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Impact of Artificial Intelligence to the Future of the Adamawa State Economy

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***Abstract* - Apparently, the life of an average Nigerian is characterized by economic hardship which keeps deteriorating at a frightening rate. Against this backdrop, the central aim of this treatise is to examine the popular notion that Digital Economy is the hub of "internet fraudsters" and Artificial Intelligence will render many jobless in the nearest future; thereby compounding the their already poor economic state. The four crucial concerns that constitute the problem of this study include the skill and technological gap that characterizes Nigeria's Digital Economy, Artificial intelligence taking over human jobs, digital fraud and biases in some AI algorithm/data. Instead, accelerated and augmented access to faster and improved quality internet, up-skilled tech literacy and aptitude pool, an effervescent start-up ecosystem, access to a wide variety investment and partnership opportunities have the incredible prospect of drastically improving the living standard of Nigerians. Therefore, the paper concludes that Artificial Intelligence and Digital economy, if creatively and reasonably deplored will better the lot of Nigerians, economically.**

Keywords: Artificial Intelligence, Digital Marketing, Marketing Analytics, Consumer Behavior.

I. INTRODUCTION

With technology advancing daily, businesses are always looking for the next new innovative project [1]. The advancement of a self-sufficient programmed, a system with cognitive capabilities, is on the rise in the developed nations. The effects of modernization and automation of the economy will change the foundation of how businesses will evolve [2]. Artificial intelligence has been a major topic and research content all over the world. It is the attempt to assimilate computer technology with human physiology by formulating computer programmed to make computers smarter. The input of human thinking into machines was a proposition in the 1950s and has been in development ever since. As it continues to grow, many industries are seeking for possible opportunities to invest in robotics and development of "thinking" computer systems. The current economic state of modernized countries is already adapting to the new Artificial intelligence featured services, such as airport support (robots in Korean airports) and online chatting help desks [3]. Some industries specialized in customer relations sectors are diving deeper into employing artificial intelligence to enhance customer service. The involvement of artificial intelligence has proven its advantages to several industries around the globe. The merging of considerable precision and less computation time makes artificial intelligence a revolutionary innovation [4]. Distinct industries already rely heavily on the advanced technology for analyzing customer algorithms such as Amazon and Alibaba. These companies prove that they are dependent on their algorithms to attract more consumers and increase sales through the collection of primary information about their target market/consumers. It is imperative to state that the developments of artificial intelligence generate both positive and negative perceptions. Technological advancement enabled the possibility of replacing human labor in manual and cognitive routine tasks [5]. Humanity is constantly striving for modernization and solutions to obstacles but due to computers becoming smarter and AI governing, our society needs to conservatively consider how this may or may not affect future employment in various industries. With artificial intelligence developing and its increasing awareness etc [6].

II. LITERATURE REVIEW

2.1 Artificial Intelligence

Artificial intelligence, also known as an expert system is the theory of machines imitating the ability of cognitive thinking. AI is the science of building intelligent machines from large volumes of data and learning from experience to perform human-like tasks. The concept of a neural network was first introduced by John Mccarthy, who is also known as the father of artificial intelligence [7]. The implementation of natural human intelligence into machines has been considered by many well-renowned individuals as one of the most important changes in mankind. Understanding how artificial intelligence influences the current economy and potential changes it might bring is recognizing the different types of AI. The capacity levels of Artificial intelligence are divided into three groups, Narrow, General and Super AI. Narrow AI, also referred to as weak artificial intelligence, and has limited

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capabilities [8]. It can only execute one narrow task and cannot operate beyond its limitations.

2.2 The AI Involvement

Artificial intelligence plays an enormous role in certain industry sectors. Many businesses are implying and adapting to the new norm of making work more efficient and cost effective [9]. The smart artificial intelligence machines interact with customers and also improve cognitive strengths to help employees with their work in many industries. These new updates are reasons for leading tech companies to continue to develop advanced AI features. Recent research and experiments are shaping our future. Artificial intelligence is involved in various industries that are adapting to the digital transformation [10]. The applications of AI are separated into their section of capabilities due to its limitation of performances. Cognitive science applications are programs that resemble human intelligence. In order for an AI to be recognized as a cognitive science application it requires a learning system, neural network, expert system, genetic algorithm, and intelligent agent [11]. For the intelligent program to be fully involved in diverse sectors, it still requires an extensive amount of testing and research. The manufacturing sector deploys artificial intelligence with robotic applications for assembling and packaging processes to reduce costs and for higher accuracy [12]. The human-like ability of artificial intelligence is becoming more desirable, to the extent where it is being implemented in many industries including the customer service division. The involvement of AI is very evident in many corporations and also in daily human surroundings. Innovative artificial intelligence is at the beginning stage of shaping the fundamentals of business operations. The more AI develops and grows the more influential it becomes in changing the future economy and society [12].

2.3 Collaborative Innovation

Digitalization has rapidly changed the way of communication and the way of operation. Co-creation is another factor where businesses gain insights on making improvements on services and operations from consumers. The increase in easier accessibility to the World Wide Web enabled the rise of customers to become more involved with the design process of products [13]. The exchange of words between two entities creates the potential of data becoming more available, resulting in the modification of long established business procedures. Artificial intelligence can be formulated as an expert system that shows potential capability to perform functions that emulate human cognitive skills. Gathering data from consumers and potential consumers is crucial to improve one's service and decision-making. Artificial intelligence approaches challenges in order to produce the optimal results or in the event of ambiguity, the most beneficial solutions. AI implementations pursue answers to detailed and organized issues that demand the application of logic [13]. To utilize the Implementation of artificial intelligence enhances the process of personalized customer service and its vast and detailed information savings. The competence of artificial intelligence in collecting, analyzing external/internal structured/unstructured, and the interpretation of data, led to the increase of implementing computer systems that may have a major impact in the future of possibly outperforming human abilities [14].

2.4 Growth Potential of Innovative Technology

The assertions of technology leaders and venture capitalists indicate the rapid progress of information technology (IT) in various sectors. Increasing computer power/capabilities and developing improved cloud infrastructures. Machine learning is the backbone of artificial intelligence [15. Most computer programs were created by human intelligence inputs and outputs. On the contrary, machine learning applications are able to identify solutions with large data sets and work on its own without human intervention. As data resources have grown meticulously, AI has made remarkable strides in perception and cognition, which are important attributes for implementation into the labor environment [15]. As time progressed and technological advancement increased, the error rate was down to more than five percent in 2021, lower than the human error rates. Such indication displays significant milestones in technological advancements. This actively demonstrates that the foundation of economics might potentially become influenced with new conveniences for increased value of a business and reduction of operation costs [16].

2.5 Innovators building the future

Well-known innovators, who actively seek improvements of our world, have changed our world through their inventive ideas that often seemed impossible. It requires breaking through the status quo to invent something that seems unrealistic. Starting from determined dreamers to studious scientists, they have all contributed to great innovation and continue to help make special attributes to advance our society. Several new Innovators emerged in the context of AI in the last decade. Artificial intelligence will have a great impact on the efficiency of the future economy. Therefore, influential innovative firms identify the potential of the expert system as the technology that will advance the prospect of the world. The success of artificial intelligence not only depends on the development process of companies that seek innovation and technological advancement, but it also depends on the

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level of intelligence within technology [17]. Achieving a long lasting competitive advantage is one of the factors that drive companies to reach higher goals.

2.6 E-commerce

New technology is disrupting and maturing the customer experience in the retail industry. Many industries are facing the adaptation of advanced technology. Identifying artificial intelligence applications in any market field will mostly stimulate a change or a redesign in the business model. The full implementation of AI into any industry is still at the beginning stage despite its advancement in recent years [18]. The clear understanding of the importance of artificial intelligence in the retail industry will produce an advantage in the future. The capability to operate with large quantities of data is crucial to a successful enterprise and data driven decisions are becoming decisive measures in a supply chain [19]. The reliance on processing and analyzing information decides the outcome of efficiency and profitability. Technology with AI has prospered into a powerful tool to amplify sales growth and enhance electronic commerce operations. Companies currently present AI in e-commerce through search/recommendation engine and optimal pricing.

2.7 Manufacturing

The production capacities have increased through the implementation of AI in various sections of the manufacturing processes [20]. A concentration of facilities specialized in the production of specific goods enabled for the overall growth of manufacturing capabilities and efficiency in operation. Employees clocked-in and out at exact times to fill and avoid any pauses in productions. The manufacturing sector is a key role in a company's supply chain network and the global supply chain. The rise of demand requires facilities to increase its production capacities. To become and maintain a lucrative manufacturer in today's exhilarating competitive global economy requires determined innovation to achieve higher levels of productivity [20]. Innovations that can determine an optimal outcome are the additional applications of artificial intelligence. Modern manufacturing facilities need an updated manufacturing operation network. As global competitiveness becomes more challenging to handle and companies seek efficiency, sustainability and increase of profitability, corporations are shifting to focus on long-term collaborations with advanced technology to have a greater possibility to reach the desired objective of becoming a leading enterprise [21]. The process of the production of complex goods is time consuming and enabling the full functionality of software systems with advanced artificial intelligence applications can speed up the operation. The full utilization of advanced technology can enable the increase in profitability for companies with long term goals of implementation. A database containing previously composed outputs enables BMW's artificial intelligence software to evaluate segments of illustrations in ongoing production and compare them to the images in the dataset faster than any human can perform [21].

2.8 Labor Market

The labor market is the supply and demand of the workforce. It can be seen as the employees providing the supply and the employers contributing to the demand. Factors like globalization and technological advancement have forced the population to either adapt or get left behind [22]. It is known that throughout the decades, progress eliminated jobs but also created new ones. When the demand for certain types of jobs decreases and the supply remains with no change, disruption in the economy, poverty and unemployment are possible outcomes. The era of digitalization has opened up many new opportunities for the upcoming labor force. As information availability becomes more accessible over time, the labor markets flexibility increases, meaning that the ability of the markets to respond and adapt to the developing economic conditions become more possible [22]. Automation and artificial intelligence create optimistic outcomes of productivity and economic growth but may have negative effects on millions of people in the world having to seek for other occupations or upgrade their skill sets [23]. The complete transformation of operations may leave many in concern for their future. It has sparked a dilemma and disagreements among various individuals. The forecast ranged from promising to disastrous with estimated number differences of millions. Despite the disagreements about the influence artificial intelligence has on job creation or job destruction, the enforcement of AI will disrupt labor markets in the majority of its sectors [24].

III. MATERIALS AND METHODS

The necessity of choosing the right methods for the collection of various data is of high importance as it can be essential for determining how and what type of information is needed. This research proposal demand the insights and experience preferred sample population regarding AI. The author will utilized open-ended questions for gathering information, as it is often applied for measuring public opinion [22]. The central objective of this research as the nature of this proposal and its research topic requires a phenomenological approach, the online survey will be created to explore how influenced artificial intelligence technology is in the current economy and examining what the perceptions are towards it. The first part of the survey includes close-ended questions for only collecting demographic factors to identify the background information of the participants. The main part of

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the survey contains open-ended questions to best collect the participants' experience. Open-ended questions provide the participants the opportunity to share their responses in their own words. The purposive sampling strategy is the selection of certain individuals who can contribute substantial information [23]. The research questions of this proposal demand a sample of a population with some knowledge on artificial intelligence. Once the sample population has been identified, the respondents are approached through various channels. In order to reach out to the participants, a Google form with a link will be utilized to send out the online survey. It will be created with simple structures and instructions that will be easy to follow in order to avoid any complications. In an effort to reach the qualifying respondents, multiple email reminders, text messages and phone calls will be diligently executed in order to acquire all participants to fill out the survey. The study is set to take place in Yola South Local Government Area of Adamawa State. The research will go a long way in helping to examine the extent of how Artificial Intelligence (AI) is utilized in the current economic system and the different perceptions it receives.

IV. RESULTS AND DISCUSSIONS

Table 1: Items total statistics

Items	Scale Mean	Scale Variance	Corrected Items
Artificial Intelligence	12.4541	13.482	0.394
BigData	13.1762	13.907	0.338
AI Platform	11.7072	12.586	0.357
Machine Learnung	11.6873	13.599	0.357
Awareness	10.9479	13.960	0.151

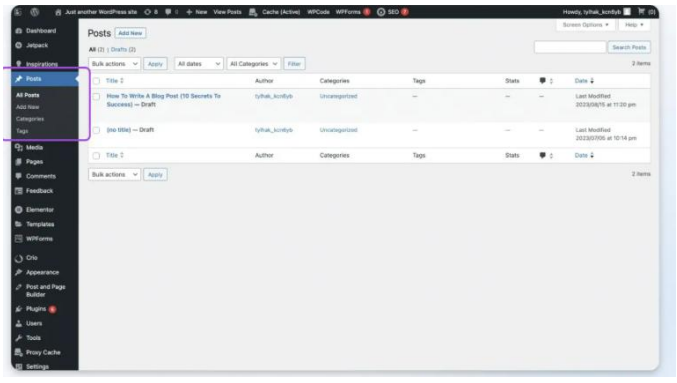

Figure 1: Blog tools generating data for marketing activities

Figure 1 shows blog tools, combined with analytics, generate valuable data for marketing activities by providing insights into content performance, audience behavior, and overall marketing strategy effectiveness (Feroz*et al.*,2024). This data helps marketers optimize campaigns, understand customer journeys, and make informed decisions for better ROI. By leveraging blog tools and analytics, marketers can gather valuable data that helps them make informed decisions, optimize their campaigns, and improve overall marketing performance.

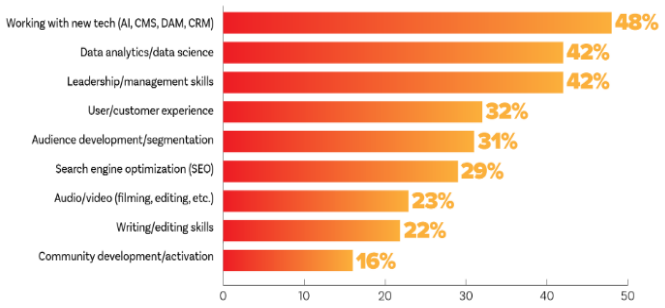

Figure 2: AI Showing the Content Creation for the study area

Figure 2 portray AI for content creation which generate, optimize, and repurpose various types of content like text, images, and videos (Prakash & Sabharwal, 2024). These AI-powered tools leverage machine learning and natural language processing to revolutionize the way content is created.

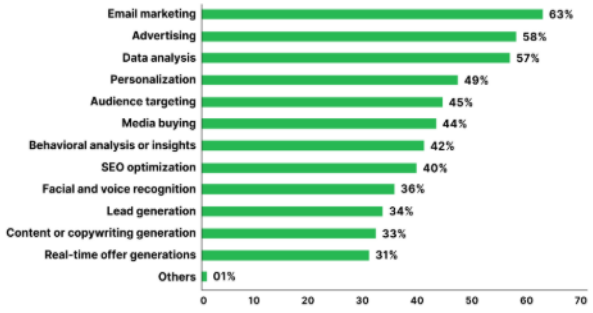

Figure 3: AI Showing status in customer engagement

Figure 3 portray AI role in understanding customer status and driving engagement by analyzing data, predicting behavior, and personalizing interactions. It helps assess customer health, anticipate needs, and improve the overall customer experience. Creative development has the highest percentage followed bystrategy, then leadership. This could be as a result of organization/company interest.

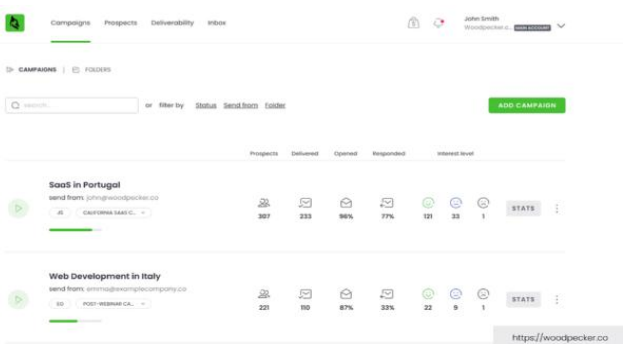

Figure 4: AI showing automated email marketing campaigns

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AI analyzes email marketing data shown in figure 4 above portray an algorithms to sift through large datasets and identify patterns in user behavior, engagement metrics, and campaign performance (Arora & Thota, 2024). It tracks how recipients interact with emails such as opens, clicks, and conversions and uses this data to predict future behaviors. Automated email marketing has also been around for years. However, AI tools can help produce more engaging email content and learn about your email list behaviors. The goal is to have your marketers spend less time researching and brainstorming so they can focus on sending successful campaigns. As AI expands and improves, automated email marketing software becomes even more important to include in your marketing stack. HubSpot Content Assistant can help you create marketing emails. Write a prompt about what you'd like to promote from a discount to a webinar to a blog post and AI can generate a message with the right tone (Arora & Thota, 2024).

V. CONCLUSION

This study shows the impact of AI on marketing brand awareness leading to brand recognition for Social businesses. The findings from this study might be helpful to marketers who are looking to incorporate AI in their operations to achieve brand recognition for Social businesses. However, companies need to take the positive sides and the drawbacks of the integration of AI into consideration before going ahead with it. The conceptual framework has shown that brand awareness is a moderating variable that helps in the achievement of brand recognition because of the implementation of AI marketing. It can therefore be concluded.

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