and maturing of technologies like cloud computing, big data, and deep learning. Xu, Mu and Liu (2017) contend that artificial intelligence has drawn a growing amount of interest ever since AlphaGo defeated Lee Sedol in a Go match in 2016. Thus, numerous fields have adopted artificial intelligence technologies.

AI has made enormous strides and accomplished a lot in many fields as a revolutionary force. According to Bai (2022), the telecommunications industry makes extensive use of information and communication technology (ICT), addressing a range of consumer

demands regarding individualisation requirements, multimedia services, and precision management, which has increased the importance of network security.

By engaging in a variety of tasks that require analytical learning and thinking, resolving problems, and drawing varied conclusions, artificial intelligence is able to imitate human intellect (Lins, Pandl, Teigeler, Thiebes, Bayer & Sunyaev, 2021). Consequently, Dick (2019) refers to artificial intelligence as the ability of robots to absorb, interpret, or reason about inputs in a manner similar to that of living organisms. In the domains of computers and automation, the ability to create robots that can perform activities that previously required human faculties is a relatively recent breakthrough. Mihret (2020) expands on this description by stating that the process of creating systems with the cognitive abilities that distinguish humans, such as the capacity for reasoning, meaning-finding, generalisation, and experience-based learning, is what artificial intelligence entails.

More importantly, when artificial intelligence becomes more widely used by both individuals and businesses, it has a tremendous impact on the lives of customers. This, coupled with understanding the broad objectives that organisations hope to accomplish using artificial intelligence from virtual assistants, is one of the topics that is currently being addressed the most (Daqar & Smoudy, 2019). Meanwhile, marketers are using machine learning's capacity to link data points in order to gain insights

into their customer base (Attaran & Deb, 2018). These tools are able to analyse speech to identify sentiment, create visual representations of social media trends, and process data to produce forecasts. One of the most popular techniques over the past few years is machine learning, which is a subset of AI techniques. Over the past few years, there has been a lot of interest in machine learning, especially as a result of the expansion of data availability and improvements in computing power (Mahesh, 2020). It is a pressing concern for businesses that are having trouble managing their customer data. The ability of machine learning to connect data points is being used by marketers to gain insights into their customer base (Attaran & Deb, 2018). These tools are capable of analysing speech to identify sentiment, creating visual representations of social media trends, and processing data to produce forecasts.

A part of the large digital wave in Nigeria's telecoms business is the employment of artificial intelligence in the industry. Artificial intelligence is employed and deployed in customer communication and back-end operations in a variety of ways and at different operational phases (Agidi, 2019). In brief, telecommunications companies are better positioned to personalise products, services, and interactions based on the behaviour of specific customers by utilising machine learning to integrate and analyse data from multiple, discrete databases to form a 360-degree customer view (Mahesh, 2020). In this paper, an attempt was made to provide a synthesis of the current body of knowledge into artificial intelligence technology as a sustainable strategy for improving

and transforming customer service in the telecommunication industry. Thus, a scoping review was carried out so as to map the research done in this field systematically and to pinpoint any knowledge gaps.

Problem Statement

With the rise of e-commerce in Nigeria, the use of artificial intelligence technology in communication has become increasingly necessary. Nigeria's telecommunications industry is only starting to use artificial intelligence, and the general public has a very limited grasp of this technology (Busayo et al., 2023). Hence, the observance of the inadequacy of effective and efficient services in the telecommunication industry in Nigeria. Within this context, several customers of telecommunication companies are faced with numerous challenges that lead to complaints and grumbles in relation to poor network performances and challenges with products and services offered by the operators (Nwachukwu, 2023). There is distrust from the customers that the relationship existing between them and the telecommunication service providers is deteriorating as it takes more time to get feedback on requests and complaints (Akpoviroro, Amos, Oladipo & Adewale, 2020).

With the dynamism and innovation on the ground, artificial intelligence can be used to conveniently solve most of these problems and create customer satisfaction. Daqar and Smoudy (2019) observe that a happy customer is a great asset to the business since the customer has a high tendency to promote the brand and refer other people to it by word of mouth. In the meantime, only a handful of studies have examined how artificial intelligence affects organisations' ability to provide great customer service, and very few of these studies have focused on telecommunications operators (Busayo, Igbekoyi, Oluwagbade, Adewara, Dagunduro & Boluwaji, 2023). Accordingly, this study aims to synthesise previous studies that sufficiently and thoroughly investigate how the telecommunications sector uses artificial intelligence technology as a sustainable strategy to enhance and revolutionise customer service. Hence, the following research questions were formulated:

- What is the level of awareness of artificial intelligence among customers in the telecommunication industry?
- What is the level of application of artificial intelligence in promoting quality customer service in the telecommunication industry in Nigeria?
- What is the effect of artificial intelligence-enabled service quality on customer service in the telecommunication industry?

Research Methodology

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR) technique was employed in this study, as the method has proven to possess all the prerequisites necessary to accelerate the achievement of the objectives of the study. This is in line with the

submission by Tricco et al. (2016) that the objectives of scoping reviews are to map a wide variety of literature and identify potential gaps and creative techniques. Peters et al. (2021) add that a scoping review is a sort of evidence synthesis with the goal of locating and mapping pertinent data regarding the topic, field, context, idea, or issue under review that satisfies pre-established inclusion criteria. Basically, literature mapping is a method for locating and analysing connections between scholarly works and current research (Kraus et al., 2022). In recent times, scoping reviews have become more widely used and published across a variety of academic fields (Khalil et al., 2021). Essentially, Arksey and O'Malley (2005) created a six-stage methodological framework in an effort to offer guidance to authors doing scoping investigations. This entails identifying the research topic, searching for pertinent studies, selecting studies, charting the data, compiling, summarising, and reporting the findings, and consulting with stakeholders. In order to clarify or validate study findings. The authors sought assistance and support from four independent librarians before embarking on this study. Thus, the librarians assisted with search documentation, knowledgeable citation management, and grey literature searches. This aided the development of a thorough search strategy.

In order to ensure that all pertinent literature to date was included in the analysis, the review was undertaken in six discrete stages using the recognised PRISMA-ScR methodology (Tricco et al., 2018). First, a review etiquette was created, outlining the selection and organisation of keywords and phrases.

Second, in order to narrow down the publications that were relevant to the paper review, the inclusion and exclusion criteria for those articles were identified. Third, pre-defined phrases that were keyword combinations were used to do the paper search. Before completing data extraction and synthesising the results, the articles that the search turned up were thoroughly evaluated. The next subsections provide a more thorough explanation of the stages that were previously indicated.

Search Results

In the identification process of this scoping review paper, nine thousand three hundred and fifty-nine (n= 9,359) records were found from different databases. The search process mainly focused on the role of AI as a sustainable strategy for improving and transforming customer service in the telecommunication industry. The outcomes of the database searches were reduced to fit in according to the research aims and the inclusion criteria. By eliminating the duplicated records, a total of four thousand, one hundred and twenty-seven records (n = 4,127; 44.1%) met the search criteria and were left for further screening. By eliminating records not relevant to the research aim, a total of three hundred and twenty-two (n = 322; 3.4%) records met the eligibility criteria. By limiting the records, the search to customer service, full-text assessment and eligibility, a total of (n = 48; 0.5%) eventually met the criteria and were found relevant to be included in this study. The PRISMA flow diagram for search steps is shown below (see Figure 1).

Figure 1. *A PRISMA Flowchart of the Study Selection Process*
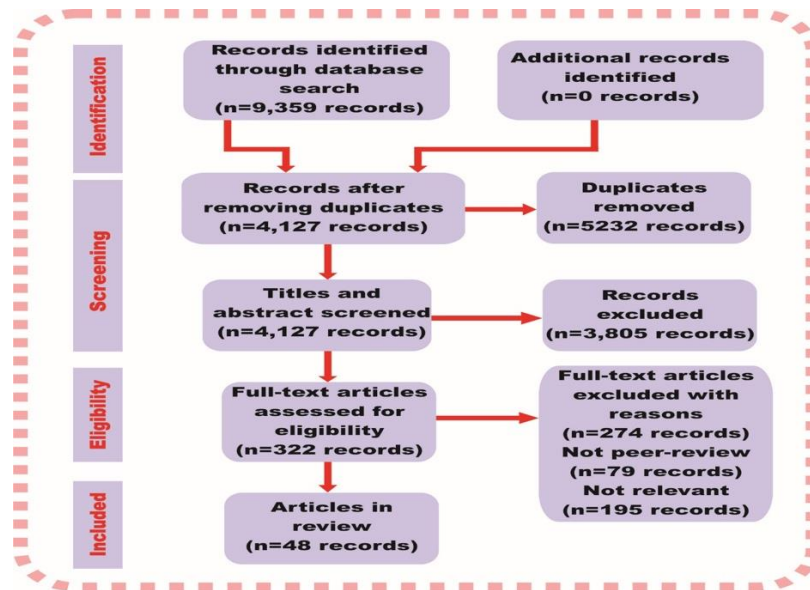
Source: Adapted from Tricco et al. (2016)

Development of Review Protocol

The method of PRISMA extension for scoping reviews (PRISMA-ScR), checklist and explanation by Tricco (2018) was used to create a review protocol for the review of the literature. The key research topics, search technique, inclusion, exclusion, and quality criteria were all outlined in the review protocol. The protocol also specified the synthesis technique, and the review process was driven by the following research inquiries: What is the level of awareness of artificial intelligence among customers in the telecommunication industry? What is the level of application of artificial intelligence in promoting quality customer service in the telecommunication industry in Nigeria? What is the effect of artificial intelligence-enabled service quality on customer service in the telecommunication industry? These research questions served as the foundation for choosing the next steps, keyword sets, and data sources to employ.

Eligibility Criteria

For the scoping review, a number of inclusion and exclusion criteria were used to establish parameters. The studies that were included were those that concentrated on how AI technology can be utilised to enhance or revolutionise customer service in the telecommunications industry, or how AI is adopted and employed in the telecommunications industry for the context of customers' satisfaction. However, studies that focused solely on technical

aspects of AI, analysis of challenges associated with the adoption of AI, ethical approaches of AI, and AI technology modelling were outside the purview of the articles that were selected. Besides, research using mixed-methods, quantitative, and qualitative approaches were included in order to take into account various elements of assessing the contribution of AI to the provision of high-quality customer service in the telecommunications sector. More essentially, as the telecommunications industry has only recently begun using AI with innovative techniques, only publications from the years 2015–2023 were included in the review. Articles were disregarded if they did not adhere to the study's conceptual framework, which is centred on the application of AI in the telecommunications industry for improved service delivery, such as a means of fostering long-term customer satisfaction and service excellence. More so, articles that were not written in English were also disqualified from review. The scoping literature review also included journal articles, conference proceedings, and book series. Nonetheless, blogs, reports, and dissertations were not included, nor were any other publications that had not undergone peer review.

The first step in the search strategy was to form search strings. Three sets of keywords were created (see Table 1). The first set contains keywords related to AI and associated technologies, the second set involves the telecommunications perspective, and the third set of keywords encompasses customer service and associated values. Keywords from the three sets were combined to form the search string using wildcard symbols in order to reduce the number of search strings. To identify potentially relevant documents, the search terms were applied in the search engine Google Scholar, as well as several other electronic databases such as Search Proquest, Scopus, Research Gate, RePEc, Business Source Complete, Leeds Beckett, Archive Scholar, Emerald, Science Direct, Taylor & Francis, Guavus, Springer, Web of Knowledge, Academia, IEEE Xplore, Growing Science, and the Research Management. Besides, the search strategies were drafted by an experienced librarian and further refined through team discussion. This was done to ensure that all relevant articles had been indexed. Moreover, the collection of articles occurred between March 2023 and July 2023. The final search results were exported into EndNote, and duplicates were removed by two library technicians.

Search Technique and Sources of Information

Table 1. *Keywords used in selection of Articles.*

Thematic Category	Keywords

AI Technologies	Artificial intelligence, computer technology, machine intelligence, natural intelligence, cognitive automation, human intelligence, cognitive technology, AI application layer, robotic automation, data processing, data extraction, data analysis, natural language processing, expert systems, AI framework, cognitive layer, genetic algorithms, intelligence agents, neural networks, AI dimensions, computer vision, robotics, machine learning, speech recognition, cognitive insight, process automation, machine learning, deep learning, neural network, perceptual intelligence, cognitive intelligence, decision-making intelligence, perception layer, experience-based learning, AI techniques, AI-enabled service, sound recognition, AI awareness, AI applications, supervised learning, machine vision, cognitive application, image recognition, adaptive algorithms, machine perception, chatbots, image recognition, big data.
Telecommunications	Telecoms sector, communication firms, telecommunication companies, telecommunication industry, internet providers, service provider, business value, analytical learning, firm reasoning, problem solving, decision-making, organisational opportunities, organisational objectives, organisational goals, organisational benefits, organisational process, service delivery, organisational change, organisational performance, organisational adaptation, complaints handling, organisational approach, employees quality, technological skills, productivity, professionalism, telecoms data storage, telecoms processing capacity, cyberspace management, competitive advantage, process innovation, precision management, transformation, business process management, network security, digital transformation, business strategy, operational phases, transformation process, telecoms activities, organisational efficiency, company growth, corporate value, telecoms products, telecoms services, network management, telecoms operators.

Customer Service   Customer service, customer value, consumer demands, customer satisfaction, customer happiness, customer benefits, service delivery, service revolution, multimedia services, virtual assistants, customer insights, customer base, customer sentiments, social media trends, service upgrade, service expansion, service transformation, customer communication, customer feedback, customer ratings, customer behaviour, customer complaints, customer management, customer relationship, customer requests, customer awareness, service quality.

Screening and Eligibility Assessment

All of the authors independently reviewed the forty-eight articles that were selected for this study following a careful eligibility check, evaluated the publications' merits, discussed the findings, and updated the screening and data extraction manual, in order to assure consistency among reviewers. The titles, abstracts, and full texts of all papers found through the searches for possibly relevant publications were evaluated sequentially by each of the six reviewers. The articles were scrutinised to make sure proper research methodology was used, the findings were clearly stated, and the findings were pertinent to the body of literature, general knowledge, and achievement of the objectives set for this paper. Essentially, conflicts between authors regarding research selection and data extraction were settled by consensus and, where necessary, discussion with other reviewers. For one thing, these quality standards guarantee that the articles that were still available after this stage added something worthwhile to the review process. For another thing, following this stage, forty-eight (48) articles remained for data extraction and synthesis.

Data Extraction and Synthesis of Results

Four reviewers worked together to create a concept matrix that helped to decide which variables to extract, how to classify the research, and how to summarise the results. This was accomplished by scrutinising the articles and compiling their data into a spreadsheet. It is simpler to compare studies when they are organised in this fashion, and it is also simpler to understand the data in higher-order ways. The studies were examined based on the following areas of focus: the level of awareness of AI among customers in the telecommunication industry, the level of application of AI in promoting quality customer service in Nigeria's telecommunication industry, and the effect of AI-enabled service quality on customer service in the telecommunication industry. The information documented included the key definitions, study designs, measures adopted, theories employed, pertinent findings, and other significant study concepts. The data extraction was carried out by three of the reviewers using the created matrix, and through an iterative process, all the reviewers came to an agreement on the context included in each category. Before the results were

summarised, all forty-eight papers were examined and included in the concept matrix.

Conceptual Framework

Artificial Intelligence Concept

Artificial intelligence, also known as machine intelligence (MI), is intelligence displayed by machines as opposed to natural intelligence (NI), which is intelligence exhibited by humans and other animals. It is perceived as any object that detects its surroundings and acts in a way that increases the likelihood of accomplishing its objectives (Zaki, 2019). A relatively recent field in computers and automation has made it possible for machines to perform jobs that previously required human faculties. According to Brynjolfsson and McAfee (2017), artificial intelligence is able to mimic human intelligence by performing a variety of tasks that require analytical learning and reasoning, problem-solving, and decision-making. People's dependence on technology has reportedly grown dramatically as a result of AI's efficient performance of cognitive activities. Besides, tools based on artificial intelligence are capable of processing massive amounts of data as well as extracting and analysing data at breakneck speeds. According to Mihret (2020), related artificial intelligence technologies such as natural language processing (NLP), computer vision, robotics, machine learning, and speech recognition have made significant strides over time to combine into systems that act, think, learn, and continuously adapt. The creation of machines that can think like humans do, including learning, reasoning, and self-correction, is the brain behind the creation of artificial intelligence. It also aims at how technology might advance to enable computers to demonstrate characteristics of human intelligence, such as learning, adapting, and self-correction (Lake, Ullman, Tenenbaum, & Gershman, 2017). Moreover, Ghaffar, Kaplanoglu and Nasab (2023) submit that artificial intelligence is the ability of a machine to comprehend and interpret sounds and languages, solve issues, diagnose medical conditions, operate vehicles on the road, play board games like chess, and mimic impressionistic paintings. Frank et al. (2019) add that the labour market may be severely impacted by the rapid progress of AI and automation technologies. While automation and AI can boost the productivity of some individuals, they can also displace others from their jobs and, in the long run, potentially revolutionise almost all professions.

Artificial Intelligence Dimensions

The following are the artificial intelligence dimensions:

i. **Expert Systems (ES)**: According to Hunt (2012), the field of expert systems is the most significant applied dimension of AI. It is a knowledge-based system that applies information from its application domain and makes inferences to resolve issues that would typically call for human skill or competence. Expert systems' strength mostly comes from the detailed information about a limited subject that is kept in their knowledge base. It's crucial to emphasise that expert systems support decision-makers, not act in their place.

ii. **Neural Networks (NN):** Neural networks, also called artificial neural networks, attempt to mimic the human brain's actions. It is a device or program that is designed in the shape of neurons in the human brain, and it is a variety of deep learning technology which falls under the family of AI (Oneto, Bunte, & Navarin, 2022). Neural Network is viewed as a process of processing information in a manner similar to the human nervous system, and the main thing is the different structuring of the information processing system by processing large amounts of unconnected information to solve special problems.

iii. **Genetic Algorithms (GA):** An algorithm is a set of instructions that are repeated to solve a problem. The word genetic refers to the behaviour of algorithms that can resemble biological processes. It is also inspired by Darwin's theory of natural selection to solve optimisation problems, especially with incomplete or incomplete information or even limited computational ability (Latifi, Mahdavinezhad, & Diba, 2016). More so, Ajam (2018) claims that genetic algorithms are designed to function similarly to how people solve problems by modifying and rearranging component parts using techniques like reproduction, transformation, and natural selection.

iv. **Intelligence Agents (IA)**: An intelligence agent is an object that can perceive the environment in which it is present through the sensors that this object possesses and then respond to it by means of the actuator or prey mechanisms. It is a knowledge-based implanted within information systems that are dependent on the computer or its components to make

it smarter; also, it is an end-user program or method for carrying out events (Petropoulos, 2018).

The General Framework of Artificial Intelligence

Figure 2 presents the overall structure of AI. Perceptual, cognitive, and decision-making intelligence are all involved in the creation of AI. The breakdown of the general framework of artificial intelligence is given in the work of Xu et al. (2021). A machine is said to be perceptually intelligent if it possesses the fundamental senses that humans take for granted, such as sight, hearing, touch, and so on. Cognitive intelligence is a more advanced capacity for deduction, thinking, and knowledge acquisition. In order to give robots thinking logic and cognitive ability similar to human beings, it is inspired by cognitive science, brain science, and brain-like intelligence. When a machine possesses perception and cognition abilities, it is frequently assumed that it will behave rationally and make the best choices possible to enhance human life and industrial production. To expand data science and produce optimal outcomes, decision intelligence necessitates the application of applied data science, social science, decision theory, and managerial science. The infrastructural layer of artificial intelligence, backed by data, storage, and processing capacity, ML algorithms, and AI frameworks, is necessary to realise the goals of perceptual intelligence, cognitive intelligence, and decision-making intelligence. It can then learn the internal rules of data for supporting and developing AI applications by training models. The application layer of AI is expanding and thoroughly integrating with cyberspace, human life, social

governance, industrial manufacturing, and basic sciences, which has a significant impact on our jobs and way of life.

Figure 2. *The AI Application Layer*
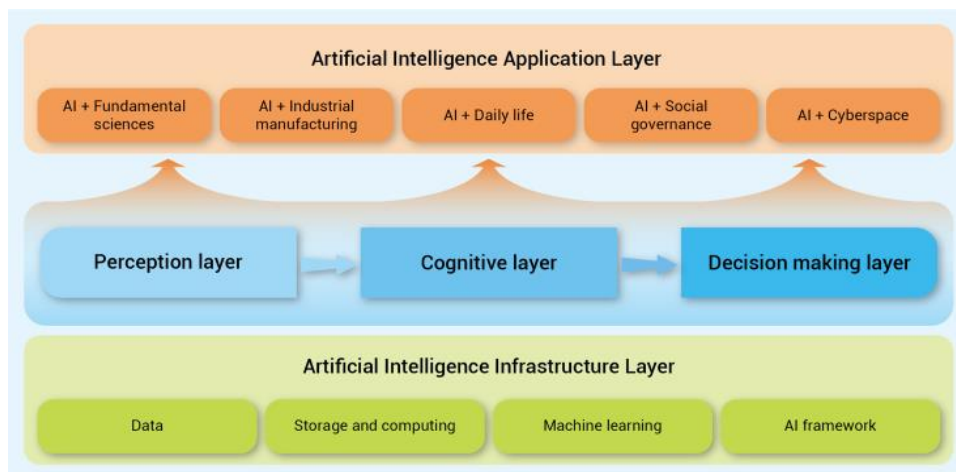
Source: Xu et al. (2021)

Synthesis of Literature Review

The findings from the scoping literature review are presented in this section and are organised based on the thematic codes that were discovered during the examination of previous studies. The research approach was followed in the analysis phase that produced the results. The study concentrated on three areas in order to evaluate the body of information on the use of AI technologies in the telecommunications industry as they affect customer service: the level of awareness of AI among customers in the telecommunication industry, the level of application of AI in promoting quality customer service in Nigeria's telecommunication industry; and the effect of AI-enabled service quality on customer service in the telecommunication industry. The section is organised such that it concludes with a summary of the expectancy disconfirmation theory, which is the most widely used theory in the research on AI and customer service.

Level of Awareness of AI among Customers in the Telecommunications Industry

Customers' level of awareness of artificial intelligence, according to a study by Sjödin, Parida, Palmié and Wincent (2021), essentially enables the deployment of AI-enabled services to power and build up machine learning and artificial intelligence networks. Thus, with the programmable architecture of artificial intelligence technology, customers can continue to evolve their ideas as workloads change. Therefore, customers' level of awareness of artificial

intelligence affects every aspect of their lives, whether it is as overt as Alexa or as covert as the monitoring of individuals' social media activities. According to Mero (2018), the real-time nature of chat services has changed customer support into a two-way dialogue with major implications on word-of-mouth intentions as well as trust, satisfaction, and repurchase. The most popular method to get customer service during the past ten years has been through chat services. Human chat service agents have increasingly been replaced by conversational software agents like chatbots in recent years, which are systems designed to communicate with human users using natural language (Pfeuffer, Benlian, Gimpel & Hinz, 2019). This trend is largely due to technological advancements in artificial intelligence.

Chatbots, content production, and consumer analytics are just a few of the ways that customers are utilising artificial intelligence (Ameen, Tarhini, Reppel & Anand, 2021). Moreover, Chen, Chan-Olmsted, Kim and Sanabria (2022) express that customers consider voice-assisted artificial intelligence as a valuable addition to their lives for convenience and simple tasks. More importantly, such innovations and awareness enable the delivery of high-quality customer service in addition to the economic opportunities this generates (Sarker, Hoque, Uddin & Alsanoosy, 2021). Additionally, buyers typically accept artificial intelligence marketing since it is perceived as inevitable. Customers are generally amazed by the sophistication and intelligence of artificial intelligence, as well as by what it is capable of (Ameen et al., 2021). Customers are consequently interested in the ability of artificial intelligence to personalise marketing messages and experiences. Customers do understand that data collection enables artificial intelligence to serve them through customisation, according to Puntoni, Reczek, Giesler and Botti (2021), add that AI-powered telecom solutions personalise the customer experience by providing highly relevant recommendations and content, increasing customer engagement and loyalty.

The Level of Application of AI in Promoting Customer Service in Telecoms Industry

According to Naderializadeh, Sydir, Simsek and Nikopour (2021), machine learning is currently used in mobile networks to enhance data transmission to and from base stations. The radio properties are influenced by the separation between users, the number of users connected, and particular environmental factors. As a result of the continual rise in customer expectations, organisations cannot avoid making efforts to improve the customer experience. Busayo et al. (2023) argue that telecom providers employ speech recognition and natural language processing AI technologies to construct voice assistants, which aid customer interaction with chatbots. To improve customer experience, telecom operators have created a variety of AI systems, including the intelligent customer service system, the smart business hall, and the smart home (Chen et al., 2021). Moreover, in order to enhance effectiveness and customer happiness, algorithms are being utilised to dynamically determine which portion of the spectrum should be used for each user and with which

parameters (Almuhanna & Alharbi, 2023). Thus, AI is used to modify the settings of these algorithms.

According to Chen et al. (2021), the use of AI in telecom services produces a considerably higher level of personalisation for clients based on their purchase histories, data consumption patterns, frequency of calls, and length of calls. Better phone calls and data connections for online conferences are all possible thanks to this level of personalisation, which also includes the development of personalised service plans and offers. Additionally, the use of intelligent chatbots, intelligent voice assistants, interactive voice response systems, and other tools has diminished the need for human-to-human interactions, allowing telecom companies' service portfolio to provide the highest level of customer support with the resources at their disposal (Adam, Wessel & Benlian, 2021). More so, Huang and Rust (2018) claim that artificial intelligence is currently a major source of innovation and is being used more and more in telecom services. Robots employed in homes, hospitals, hotels, restaurants, and telecommunications, for example, have automated many parts of customers' lives. Additionally, self-service has replaced customer service thanks to virtual bots. Moreover, big data AI systems are utilised to replace portfolio managers, and social robots like Pepper are used to replace human greeters in customer-facing businesses (Cossins, 2019). According to Larivière et al. (2017), the ongoing use of AI is now revolutionising how clients interact with service providers in the telecoms sector. Due to AI technology's developing capacity to handle queries autonomously, conversational agents and

other AI-enabled technologies are applied in a range of business scenarios to increase the effectiveness and efficiency of text-based service delivery (Sarker, 2021).

According to the research done by Busayo et al. (2023), the use of artificial intelligence in telecommunications has significantly increased value for both users and operators while also assisting in the resolution of a number of challenging and oftentimes vexing issues. Therefore, with AI, this enormous accumulation of previously unused data is transformed into fertile ground for creating new services, improving the quality of those that already exist, boosting the user experience, and optimising business operations (Adam et al., 2021). Hence, AI and machine learning have enabled the telecommunications sector to gain crucial commercial insights. Due to the enormous quantity of big data that the telecom sector has access to, AI uses it to segment customers in order to make effective and efficient decisions, calculate a customer's lifetime value, and make purchase recommendations (Yayah, Ghauth & Ting, 2017). Furthermore, Dixit (2022) claims that artificial intelligence applications in the telecommunications industry help communication service providers build self-optimizing networks to improve customer satisfaction, lower customer care costs, prevent outages and maintain a certain level of network quality. Additionally, AI systems automatically detect and accurately forecast anomalies in these networks (Busayo et al., 2023). Additionally, they have the ability to proactively

optimise and reorganise the network in order to deliver higher-quality services.

The Effect of AI-Enabled Service Quality on Customer Service in the Telecoms Industry

Service quality is the ability of a company to meet the expectations of its customers regarding its service offerings while also covering any discrepancies that might exist between the level of service that customers expect and the level of satisfaction they actually receive (Zouari & Abdelhedi, 2021). The exchanges between customers and employees, in which staff attempt to gain an advantage to affect customers' impressions and the image of the carriers, make up the act of providing quality service (Rashid & Rokade, 2019). According to Ramya, Kowsalya and Dharanipriya (2019), the notion of service quality takes into account both the process of service delivery and the results of the service. Thus, in the highly competitive market of today, service quality and customer retention have long been acknowledged as being essential for success and survival (Ibojo, 2015).

Bordenave (2018) claims that the quality of AI-enabled service enhances the dependability of customer services based on the assumption that it can support objective client interactions, even if most of these data are often not sensitive. The use of chatbots and other AI-assisted customer support technology is an automated strategy that improves the customer journey (Schanke, Burtch & Ray, 2021). Because many AI-enabled services are developed on the self-service paradigm, a carefully designed user interface is sometimes referred to as a critical success

component of such services. According to Bharadiya (2023), since AI has complete control over the design's visual elements, typography, animations, and graphical data, it actually has the power to radically alter the user interface. More so, an AI-enabled service that customers perceive as polite, courteous, and attentive raises customer confidence in the company (Wang & Lin, 2017). Besides, AI-powered customer care technologies can effectively reduce the volume of call centre inquiries and, as a result, aid telecom companies in cost-saving efforts.

Moreover, Almuhanna and Alharbi (2023) aver that real-time traffic analysis and network reconfiguration are two things that AI-enabled services are good at, and AI-enabled systems do alter network settings and re-route traffic to healthy nodes as necessary to respond to local equipment failures and clogged channels. Additionally, one of the things that AI-enabled services in telecommunications have done really effectively is fraud identification and prevention. Anti-fraud analytical tools can detect suspicious behaviour patterns and immediately block related services or user accounts by processing call and data transfer logs in real time (Brynjolfsson & McAfee, 2017). Thus, with the integration of machine learning, the systems can operate even faster and with greater accuracy. Furthermore, Daqar and Smoudy (2019) submit that a variety of business-critical procedures are automated and streamlined in the back office by using AI-enabled services, which reduces overhead costs and enhances planning. Hence, increased financial efficiency leads to a higher return on investment and more funds available for capital

expenditures, which in turn boosts customer satisfaction. Misischia, Poecze and Strauss (2022) observe that AI-driven chatbots and virtual assistants are gradually replacing live operators in the telecoms sector in order to cut costs and give customers a quicker, more convenient way to get their questions answered and issues resolved. Besides, AI-enabled services that improve the user experience for self-service are advantageous for the telecommunications industry. Besides, with the widespread usage of natural language processing, interacting with chatbots has grown more conversational (Dick, 2019).

Theoretical Review

The expectancy disconfirmation theory was adopted by the majority of the articles reviewed in the course of this study. Moreover, the theory best describes the purpose and serves as the foundation for the study.

Expectancy Disconfirmation Theory (EDT)

The Expectancy-Disconfirmation Theory was identified by Oliver in 1977 as the most promising theoretical framework for evaluating consumer happiness. According to the paradigm, consumers make purchases of goods and services with anticipations of how they will perform. The level of expectation then serves as a benchmark for evaluating the quality of the good or service. In other words, when the product or service has been used, results are compared against predictions. Confirmation takes place if the result is as anticipated. Disconfirmation happens when expectations and results do not match up. When expectations and perceptions differ positively or

negatively, a consumer is either satisfied or unsatisfied. Therefore, when service performance exceeds the customer's initial expectations, there is a confirmation between expectations and perceptions that leads to satisfaction, whereas when service performance is as expected, there is a confirmation between expectations and performance that leads to satisfaction. In contrast, there is a negative disconfirmation between expectations and perceptions when service delivery is below what the customer anticipated, which results in unhappiness.

Discussion of Findings

This paper conducted a scoping review into artificial intelligence technology as a sustainable strategy for promoting and transforming customer service. This section offers the findings of the study gathered from pertinent literature relative to the field under examination. With respect to the formulated research questions, the following findings were made:

To begin with, the study's findings revealed that the level of awareness of artificial intelligence has a huge impact on customer service in the telecommunication industry. This finding buttress that of Abayomi, Adenekan, Abayomi, Ajayi and Aderonke (2021), who found that awareness of innovative technologies will enable efficient user satisfaction and further create improved customer service. According to Chao, Hsu, Liu and Cheng (2020), AI awareness and its applications are crucial, especially for those who are pursuing

information technology (IT) and relevant degrees since they will be the next generation of AI designers and users.

In a similar vein, the study found that the level of application of artificial intelligence is key to customer service promotion and customer transformation in the industry. This result complements the findings of Satheesh and Nagaraj (2021) that millions of customers undergo multiple transactions in a day as a routine. The data generated by the customers is stored and maintained as a big database. Now, AI has made it easy to reduce manual labour from the employee and customer perspectives. This kind of sophisticated work has become a simple task, which was unprecedented prior to the machine learning techniques. Nowadays, internet banking and mobile banking are attractive to customers due to the deployment, effectiveness, and user-friendliness of AI technology (Feyen, Frost, Natarajan, & Rice, 2021).

In addition, the research presented in this paper demonstrates that artificial intelligence-enabled service quality has an immense contribution to customer service in the telecommunication industry. This is consistent with research results carried out by Ameen, Tarhini, Reppel and Anand (2021). The findings indicate the significant role of trust and perceived sacrifice as factors mediating the effects of perceived convenience, personalisation, and AI-enabled service quality. On a final note, this study has established that

telecommunication operators in recent times have intensified the practice of artificial intelligence technology deployment to boost marketing communications. Meanwhile, more opportunities have been created to reach a wider market across the globe. Clearly, the use of artificial intelligence in marketing communication enabled smart segmentation of the target market section. This study suggests that artificial intelligence is playing a significant role in integrated marketing in favour of telecommunication companies.

Conclusion and Recommendations

This study aimed to assess artificial intelligence technology as a sustainable strategy for improving and transforming customer service in the telecommunication industry. Thus, the results of the scoping review indicated that the level of awareness of artificial intelligence, the level of application of artificial intelligence and the effect of intelligence-enabled service quality on customer service experience are tremendously enormous. The study, therefore, concludes that artificial intelligence technology is critical to the sustainable offering of quality customer service and customer satisfaction in the telecom industry. Hence, it is recommended that telecom providers should invest and intensify the adoption of artificial intelligence technology so as to allow for proactive steps in fixing problems and preventing outages.

Limitations and Future Research

The inferences of this work are vital to future researchers who may like to undertake a similar

study notably in the service industry such as bank, insurance, pension, education and more. This paper mainly relied on a review of previous works for its findings. The results of this scoping review may not be substantial. Hence, future research should explore research hypotheses and other empirical means to carry out multiple regression or *ex-post facto* analysis. This will enhance further analysis of the topic under investigation, more so create room for valid and reliable comparison of results.

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