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Article

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REGIONAL INTEGRATION AND ARTIFICIAL INTELLIGENCE: THE CASE OF ECOWAS IN SUB-SAHARAN AFRICA

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Abstract

This study examined the role of artificial intelligence (AI) in promoting regional integration and economic diversification within the Economic Community of West African States (ECOWAS). The research achieved three key objectives: it evaluated AI's impact on economic diversification, assessing its role in regional integration, and identifying the risks and challenges associated with AI implementation in the region. Using a descriptive-analytical research design, the researcher comprehensively analyzed secondary data from government reports, academic journals, and industry publications. Findings indicated that AI drives economic diversification by fostering innovation, enhancing productivity, and supporting the transition to digital economies in ECOWAS. The study also contributed to long-term economic growth by improving sectors like agriculture, manufacturing, and services. Furthermore, AI plays a significant role in regional integration by streamlining governance processes, promoting cross-border cooperation, and enhancing resource management. However, challenges such as job displacement, the digital divide, and technological readiness pose barriers to AI's full potential. The study emphasizes the need for inclusive digital infrastructure, skill development, and ethical governance frameworks to ensure AI's successful adoption in ECOWAS. In conclusion, AI presents immense potential for socio-economic development and regional integration in West Africa. However, addressing the linked risks through policy coordination and capacity building is essential for actualizing these benefits.

Keywords: Artificial Intelligence (AI), Regional Integration, Economic Diversification, ECOWAS, and Digital Transformation.

Introduction

Regional integration in Africa, particularly within the Economic Community of West African States (ECOWAS), presents a unique opportunity for economic growth, political cooperation, and social development. Over the past few decades, West African countries have pursued deeper integration to address common challenges, including political instability, economic diversification, and social cohesion. ECOWAS, with its vision of a unified West Africa, has made notable strides in fostering regional collaboration. However, the success of such integration efforts depends heavily on adopting innovative technologies that can address complex regional issues. Among these technologies, Artificial Intelligence (AI) stands out as a critical enabler of transformation across sectors, offering the potential to enhance decision-making, improve public service delivery, and stimulate economic development. The role of AI in promoting economic diversification is particularly pertinent for ECOWAS, a region that is often heavily reliant on agriculture, mining, and other primary sectors. By embracing AI-driven solutions, ECOWAS countries can shift towards more knowledge-based economies, enhancing productivity and fostering new industries. AI can also support the optimization of regional supply chains, promote innovative governance, and encourage the development of digital economies, thus facilitating sustainable growth. According to African Union's Continental Artificial Intelligence Strategy (2024), AI has the potential to drive economic diversification, improve infrastructure, and support the creation of an inclusive digital economy. Moreover, AI holds significant promise for enhancing regional cooperation within ECOWAS by facilitating sharing knowledge, resources, and data across borders. As countries strive to harmonize policies and collaborate on regional issues, AI can provide the tools to ensure more efficient management of resources and create data-driven frameworks for policy decisions. AI technologies such as machine learning, data analytics, and AI-guided chatbots have been successfully implemented in various public sectors globally to enhance transparency, governance, and citizen engagement (Androutsopoulou et al., 2019; Aoki, 2020). In the context of ECOWAS, AI-driven governance solutions could play a pivotal role in reducing administrative bottlenecks, improving cross-border trade, and optimizing regional security operations.

The significance of this study lies in its exploration of the intersection between regional integration and AI within ECOWAS. It aims to examine how AI can catalyze achieving the goals of the ECOWAS Vision 2020 and its successors, focusing on the potential benefits of AI adoption in key sectors such as governance, trade, and economic development. Additionally, this study will assess the challenges and opportunities associated with AI adoption in a region that faces both digital and infrastructural gaps and the need for regulatory frameworks to guide the responsible use of AI technologies (Dentons, 2024). By analyzing the role of AI in the context of regional integration, this study provides valuable insights into how technological advancements can reshape the future of West Africa. It will also contribute to the broader discourse on digital transformation in Africa as the continent continues to explore ways to integrate emerging technologies into its development agenda (Business Continuity Institute, 2023; Strathmore University Centre for Intellectual Property and Information Technology Law, 2023). In this way, the study highlights the relevance of AI for ECOWAS and presents a framework for understanding its implications for regional governance, economic growth, and technological innovation across the African continent.

Statement of Research Problem

The Economic Community of West African States (ECOWAS) has long desired to achieve deeper regional integration and boost economic growth among its member states. However, despite ongoing efforts, the pace of integration and economic diversification has been delayed by several factors, including limited cooperation among member states, dependence on traditional economic sectors, and a lack of technological innovation. In this context, as artificial intelligence (AI) gains global prominence, the potential for leveraging AI to address these challenges has emerged. However, despite the growing influence of AI, the specific ways AI technologies can be harnessed to enhance regional cooperation within ECOWAS remain primarily unexplored (Bassey, Etefia, & Ebong, 2024; Bala, 2017). Furthermore, while AI's transformative potential in governance, business, and public service delivery is well-documented (African Union, 2024; Aoki, 2020; Criado & Gil-Garcia, 2019), the role AI can play in driving economic diversification within ECOWAS has received minimal attention. Specifically, there is a lack of comprehensive research on how AI can promote innovation and reduce the region's reliance on traditional sectors such as agriculture and raw materials (Bjerke-Busch & Thorp, 2024; Ben Abdelaziz et al., 2022). Given ECOWAS's dependence on these sectors, it is important to investigate how AI can stimulate diversification and foster sustainable growth across a broader range of industries.

Additionally, although AI offers significant economic and social development opportunities, it also presents risks and challenges, particularly in regions like West Africa, where digital infrastructure and governance frameworks are often underdeveloped (Mahama et al., 2024; Misra et al., 2023). Issues such as data governance, infrastructure readiness, and the digital divide between member states complicate the adoption of AI technologies in the region. Consequently, there is a pressing need to explore these risks and develop strategies to mitigate the challenges associated with implementing AI in ECOWAS, ensuring that AI-driven innovations contribute positively to regional integration and development (Dentons, 2024; Nnamani, 2023).

Thus, despite the promise AI holds for ECOWAS, notable research gaps must be addressed to realize its full potential. The lack of focused studies on AI's role in fostering regional integration and economic diversification, coupled with the limited analysis of the challenges of AI implementation, underscores the need for targeted research in these areas. Therefore, this study aims to (1) assess the impact of AI on regional integration efforts within ECOWAS, focusing on how AI technologies can strengthen cooperation among member states, (2) evaluate the role of AI in driving economic diversification within the ECOWAS sub-region, specifically in promoting innovation and reducing reliance on traditional economic sectors, and (3) investigate the risks and challenges associated with implementing AI in ECOWAS and propose strategies to mitigate these challenges.

Literature Review

Conceptual Review - The Role of Artificial Intelligence in Regional Integration and Economic Diversification within ECOWAS through Digital Transformation: Artificial Intelligence (AI) has emerged as a crucial driver of digital transformation across the globe, significantly impacting both the public and private sectors. In the Economic Community of West African States (ECOWAS) context, AI plays a pivotal role in advancing regional integration and economic diversification efforts. The African Union's (2024) Continental Artificial Intelligence Strategy outlines the importance of AI for enhancing regional

collaboration and economic growth. It emphasizes that AI-driven technologies can help streamline processes, optimize trade, and foster innovation, thus enabling ECOWAS member states to harness the power of technology to achieve their integration goals. Regional integration has been a key objective for ECOWAS, as evidenced by various frameworks like the African Union's Digital Transformation Strategy for Africa 2020-2030 (African Union, 2020). This strategy underscores the transformative potential of digital technologies, particularly AI, in facilitating cross-border trade, improving regional governance, and enhancing the competitiveness of ECOWAS economies. AI can be applied to create more intelligent and more efficient government systems, making e-procurement and cross-border trade more transparent and accessible (Brandon-Jones & Kauppi, 2018). Furthermore, integrating AI into governmental processes, such as deploying AI-guided chatbots, can improve communication between citizens and government entities, as noted by Androutsopoulou et al. (2019).

ECOWAS faces challenges related to economic diversification, with many member states relying heavily on agriculture and natural resources. AI has the potential to catalyze economic diversification by enabling new industries and improving productivity in existing sectors. Bjerke-Busch and Thorp, (2024) highlight that AI's role in overcoming the productivity paradox in the public sector is essential for achieving sustainable growth. AI-driven innovations in agriculture, manufacturing, and service industries can reduce dependency on a narrow set of resources, thereby broadening the economic base of ECOWAS countries. In terms of governance, AI can also enhance decision-making and improve efficiency in government institutions. Mahama et al., (2024) emphasize the role of AI in improving supply chain agility and decision-making, which is particularly relevant for ECOWAS countries looking to strengthen trade and logistics. By leveraging AI for data analytics and automation, governments, no doubt, can make more informed decisions, enhancing regional integration efforts and economic policies in ways that are more robust. This aligns with the work of Choi et al., (2021), who explored how AI can aid data-driven decision-making in government. However, for AI to be effectively utilized in ECOWAS, significant regulatory and policy challenges exist to address. Dentons (2024) points out the need for comprehensive AI regulation in Africa to ensure that AI systems are used ethically and responsibly. The successful integration of AI into regional and economic frameworks within ECOWAS requires a collaborative effort to create policies supporting innovation while mitigating AI risks, such as biases and data privacy concerns.

Aside all these facts, the role of AI in addressing trans-border challenges within ECOWAS is critical, and this informs Luqman et al. (2023)'s claim on the issue of cross-border crimes and how AI can enhance security and regional integration through improvement of surveillance, data sharing, and border management. Thus, AI can help ECOWAS address economic diversification and security challenges that threaten regional stability. In conclusion, AI is poised to be a game changer in advancing regional integration and economic diversification in ECOWAS. By embracing AI-driven digital transformation, member states can optimize governance, improve economic performance, and strengthen regional ties. However, this potential can only be fully realized with the proper regulatory frameworks, robust infrastructure, and a commitment to ethical AI implementation.

Empirical Reviews

A study by Androutsopoulou et al., (2019) underscores how AI-guided chatbots have transformed communication between citizens and government by enhancing public service delivery, mainly through increased efficiency and reduced human errors. Similarly, Aoki's (2020) experimental study investigates public trust in AI chatbots within the public sector, highlighting that while chatbots improve service accessibility, trust issues related to data privacy and fairness remain significant obstacles. Building on this, Criado and Gil-Garcia (2019) explore how AI technologies, alongside innovative strategies, can create public value by making public services more transparent and participatory, thereby improving decision-making processes. Moreover, Fan and Pan (2023) analyze the interaction between information technology and organizational resources, showing that AI-driven services can significantly enhance government performance, particularly in environments with high levels of uncertainty. They demonstrate that external factors, such as environmental instability, can influence the success of AI applications in public administration. In the same vein, Misra et al. (2023) provide a framework to address the challenges of adopting AI in government organizations, specifically in India, by proposing strategies like capacity building and regulatory frameworks to overcome technical and infrastructural barriers. Altogether, these studies underscore the transformative potential of AI in public service delivery while highlighting the challenges related to trust, environmental uncertainty, and adoption hurdles.

Theoretical Framework

The Technology Acceptance Model (TAM), developed by Fred Davis in 1989 (Davis, 1989)), serves as a key framework for understanding how individuals accept and use new technologies. Rooted in the Theory of Reasoned Action (TRA) by Ajzen and Fishbein (1975), TAM specifically focuses on two primary constructs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). These constructs aim to explain why users adopt, reject, or continue to use new technologies based on their perceived value and ease of integration into daily practices. Through his seminal work, Davis (1989) sought to simplify the complex process of understanding technology acceptance, particularly for information systems. He identified Perceived Usefulness (PU) as the degree to which a person believes that using a technology would enhance their performance and Perceived Ease of Use (PEOU) as the extent to which a person believes that using the system would be free from effort. These two variables, as suggested by Davis, significantly influence attitudes toward using technology and, ultimately, behavioral intentions to use technology. Over time, Venkatesh and Davis (2000) expanded upon this model by proposing additional variables, including social influence and facilitating conditions, which enhance the model's applicability across different contexts. As a result, TAM has become a widely accepted framework in technology adoption research.

Given its foundational principles, TAM is highly relevant to the study of artificial intelligence (AI) adoption in regional integration within ECOWAS (Economic Community of West African States). AI holds immense potential to transform public service delivery, enhance governance, and facilitate regional integration across Africa. However, the successful implementation of AI in this context is mainly contingent upon users' perceptions of its usefulness and ease of use. As such, Perceived Usefulness (PU) becomes a critical factor in understanding how stakeholders, including government officials, policymakers, and the public within the ECOWAS region, perceive AI's ability to enhance regional integration.

For instance, AI could streamline border control, strengthen trade facilitation, and improve the efficiency of public service delivery - key aspects of regional cooperation and integration. Consequently, if users within ECOWAS perceive AI to benefit from these functions, they are more likely to adopt and integrate AI technologies into regional operations. In parallel, Perceived Ease of Use (PEOU) also plays a crucial role in how AI technology is perceived in terms of its implementation within West African countries' socio-political and economic landscapes. As AI systems are often complex and require technical expertise, the perceived ease of use can significantly impact whether AI is adopted. If AI systems are considered user-friendly and adaptable to existing infrastructures in ECOWAS countries, there is a higher likelihood of successful integration. Therefore, attitudes toward using AI and behavioral intentions to use AI are directly influenced by these perceptions. The Technology Acceptance Model offers an effective theoretical lens for analyzing how usefulness and ease of use factors could impact the acceptance of AI technologies in promoting regional integration within ECOWAS. With the continued growth of AI technologies in governance and public service delivery, TAM remains a critical framework for understanding user acceptance and behavior, particularly in the context of ECOWAS's efforts to foster deeper regional cooperation.

Methodology

This study used a descriptive-analytical research design to explore the role of artificial intelligence (AI) in fostering regional integration and economic diversification within the ECOWAS sub-region. Relying entirely on secondary data, it drew from various sources such as government reports, academic journals, international organizations, and industry white papers. Consequently, these sources provided thorough insights into AI's impact on regional integration, technological innovation, and economic growth. In gathering data, the study systematically reviewed literature, analyzed policy documents, and compiled quantitative and qualitative data relevant to the research objectives. As a result, this allows the research to capture existing information on AI's adoption and economic trends in the ECOWAS region. Thematic, trend, comparative, and content analysis methods are applied to analyze the data. Notably, the analysis is structured to identify key trends in AI adoption, economic integration, and the challenges associated with implementing AI-driven policies. However, the research is limited by the accuracy and timeliness of the secondary data, as some reports may not reflect the most current developments. Additionally, gaps in the data across ECOWAS member states might restrict a complete understanding of AI implementation efforts. Nevertheless, the descriptive-analytical approach broadly explores AI's role, presenting valuable insights for policymakers.

Data Analysis and Interpretation of Findings

The "Data Analysis and Interpretation of Findings" section provides a comprehensive examination of secondary data concerning the role of artificial intelligence (AI) in fostering regional integration and economic diversification within ECOWAS and assessing the impact of AI on regional integration in ECOWAS. It also explores the associated risks and challenges accompanying the adoption of AI technologies, offering insights into the region's potential impact on governance, trade, and socio-economic development.

Evaluating the Role of AI in Driving Economic Diversification within ECOWAS

The use of artificial intelligence (AI) is important for economic changes in ECOWAS and helps with long-term growth in the area. AI technologies can help drive new ideas in important sectors, leading to chances for economic development beyond traditional areas. The African Union's Digital Transformation Strategy (2020) points out that AI can help governments work better, use resources more wisely, and strengthen economic stability. By using AI tools, ECOWAS can enhance business productivity, aid in moving towards digital economies, and promote new ideas in agriculture, manufacturing, and services. AI can analyze large sets of data, improving decision-making in complicated sectors and promoting economic changes. For example, AI can help manage supply chains and improve resource planning, which is key for increasing industrial growth and supporting regional trade (Mahama et al., 2024). Moreover, AI solutions like machine learning and automation can cut costs and enhance services, creating a better environment for business and innovation in the region (Ben Abdelaziz et al., 2022). As ECOWAS aims to reduce reliance on a few sectors, AI will be essential in diversifying economies by offering tools for innovation, effective resource use, and market growth (Bassey et al., 2024). In the end, integrating AI into regional economic plans connects with wider goals to modernize industries and promote sustainable growth in ECOWAS.

Assessing the Impact of AI on Regional Integration in ECOWAS

The role of artificial intelligence (AI) in advancing regional integration within ECOWAS is significant, as it offers numerous opportunities to strengthen cooperation among member states and facilitate deeper economic and political integration. Notably, AI's application in governance, infrastructure, and technology is reshaping how countries in the region collaborate, improving and challenging their integration efforts. The African Union's Continental Artificial Intelligence Strategy (2024) highlights AI's potential to drive economic growth, bridge infrastructural gaps, and foster cooperation across borders, contributing to regional integration. As the AU's Digital Transformation Strategy for Africa (2020) underscores, the continent's digital revolution is pivotal in aligning economic and technological progress within regional frameworks like ECOWAS. In particular, AI facilitates enhanced communication between citizens and government bodies, contributing to the delivery of services across borders. According to Androutsopoulou et al. (2019), AI-powered systems such as chatbots transform citizens' and government interaction by streamlining administrative processes, promoting transparency, and fostering efficient governance. This technological advancement supports trust in public institutions, which is crucial for facilitating smoother cross-border cooperation among ECOWAS members. Furthermore, Aoki's (2020) research into public trust in AI systems demonstrates the significance of establishing trust in these technologies, as such trust can enhance collaboration between states, driving more integrated regional governance structures. Moreover, AI can potentially reduce the complexity of transnational issues, which have traditionally hindered integration efforts in West Africa. As Nwangwu et al. (2019) note, West African countries face challenges in regional integration due to political, economic, and social divisions. AI addresses these challenges by enabling data-driven decision-making, which supports more informed policy choices. Choi et al. (2021) emphasize that AI can transform governance by identifying key issues, facilitating better resource allocation, and enhancing decision-making processes, all essential to fostering closer regional cooperation.

Similarly, the economic potential of AI in the ECOWAS region is undeniable. As Ben Abdelaziz et al. (2022) argue, AI and machine learning technologies drive innovation within businesses, improve supply chain management, and boost regional productivity. AI tools that enhance economic planning, predict market trends, and optimize resource distribution can directly contribute to the region's economic integration, ensuring that policies are both aligned and mutually beneficial. Mahama et al. (2024) further highlight how AI enhances decision-making and supply chain agility, which are key to facilitating regional trade and intergovernmental collaboration. Such developments can significantly improve the economic fabric of West Africa, enhancing trade relationships among ECOWAS states and promoting a single economic space. In addition, AI's integration into the public sector fosters improved governance across member states, thereby strengthening regional institutions. Valle-Cruz and García-Contreras (2023) demonstrate that AI-driven transformations in governance allow for more intelligent data management and increased service efficiency, aligning with the strategic objectives of ECOWAS in building a more resilient and efficient regional governance structure. Furthermore, the use of AI in public services, such as border control and customs management, as noted by Luqman et al. (2023), can help streamline cross-border processes, reduce corruption, and accelerate economic exchanges, thus reinforcing the integration process. However, while the prospects are promising, implementing AI in ECOWAS faces challenges related to technological infrastructure, regulatory frameworks, and data privacy concerns. As noted by Dentons (2024), AI regulation across African nations is still in its nascent stages, which presents hurdles in harmonizing policies for AI integration. Additionally, the varying levels of technological adoption and readiness among ECOWAS states complicate the collective use of AI. De Melo and Tsikata (2015) observe that such disparities in digital infrastructure often undermine the coherence of regional integration efforts. This suggests the need for a unified approach to policy development and AI governance across member states. Despite these challenges, AI's potential to drive regional integration in ECOWAS remains substantial. Through collective efforts in policy harmonization, technological investment, and capacity building, ECOWAS member states can harness AI to strengthen cooperation, enhance economic integration, and improve governance. As highlighted by the Business Continuity Institute (2023), digital transformation through AI offers the region a path toward resilience, driving regional integration and ensuring that the ECOWAS framework adapts effectively to the challenges of the digital age.

Investigating the Risks and Challenges of Implementing AI in ECOWAS

Using artificial intelligence (AI) in the Economic Community of West African States (ECOWAS) has potential to improve governance, public services, and regional cooperation. However, there are significant risks and issues related to job loss, the gap between digital access, and problems with trust and infrastructure readiness. It is important to look at these concerns and suggest ways to overcome them. A major concern is job loss. AI may automate many tasks, especially in agriculture, manufacturing, and public service areas, possibly leading to large employment disruptions, particularly among low-skilled workers. For example, the use of AI chatbots in public services, as mentioned by Androutsopoulou et al. (2019), might replace jobs in customer service and administration, which are crucial in many West African economies. This change can significantly affect the workforce, especially in countries with high unemployment. Additionally, there is a risk of widening inequality, as certain groups

may not have the skills needed for new AI-related jobs, deepening the gap between skilled and unskilled workers (Bjerke-Busch & Thorp, 2024). To tackle this issue, training and skill development programs should be a priority. According to the African Union's (2024) Continental AI Strategy, investing in educational programs focused on AI literacy and digital skills is crucial for ensuring the workforce is prepared for AI-driven changes. This can be achieved through collaborative efforts between governments, educational institutions, and the private sector to develop training programs tailored to the needs of the evolving job market. Furthermore, governments should create frameworks for social protection to support workers displaced by AI, helping them transition to new roles within the economy (Strathmore University Centre for Intellectual Property and Information Technology Law, 2023).

Another critical challenge in implementing AI in ECOWAS is the digital divide, which reflects disparities in access to digital technologies across different regions and socio-economic groups. While AI can potentially drive transformative change, its benefits may not be evenly distributed if access to the necessary infrastructure is limited. In rural areas, for example, a lack of internet connectivity and computing devices can impede the adoption of AI solutions. The African Union's (2020) Digital Transformation Strategy emphasizes the need for comprehensive digital infrastructure to support the deployment of AI across the continent, yet many West African countries still face substantial gaps in this regard. To mitigate the digital divide, ECOWAS can focus on inclusive digital infrastructure development, ensuring that urban and rural areas have the technological resources required for AI adoption. Public-private partnerships could be instrumental in extending broadband coverage and providing affordable access to digital devices. Furthermore, governments must ensure that AI policies are inclusive, addressing the needs of marginalized communities and promoting digital equity (Fan & Pan, 2023). Initiatives such as mobile-based AI solutions could help bridge the gap, enabling more widespread use of AI in sectors such as healthcare and education. Moreover, public trust in AI remains a significant challenge. In the public sector, citizens must have confidence in AI systems to accept and engage with them. Studies such as those by Aoki (2020) and Kleizen et al. (2023) highlight the importance of building trust through transparency, accountability, and ethical AI practices. In ECOWAS, where governance challenges are prevalent, AI could be viewed with skepticism if it is perceived as a tool for corruption or political manipulation. To overcome this barrier, ECOWAS governments should adopt strong AI governance frameworks that prioritize ethical considerations, transparency, and the protection of citizens' rights. As suggested by Dentons (2024), trust in AI systems can be cultivated by adhering to best practices in AI regulation and involving citizens in the decision-making process.

Finally, the technical readiness of governments in West Africa poses another challenge. Many regional public institutions lack the infrastructure, expertise, and data management systems required to implement AI successfully. To address this, governments should focus on capacity-building programs to develop public sector employees' skills in AI and data analytics. Additionally, ECOWAS could create a regional AI framework that supports cross-border collaboration in AI research and development, as advocated by Bassey et al. (2024), to promote shared knowledge and resources. In conclusion, while AI offers substantial benefits for ECOWAS countries, its implementation must be carefully managed to mitigate risks such as job displacement and the digital divide. By investing in education, infrastructure, and governance frameworks, ECOWAS can harness AI's potential while

ensuring its inclusive, ethical, and sustainable deployment. Through these strategies, AI can be a powerful tool for driving economic growth, improving public service delivery, and advancing regional integration in West Africa.

Conclusion and Recommendations

Summary of Findings: This research examined the influence of artificial intelligence (AI) in fostering regional integration in West Africa. Three objectives were achieved. The study assessed the impact of AI on regional integration efforts within ECOWAS. It evaluated the role of AI in driving economic diversification within the ECOWAS sub-region. It investigated the risks and challenges associated with implementing AI in ECOWAS. The study used a descriptive-analytical research design, relying entirely on secondary data from various sources such as government reports, academic journals, international organizations, and industry white papers. The findings are derived from a comprehensive evaluation of AI's role in driving regional development, its impact on integration efforts, and the obstacles that must be addressed to ensure its successful deployment across member states.

Objective One: Evaluating the Role of AI in Driving Economic Diversification within ECOWAS The study found that AI plays a critical role in diversifying the economies of ECOWAS by fostering innovation, improving resource management, and boosting business productivity. AI technologies such as machine learning, data analysis, and automation are pivotal in enhancing key sectors, including agriculture, manufacturing, and services, contributing to long-term economic growth. The integration of AI facilitates the shift towards digital economies, improves industrial productivity, and enhances regional trade. This aligns with regional strategies like the African Union's Digital Transformation Strategy (2020), which underscores the transformative potential of AI in shaping modern economies. The findings highlight the ability of AI to reduce dependency on traditional sectors and support economic diversification across the region, which is crucial for sustainable growth in ECOWAS.

Objective Two: Assessing the Impact of AI on Regional Integration in ECOWAS

AI is found to be a powerful tool for advancing regional integration within ECOWAS. By improving governance, infrastructure, and communication, AI fosters cooperation among member states and facilitates deeper political and economic integration. AI enhances cross-border service delivery through tools like chatbots and data-driven governance, which streamline administrative processes and promote transparency. Furthermore, AI strengthens regional institutions by improving governance efficiency and enabling better policy formation and resource allocation decision-making. However, the study also identifies challenges, such as technological disparities and regulatory inconsistencies, that hinder the full realization of AI's potential. Despite these challenges, the findings suggest that AI can significantly enhance regional trade, improve productivity, and support closer economic collaboration among ECOWAS countries.

Objective Three: Investigating the Risks and Challenges of Implementing AI in ECOWAS

The study highlights several critical risks and challenges associated with implementing AI in ECOWAS. One primary concern is the potential for job displacement, especially in sectors reliant on low-skilled labor, such as agriculture and public services. As AI automates tasks traditionally performed by humans, there is a risk of widening inequality between skilled and

unskilled workers. The study recommends developing educational programs to enhance AI literacy and digital skills across the region, ensuring that workers are equipped to adapt to AI-driven changes. Another significant challenge is the digital divide, where unequal access to technological infrastructure impedes AI adoption, particularly in rural areas. The findings emphasize the need for inclusive digital infrastructure development to ensure equitable access to AI technologies. Furthermore, trust in AI systems remains a barrier to widespread adoption, particularly in the public sector, where transparency and ethical considerations are vital for fostering confidence. Finally, the study notes that the lack of technical readiness and expertise in public institutions across ECOWAS poses another challenge, urging the need for capacity-building programs to equip governments with the necessary skills and resources to implement AI effectively. In conclusion, while AI offers substantial economic and regional development opportunities within ECOWAS, its successful implementation requires careful management of risks and challenges. The study recommends a coordinated approach among ECOWAS member states to address infrastructure gaps, develop human capital, and establish robust governance frameworks that promote ethical AI practices and build public trust. By overcoming these obstacles, AI can become a transformative force that drives economic diversification, strengthens regional integration, and supports sustainable development across West Africa.

Policy Implications

To effectively integrate AI into ECOWAS's economic and political frameworks, policymakers should focus on several key areas:

Digital Infrastructure: Improve access to affordable internet and digital devices, especially in rural areas. **AI Education & Workforce Development:** Invest in AI literacy and skills training, focusing on retraining workers displaced by automation.

AI Governance: Create ethical AI frameworks to ensure transparency, accountability, and public trust. **Regional Collaboration:** Promote cross-border AI research, development, and innovation to boost regional integration. **Equitable Impact:** Ensure AI benefits all communities, particularly marginalized ones, and promotes social equity. **Cybersecurity & Data Privacy:** Develop robust cybersecurity and data privacy laws to protect citizens' information. **Political Leadership:** Ensure strong political will and leadership to support AI integration as part of national development strategies. In conclusion, a comprehensive, inclusive approach to AI can drive innovation, economic diversification, and regional cooperation in ECOWAS.

Conclusion

In conclusion, artificial intelligence (AI) presents significant opportunities to drive sustainable socio-economic growth and enhance regional integration within the ECOWAS sub-region. By fostering innovation, improving governance, and optimizing resource allocation, AI can diversify economies, enhance productivity, and facilitate cross-border cooperation. However, successful integration requires overcoming challenges related to infrastructure, digital divides, and public trust. Policymakers must prioritize inclusive digital infrastructure, workforce development, and robust governance frameworks to unlock AI's full potential. Future research should explore the long-term impacts of AI on employment, regional trade, and the digital economy, as well as the ethical implications of AI deployment in governance and public services across ECOWAS member states.

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