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Original Research Article

Artificial Intelligence and Competitive Advantage of Micro, Small and Medium Enterprises (MSMEs) in Anambra State

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Abstract: Companies are adopting artificial intelligence (AI) to be innovative, improve their strategies and differentiate themselves from competitors. This research on Artificial Intelligence and Competitive Advantage of Micro, Small and Medium Enterprises (MSMEs) in Anambra State. The objective is to examine the extent of the introduction of AI in achieving competitive advantage among MSMEs in Anambra State. This study made use of a Survey Research Design, and the population was 1399 MSMEs from the state. Krejcie and Morgan's 1970 sample size determination formula was used to get a sample size of 301. The analysis for the study was carried out using both descriptive and inferential statistics and the hypotheses were tested at a 5% level of significance. The study revealed that there is a statistically significant positive relationship between data-driven targeted online adverts and increase quality lead generation for ($r = .922$; p-value < 0.05), The study, therefore, concluded that using data-driven targeted adverts will lead to generating quality that need little effort on converting to paying customers. Sequel to this, the researches recommend among others that the MSMEs in Anambra state need to increasingly rely on data in decision-making, especially in running adverts, as this will give them the opportunity to choose who sees the advert and will lead to generating quality leads which will boost their competitive advantage over their rivals.

Keywords: Artificial Intelligence, Competitive Advantage, Targeted Online Adverts, Lead Generation, Micro Small and Medium Enterprises (MSMEs) and Anambra State.

INTRODUCTION

Companies are increasingly adopting artificial intelligence (AI) as a solution. AI is a part of a technological movement known as the fourth industrial revolution, industry 4.0, or digital transformation (Grandinetti, 2020). Technology has morphed over the years, from when computers and their deployment in businesses were the only technology people are talking about, to what is on the lips of almost everybody today, "Artificial Intelligence (AI)". This was the position of Helm, Swiergosz, Haeberle, Karnuta, Schaffer, Krebs and Ramkumar (2020) when they state that AI is on everyone's lips and will — many authors in theory and practice agree — dominate the coming years of business. AI is a catalyst that is presently disrupting normal operations in the business world and even in private lives, where functions that are hitherto performed by individuals, are now being handled by intelligent machines most times, more effectively and efficiently. Choi and Ozkan (2019) aver that AI is a disruptive technological development that, together with robotics, is changing the operating model in companies in every one of its basic functions. It is considered to be the biggest commercial opportunity in today's fast-changing economy, estimated to increase global Gross Domestic Product (GDP) growth by 15.7 trillion United State Dollars (USD) by 2030 (Rao & Verweij, 2017).

AI entail when machines start functioning in such a way that if humans function, they will be regarded as intelligent people. A popular standard definition that is supposed to cover the essential facets of AI goes back to 1955, in which McCarthy, Minsky, Rochester, and Shannon define AI as making a machine behave in ways that would be called intelligent if a human were so behaving (Floridi, 2019; McCarthy, Minsky, Rochester, & Shannon, 1955). These machines can be taught to respond or behave in certain ways that could be regarded as intelligent, or they can be programmed to learn on their own to improve on their functions as new information and data are fed into them. Whichever way, AI seems to have come to stay and big businesses appear to be jumping onto the trend, a trend which MSMEs in Anambra State appear to be still observing, and consequently lagging.

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Today, AI has come out of the realm of science fiction and has entered our homes (Reddy & Singh, 2022). It has gone from, in the twentieth century, being a branch of knowledge in the field of computer science with limited application and restricted by the capabilities of the hardware of the time, to becoming a vital element for the development of industry and services of 21st-century society (Ruiz-Real, Uribe-Toril, Torres & De Pablo, 2021). While many organizations, including MSMEs in Anambra State seem to struggle with scaling it and capturing the value, AI-leading organizations such as Google, Amazon, Tencent and Alibaba in the front are succeeding with hard tasks to scale AI projects and generate insights into valuable outcomes and creating a competitive edge for their businesses (Aarstad & Saidl, 2019).

What gives firms a competitive advantage has changed over the years, and technology has played an increasingly significant role in that context. Amesho, Edoun, Naidoo and Pooe (2022) posit that competitive advantage has metamorphosed over time as a result of technological innovations and modernisation, and recently AI. AI has provided a new way for organizations to enhance their resilience and competitive advantage (Yulia & Wamba, 2022). It offers a greater advantage as it may accelerate the decision process in identifying, prototyping, and testing novel solutions (Belhadi, Mani, Kamble, Khan & Verma, 2021). The implementation of AI over the last decade has led to organizational successes creation of competitive advantages that are difficult to imitate (Olan, Arakpogun, Suklan, Nakpodia, Damij, Jayawickrama, 2022). As such, organizations are gradually embracing the benefits of AI (Arakpogun, Elsahn, Olan & Elsahn, 2021).

Organizations are deploying a range of AI tools and solutions such as machine learning and deep learning to improve their forecast accuracy and detect problems at an early stage (Burian, 2021). Other categories of AI that organizations could deploy are the use of ChatBots, language recognition and processing, image recognition, and object manipulation. Others are natural language processing (NLP), learning systems, gaming systems and object detection (Greenberg, 2017). The deployment of these AI tools and technology could greatly reduce the cost of operations of firms, increase efficiency and effectiveness and ultimately improve the performance of organizations, MSMEs inclusive. Sadly, the MSMEs in Anambra state appear to be left behind in the opportunities that lie in the deployment of AI systems and components in their operation. Many SMEs especially in Africa shy away from AI deployment because of a seeming assumption of it being the exclusive preserve of multinational corporations, because they presume it is expensive for smaller firms (Arachie, Dibua & Idigo, 2023). This situation may be responsible for MSMEs perpetually remaining small; they hardly grow to become big corporations. It is against this backdrop that this study was necessitated to examine the role AI could play in giving these firms a competitive edge over others.

The broad objective of this study is to examine the relationship between Artificial Intelligence and the Competitive Advantage of MSMEs in Anambra State. Specifically, the study seeks to:

a. **Determine the relationship existing between data-driven targeted online adverts and increase quality lead generation for MSMEs in Anambra State.**

REVIEW OF RELATED LITERATURE

Artificial Intelligence (AI)

Intelligence is a concept that is usually associated with humans. When people function in ways that bring results, think out of the box and do things that are usually difficult for others to do and proffer solutions to issues, such people are regarded as intelligent people. However, the advent of technology has made it possible to create machines that function in such a way that solving problems is made seamless, effective and efficient, thus, bringing the concept of Artificial intelligence (AI) to bear. AI is the assemblage of ICT techniques, gadgets, software and processes that are capable of imitating the intelligence level of humans; making machines perform tasks that are hitherto performed by people that are regarded as intelligent beings. In support of this position, Arakpogun *et al*., (2021) aver that AI is a collection of ICTs that imitate human intelligence. It enables machines to perform cognitive functions previously only associated with human minds (Rai, Constantinides & Sarker, 2019).

Grover, Kar and Dwivedi (2020) opine that AI is a system's capacity to learn by analysing the data from its external environment and using that knowledge to modify existing plans or create new ones in response to environmental changes. This includes using algorithms (such as machine learning for text analytics, and predictive models) to extract patterns from data (Sturm, Gerlach, Pumplun, Mesbah, Peters, Tauchert... & Buxmann, 2021), as well as using robotic automation and virtual agents to support business processes (Davenport & Ronanki, 2018). It is the theory and creation of computers to carry out operations that ordinarily call for human intelligence, such as voice recognition, visual perception, and decision-making (Rai, Constantinides, & Sarker, 2019).

The primary purpose of deployment of AI especially in businesses is to improve performance by reaching more customers, making data-driven decisions, increasing speed, accuracy and making for effectiveness and efficiency of processes. Arakpogun *et al*., (2021) assert that the primary essence of AI deployment is to improve jobs, create greater efficiencies, and drive economic growth. AI is used to assure the improvement of technology, product, process, knowledge, experiences

and organisation (Ferreira, Mueller & Papa 2020; Knudsen, Lien, Timmermans, Belik & Pandey, 2021).

Data-Driven Targeted Online Adverts

Online advert is nothing quite like traditional adverts on radio, television or even newspapers or usage of churches, town meetings, mosques and other places. In the world of AI, adverts have now taken a whole new dimension, and the concepts of targeted adverts are increasingly taking centre stage. With data-driven targeted online adverts, specific people in specific areas and at specific times can be targeted for adverts. For instance, an MSME that is into selling laptops and phones can decide to target only people between the age of 20-40, these groups are regarded as people who would know how to use these devices and who may have the money to buy. Similarly, if the business is located in Anambra state, for the sake of location, the advert may target more people within the southeast and south-south while excluding those in the North-East or North-West. These are the things that AI can do for you, using Facebook for instance as the means of running the online advert, the algorithm with utilize the data fed by users to look for those whose ages fall between the age bracket of those targeted, and those that have selected Southeast and South-South as their location. With this type of data-driven targeted adverts, the people that will see the adverts will be people that can potentially afford the products and are within the region or zone of the business. This cannot be achieved with traditional adverts on radio or television because everybody will see or hear about the advert and there may not be any real metrics to measure how many people have seen the adverts and how many people have taken action to reach out to the business owners. All these are made possible by AI-driven targeted online adverts the likes.

The role of AI in marketing and adverts is humongous, but only those who have foresight can see it. With AI, more people can be reached, with relatively more ease and lesser cost in the long run. AI brings data to bear, and everything can be measured, like how many people have been reached by the advert, how many people have taken action and even the extent of how many people have purchased the product. AI plays an important role in processes related to marketing (Chopra, 2019; Lee, Dabirian, McCarthy & Kietzmann, 2020; Li, Hou, Yu, Lu, & Yang, 2017; Stalidis *et al*., 2015; Wirth, 2018); customer management (Marinchak, Forrest & Hoanca, 2018); product launches, after-sales services and stock management (Sheta, Ahmed & Faris, 2015; Soltani-Fesaghandis & Pooya, 2018); or in the implementation of industry 4.0 processes (Lee & Park, 2018; Ramakrishna, Ngowi, De Jager & Awuzie, 2020). AI enables machines to analyse enormous volumes of data to find patterns, gain insights, and take appropriate action in response to those discoveries (Rai, Constantinides, & Sarker, 2019).

Competitive Advantage

Competitive advantage entails having an edge over other firms. That is, doing something better than your competitors or offering something that others do not. It could be something as small as a good, friendly and cosy environment. That thing an organization does better than others that endears customers to them and others find it difficult to imitate defines the competitive advantage of a firm. Since the advent of technology and its deployment in businesses, organizations have increasingly been seen to want to build a competitive edge over others using it. Management scholars surmise that AI changes the sources of competitive advantage (Daugherty & Wilson, 2018; Davenport & Kirby, 2016), but offer contrasting views on how this change occurs. Similarly, Amesho, Edoun, Naidoo and Pooe (2022) opine that digital technologies and AI have progressed to the point where their implications for competition and competitive results have become far more significant.

The utilisation of technology and development of AI strategies will help the organisation to adapt itself to the dynamic condition and improve its competitive position (Li *et al*., 2020b; Santoro *et al*., 2018). The sanctified treasure of an organisation's success is to gain a long-term strategic competitive advantage, in which an organisation outperforms its competitors and does not destroy that advantage soon, and AI is one of the surest ways to achieve this (Amesho, Edoun, Naidoo & Pooe, 2022). The incorporation of AI into companies is increasing, as reflected in the report of MIT Sloan Management Review (2017) (in collaboration with Boston Consulting Group), which shows that 85% of CEOs consulted believe that AI offers competitive advantages to their companies, although its implementation is carried out slowly, with 20% of companies digitized with this technology.

With the potential to alter the laws of competition in many industries, the development of AI can be considered a disruptive innovation (Buntic, Dami, & Duevi, 2021). Implementing AI has the potential to spur new business model development and allow industry disruption (Armour & Sako, 2020). To obtain a competitive edge and to support domestic businesses in competing with multinational corporations, several nations have begun to invest in AI (Bunti, Dami & Duevi, 2021). Companies that pioneer certain applications of AI may significantly boost the economies of the nations in which they do business (Horowitz, Allen, Kania & Scharre, 2018). This is especially true for first-mover advantages that are challenging to duplicate and copy, such as heavy computing techniques (Bunti, Dami & Duevi, 2021).

Quality Lead Generation

A potential consumer or prospect who has expressed interest in a product or service is referred to as a "lead" in marketing and Internet advertising. A person becomes a lead when they demonstrate interest by giving

their contact information or by doing a certain activity, such as completing a form or signing up for a newsletter. The method of luring and seizing these prospective clients is referred to as "lead generation."

Online advertising campaigns, content marketing, search engine optimisation (SEO), social media marketing, and email marketing are just a few of the tactics that marketers use to create leads. Building a database of people who have expressed interest in a specific brand, product, or service is the goal of lead generation campaigns. Following lead capture, marketers may develop a connection with the lead by supplying pertinent offers and information with the ultimate objective of turning the lead into a paying client.

Lead generation is significantly influenced by online adverts. In order to draw in potential clients, advertisements are strategically placed on websites, search engines, social media platforms, and other online channels. These advertisements frequently have a call-to-action (CTA) that invites viewers to act, such as clicking on the advertisement to go to a website, completing a form, joining a mailing list or coming directly to w whatsapp direct message (DM) of the advert creator or business owners. Users that click on the CTA become leads, which the company may contact to further engage and win their business.

Lead generation is a crucial step in the sales funnel that assists companies in identifying and cultivating new clients, ultimately resulting in growth and profit. Some leads can be regarded as quality leads while others may not be quality leads. Quality leads are defined as those leads that are willing to make a buy decision within the shortest possible time with little persuasion. A quality lead exhibits appropriateness, intent, the accuracy of data, degree of involvement, fit with the desired consumer profile, a reliable lead source, and timely interest or need.

Data-driven targeted adverts can considerably aid in generating quality leads because data analysis enables the identification and segmentation of certain audience groups according to pertinent demographics, behaviours, interests, and preferences. Businesses may acquire leads who are more likely to be sincere about their interest in the advertised product or service by creating advertising that appeals to these target audiences. Also, businesses may carefully target their advertisements to individuals who fit their desired client profile using data-driven insights. Similarly, by utilising data, it is possible to tailor and personalise advert material in accordance with user preferences and previous actions. Data analysis aids in the identification of the platforms, websites, or channels that are most suitable for the placement of advertisements. Businesses may increase visibility to the appropriate individuals and raise their chances of obtaining quality leads by knowing where the target audience is most likely to be. Data-driven advertising offers insightful information about how well ads work, including metrics for engagement, click-through rates, and conversion rates. Data-driven targeting makes it possible to conduct retargeting campaigns, which are designed to get in touch with people who have previously shown interest in the company but may not have converted into leads or customers. Finally, data-driven targeted advertisements enable businesses to maximise their marketing initiatives by addressing the appropriate audience with individualised content and boosting the likelihood of obtaining high-quality leads who are more likely to become devoted clients.

Theoretical Framework

This work is anchored on the Resource Based View (RBV). This theory was propounded by Penrose in 1959. However, over time the RBV was further developed by scholars such as Wernerfelt (1995) and Barney and Conner (1991). According to Barney (1991), RBV provides the theoretical mechanisms through which resources are linked to competitive advantage. It portrays people's cognitive talents as a significant source of advantage since they are heterogeneously dispersed, scarce, and challenging to replicate. As a result, when managers apply these competencies to make strategic decisions and solve problems, performance disparities result (Helfat & Peteraf, 2015; Kunc & Morecroft, 2010). However, the RBV's forecasts regarding how AI deployment would impact decision-making competitive advantage are not conclusive. The RBV anticipates that the advantage conferred by humans' cognitive talents will diminish as AI takes its place (Peteraf & Bergen, 2003). This is due to AI's almost negligible marginal reproduction costs and low imitability hurdles as a technological resource (Brynjolfsson & McAfee, 2014). As a widely used technology, AI enables the creation of special bundles of previously unrelated resources, such as medical professionals' expertise and AI's machine prediction (Agrawal, Gans, & Goldfarb, 2018). On the other hand, if AI complements humans' cognitive abilities, the RBV expects it to generate benefits (Argyres & Zenger, 2012).

The link of this theory to the work is that AI standing on its own may not be able to give firms a competitive edge as it has little or low barriers, that is, just any company with the resources and the know-how can replicate the AI usage. However, when AI adoption complements human intelligence and ingenuity, that is, when AI is there only to help humans complete what they started or to perform what humans have helped to set up, then it will be a competitive edge. Humans' initiation, innovativeness and ingenuity will be difficult to replicate and when it is combined with the effectiveness and efficiency of machines or systems (AI), then it becomes a source of competitive advantage.

Empirical Review

Himanshu, Chandrika and Rabindra (2022) conducted a pilot study to assess the influence of AI on the operating performance of companies in Bhubaneswar India. They aimed at establishing the relationship and exploring the influence of AI on the operational performance of companies in different sectors in India. The study was based on secondary data which has been collected from annual reports of sample companies. The sample companies under study comprise manufacturing, telecommunication, and IT companies for the period from the year 2004 to 2018. The statistical software i.e., Ms. Excel and EViews 10 have been used to run the t-test and panel regression model for statistical inferences. The study found that AI has a significant influence on companies operating costs as well as operating profits.

Dhruv, Ritu and Manish (2022) examined the relationship between Digital Advertising (DA) and Artificial Intelligence (AI) and their impact on creating a suitable Marketing Strategy (MS) for any organization in India. The study was descriptive; the survey method was used for the collection of data. AI Survey Instrument (Weng, 2020), and Marketing Strategy Scale (Weng, 2020), whose face, discriminant, and construct validity were measured. Apart from this, Cronbach's alpha coefficient (α) and composite reliability (CR) were calculated to measure their reliability. Analysis of required data was done by using the SPSS software package (ver. 22) in the form of descriptive statistics as well as the SmartPLS software utilizing inferential statistics and structural equation modelling (SEM). The study revealed that the way we communicate with consumers has changed marketing. It was morphing every day and that's where the big shift has happened. The big change that is happening in marketing, is AI and machine learning. It creates new opportunities for storytelling and marketing. It will change how people interact with information, technology, brands, and services.

Rosa, Bento, Pereira, da Costa, Dias and Gonçalves (2022) examined the extent of the introduction of AI in companies located in Portugal, with a focus on marketing activities. It explored the reasons and challenges companies face to introduce it, their perception of AI and whether they feel pressure to adopt this technology. The research used a qualitative approach, the content analysis of 21 interviews with professionals familiar with the theme. The study concluded that the main challenges faced are the cost of the investment and the loss of 'the human connection with the customer. In contrast, the principal benefit is the degree of personalisation AI can achieve due to its ability to provide strategic information. Concerning the interviewees' perception of this technology, 95% considered it as a competitive advantage.

Chaudhuri, Chatterjee, Vrontis and Chaudhuri (2022) examined AI dynamism and its impact on the sustainability of firms, including small and medium enterprises (SMEs) in India. They developed a theoretical model through the lenses of expectation disconfirmation theory (EDT), technology–trust–fit (TTF) theory, contingency theory, and the knowledge contained in the existing literature. They tested the proposed theoretical model using the factor-based PLS-SEM technique by analyzing data from 343 managers of SMEs. The findings of demonstrated that organizational characteristics, situational characteristics, technological characteristics, and individual characteristics all impacted SMEs' deployment of AI technologies to achieve sustainability, with technological and leadership support acting as moderators.

A quantitative cross-sectional correlational study was conducted by Dipak (2021) to ascertain the influence of several variables on the adoption, implementation, and usage of AI in the Indian small- and medium-sized business (SME) sector. As part of the data-gathering process, the study employed pre-validated survey items and online surveys conducted using the Survey Monkey platform. Ten chosen components from the DOI, TOE, and TAM theories were shown to be correlated among survey data from 152 individuals. Analysing nine factors separately revealed modest to moderately significant positive statistical connections with decisions affecting the adoption of AI. There was no statistically significant link between compatibility and decisions to embrace AI. The implications for effective AI adoption for SME leaders included stronger managerial assistance, more sophisticated IT, and better management of mimetic and normative pressure.

METHODOLOGY

This study made use of Survey Research Design. This is because of the nature of the study which seeks to elicit data from sampled respondents about a phenomenon using a structured questionnaire. The population of the study consist of MSMEs from three areas in the three senatorial zones of the state. These areas and the number of MSMEs are Onitsha (772), Awka (231), and (396) making it a total of 1399. The sample size of 301 was determined using Krejcie and Morgan's 1970 sample size determination formula. To determine the appropriate allocation of the questionnaire to each of the areas, Bowley's allocation formula was adopted. The data source for this study was primary source. The instrument for data collection is a structured questionnaire. The data collection method is through physical/personal distribution with the help of two research assistants. Face and content validity were deployed to check if the questionnaire measured what it intends to measure. The reliability of the instrument was achieved through the use of Cronbach Alpha, which returned a coefficient of .873 which was higher than the threshold of 7, hence, it was confirmed to be reliable. The analysis for the study was carried out using both descriptive and inferential statistics. Frequencies, mean

and rank were used for description while correlation analysis was carried out to test the hypothesis at a 5% level of significance.

Data Presentation and Analysis

A total of 301 copies of the questionnaire were distributed in accordance with the sample size, in the end, only 287 were collected representing a 95 per cent collection rate, out of which 4 were not usable. Therefore, only 283 copies of the questionnaire were analyzed for the study.

Data Analysis

What is the type of relationship existing between data-driven targeted online adverts and increase quality lead generation for MSMEs in Anambra State?

Table 1: Distribution of Responses for Data-Driven Targeted Online Adverts and Increase Quality Lead Generation

S/N	Questionnaire Items	SA (5)	A (4)	UD (3)	D (2)	SD (1)	Mean	Remark
	Data-Driven Targeted Online Adverts							
1	I would like to use AI to select those that will see my adverts.	193	66	12	12	-	4.55	Accept
2	Having the opportunity to select the age of those that will see my advert will be great for my business.	112	130	17	24	-	4.17	Accept
3	Choosing the location of those that will see my advert will do my business good.	109	139	23	11	1	4.22	Accept
	Quality Lead Generation							
4	Selecting a particular set of people in an advert will make my business have the right set of customers/clients.	92	129	44	18	-	4.04	Accept
5	The type of potential clients I get will determine my level of sales.	90	129	20	44	-	3.94	Accept
6	I would prefer to get only those that will be interested in what I sell/offer to see my adverts.	100	105	11	46	21	3.77	Accept

Source: Field Survey, 2023

Table 1 shows the distribution of the questionnaire for data-driven targeted online adverts and increase quality lead generation. With a threshold of acceptance of 3, the mean statistics for the individual questionnaire items which are all above 3 show that the respondents agreed to all the questions in the questionnaire.

Test of Hypothesis One

There is a significant relationship existing between data-driven targeted online adverts and increase quality lead generation for MSMEs in Anambra State.

Table 3: Correlation Analysis for Hypothesis One

		DDTOA	QLG
DDTOA	Pearson Correlation	1	.922**
	Sig. (2-tailed)		.000
	N	283	283
QLD	Pearson Correlation	.922**	1
	Sig. (2-tailed)	.000	
	N	283	283
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Field Survey, 2023

Keys:
DDTOA: Data-Driven Targeted Online Adverts
QLG: Quality Lead Generation

Table 3 shows the correlation analysis for hypothesis one which states that there is a significant relationship existing between data-driven targeted online adverts and increase quality lead generation for MSMEs in Anambra State. The analysis reveals that indeed, there is a statistically significant positive relationship between the variables with a correlation coefficient of .922 and a probability value that is less than the 0.05 level of significance. Therefore, the alternate hypothesis is accepted.

CONCLUSION

Businesses around the world are no longer over-reliant on the traditional processes of delivering services

or selling products to the customers and or clients the traditional ways, some of them are now deploying technology and AI in customer acquisition and retention, stock taking and restocking, customer service provision and increasingly making use of data-driven decision making in various areas, including running adverts. This study, drawing from the findings concludes that using data-driven targeted adverts will lead to generating quality leads that need little effort on converting to paying customers, hence, AI gives MSMEs a competitive edge.

Recommendations

Following the findings herein, the study recommends that:

a. That MSMEs in Anambra state need to increasingly rely on data in decision-making, especially in running adverts, as this will give them the opportunity to choose who sees the advert and will lead to generating quality leads.

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