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APPLICATION OF ARTIFICIAL INTELLIGENCE IN ENTREPRENEURSHIP PRACTICE IN NIGERIA

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Abstract
Artificial Intelligence (AI) is the application of the intelligence of machine software instead of the human intelligence in doing things. Life is all about changes and positive changes should at all times be embraced. Technology has developed Artificial Intelligence machines capable of simulating human intelligence processes, which include expert systems, natural language processing, speech recognition, machine vision, etc. These qualities make Artificial Intelligence an "electronic human being" whose potentials should be explored to full advantage in all human endeavors, including education and entrepreneurship practices. This paper x-rays the types and uses of the various forms of AI which include the Narrow AI, Artificial General Intelligence, Artificial Super Intelligence, Reaction Machine Intelligence, Limited Memory Artificial Intelligence, Theory of Mind AI and Self Aware AI. It equally considered the capacities of these AI option types and saw Artificial Intelligence as a welcome development in the practice and achievement of entrepreneurial goals and objectives. The essence of entrepreneurship practice is to build a better financial stability that supports growth and development. These can only be achieved through efficient allocation and management of resources. It was found that the introduction and application of AI in entrepreneurship practice will enhance efficiency and reliability in service delivery with its consequential elimination of human errors and disappointments; and recommends among other things, the incorporation of this all important technological innovation in our entrepreneurship practice in Nigeria to encourage its growth and development.

Keywords: Application, Artificial Intelligence, Technology, Entrepreneurship Practice.

Introduction

Artificial intelligence is a technical and scientific field devoted to the engineered system that generates outputs such as content, forecasts, recommendations or decisions for a given set of human-defined objectives (Nie, 2020). Artificial intelligence allows machines to match, or even improve upon, the capabilities of the human mind. From the development of self-driven cars to the proliferation of generative AI tools. It is increasingly becoming part of everyday life such as making predictions, identifying objects, interpreting speech and generating natural language. AI systems learn how to do so by processing massive amounts of data and looking for patterns to model in their own decision-making. In many cases, humans will supervise an AI's learning process, reinforcing good decisions and discouraging bad ones, but some AI systems are designed to learn without supervision Obschonka and Androtsch 2020).

While the world attempts to grasp the ramifications of the technology in its current iterations, AI continues to evolve at blistering pace. Whether in the realm of business activities, industrial automation, scientific research or the creative industries, the far-reaching effects of AI are still to be determined. However, it is already impacting our daily lives.

According to Townsend and Hunt, 2019, artificial intelligence aims to provide machines with similar processing and analysis capabilities as humans, making AI a useful counterpart to people in everyday life. AI is able to interpret and sort data at scale, solve complicated problems and automate various tasks simultaneously, which can save time and fill in operational gaps missed by humans.AI serves as the foundation for computer learning and is used in almost every industry from healthcare and finance to manufacturing and education, helping to make data-driven decisions and carry out repetitive or computationally intensive tasks. Over time, AI systems improve on their performance of specific tasks, allowing them to adapt to new inputs and make decisions without being explicitly programmed to do so. In essence, artificial intelligence is about teaching machines to think and learn like humans, with the goal of automating work and solving problems more efficiently (McKenzie and Sansone, 2019),

Many existing technologies have employed the use artificial intelligence to enhance capabilities. We see it in smartphones with AI assistants and e-commerce platforms with recommendation systems

Classification of Artificial Intelligence

Artificial intelligence (AI) encompasses a diverse spectrum of capabilities, which can be broadly classified into two categories: **WEAK AI** and **STRONG AI**. Weak AI, is often referred to as **artificial narrow intelligence (ANI) or narrow AI.**

Weak AI (or narrow AI) refers to AI that automates specific tasks. It typically outperforms humans, but it operates within a limited context and is

applied to a narrowly defined problem. For now, all AI systems are examples of weak AI, ranging from email inbox spam filters to other examples of narrow AI applications, characterized by their specialized algorithms designed for specific tasks:

- **Smart assistants**: Often referred to as the best examples of weak AI, digital voice assistants use natural language processing for a range of specific tasks like setting alarms, answering questions and controlling smart home devices.
- **Chatbots**: Generative AI tools, sometimes referred to as AI chatbots including ChatGPT, Gemini, Claude and Grok — use artificial intelligence to produce written content in a range of formats, from essays to code and answers to simple questions.
- **Recommendation engines**: Ever wondered how Netflix always seems to know what movie you want to watch or how Amazon predicts your next purchase? These platforms use ANI to analyze your viewing or purchasing habits, alongside those of similar users, to deliver personalized suggestions.
- **Navigation apps**: How do you get from A to B without getting lost? A navigation app, such as Google Maps, is a software application that uses ANI designed to provide real-time directions to users when navigating from one location to another.
- **Email spam filters**: A computer uses artificial narrow intelligence to learn which messages are likely to be spam, and then redirects them from the inbox to the spam folder.
- **Autocorrect features**: When your iPhone rectifies your typos as you write, you're experiencing the power of weak AI at work in your everyday life. By leveraging algorithms and user data, these predictive text functions ensure smoother and more efficient text composition across devices.
- **Visual Filters**: Filters used on social media platforms like TikTok and Snapchat rely on algorithms to distinguish between an image's subject and the background, track facial movements and adjust the image on the screen based on what the user is doing.

Each of these applications demonstrates the strength of ANI to execute well-defined tasks by analyzing large datasets and following specialized algorithms.

Strong AI, often referred to as artificial general intelligence (AGI), is a hypothetical benchmark at which AI could possess human-like intelligence and adaptability, solving problems it has never been trained to work on. AGI does not actually exist yet, and it is unclear whether it ever will. The concept of strong AI, also known as **general AI**, aspires to develop systems capable of tackling a wide array of tasks with a level of proficiency that satisfies human standards (Chalmers et al. 2021). Unlike their narrow AI counterparts, strong AI systems aim to possess a form of general intelligence, allowing them to adapt, learn and apply knowledge across various domains. Essentially, the goal is to create artificial entities endowed with cognitive

abilities akin to those of humans, capable of engaging in intellectual endeavors spanning diverse fields.

Kinds of Artificial Intelligence

AI can be further categorized into four main types: reactive machines, limited memory, theory of mind and self-awareness.

Reactive machines AI: This type of AI perceives the world in front of them and reacts. They can carry out specific commands and requests, but they cannot store memory or rely on past experiences to inform their decision making in real time. For instance, chatbots used to interact with online customers often rely on reactive machine intelligence to generate responses based on programmed algorithms. While they perform well within their designated functions, they cannot adapt or evolve beyond their initial programming. This makes reactive machines useful for completing a limited number of specialized duties. Examples include Netflix's recommendation engine and IBM's Deep Blue (used to play chess).

Limited memory AI: Unlike reactive machines, AI systems with limited memory possess the ability to learn from historical data and past experiences. By processing information from previous interactions, these types of AI systems can make informed decisions and adapt to some extent based on their training. Examples include self-driving cars equipped with sensors and machine learning algorithms that enable them to navigate through dynamic environments safely. Natural language processing applications also use historical data to enhance language comprehension and interpretation over time. AI has the ability to store previous data and predictions when gathering information and making decisions. Essentially, it looks into the past for clues to predict what may come next. Limited memory AI is created when a team continuously trains a model in how to analyze and utilize new data, or an AI environment is built so models can be automatically trained and renewed. Examples include ChatGPT and self-driving cars.

Theory of mind AI: This is a type of AI that does not actually exist yet but describes the idea of an AI system that can perceive and understand human emotions, then use that information to predict future actions and make decisions on its own. Developing AI with a theory of mind could revolutionize a wide range of fields, including human-computer interactions and social robotics, by enabling more empathetic and intuitive machine behaviour is a type of AI that does not actually exist yet,

Self-aware AI: This refers to artificial intelligence that has self-awareness, or a sense of self. This type of AI does not currently exist. In theory, though, self-aware AI possesses human-like consciousness and understands its own existence in the world, as well as the emotional state of others.

Entrepreneurship Education and Practice

In envisioning future jobs and human resources specialists' requirements, entrepreneurs must equip themselves with a proficiency that makes them adaptable to challenges. Teachers significantly contribute to society by

educating generations of upcoming students that will become future entrepreneurs. Tan (2020) underlines that the teacher exerts a triple role, being a content expert and creator, a knowledge spreader, and "an ethical-spiritual guide" with wisdom. The students should be able to chase trends and not just stay current with the events and environment (Elhajjar, Karam and Borna, 2021). Hence, the demand for innovative teachers embracing change, integrating new materials, and enabling student-AI interactions in education is increasing.

AI augments human skills in the workplace (Nuseir, Basheer and Aljumah, 2020) and serves as an educational partner, enhancing content and competencies (Tan, 2020). Tan, 2020 advocates integrating AI into education to equip students with skills essential for future jobs and digital society's demands, such as innovation, creativity, and design thinking. AIEd employs diverse tools, techniques, and systems in educational activities (McGrath et al., 2023). Investing in human capital to embrace AIEd tools is vital for societal development, despite widespread distrust and misconceptions about AI's role in human activities, especially in education (Antonenko and Abramowitz, 2023).

AI technology in education is expected to grow significantly in the coming decades, presenting new opportunities and challenges. Researchers, policymakers, and practitioners are integrating AIEd to enhance teaching, personalized learning, assessments, and administrative services (Chiu et al., 2023). AI represents progress in education, offering benefits on multiple levels, and stimulates the evolution of teaching and learning through technologies like chat bots, robots, automated assessment, digitized artifacts, and intelligent tutoring systems, despite occasional organizational challenges.

An entrepreneur is defined as an individual who exploits a business opportunity through some form of innovation. This means they foresee a gap in the market that can be filled by a new business idea. To do this, some requires are needed for creating some form of product, process, or service that will lead to financial gain. By effectively seeking new opportunities the entrepreneur focuses on how they can be involved both in innovation focused and profit-seeking activities. Entrepreneurship involves understanding of how opportunities and how ideas are recognized. This often involves a degree of creativity at different ways of thinking and allows new ideas to emerge.

Entrepreneurship education is part of the total educational system that involves the acquisition of skills, ideas and management abilities necessary for job creation. Therefore, there is a need to embrace this type of education and provide all the necessary resources needed to make it functional. Entrepreneurship development is considered as a way to tackle some of the socio economic problems that is affecting some countries presently, especially problem of high poverty and unemployment (Abubakar, 2019). Oguejiofor (2017) asserted that the continual emphasis on entrepreneurship development in Nigeria is aimed at generating employment opportunities and reducing the incessant search for white collar jobs which is scarce to come

by. Entrepreneurship remains the gateway to sustainable wealth creation in Nigeria (Ogundele, 2020). Despite the efforts of government in this direction, the "poverty virus" is getting more entrenched and spreading faster and wider among the populace. This incidence is higher among the youths who fall within the age bracket of 15-35 (Adofu and Ocheja 2019). The untrained and unskilled youth grows into an unemployable man or woman who cannot be employed because of his or her lack of marketable skills to be engaged in a job that can adequately support his or her family (Adofu and Ocheja, 2019). The best remedy for poverty alleviation in any country of the world: lies in encouraging more on business activity and startup the new ventures through entrepreneurship development (Alan 2019). Moreover, entrepreneurship provides a basis for economic change through new knowledge, creation and application. This has become increasingly important in a globalized world (Oguejiofor,2023).

Poverty as an outcome of unemployment is one of the most critical problems facing contemporary Nigerian society. Poverty alleviation in the society today is seen as a global challenge and an indispensable requirement for national and sustainable development. In Nigeria most of the poverty alleviation measures or initiatives are embedded in entrepreneurship but have suffered several challenges culminating into their failure.

Application of AI in Entrepreneurship Practice

The infusion of artificial intelligence (AI) into the entrepreneurial landscape marks a transformative era (Robledo et al., 2023) where value creation through innovation is not just an aspiration but a tangible reality. This special issue is devoted to uncovering the multifaceted role of AI in empowering entrepreneurial firms to transition from ideation to value creation. The omnipresence of AI in contemporary entrepreneurial practices has redefined the essence of business operations, strategy formulation, and decision-making processes (Lévesque, Obschonka, & Nambisan, 2022). Its potential in entrepreneurship extends beyond mere automation. Because it promises to revolutionize how entrepreneurs think, conceptualize, strategize, and manage business ventures (Nambisan, Wright, & Feldman, 2019). This technological leap presents an intriguing inquiry into how AI can act in practice as a catalyst for transforming creative ideas into profitable ventures.

Artificial intelligence (AI) is seeing widespread adoption across industries and business functions, and is reshaping how companies operate. From marketing to human resources, AI is being used throughout organizations to automate tasks, improve data analytics, and make better informed decisions more quickly.

According to (Mary 2024), Artificial intelligence (AI) has created a paradigm shift in the landscape of entrepreneurship, presenting both new opportunities and challenges. As AI technologies continue to evolve through various sectors, entrepreneurs find themselves at the forefront of a rapidly changing business environment. From revolutionizing traditional industries to creating entirely new markets, AI has the potential to significantly enhance

productivity, streamline operations, and drive innovation. However, this technological advancement also raises important questions about job displacement, ethical implications, and the equitable distribution of benefits. Thus, understanding the impact of AI on entrepreneurship is essential for navigating the complexities of the digital age and harnessing its transformative potential for sustainable economic growth (Giuggioli and Pellegrini2022).

As innovation continues to simplify business practices, many entrepreneurs have been closely monitoring AI advancements. And for good reason, while entrepreneurial minds excel in intuition, creativity and nuanced understanding, their decision-making can sometimes be hampered by incomplete information or cognitive constraints. AI, on the other hand, possesses remarkable abilities to process vast data, identify hidden patterns and predict future outcomes with high precision. Rather than replacing workers, AI is used to reduce repetitive work, drive efficiencies, and maximize human potential by helping employees and businesses across industries work more strategically (Nambisan and Feldman, 2019).

While some jobs may be displaced by AI, there is also potential for job transformation and creation in areas such as AI validation and verification, building businesses around facilitating AI integration, and addressing new roles in the evolving AI landscape. Consulting, big data analytics, coding, and other technological skills are a few important areas using AI. Micro-entrepreneurs are also using AI for assisting with grant applications/funding requests and creating advertisements or social media posts (Shepherd and Majchrzak, 2022). The value of AI-related resources lies in understanding how to effectively utilize them to save time, energy, and money and further boost productivity. Some of the top emerging trends in AI include generative AI and natural language processing (NLP) tools like ChatGPT, machine learning, and deep learning.

Some potentials of AI in the improvement of entrepreneurship practice include:

- Potential to significantly enhance overall performance in complex work tasks across various domains and showing consistent improvements in efficiency and quality
- Act as a leveler, supporting lower performers, though the long-term effects on this dynamic are uncertain
- Help identify broad market possibilities and capitalize on diverse products and services, which may be particularly impactful for entrepreneurs with limited economic resources
- Bridge literacy gaps and enhance skills development**,** e.g., in areas such as marketing, finance, human resources, and logistics
- Simplify complex tasks, e.g., market research, business planning, pricing, inventory management, and social media management

Artificial intelligence has the capacity to assist and improve entrepreneurship practice through the following ways:

- **Automating Repetitive Tasks**: Repetitive tasks such as data entry and factory work, as well as customer service conversations, can all be automated using AI technology. This lets humans focus on other priorities.
- **Solving Complex Problems**: AI's ability to process large amounts of data at once allows it to quickly find patterns and solve complex problems that may be too difficult for humans, such as predicting financial outlooks or optimizing energy solutions.
- **Improving Customer Experience**: AI can be applied through user personalization, chatbots and automated self-service technologies, making the customer experience more seamless and increasing customer retention for businesses.
- Reducing Human Error: The ability to quickly identify relationships in data makes AI effective for catching mistakes or anomalies among mounds of digital information, overall reducing human error and ensuring accuracy.
- **Retail**: AI in retail amplifies the customer experience by powering user personalization, product recommendations, shopping assistants and facial recognition for payments. For retailers and suppliers, AI helps automate retail marketing, identify counterfeit products on marketplaces, manage product inventories and pull online data to identify product trends.
- **Customer Service**: In the customer service industry, AI enables faster and more personalized support. AI-powered chatbots and virtual assistants can handle routine customer inquiries, provide product recommendations and troubleshoot common issues in real-time. And through NLP, AI systems can understand and respond to customer inquiries in a more human-like way, improving overall satisfaction and reducing response times.
- **Manufacturing**: AI in manufacturing can reduce assembly errors and production times while increasing worker safety. Factory floors may be monitored by AI systems to help identify incidents, track quality control and predict potential equipment failure. AI also drives factory and warehouse robots, which can automate manufacturing workflows and handle dangerous tasks.
- **Finance:** The finance industry utilizes AI to detect fraud in banking activities, assess financial credit standings, predict financial risk for businesses plus manage stock and bond trading based on market patterns. AI is also implemented across fintech and banking apps, working to personalize banking and provide 24/7 customer service support.
- **Marketing**: In the marketing industry, AI plays a crucial role in enhancing customer engagement and driving more targeted advertising campaigns. Advanced data analytics allows marketers to gain deeper insights into customer behavior, preferences and trends, while AI content generators help them create more

personalized content and recommendations at scale. AI can also be used to automate repetitive tasks such as email marketing and social media management.

Conclusion

AI has been used in the e-commerce and financial industries to improve customer experience, efficient supply chain management, operational efficiency, and mate size, with the main goal of designing standard, reliable product quality control methods and the search for new ways of reaching and serving customers while keeping costs low. The surge in AI development has given rise to a range of software solutions, and AI-powered systems are already widely used by top-performing innovative businesses in the areas of sales and marketing, workflow automation, order fulfillment, inventory management, supply chain management, accounting management and much more.

Although the multi-dimensional potential of AI-powered processes is undeniable, it's essential to note that no single tool can flawlessly fulfill all outlined tasks. Through a thoughtful combination of diverse solutions, entrepreneurs can establish a system that efficiently, effectively and personally addresses their task prioritization needs.

Recommendations

Based on the opinion of this paper, the following recommendations are suggested:

1. Practical education and proper introduction of entrepreneurship students to Artificial Intelligence systems.
2. Incorporation of artificial intelligence systems in entrepreneurship practice in Nigeria.
3. Introduction of AI applications in entrepreneurship training.
4. Further investigation into the application of Artificial Intelligence in entrepreneurial practice in Nigeria

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