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INTEGRATION OF ARTIFICIAL INTELLIGENCE AND HUMAN INTELLIGENCE AMONG SMES IN ANAMBRA STATE

Friday, Emmanuel Chukwuemeka[1]
efriday799@gmail.com

Onwuka, Ebele Mary[2]
em.onwuka@unizik.edu.ng

Ozoh, Ikechukwu Gerald[3]
ozohikechukwu2013@gmail.com

Onah, Fortunatus Sochima[4]
Fs.onah@unizik.edu.ng

[1-4] **Department of Business Administration, Nnamdi Azikiwe University, Awka, Anambra State**

Abstract

This study explores the dynamic interplay between Artificial Intelligence (AI) and Human Intelligence in business operations, focusing on Anambra State, Nigeria. As AI technologies reshape the business landscape by enhancing operational efficiency and decision-making, the need for a strategic integration with human intelligence becomes increasingly vital. This research highlights the complementary strengths of both intelligences, emphasizing that while AI excels in data analysis and automation, human intelligence brings creativity, emotional understanding, and ethical judgment to the forefront. The study applied qualitative research approach using thematic analysis of which a descriptive research design was used to gain an in-depth understanding of the subject

matter. Convenient sampling techniques were employed in selecting 5 participants for the interviews. All interviews were transcribed verbatim and uploaded into MAXQDA Analytics Pro 2020 (qualitative data analysis software). The coding scheme was systematically applied to all transcripts through multiple close readings of the data. Both semantic/explicit content and latent content requiring interpretative analysis were captured by the codes. Through qualitative interviews with small and medium enterprise (SME) owners, the study reveals the advantages of AI adoption, the irreplaceable value of human insight, and the challenges organizations face in this integration process. Ultimately, the findings underscore the necessity for businesses to embrace a balanced approach, harnessing the transformative potential of AI while preserving the human touch essential for innovation and sustainable growth.

Keywords: Artificial Intelligence, Human Intelligence, SMES, Business Operation and Integration

Introduction

Artificial Intelligence (AI) has emerged as a transformative technology, reshaping the business landscape across various industries (Eboigbe, Farayola, Olatoye, Nnabugwu and Daraojimba, 2023). From automating routine tasks to empowering data-driven decision-making, AI-powered solutions have demonstrated their ability to enhance operational efficiency, improve strategic planning, and unlock new avenues for innovation. As businesses strive to maintain a competitive edge in an increasingly dynamic and technology-driven market, the integration of AI has become a strategic imperative (Kaggwa, Eleogu, Okonkwo, Farayola, Uwaoma and Akinoso, 2024). AI-driven systems can process and analyze vast amounts of data, identify patterns, and generate insights that inform decision-making at a scale and speed unmatched by human capabilities (Saxena, Saxena, Pandey, Flato and Shukla, 2023). This has led to a growing debate on the role of AI versus human intelligence in the business context. While AI presents remarkable

opportunities, it is important to recognize that human intelligence remains a crucial component in the overall success of businesses. Human decision-makers bring unique qualities to the table, such as intuition, emotional intelligence, and the ability to navigate complex social and ethical considerations – aspects that are often challenging for AI systems to replicate (Bickley and Torgler, 2023).

The optimal approach lies in the strategic integration of AI and human intelligence, harnessing the strengths of both to create a synergistic and complementary ecosystem (Jarrahi, Askay, Eshraghi and Smith, 2023). By leveraging AI-powered tools to automate repetitive tasks, optimize workflows, and generate data-driven insights, businesses can empower their human workforce to focus on higher-level strategic thinking, creative problem-solving, and the development of innovative products and services. However, the integration of AI within the business landscape is not without its challenges. Concerns around data privacy, algorithmic bias, and the potential displacement of human labor have emerged as critical considerations for organizations (Arora, Barrett, Lee, Oborn and Prince, 2023). Additionally, the successful adoption of AI requires significant investments in technological infrastructure, data management capabilities, and workforce upskilling and reskilling. Despite these challenges, the potential benefits of AI integration in the business context are substantial. By striking the right balance between AI and human intelligence, organizations can enhance their overall decision-making capabilities, improve operational agility, and unlock new avenues for growth and innovation (Kaggwa, Eleogu, Okonkwo, Farayola, Uwaoma and Akinoso, 2024). This synergy can lead to increased productivity, enhanced customer experiences, and the development of market-leading products and services.

This study aims to explore the dynamic interplay between Artificial Intelligence (AI) and human intelligence in the business context, with a specific focus on Anambra State, Nigeria. It seeks to investigate the current state of AI adoption among businesses in the

region, the perceptions and attitudes of business leaders towards AI integration, and the strategies employed to harness the complementary strengths of AI and human intelligence. Embracing the transformative power of Artificial Intelligence is not just a choice, but a necessity for the sustained growth and competitiveness of Small and Medium Enterprises in Anambra State, Nigeria.

2. Review of Related Literature

2.1 Artificial Intelligence (AI)

Artificial Intelligence (AI) is the field of computer science and technology focused on developing machines and systems capable of performing tasks that require human intelligence (Vrontis, Christofi, Pereira, Tarba, Makrides and Trichina, 2023). AI encompasses various subfields such as machine learning, natural language processing, computer vision, robotics, and expert systems. The ultimate goal of AI is to create intelligent agents that can replicate or surpass human cognitive abilities in areas like perception, reasoning, learning, and decision-making (Rayhan, Rayhan and Rayhan, 2023). AI involves designing algorithms, models, and computational techniques that enable machines to exhibit intelligent behavior. These intelligent agents follow a cycle of sensing, reasoning, and acting, where they gather information, analyze it, and execute actions to achieve specific goals. AI intersects with disciplines like cognitive science, neuroscience, philosophy, and social sciences, fostering a deeper understanding of human intelligence and the implications of AI development (Panda and Padhy, 2024).

The integration of technologies like machine learning, natural language processing, and neural networks continues to expand AI's capabilities, driving advancements in problem-solving, predictive analytics, and intelligent automation across various industries. AI has the potential to revolutionize industries and domains, offering opportunities for

automation, optimization, and augmentation of human capabilities. This can lead to increased efficiency, productivity, and innovation. However, AI also poses challenges and ethical considerations regarding privacy, bias, accountability, job displacement, and potential misuse (Li, 2024). Ongoing research, development, and regulation are crucial to ensure that AI technologies are responsibly developed and deployed in alignment with societal values.

2.1.2 Emergence of AI in businesses in Anambra State

Anambra State, located in the southeastern region of Nigeria, has witnessed a growing interest and adoption of Artificial Intelligence (AI) technologies within its business landscape (Chukwuemeka, Ndubuisi-Okolo and Agbata, 2023). As a hub for entrepreneurship and innovation, Anambra State has provided a fertile ground for the emergence and integration of AI-powered solutions. As opined by Chukwuemeka, Ndubuisi-Okolo and Agbata, (2023) Several factors have contributed to the rise of AI in Anambra State businesses. Firstly, the state's vibrant small and medium-sized enterprise (SME) sector has been quick to recognize the potential of AI to streamline operations, enhance decision-making, and gain a competitive edge. Startups and SMEs in sectors such as e-commerce, fintech, and logistics have been at the forefront of AI adoption, utilizing intelligent automation, predictive analytics, and chatbots to improve customer experiences and operational efficiency. The development of Anambra's digital infrastructure, including the expansion of high-speed internet connectivity and the proliferation of mobile devices, has also facilitated the adoption of AI-based solutions. Businesses in the state have leveraged AI-powered applications and cloud-based platforms to optimize their processes, from inventory management to marketing and sales.

The growing awareness and understanding of AI's potential among Anambra's business leaders have contributed to its increasing integration (Onwuka, Friday, Onah and Onyebiuwanso, 2024). Key decision-makers have recognized the need to invest in AI-

driven technologies to remain competitive and responsive to evolving market demands. This has led to a surge in collaborations between businesses and technology providers, as well as the emergence of AI-focused training and capacity-building initiatives within the state. However, the adoption of AI in Anambra State businesses is not without its challenges. Concerns around data privacy, cybersecurity, and the potential displacement of human labor have emerged as critical considerations for organizations. Additionally, the lack of specialized AI talent and the need for substantial investment in infrastructure and training have presented barriers to widespread AI adoption, particularly among smaller businesses (Onwuka, Friday, Onah and Onyebiuwanso, 2024).

Despite these challenges, the momentum behind the emergence of AI in Anambra State businesses is steadily gaining traction. As the state continues to foster an environment conducive to technological innovation, the integration of AI-powered solutions is poised to become increasingly prevalent, driving business transformation and unlocking new avenues for growth and competitiveness (Chukwuemeka, Ndubuisi-Okolo and Agbata, 2023).

2.2 Human Intelligence in business

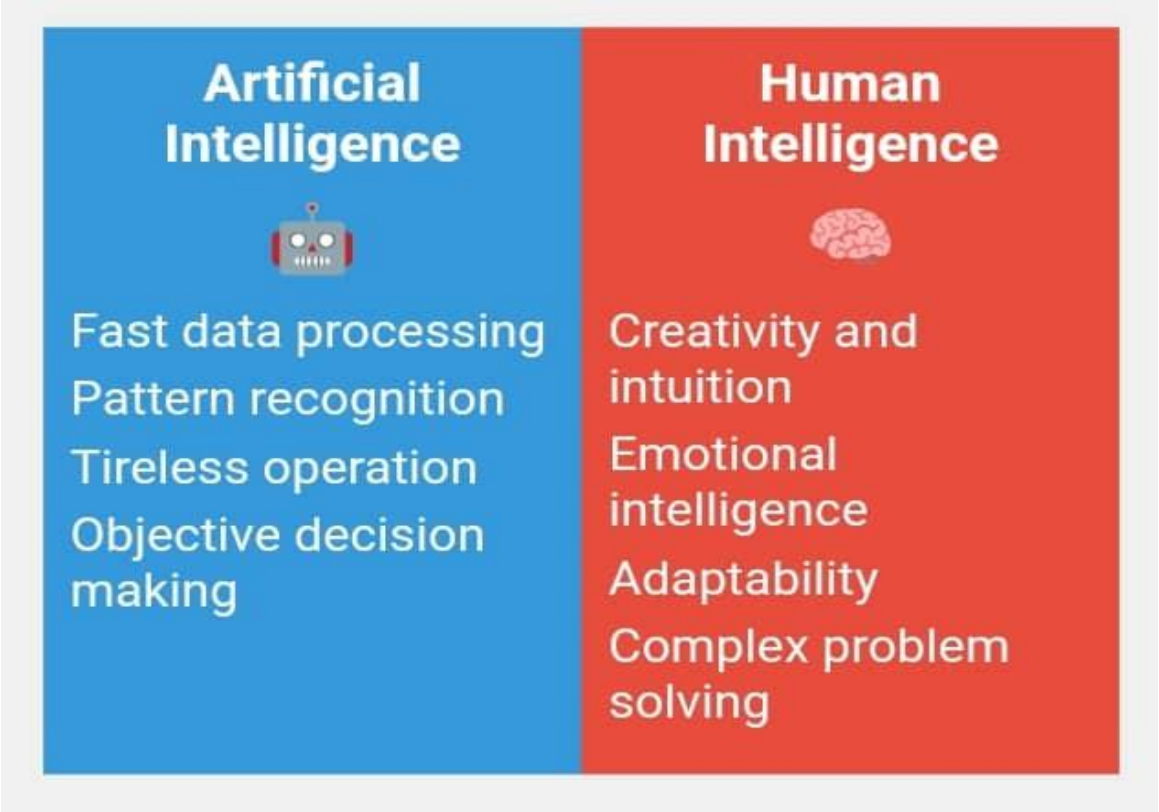
While the advancements in Artificial Intelligence (AI) have undoubtedly transformed the business landscape, human intelligence remains a crucial and irreplaceable component for organizational success (Eboigbe, Farayola, Olatoye, Nnabugwu and Daraojimba, 2023). The unique qualities and cognitive capabilities of human beings continue to play a vital role in driving innovation, strategic decision-making, and the successful navigation of the complex business environment. One of the primary strengths of human intelligence in the business context is the ability to exercise intuition and emotional intelligence (Higgs and Dulewicz, 2024). Humans possess an innate capacity to understand nuanced social cues, empathize with stakeholders, and make judgments that go beyond the purely rational and data-driven. This emotional acumen allows business leaders to foster strong relationships,

build trust, and make decisions that consider the human element something that even the most sophisticated AI systems struggle to replicate. The capacity to think creatively, connect disparate ideas, and identify unconventional solutions is another hallmark of human intelligence that sets it apart from AI (He, Shrestha, Puranam and Miron-Spektor, 2023). Innovative breakthroughs and groundbreaking business models often stem from the ability of individuals to think outside the box, challenge assumptions, and envision new possibilities.

Furthermore, human intelligence excels in navigating complex ethical dilemmas and making decisions that balance competing priorities and stakeholder interests. While AI can be programmed to follow specific rules and guidelines, the nuanced understanding of moral, social, and cultural norms that guides human decision-making is essential in the business world (Gupta, 2023). Ethical considerations around data privacy, algorithmic bias, and the responsible deployment of AI-powered technologies require a level of contextual awareness and judgment that only human intelligence can provide (Ansarullah, Kirmani, Alshmrany and Firdous, 2024). Business leaders who leverage their human intelligence are better equipped to make decisions that not only drive financial performance but also align with the organization's values and societal expectations. The ability to adapt to changing circumstances, constantly learn, and apply acquired knowledge in novel situations is a hallmark of human intelligence that remains unmatched by current AI systems. As the business environment becomes increasingly volatile, uncertain, complex, and ambiguous, the capacity of human beings to quickly assess, pivot, and develop innovative solutions is crucial for organizational resilience and success. While AI can assist in processing large datasets and identifying patterns, the human ability to synthesize information, draw insights, and make strategic decisions in the face of uncertainty is invaluable (Bickley, Macintyre and Torgler, 2024).

While AI presents remarkable opportunities for businesses, human intelligence remains an indispensable asset in the pursuit of sustainable growth and competitive advantage (Friday, Onah, Onwudinjor and Ezenwoke, 2024). By leveraging the complementary strengths of AI and human intelligence, organizations can create a synergistic ecosystem where data-driven insights and automated processes are seamlessly integrated with the unique cognitive abilities, emotional intelligence, and ethical decision-making of their human workforce (Kasowaki and Yildiz, 2024). This strategic integration will be key to navigating the dynamic business landscape, fostering innovation, and ensuring long-term organizational success.

PICTORIAL REPRESENTATION OF ARTIFICIAL INTELLIGENCE VS HUMAN INTELLIGENCE



Source: google.com

3.1 METHODOLOGY

A qualitative method of research was employed to study Artificial Intelligence Vs Human Intelligence in Business in Anambra State. To facilitate coding and analysis, all interviews were transcribed verbatim and uploaded into MAXQDA Analytics Pro 2020, a qualitative data analysis software. The initial step involved open coding, where tentative themes in the data were identified. These codes were then refined, resulting in a preliminary coding scheme or codebook. The coding scheme was systematically applied to all transcripts through multiple close readings of the data. Both semantic/explicit content and latent content requiring interpretative analysis were captured by the codes. A total of 5 SMES Owners were targeted for interview to provide a diverse range of perspective.

Upon finalizing the coding process, the codes were categorized into potential overarching themes. The determination of these themes took into consideration their prevalence across interviews and their significance to the research questions. The analysis yielded five themes. Convenient sampling was employed to select participants for the interviews due to its practicality and ease of access to individuals with relevant knowledge and experience regarding AI and Human intelligence in businesses in Anambra State. Participants who are directly involved with the use of AI in their businesses were selected based on their availability and willingness to participate in the study. The following interview question was used during the group discussion:

1. What are the primary advantages of using Artificial Intelligence in businesses in Anambra State compared to Human Intelligence?
2. In what areas do you think Human Intelligence outperforms Artificial Intelligence in the business context?
3. How do businesses in Anambra State integrate both Artificial and Human Intelligence to optimize their operations?
4. What challenges do businesses face when implementing Artificial Intelligence solutions in Anambra State?

5. How do you foresee the future of Artificial Intelligence impacting employment and skill requirements in Anambra State businesses?

4.1 Demographic characteristics of SMEs

Organization Type	**Frequency**	**Percent**
Tech Start-up	1	20
Retail Business Owner	1	20
Manufacturing	1	20
Service Industry	1	20
Consultancy Firm	1	20
Age of Organization	**Frequency**	**Percent**
1-5 years	2	40
6-10 years	3	60
>11 years and above	0	0

Themes and their frequency and percentage occurrence

Themes	Frequency	Percentage	Percentage (valid)
Advantages of Artificial Intelligence	4	80.0	80
Strengths of Human Intelligence	5	100.00	100.00
Integration of AI and Human Intelligence	4	80.00	80.00
Challenges of AI Implementation	3	60.00	60.00
Future Impacts of AI on Employment	5	100.00	100.00

The table shows that almost all the themes were consistent across all the participants.

Discussion of Findings

Interview Responses

Theme 1: Advantages of Artificial Intelligence

In discussing the advantages of Artificial Intelligence, **Participant A**, a tech startup owner, emphasized its capability to analyze data swiftly, providing insights that can drive strategic decisions. **Participant B**, a retail business owner, shared how AI has improved customer engagement through personalized marketing, greatly enhancing sales performance. **Participant C**, from manufacturing, noted that AI's automation of production processes has significantly increased efficiency and reduced labor costs. **Participant D**, representing the service industry, pointed out that AI-driven analytics help in understanding customer preferences, allowing for better service customization. Lastly, **Participant E**, a consultant,

highlighted AI's role in minimizing human error in data processing and enhancing overall decision-making effectiveness.

Theme 2: Strengths of Human Intelligence

When reflecting on Human Intelligence, **Participant A** noted the importance of creativity, stating that while AI can analyze data, it lacks the ability to generate innovative ideas essential for tech development. **Participant B** emphasized the value of personal relationships in customer service; noting that trust and loyalty are built through human interaction, which AI cannot replicate. **Participant C** pointed out that human judgment is crucial in quality control, as nuanced assessments often escape the capabilities of AI. **Participant D** highlighted the significance of emotional intelligence, particularly in the service sector, where understanding customer emotions can lead to exceptional service. Lastly, **Participant E** discussed adaptability, explaining that humans excel in complex and unpredictable situations, showcasing the value of flexible thinking.

Theme 3: Integration of AI and Human Intelligence

In terms of integrating AI and Human Intelligence, **Participant A** described a model where AI handles data analysis, while human teams make the final decisions, fostering a partnership that enhances project outcomes. **Participant B** explained how AI assists with inventory tracking in his retail business, but the human staff plays a critical role in engaging customers. **Participant C** shared that AI is utilized for predictive maintenance in manufacturing, but human technicians are essential for repairs and quality assurance. **Participant D** talked about implementing AI chatbots for initial customer inquiries, with human agents taking over for more complex interactions, ensuring efficiency while preserving the personal touch. **Participant E** highlighted the importance of training

employees to leverage AI insights, enhancing overall decision-making capabilities within organizations.

Theme 4: Challenges of AI Implementation

The challenges of implementing AI were vividly expressed by the participants. **Participant A** pointed out the significant initial investment as a barrier for many SMEs. **Participant B** expressed concerns regarding staff resistance, noting that employees fear job loss and are often hesitant to adopt new technologies. **Participant C** discussed the technical hurdles of integrating AI with existing systems, which can complicate workflows. **Participant D** raised issues concerning data privacy and security, emphasizing the potential risks to customer trust if data is not properly safeguarded. Finally, **Participant E** highlighted the talent shortage, stressing the need for specialized training to manage AI systems effectively.

Theme 5: Future Impacts of AI on Employment

The future impacts of AI on employment sparked a thoughtful discussion. **Participant A** anticipated a rising demand for tech-savvy professionals, as job roles evolve to include more technology management. **Participant B** expressed concerns about potential job displacement for low-skilled workers due to automation, advocating for proactive reskilling initiatives. **Participant C** acknowledged that while some jobs may be lost, new roles focused on AI oversight will emerge. **Participant D** emphasized the ongoing need for skills that cannot be replicated by AI, such as emotional intelligence and creativity. **Participant E** advocated for a continuous learning approach, urging businesses to invest in skill development to prepare employees for the changing job landscape driven by AI advancements.

Overall Finding from the Participants Responses

The participants collectively recognized the transformative potential of AI, while also emphasizing the irreplaceable role of Human Intelligence in maintaining the human touch in business processes. They agreed that integrating both types of intelligence could lead to more effective operations and enhanced customer experiences. However, they also voiced concerns about the challenges posed by AI adoption, particularly in terms of cost, employee resistance, and data security. Looking towards the future, there was a consensus that while AI will reshape job roles and skill requirements, proactive reskilling and a focus on human-centric skills will be essential for navigating this evolving landscape. Overall, the discussion underscored the need for a strategic and balanced approach to leverage the strengths of both AI and Human Intelligence.

Conclusion

The integration of Artificial Intelligence (AI) and Human Intelligence in business is crucial for sustainable growth and competitiveness in today's technology-driven landscape. Businesses must harness AI's efficiency and analytical capabilities while preserving the irreplaceable qualities of Human Intelligence, such as creativity, empathy, and strong interpersonal relationships. A balanced approach allows these two forms of intelligence to complement each other, enhancing productivity and enriching customer experiences. However, the successful integration of AI and Human Intelligence will empower companies to navigate modern market complexities, ensuring innovation and connection. "Embracing both technology and humanity is not just a path to efficiency; it's a commitment to innovation and connection in the future of business.

Recommendations

1. Educate SMEs on the advantages of AI through workshops and training, focusing on how it can enhance efficiency, customer insights, and cost management. This knowledge can empower them to make informed decisions about adopting AI solutions.
2. Encourage businesses to maintain a strong focus on interpersonal skills and creativity through formal training and development programs. Initiatives should highlight the value of emotional intelligence and relationship-building in customer interactions.
3. Create frameworks that promote the seamless integration of AI tools with human oversight. Businesses should assess their workflows to identify repetitive tasks suitable for automation while ensuring that humans remain integral in decision-making processes and customer relations.
4. Form local business associations that can provide resources and support for AI implementation. These networks could offer access to funding, expertise in technology integration, and guidance on navigating data privacy and security issues.
5. Launch targeted reskilling initiatives focusing on equipping the workforce with capabilities relevant to AI and emerging job roles. Encourage partnerships between businesses and educational institutions to align training programs with market needs.

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