AI and Digital Economies: A Comparative Analysis of South and Southeast Asia and Africa

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Review Article

ABSTRACT

This study aims to analyze the adoption of Artificial Intelligence (AI) in South and Southeast Asia and Africa, focusing on how AI technologies shape the digital economies in these regions. The objective is to assess AI's role in key sectors such as energy, manufacturing, healthcare, and finance, and examine its impact on policy formulation, public service delivery, and governance. The paper employs a comparative literature review methodology. Data is gathered from secondary sources, including academic papers and reports, to analyze AI infrastructure, policy frameworks, sectoral impacts, and barriers to adoption. The study identifies similarities and differences in AI integration across the regions. The study reveals that South and Southeast Asia have made greater advancements in AI adoption, driven by stronger infrastructure and government policies, while Africa faces challenges due to infrastructure deficits and limited AI expertise. However, both regions show potential for leveraging AI to drive economic growth, particularly in underserved

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sectors like agriculture and financial inclusion. Additionally, the research highlights the critical role of AI governance, with a strong need for both regions to develop robust regulatory frameworks to ensure responsible and ethical AI implementation. The study is limited by its reliance on secondary data, which restricts deeper insight into on-the-ground challenges. Future research should incorporate field studies and interviews with AI practitioners for a more comprehensive understanding of AI's impact. This paper contributes to the limited comparative research on AI adoption between South and Southeast Asia and Africa. It offers insights for policymakers and industry leaders on how AI can be harnessed for inclusive economic growth and transformation in these regions.

1. INTRODUCTION

In the evolving landscape of the digital economy, Artificial Intelligence (AI) has emerged as a transformative technology, reshaping industries, enhancing productivity, and driving innovation across the globe [1]. AI's ability to simulate human intelligence through advanced algorithms enables systems to perform tasks such as data analysis, decision-making, and automation with greater efficiency and accuracy [2]. However, the adoption and impact of AI vary significantly across regions due to differences in infrastructure, economic development, policy frameworks, and technological capacity [3].

In South and Southeast Asia, countries like India, Indonesia, and Vietnam are rapidly developing their AI capabilities [4]. Governments in these countries have begun investing heavily in AI research, digital infrastructure, and capacity-building initiatives to drive economic growth [5]. AI applications are emerging across sectors such as agriculture, finance, and energy, helping these nations address critical challenges related to urbanization, resource management, and financial inclusion [6]. Despite these advancements, many countries in the region still face issues such as regional disparities in infrastructure, low AI literacy, and a need for more comprehensive AI policies [6].

Africa is still in the early stages of AI adoption [7]. Countries like South Africa, Kenya, and Nigeria are making progress in applying AI to sectors like agriculture, public health, and financial services [8]. However, much of the continent remains hampered by infrastructure deficits, lack of AI expertise, and policy gaps that limit large-scale AI deployment [8]. Despite these challenges, Africa has significant potential to leapfrog traditional development stages by leveraging mobile technologies and AI-powered solutions to address critical issues such as food security and energy access [8].

While there has been considerable research on the adoption of Artificial Intelligence (AI) within individual regions particularly Asia, Africa, and Europe there is a notable lack of comparative studies that analyze the differences, similarities, and intersections between these regions [9]. Most existing studies focus on region-specific factors influencing AI implementation, such as governmental policies, infrastructure, and socioeconomic conditions [10]. However, few have attempted to systematically compare AI adoption across multiple regions, particularly in the context of the digital economy [11].

This gap in the literature presents a significant opportunity for deeper analysis. By exploring the distinct trajectories of AI adoption in Asia and Africa, this paper explores the current state of AI integration in the digital economies of these continents and provides a comparative review of AI adoption in South and Southeast Asia and Africa, focusing on how these regions, despite their differing economic and technological landscapes, can harness AI to drive economic growth and digital transformation. The study addresses the following research questions: How are AI technologies being integrated into key sectors in South and Southeast Asia and Africa? What are the major barriers to AI adoption in these regions, particularly in terms of infrastructure, digital literacy, and policy frameworks? What role do governments and policy frameworks play in facilitating or hindering AI's development in these regions?

The paper is structured as follows: Section 2 provides the literature review. Section 3 explains the methodology, followed by the analysis and results in Section 4. Section 5 discusses the findings, and Section 6 offers recommendations.

The paper concludes in Section 7, with Section 8 addressing the limitations.

2. LITERATURE REVIW

2.1 Artificial Intelligence (AI)

Artificial Intelligence (AI) refers to the development of computer systems capable of performing tasks typically requiring human intelligence, such as visual perception, speech recognition, decision-making, and language translation [12]. The field of AI includes various technologies such as machine learning (ML), natural language processing (NLP), computer vision, and robotic process automation (RPA), all of which have the potential to revolutionize industries by improving efficiency, reducing costs, and enabling data-driven decision-making [13].

2.2 Types of AI

AI is categorized into several types based on complexity:

- Reactive AI: These systems react to specific inputs but do not store memories or learn from past experiences, making them limited in scope [14].

- Limited Memory AI: AI that uses historical data to make future decisions, commonly applied in systems like self-driving cars and fraud detection systems [15].

- Theory of Mind AI: This AI aims to understand human emotions and social interactions, a development that could transform sectors like customer service and healthcare [16].

- Self-Aware AI: The most advanced form of AI, still hypothetical, where machines possess consciousness and self-awareness [17].

2.3 The Current Stage of AI Adoption in South and Southeast Asia

Countries in South and Southeast Asia, such as India, Indonesia, Vietnam, and Malaysia, are becoming important players in AI adoption, driven by government policies and private-sector initiatives [4]. India has advanced AI adoption in sectors such as agriculture, finance, and healthcare [18]. The National Strategy for Artificial Intelligence (NSAI), launched in 2018, highlights AI as a tool for inclusive growth, with applications in smart agriculture and smart cities [19]. For instance, AI applications in precision farming help optimize crop yields and resource use, improving agricultural outcomes [20].

Indonesia and Vietnam are leveraging AI to address challenges related to urbanization and sustainability [21]. Indonesia emphasizes AI's role in public services, particularly in healthcare and disaster management [22]. Vietnam is investing in AI-driven smart cities, focusing on using AI for traffic management, infrastructure development, and pollution control [23]. Despite these advances, infrastructure challenges and a shortage of AI talent hinder the broader adoption of AI across South and Southeast Asia. The Asian Development Bank (ADB) identifies infrastructure gaps and unequal digital access as major obstacles [24].

2.4 The Current Stage of AI Adoption in Africa

AI adoption in Africa is at a nascent but growing stage, characterized by both significant challenges and emerging opportunities [25]. While African countries are not yet at the forefront of AI development compared to regions like Asia and Europe, there is a rising interest in leveraging AI to address critical developmental challenges, such as improving healthcare, agriculture, education, and governance [26].

In recent years, several African nations, including South Africa, Nigeria, Kenya, and Egypt, Ghana have started to develop their AI ecosystems [8]. This growth is driven by tech hubs, startups, and partnerships between governments and private sectors. Countries like Rwanda have made substantial investments in technology infrastructure, positioning themselves as leaders in AI adoption on the continent [8]. Countries like South Africa, Kenya, and Nigeria are leading AI adoption efforts. In Kenya, AI-driven mobile platforms are transforming financial inclusion by offering unbanked populations access to mobile banking and digital financial services, such as M-Pesa [27]. South Africa is using AI to optimize energy management and public health services, particularly in renewable energy projects [28].

However, significant barriers persist in Africa, including infrastructure deficits, low digital literacy, and the lack of AI policy frameworks

[29]. While mobile technology is widely available, access to high-speed internet and cloud computing remains limited, preventing widespread AI integration [29]. Furthermore, the continent faces a shortage of skilled AI professionals, hindering the capacity to develop and scale AI solutions [30].

2.5 AI and the Digital Economy

The digital economy refers to economic activities that are enabled by digital technologies, encompassing everything from e-commerce to online financial services and digital communication platforms [31]. In recent years, Artificial Intelligence (AI) has emerged as a central force in driving the growth of the digital economy, revolutionizing how businesses operate, governments manage public services, and individuals interact with digital platforms [32]. By enabling more efficient data processing, automation, and personalization, AI is creating new opportunities for innovation and economic development across both developed and developing regions.

- South and Southeast Asia

In South and Southeast Asia, AI is playing a key role in expanding the digital economy, particularly in sectors such as e-commerce, digital banking, and telecommunications [33]. Countries like India, Indonesia, and Malaysia are experiencing rapid growth in their digital economies, driven by the adoption of AI technologies that enhance business operations, customer experiences, and service delivery. AI is being used to improve the performance of e-commerce platforms by providing personalized shopping experiences through recommendation engines and customer behavior analysis [34]. AI also helps optimize logistics and supply chains, making it easier for businesses to manage inventories and fulfill orders [35]. Similarly, in Indonesia, AI is being integrated into fintech platforms to offer more accurate credit scoring, risk management, and fraud detection, enabling the growth of digital finance and mobile payments [36].

AI is also significantly enhancing the telecommunications industry in this region. By leveraging AI-driven network management systems, telecommunications companies can optimize network performance, predict outages, and ensure faster, more reliable services [37]. 5G networks being deployed across countries

like Vietnam and Thailand rely heavily on AI technologies to manage data traffic and support smart cities and Internet of Things (IoT) ecosystems. Despite these advancements, digital infrastructure gaps and the urban-rural divide remain significant challenges to the widespread adoption of AI in the digital economy [37]. Many rural areas in South and Southeast Asia still lack reliable access to high-speed internet, limiting the ability of businesses and individuals to fully participate in the digital economy [24].

- Africa

The digital economy in Africa is expanding rapidly, with AI poised to play a transformative role in driving further growth [38]. Mobile technology has been the backbone of Africa's digital economy, and AI is now being integrated into various digital platforms to improve efficiency and scalability, particularly in mobile banking, e-commerce, and digital public services [39]. In Kenya, mobile payment platforms like M-Pesa are leveraging AI to offer more sophisticated services, such as microloans and investment products, tailored to the financial needs of low-income users [40]. By analyzing transaction histories and user behavior, AI systems can assess creditworthiness and offer personalized financial solutions, driving financial inclusion and supporting the growth of Africa's fintech sector.

AI is also being used to enhance e-commerce platforms across Africa [41]. In Nigeria, AI is helping online retailers improve customer experiences through personalized recommendations and predictive analytics that optimize inventory management and logistics [42]. By enabling smarter supply chains and faster delivery services, AI is helping businesses reduce costs and enhance their competitiveness in the global market

2.6 AI and the Various Sectors of the Economy

- Energy

    AI is poised to revolutionize the energy sector, driving efficiencies, reducing costs, and enabling the integration of renewable energy systems [43]. In South and Southeast Asia, countries like India are applying AI to manage smart grids and enhance energy optimization. AI systems predict energy consumption

patterns and optimize the use of solar and wind power, making renewable energy more reliable and scalable [44]. In Africa, AI is being used to improve energy access through microgrids and optimize solar energy management in rural areas [45]. South Africa is deploying AI to manage its national power grid and integrate renewable energy sources, helping to meet the continent's growing energy demands [28].

- Manufacturing

  AI is transforming the manufacturing sector by enabling automation, improving predictive maintenance, and enhancing supply chain management [46]. In India, AI-powered robots and smart factories are reducing operational costs and improving productivity [47]. Similarly, in Vietnam, AI is being integrated into manufacturing processes to reduce waste and increase efficiency [48]. In Africa, the manufacturing sector is also beginning to see the benefits of AI, particularly in automated production lines and quality control [49]. South Africa is leading the continent in AI-driven manufacturing, where companies are using AI to monitor machinery performance and reduce downtime through predictive maintenance [50]. This helps minimize production losses and improves operational efficiency.

- Education

  AI is being applied in education to offer personalized learning experiences, automate administrative tasks, and improve access to education [51]. In South and Southeast Asia, AI is used to tailor educational content to individual learners, particularly in rural areas, where access to quality education is limited [52]. In Africa, AI-powered education platforms are helping bridge the gap in teacher shortages and delivering remote learning to students in underserved areas [53].

- Healthcare

  AI is transforming healthcare systems by improving diagnostics, streamlining patient management, and enabling telemedicine [54]. In India, AI-driven diagnostic tools are being used to detect diseases such as diabetes and tuberculosis earlier and more accurately [55]. In Africa, AI is helping governments manage public health crises by optimizing healthcare delivery and tracking disease outbreaks, such as during the COVID-19 pandemic [56].

3. METHODOLOGY

This study uses a comparative literature review methodology, by analyzing and comparing academic papers on AI adoption in South and Southeast Asia and Africa. By comparing existing literature on AI adoption in South and Southeast Asia and Africa, this study examines the role of AI in the digital economy, key sectors of the economy, Challenges and Barriers and analyzes its impact on policy formulation and governance.

3.1 Analytical Framework

The analysis focuses on the following dimensions:

- Infrastructure Development

Assessing the availability of digital infrastructure, broadband access, and AI research centers.

- Policy and Governance

Analyzing the role of AI in policy development and the effectiveness of governance structures in implementing AI initiatives.

- Sectoral Impact of AI

Evaluating how AI technologies are transforming critical sectors such as agriculture, energy, and finance.

- Challenges and Barriers

Identifying barriers such as infrastructure limitations, data privacy concerns, and digital literacy gaps.

4. ANALYSIS AND RESULTS

The analysis of AI adoption and its impact on the digital economies of South and Southeast Asia and Africa is structured around four key

dimensions: Infrastructure Development, Policy and Governance, Sectoral Impact of AI, and Challenges and Barriers. These dimensions provide a comprehensive view of the current state of AI integration in these regions and highlight the factors that are influencing AI-driven economic transformation.

4.1 Infrastructure Development

A critical factor in the adoption and success of AI in both South and Southeast Asia and Africa is the availability of digital infrastructure, including reliable broadband access, data centers, and AI research institutions [57]. In South and Southeast Asia, countries like India, Vietnam, and Malaysia have made significant investments in broadband infrastructure and AI research hubs, enabling faster integration of AI technologies into key sectors [4]. However, there are still regional disparities, particularly between urban and rural areas, where infrastructure is less developed, limiting the scalability of AI solutions. The 5G rollout in countries like Thailand and Indonesia is expected to further boost AI deployment by enabling faster data processing and more reliable connectivity, crucial for AI-driven sectors such as smart cities and digital finance [4].

In Africa, the situation is more challenging. Many countries still suffer from limited access to high-speed internet and a lack of digital infrastructure in rural areas, which hampers the widespread adoption of AI [58]. While mobile technology has helped bridge the gap in certain areas, the absence of sufficient cloud computing facilities and AI research centers limits the region's ability to develop and implement advanced AI solutions [59]. In South Africa and Kenya, there have been efforts to improve digital infrastructure, but overall, the region lags behind its Asian counterparts.

4.2 Policy and Governance

The role of policy development and the effectiveness of governance structures in implementing AI initiatives are crucial for guiding the ethical and sustainable use of AI technologies [60]. In South and Southeast Asia, governments are increasingly incorporating AI into their national development strategies [4]. AI roadmap focus on developing AI talent, promoting AI research, and integrating AI into critical sectors like agriculture, healthcare, and urban planning [61]. These policies are aimed at fostering innovation while addressing ethical

concerns, such as data privacy and bias in AI algorithms. However, the effectiveness of these policies varies, with some countries having more advanced frameworks than others. For example, Singapore has been a leader in establishing AI governance standards, while countries like Indonesia are still in the early stages of policy development [62].

In Africa, AI policies are less developed, with only a few countries like South Africa and Kenya making significant strides in formalizing AI governance frameworks [63]. Kenya has taken steps to integrate AI into public services, but much of the continent lacks clear policies regarding data protection and AI ethics [63]. Without strong regulatory oversight, there is a risk that AI technologies could be deployed in ways that exacerbate inequalities or violate privacy rights, particularly in regions where governance is weak or inconsistent [64].

4.3 Challenges and Barriers

Despite the potential of AI to transform economies, both South and Southeast Asia and Africa face significant challenges in fully realizing the benefits of AI technologies. These include:

- Infrastructure Limitations: The lack of reliable digital infrastructure remains a major barrier, particularly in rural areas. Without access to high-speed internet, cloud computing, and modern data centers, the scalability of AI solutions is severely constrained, especially in Africa, where infrastructure development has lagged behind other regions [57,65].

- Data Privacy Concerns: The growing use of AI in sectors like finance and healthcare has raised concerns about data privacy and the potential misuse of personal data [66]. In South and Southeast Asia, countries like India have introduced the Personal Data Protection Bill, but enforcement remains inconsistent, and concerns about government surveillance persist [67] In Africa, the absence of comprehensive data protection laws in many countries poses significant risks to individuals' privacy and security [68].

- Digital Literacy Gaps: Both regions face significant digital literacy challenges, with a shortage of AI expertise limiting the ability of local industries to adopt and innovate

with AI technologies [69]. In Africa, particularly, there is a critical need for education and training programs to build the skills required to develop, maintain, and govern AI systems effectively [59]. The lack of AI education also means that many workers are unprepared for the digital transformation, leaving them vulnerable to job displacement as AI becomes more prevalent.

- Regulatory and Policy Gaps: The lack of clear AI regulations and governance frameworks is a major barrier, particularly in Africa, where many governments have yet to develop comprehensive AI policies [60]. Without proper guidelines, there is a risk that AI could exacerbate inequalities or be used in ways that undermine ethical standards, such as through biased algorithms or unchecked surveillance systems [70].

5. DISCUSSION

The results highlight clear differences in AI adoption between South and Southeast Asia and Africa, primarily driven by variations in infrastructure and policy frameworks. In South and Southeast Asia, countries like India, Vietnam, and Malaysia have made significant progress in developing the necessary digital infrastructure, such as broadband access and AI research hubs, to support AI applications across sectors like agriculture, finance, and healthcare [4,5]. This reflects earlier discussions in the literature, where infrastructure was emphasized as a key enabler of AI-driven economic transformation [3].

In contrast, Africa faces considerable barriers due to inadequate infrastructure, including limited access to high-speed internet and a lack of AI expertise, especially in rural areas [8,6]. Despite these challenges, there are emerging opportunities, such as mobile technology, which has been instrumental in driving AI-based solutions like mobile banking and financial inclusion, exemplified by Kenya's M-Pesa [8].

Policy frameworks also play a crucial role in AI adoption. South and Southeast Asia have seen proactive policy development, with countries like India and Indonesia integrating AI into their national strategies to promote innovation and address issues like data privacy [22]. However, Africa's progress is slower, with gaps in AI governance and policy development across many nations [6]. The lack of comprehensive AI policies, especially regarding ethical concerns like bias and data privacy, poses a significant challenge to sustainable AI integration.

Sectoral impact further highlights differences in AI implementation. In South and Southeast Asia, AI is advancing precision farming, financial inclusion, and healthcare delivery [20,18]. Similarly, Africa has seen AI applications in agriculture and public health, but the scale remains limited due to infrastructure challenges [8]. AI's potential in Africa, especially in sectors like agriculture, holds promise for overcoming some of the continent's developmental hurdles, but this will require substantial investment and policy support [7].

6. CONCLUSION

The adoption of Artificial Intelligence (AI) in South and Southeast Asia and Africa presents significant opportunities for economic growth and technological advancement, but also faces notable challenges. South and Southeast Asia has made progress due to better digital infrastructure, more developed AI policies, and increased investments in AI research. In contrast, Africa faces more severe barriers, particularly in terms of infrastructure deficits, low digital literacy, and the absence of comprehensive AI governance frameworks. A key takeaway is the critical need for improved infrastructure, especially broadband access and data centers, to support AI adoption in rural and underserved areas. Both regions must also develop and enforce robust AI policies that prioritize data privacy, algorithmic transparency, and ethical AI use. Additionally, the shortage of AI expertise in these regions highlights the need for investment in education and workforce training to build the skills required for the digital economy. AI's impact on key sectors such as agriculture, finance, and energy is transformative, but its full potential will only be realized if the current infrastructure and policy gaps are addressed. By fostering regional cooperation, international partnerships, and inclusive AI strategies, South and Southeast Asia and Africa can harness AI's power to drive sustainable development and social inclusion. To fully leverage AI's potential, these regions must focus on building infrastructure, strengthening governance, and expanding AI literacy, ensuring that AI technologies are used responsibly and equitably for the benefit of all.

7. RECOMMENDATIONS

Based on the analysis and discussion of AI adoption in South and Southeast Asia and Africa, several strategic recommendations can be made to help these regions overcome existing challenges and fully realize the potential of AI-driven economic transformation. These recommendations focus on infrastructure development, policy frameworks, capacity building, and regional collaboration, all of which are crucial for fostering inclusive growth and ensuring the responsible and sustainable use of AI technologies.

7.1 Strengthening Digital Infrastructure

Infrastructure development is foundational to the successful deployment of AI across sectors, especially in rural areas that remain underserved in both South and Southeast Asia and Africa. Governments in these regions must prioritize investments in broadband networks, cloud computing facilities, and AI research centers to support widespread AI adoption.

- Invest in Broadband Expansion: Expanding access to high-speed internet, particularly in rural and remote areas, should be a top priority. Public-private partnerships can play a crucial role in funding and implementing broadband expansion projects. Universal access to broadband will ensure that AI-driven innovations, particularly in agriculture and healthcare, can reach the populations that need them the most.

- Develop Local Data Centers: Countries in both regions should focus on building local data centers to reduce reliance on foreign infrastructure. Establishing regional cloud computing hubs will not only improve data management and security but also lower operational costs for businesses adopting AI technologies.

- Leverage Mobile Networks: Given the widespread adoption of mobile technology in Africa and parts of South and Southeast Asia, these regions should capitalize on mobile networks to deliver AI-driven services. Mobile AI platforms have already proven effective in fintech and agriculture, and their role can be further expanded into healthcare and education.

7.2 Enhancing AI Governance and Policy Frameworks

The success of AI adoption is contingent on the development of robust policy frameworks that promote innovation while addressing ethical concerns such as data privacy, bias, and transparency. Both regions need to strengthen their AI governance structures to ensure the responsible use of AI technologies.

- Develop Comprehensive AI Policies: Governments should prioritize the creation of national AI strategies that outline clear goals for AI adoption, sectoral priorities, and ethical guidelines. These policies should promote inclusive AI development, ensuring that the benefits of AI are equitably distributed across all segments of society. Countries like India and Singapore can serve as models for how to create policies that encourage innovation while safeguarding ethical standards.

- Strengthen Data Protection Laws: In both South and Southeast Asia and Africa, data privacy is a growing concern as AI systems increasingly handle sensitive information. Countries should enact and enforce comprehensive data protection laws that regulate the collection, storage, and use of personal data. In Africa, in particular, where data protection frameworks are underdeveloped, governments should prioritize legislative action to safeguard citizens' privacy and build trust in AI technologies.

- Ensure Algorithmic Transparency: Governments and businesses should implement measures that promote algorithmic transparency to avoid biased decision-making in AI systems. This is especially important in sectors such as finance, healthcare, and law enforcement, where biased algorithms could reinforce existing inequalities. Regular audits of AI systems and the establishment of AI ethics boards can help monitor the impact of AI technologies and ensure fairness.

7.3 Building AI Capacity and Enhancing Digital Literacy

A significant challenge in both regions is the shortage of AI expertise and the digital literacy

gap. To fully capitalize on AI technologies, there must be a concerted effort to improve education, training, and upskilling initiatives that equip individuals and businesses with the skills needed for the AI-driven economy.

- Expand AI Education and Training Programs: Governments should collaborate with educational institutions and the private sector to establish AI-focused curricula at all levels of education. This includes introducing AI literacy programs in primary and secondary education, as well as providing specialized AI courses at universities and technical institutes. Scholarships and grants should be made available to encourage students from underserved communities to pursue careers in AI and related fields.

- Upskill the Workforce: In addition to formal education, upskilling and reskilling programs are essential to prepare the existing workforce for the digital transformation. Governments should create vocational training programs focused on AI, data science, and digital technologies to help workers adapt to the changing demands of the labor market. Collaboration with tech companies can facilitate online learning platforms and certification programs that provide flexible learning options for workers seeking to enhance their AI skills.

- Foster AI Research and Innovation: Governments should support the establishment of AI research hubs and provide funding for AI startups and innovation labs. Incentives such as tax breaks, grants, and innovation prizes can encourage entrepreneurs and researchers to develop AI solutions tailored to local challenges, such as climate resilience, food security, and healthcare access.

7.4 Promoting Regional and International Collaboration

- Collaboration across borders will be critical in accelerating AI adoption and ensuring that both regions benefit from the latest advancements in AI technologies. South and Southeast Asia and Africa can leverage their unique strengths through regional partnerships and international collaborations.

- Establish Regional AI Alliances: Countries within South and Southeast Asia and Africa should form regional AI alliances that facilitate the sharing of resources, knowledge, and best practices. By working together, countries can overcome individual limitations in infrastructure and AI expertise, and build a more connected AI ecosystem. Regional bodies such as ASEAN and the African Union could play an important role in fostering AI cooperation and establishing regional standards for AI governance.

- Engage in International Partnerships: Engaging with global tech leaders and international organizations can help these regions access advanced AI technologies and expertise. International partnerships with countries that are leaders in AI innovation, such as the United States, China, and Europe, could provide funding, technical support, and mentorship for AI startups and research initiatives in South and Southeast Asia and Africa. Collaboration with global institutions like UNESCO and the World Bank can further support AI adoption by providing financial resources and policy guidance.

7.5 Encouraging Ethical AI Development and Social Inclusion

It is critical that AI adoption in both regions be approached with a focus on social inclusion and ethical AI development. AI technologies should be designed and deployed in ways that promote equity and address existing socio-economic inequalities.

- Prioritize Inclusive AI Solutions: Governments and companies should ensure that AI technologies are developed to serve underserved populations and address local challenges. In Africa, for instance, AI solutions should focus on improving access to healthcare, education, and financial services in rural areas. Mobile-based AI platforms that provide low-cost solutions for agriculture, microfinance, and telemedicine can help uplift marginalized communities and promote inclusive growth.

- Develop Ethical AI Frameworks: Ethical AI frameworks must be integrated into national AI strategies to ensure that AI

technologies are transparent, fair, and accountable. Governments should collaborate with academia, civil society, and the private sector to create guidelines for the ethical use of AI, ensuring that issues such as algorithmic bias, privacy, and security are addressed. Implementing AI ethics boards or committees can help oversee the deployment of AI technologies and ensure compliance with ethical standards.

- Ensure Gender Equity in AI: Special attention should be paid to promoting gender equity in AI education and employment. Governments should encourage women's participation in AI fields through scholarship programs, mentorship initiatives, and support networks for women in tech. Increasing gender diversity in AI development teams is essential for ensuring that AI technologies are designed to benefit all members of society and reduce gender-based biases in AI algorithms.

8. LIMITATIONS

The analysis primarily relies on secondary data from academic literature, which limits the depth of insight into specific, on the ground challenges and successes in both regions. The absence of primary data, such as field research or interviews with AI practitioners, restricts a more nuanced understanding of real-world AI challenges and implementation. Additionally, the study employs a comparative review methodology, which introduces a methodological bias. Future research could address these limitations by incorporating primary data collection and more diverse research methods to provide a deeper and more comprehensive analysis.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare the use of generative AI technologies model (ChatGPT) was used to generate keywords that were then used to find papers regarding the topic during editing of manuscripts.

DECLARATION OF INTEREST

The authors declare that they have no conflicts of interest related to the research presented in this paper.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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