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Artificial Intelligence in Developing Nation: Bridging the Execution Gap with Potential

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Abstract: In order to bridge the gap between the enormous promise of AI and practicality, this article explores the role of AI in emerging nations. Global AI technological advances will have a significant impact on social and economic growth, particularly in areas that involve a variety of opportunities and difficulties. The paper examines how AI is now adopted in poor countries and examines the advantages, disadvantages, and ethical considerations. The study examines methods and approaches for utilizing AI's revolutionary potential in a variety of industries, including medical care, agriculture, and education, through a thorough literature analysis and case studies. The results highlight the value of talent shortages and infrastructural restrictions being addressed through legislative frameworks, public-private partnerships, and capacity building. Research advances our awareness of the potential and challenges associated with adopting artificial intelligence in developing nations, offering guidance to practitioners, policymakers, librarians, and academics as they navigate this rapidly changing technological environment.

Keywords: Artificial intelligence, global connectivity, emerging technologies, organizational flexibility, sustainable growth

I. Introduction

In the context of global technological advancement, the integration of artificial intelligence (AI) has emerged as a paradigm-shifting phenomenon, poised to transform industries, augment productivity, and catalyse innovation. Both developed and emerging nations are navigating the complexities of harnessing AI's potential, albeit with distinct challenges and opportunities. Emerging nations, in particular, face unique dichotomies in adopting and effectively implementing AI technologies, while developed nations seek to optimise their utilisation. This article undertakes a nuanced examination of the complex laws governing AI adoption in emerging nations, seeking to elucidate the symbiotic relationship between AI's vast potential and the pragmatic realities of its deployment.

Heterogeneous socioeconomic contexts characterise developing nations, which are presently situated at a critical inflexion point wherein they must harness the transformative potential of artificial intelligence (AI) to address pressing developmental challenges and catalyse economic growth (Wakonuma et al., 2020; Guo & Li, 2018; Hendler, 2023). The integration of AI technologies offers a paradigmatic opportunity for these nations to transcend traditional limitations and accelerate progress. However, given the distinctive contextual factors at play, emerging nations require nuanced strategic frameworks to effectively bridge the chasm between AI's potential benefits and its practical implementation, thereby ensuring optimal utilisation and tangible outcomes.

This investigation undertakes a comprehensive examination of the multifaceted dimensions of artificial intelligence (AI) adoption in developing nations, with a particular emphasis on addressing critical talent gaps (Kumar et al., 2022), mitigating the digital divide (Srivastava & Shainesh, 2021), and navigating the complex ethical implications associated with the deployment of cutting-edge technologies (Jobin et al., 2023). Beyond the mere integration of novel technologies, this study seeks to elucidate the profound impacts of AI on education (Zawacki-Richter et al., 2023), healthcare (Reddy et al., 2022), socioeconomic development (Kshetri, 2021), and other pivotal sectors. The primary objective of this research is to provide a nuanced understanding of the opportunities and challenges inherent to AI adoption in developing nations.

Investigating AI in developing nations transcends mere technological inquiry, emerging as a socio-economic imperative that warrants rigorous examination (World Bank, 2022; UNDP, 2023). As these countries stand at the precipice of transformative change, the findings of this study will contribute meaningfully to the global discourse on inclusive technological development, fostering a more equitable and sustainable future (Bostrom, 2022). Furthermore, this research will provide actionable insights for scholars, practitioners, and policymakers, enabling them to navigate the complexities of AI integration in developing societies and harness its potential to drive socioeconomic progress (Kshetri, 2021; OECD, 2022).

Artificial intelligence (AI) represents one of the most profound technological disruptors in contemporary times, revolutionising organisational dynamics, human-information interactions, and societal functioning (Mannuru et al., 2023). As AI technologies continue to evolve and permeate diverse aspects of daily life, the world is witnessing a paradigmatic shift that transcends traditional boundaries. Through its advanced computational capabilities, sophisticated machine learning algorithms, and complex neural networks, AI has transitioned from a specialised domain to a ubiquitous force driving innovation across multifaceted industries (Gupta et al., 2021; Zhang et al., 2021; Ukoba & Jen, 2022; Sanni et al., 2024). AI's integration into various sectors, including healthcare, finance, manufacturing, and beyond, has rendered it an indispensable component, with applications ranging from voice-activated assistants to advanced predictive analytics.

The proliferation of artificial intelligence (AI) is exerting a profound impact globally, transcending technological realms to influence societal structures, labour markets, educational systems, and communication paradigms. The transformative potential of AI has

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been catalysing extraordinary global advancements, as evidenced by notable productivity gains, innovative business model proliferation, and process optimisations in developed economies. However, the integration and implementation of AI in developing nations present distinct opportunities and challenges, underscored by disparities in educational infrastructure, economic capacity, and access to technology (Sood, Sharma, & Bhardwaj, 2022; Biswas, 2020). The resultant digital divide, characterised by unequal access to technological resources, exacerbates these disparities, hindering the equitable distribution of AI's benefits and impeding the widespread adoption of AI-driven solutions.

Developing nations are confronted with a pressing challenge: a scarcity of proficient talent in artificial intelligence (AI) technologies, which hinders the effective implementation and sustainability of AI systems (Pedro et al., 2019; Dwivedi et al., 2021). The integration process is further complicated by ethical considerations, including algorithmic bias and responsible AI utilisation, necessitating careful navigation. Nevertheless, amidst these challenges lie diverse opportunities. AI possesses the potential to catalyse innovation, enhance public services, and address pressing issues in critical sectors such as healthcare, agriculture, and education in developing nations. This article undertakes an in-depth examination of the intricate relationship between AI proliferation and its specific implications for developing countries. By judiciously harnessing AI's potential and mitigating its challenges, developing nations can leverage this technological revolution to drive sustainable development, ensuring that its benefits are equitably distributed and contribute to societal advancement.

The Adoption of Artificial Intelligence in Developing Nations: A Contemporary Overview of Trends and Trajectories

The integration of artificial intelligence (AI) in developing nations is a multifaceted and evolving narrative, influenced by a complex interplay of factors. As AI continues to redefine the global technological landscape (Bostrom, 2022; Schwab, 2022), it is imperative to examine the trends and patterns of AI adoption in developing countries, drawing comparisons with the trajectories of developed nations. This overview provides a snapshot of the current state of AI adoption in developing nations, highlighting emergent trends, challenges, and opportunities. Recent studies have underscored the potential of AI to drive socioeconomic development in emerging economies (Kshetri, 2021; World Bank, 2022). However, the adoption of AI in these contexts is often hindered by infrastructural, institutional, and capacity-related constraints. This section will explore the nuances of AI adoption in developing nations, shedding light on the opportunities and challenges that arise from this complex interplay.

Trends in Artificial Intelligence Adoption in Developing Countries:

Artificial intelligence (AI) adoption in developing nations has gained significant momentum, driven by the recognition of its transformative potential to stimulate economic growth, enhance public services, and address pressing societal challenges. Technological advancements, increased connectivity, and a growing understanding of AI's capabilities have fuelled its adoption across various sectors, including healthcare, agriculture, education, and government. Notably, AI is being leveraged to drive innovation and unlock efficiencies, with applications such as AI-powered healthcare solutions improving diagnostic capabilities and healthcare delivery in resource-constrained areas (Han et al., 2020; Al-Turjman, 2023; Patil & Shankar, 2023). Additionally, AI-driven precision agriculture is optimising yields and resource utilisation, while governments and educational institutions are exploring AI applications for informed policy-making and personalised learning experiences, respectively.

Similar to the Trends of Artificial Intelligence in Developed Countries:

The trajectory of artificial intelligence (AI) adoption in developing nations is increasingly aligning with global trends, albeit with distinct contextual nuances. Developed countries have historically spearheaded AI development and application, leveraging robust technological infrastructures, vibrant innovation ecosystems, and substantial investments in research and development (R&D) (Bostrom, 2022; Schwab, 2022). The integration of AI in developed nations has been characterised by widespread adoption across industries, including advanced robotics in manufacturing and sophisticated AI algorithms in finance and business analytics (Kshetri, 2021; World Economic Forum, 2022). As developing nations accelerate their AI adoption, they are poised to harness the transformative potential of these technologies to drive inclusive development and address localised challenges, thereby contributing to global innovation and bridging the technological divide (UNDP, 2022; World Bank, 2022).

AI capabilities to help develop contexts

Artificial intelligence (AI) possesses vast potential to drive transformative impacts in developing contexts, extending far beyond mere technological enhancements. Recent studies have underscored AI’s capacity to catalyse economic growth (Kshetri, 2021; World Bank, 2022), create new job opportunities (Fossen & Sorgner, 2022), and improve critical sectors such as healthcare (Patil & Shankar, 2023), education (Zawacki-Richter et al., 2023), and agriculture (Lipper et al., 2021). By harnessing AI’s potential, developing nations can unlock innovative solutions to pressing challenges, fostering sustainable development and enhancing the quality of life for their citizens.

Economy Growth & Job Creation:

Artificial intelligence (AI) technologies have the potential to catalyse economic growth and job creation in emerging nations by enhancing productivity, efficiency, and competitiveness across industries. As AI adoption accelerates, new markets, products, and services are likely to emerge, stimulating economic activity and contributing significantly to global economic output (Bughin et al., 2018; Manyika et al., 2021; Chui et al., 2023). While automation may displace certain tasks, AI-driven technologies have the

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potential to create new opportunities that require human expertise. This shift can lead to the generation of employment opportunities in areas such as AI development, maintenance, and oversight. To harness the benefits of AI adoption, investing in workforce development and promoting entrepreneurship in emerging technological domains is crucial, supporting the growth of a skilled workforce and driving sustainable economic growth.

Obstacles in the Adoption of AI:

The adoption of artificial intelligence (AI) in developing nations is a complex process fraught with challenges that must be addressed to unlock the full potential of these transformative technologies. Key obstacles to AI adoption include infrastructure constraints, skills shortages, educational barriers, and ethical and societal concerns (Kshetri, 2021; World Bank, 2022). For instance, limited access to reliable internet, data, and computational resources hinders the development and deployment of AI solutions. Moreover, the lack of skilled professionals with expertise in AI and data science poses a significant challenge to AI adoption. Furthermore, ethical concerns surrounding AI, such as bias and transparency, must be carefully considered to ensure that AI solutions are fair, accountable, and beneficial to society (Jobin et al., 2019).

Social and Ethical Issues to Consider:

The adoption of artificial intelligence (AI) presents intricate ethical dilemmas that require careful consideration to guarantee the responsible development and implementation of AI systems. Critical concerns include algorithmic bias, opaque decision-making processes, and data security and privacy risks (Florida et al., 2018; Jobin et al., 2019). Developing countries must prioritise the establishment of AI systems that are fair, transparent, and accountable while also tackling potential adverse effects, such as job displacement and social injustice. Furthermore, societal acceptance is crucial for the successful application of AI, underscoring the need for transparent communication about AI uses, benefits, and risk mitigation strategies (Mittelstadt et al., 2023). By fostering trust and addressing ethical concerns, governments and organisations can facilitate the responsible development and deployment of AI.

Infrastructure constraints:

Infrastructure constraints pose a significant barrier to the effective adoption of artificial intelligence (AI) in developing nations. The optimal implementation of AI requires robust computational resources, reliable high-speed internet connectivity, and advanced data storage facilities. However, many developing countries struggle with inadequate infrastructure, hindering the seamless integration of AI technologies (ITU, 2018; World Bank, 2022). The limitations imposed by poor connectivity, unreliable power supplies, and insufficient digital infrastructure can impede the real-time processing requirements of AI systems, exacerbating the digital divide between regions with and without adequate infrastructure.

The function of artificial intelligence in particular businesses:

Artificial intelligence (AI) has emerged as a transformative force across various industries, driving innovation and resolving complex challenges. As illustrated, AI's applications span multiple sectors, showcasing its versatility and potential to catalyse significant advancements. This overview highlights the pivotal role of AI in diverse industries, underscoring its capacity to enhance operational efficiency, inform strategic decision-making, and foster novel solutions. By harnessing AI's capabilities, organisations can navigate intricate challenges, capitalise on emerging opportunities, and ultimately drive sustainable growth and development.

Figure 1: Artificial intelligence in businesses

Agriculture:

The agricultural sector, a vital driver of development in numerous emerging economies, is poised to reap substantial benefits from the integration of artificial intelligence (AI). By leveraging AI-powered precision agriculture, farmers can enhance crop yields, mitigate environmental impact, and optimise resource utilisation, thereby supporting sustainable agricultural practices and ensuring food security (FAO, 2020; World Bank, 2022). Recent advancements in AI applications, including predictive analytics, pest management, and crop monitoring, have demonstrated significant potential to improve the livelihoods of farmers and facilitate data-driven decision-making. This enables farmers to respond effectively to climate variability, soil degradation, and other pressing agricultural challenges, ultimately contributing to a more resilient and productive agricultural sector.

Precision agriculture, powered by artificial intelligence (AI), is revolutionising farming practices by optimising crop yields and resource utilisation. AI-driven systems analyse data from satellites, drones, and sensors to provide actionable insights on crop conditions, pest management, and soil health (Kamilaris & Prenafeta-Boldú, 2022). Furthermore, AI-controlled automated

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machinery enhances the efficiency of planting, harvesting, and post-harvest processes, promoting sustainable and productive agriculture. By leveraging AI technologies, farmers can make data-driven decisions, reduce waste, and improve crop quality, ultimately contributing to increment in production.

Education:

The integration of artificial intelligence (AI) into education is precipitating a paradigm shift in the learning landscape, driven by the strategic deployment of intelligent tutoring systems, automated assessment tools, and personalised learning platforms. These cutting-edge technologies facilitate tailored learning experiences, adapting to the unique needs and abilities of individual students, thereby enhancing educational outcomes and promoting academic excellence (UNESCO, 2019; Zawacki-Richter et al., 2023; Ifenthaler & Yau, 2023). Furthermore, AI-powered content creation tools and virtual reality are augmenting the learning experience, rendering it more immersive, engaging, and interactive. By leveraging AI to automate administrative tasks, educators can redirect their focus towards high-value instructional activities, ultimately fostering a more efficacious and efficient education system.

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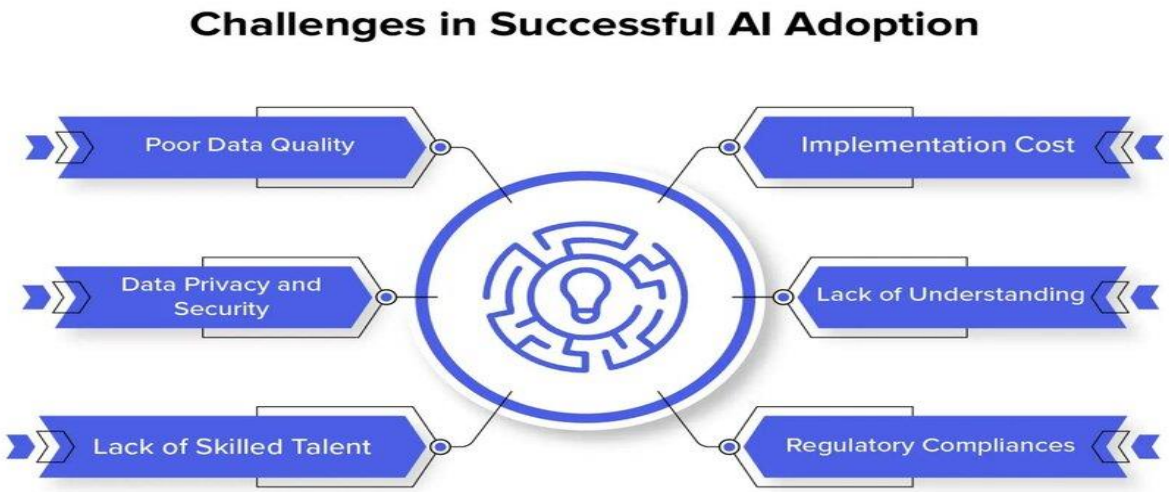
Education and Skills Gaps:

One of the pivotal challenges hindering the adoption of artificial intelligence (AI) in developing nations is the scarcity of workers possessing the requisite skills to effectively utilise AI technologies. Developing countries often grapple with a dearth of trained experts in data science, AI development, and machine learning, underscoring the need for a concerted focus on education and training initiatives (World Bank, 2022; UNDP, 2022). To bridge this skills gap, academic institutions must adapt their curricula to incorporate AI-related courses, thereby equipping students with the necessary skills to harness AI's potential. Moreover, addressing educational barriers is crucial, as limited awareness about AI can impede its adoption and integration across various industries. Promoting digital literacy and raising public awareness about the benefits of AI are essential for fostering an environment conducive to adoption (ITU, 2021).



Finance:

The integration of artificial intelligence (AI) in finance is pivotal for risk management, fraud detection, and customer service enhancement. Machine learning algorithms and predictive analytics are leveraged to analyse extensive datasets, identifying patterns and anomalies that inform strategic decision-making (Wang et al., 2020; Dutta et al., 2022). Robo-advisors provide personalised financial guidance, while chatbots and virtual assistants foster improved customer relationships through tailored interactions. Furthermore, AI-driven algorithms optimise trading strategies, enhancing market liquidity and efficiency (OECD, 2022). By harnessing AI's capabilities, financial institutions can mitigate risks, improve operational efficiency, and deliver more effective customer services.

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Industrial:

The integration of artificial intelligence (AI) in industrial operations is revolutionising supply chain efficiency, quality assurance, and predictive maintenance. AI-driven robotics and automation streamline production processes, minimising errors and enhancing productivity (Lee et al., 2019; Tao et al., 2022). Predictive analytics, powered by machine learning algorithms, enable the forecasting of equipment failures, thereby reducing downtime and optimising maintenance schedules. Furthermore, AI systems analyse real-time production data to improve product quality, facilitating adjustments to manufacturing processes and ensuring optimal performance (Kusiak, 2020). By leveraging AI technologies, industries can achieve significant improvements in operational efficiency, product quality, and overall competitiveness.

Medical Care:

The integration of artificial intelligence (AI) in medical care is transforming patient care, diagnosis, and treatment, marking a significant paradigm shift in healthcare delivery. Machine learning algorithms analyse medical imaging data to facilitate early disease detection, predict patient outcomes, and personalise treatment regimens (Topol, 2019; Rajpurkar et al., 2022). AI-powered chatbots provide patients with real-time support and interaction, enhancing patient engagement and empowerment. Furthermore, AI accelerates research processes and facilitates drug discovery, ushering in a new era of precision medicine (Esteva et al., 2021). By harnessing AI's capabilities, healthcare professionals can improve diagnostic accuracy, streamline clinical workflows, and deliver more effective, patient-centred care.

Retail:

The retail industry is undergoing a transformative shift, driven by the strategic integration of artificial intelligence (AI) to enhance customer experiences and drive business growth. Artificial intelligence (AI) applications, encompassing inventory management, 1502ptimize1502zed marketing, and demand forecasting, are being strategically leveraged to 1502ptimize retail operations, thereby enhancing efficiency and driving business growth (Verhoef et al., 2020; Grewal et al., 2021). Concurrently, AI-powered chatbots and virtual assistants are transforming customer relationships by providing contextually relevant recommendations, expediting response times, and cultivating 1502ptimize1502zed interactions that foster enhanced customer engagement and loyalty. Predictive analytics enables retailers to 1502ptimize pricing strategies and inventory levels, thereby reducing costs and increasing profitability. By harnessing the power of AI, retailers can gain a competitive edge, improve operational efficiency, and deliver seamless customer experiences, ultimately driving long-term success in a rapidly evolving retail landscape.

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Case Studies:

This section presents a series of illuminating case studies that exemplify the transformative applications of artificial intelligence (AI) in developing nations. These case studies showcase diverse projects that leverage AI technologies to address specific challenges and drive socioeconomic development, thereby underscoring the revolutionary potential of these innovations (Kshetri, 2021; Chen et al., 2022). By highlighting noteworthy AI applications in select emerging nations, this section aims to demonstrate the tangible impact of AI on development outcomes and provide insights into the opportunities and challenges associated with AI adoption in resource-constrained environments.

India: Accurate Farming with Precision for Smallholder Farmers:

The integration of artificial intelligence (AI) in precision farming is revolutionising agricultural practices for smallholder farmers in India, a country where agriculture is a significant contributor to the economy. By leveraging AI algorithms, companies like CropIn analyse soil characteristics, meteorological data, and satellite imagery to provide actionable insights (Rana, 2023; Shaktawat & Swayprava, 2024). Mobile applications are utilised to deliver personalised recommendations on pest control, irrigation, and crop management to smallholder farmers, enabling data-driven decision-making. The adoption of AI in agriculture promotes sustainable practices, enhances crop yields, and optimises resource efficiency, ultimately contributing to improved agricultural productivity and food security.

Brazil: Artificial intelligence for environmental monitoring in the Amazon rainforest:

Brazil is at the forefront of leveraging artificial intelligence (AI) to address pressing environmental concerns in the Amazon rainforest, a region of unparalleled biodiversity. The National Institute for Space Research (INPE) utilizes AI algorithms to analyze satellite imagery and monitor deforestation in real-time, enabling the detection of illicit logging activities and informing enforcement of environmental regulations (Silva et al., 2022; Almeida et al., 2023). By integrating AI with geographic information systems (GIS), Brazilian authorities can identify high-risk areas and develop targeted conservation strategies. This synergistic approach facilitates more effective monitoring and management of the Amazon's natural resources, ultimately contributing to the preservation of its unique ecosystem.

Kenya: AI-assisted medical care for remote communities

In Kenya, where geographical barriers and inadequate healthcare infrastructure often limit access to medical care, artificial intelligence (AI) is playing a transformative role in enhancing healthcare delivery (Adegbiji & Okonkwo, 2023; Mwangi et al., 2024). Ilara Health's AI-powered diagnostic technologies leverage machine learning algorithms to improve medical imaging analysis, facilitating early disease detection and timely interventions. The deployment of portable diagnostic solutions addresses the challenges of distance and limited healthcare infrastructure, enabling healthcare providers to deliver high-quality medical care to remote and underserved communities. By harnessing the potential of AI, Kenya's healthcare sector can bridge the gap in healthcare access and improve health outcomes for marginalised populations.

Rwanda: Artificial Intelligence in Education for Reinforcement Learning:

Rwanda is leveraging artificial intelligence (AI) in education to enhance learning outcomes and bridge educational disparities. The Smart Africa initiative, in collaboration with platforms like Zindi Africa, is deploying AI-driven learning platforms that provide content tailored to individual students' needs (Harerimana & Mtshali, 2020; Niyigena et al., 2022). These platforms machine learning algorithms to adapt to each student's learning pace and style, enabling teachers to deliver more effective instruction. By harnessing the potential of AI, Rwanda aims to improve student learning outcomes, increase educational efficiency, and promote inclusive education.

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Vietnam: Using AI-Powered Chatbots to Promote Financial Inclusion

Vietnam is harnessing the potential of artificial intelligence (AI) to promote financial inclusion, particularly in underserved communities. The National Payment Corporation of Vietnam (NAPAS) has deployed AI-powered chatbots to provide financial information and services to individuals without access to traditional banking (Ha & Nguyen, 2022; Le et al., 2023). These chatbots facilitate secure and convenient financial transactions, thereby bridging the financial inclusion gap in areas with limited banking infrastructure. By leveraging AI-driven solutions, Vietnam aims to enhance financial accessibility and promote economic empowerment among marginalised populations.

Methods for Closing the Gap:

Closing the implementation gap in artificial intelligence (AI) requires concerted efforts, particularly in developing countries. This section outlines key strategies to overcome barriers and facilitate widespread adoption of AI technologies. Significant investments in digital infrastructure are crucial, necessitating public-private partnerships to develop data centres, ensure reliable electricity supply, and enhance broadband connectivity (Kshetri, 2021; Chen et al., 2022). A robust and accessible infrastructure is foundational to successful AI implementation. Bridging skill gaps is equally critical, with priority given to capacity-building initiatives and education in AI-related fields. This includes integrating AI courses into academic curricula, offering professional training programmes, and fostering a culture of lifelong learning (Esteva et al., 2021; Rajpurkar et al., 2022).

Fostering collaboration among academia, industry, and government agencies is crucial for facilitating knowledge sharing and dissemination, thereby accelerating AI adoption and harnessing its potential for socioeconomic development (OECD, 2021; WEF, 2022). Effective implementation of AI strategies can bridge the AI divide and promote inclusive growth by creating opportunities for marginalised communities and enhancing economic productivity (UNDP, 2022). To create an enabling environment for AI to thrive, governments and organisations must adopt a multifaceted approach, encompassing infrastructure development, capacity building, and policy support (ITU, 2021). By prioritising these areas, countries can unlock the full potential of AI and drive sustainable development, ultimately contributing to the achievement of the Sustainable Development Goals (SDGs) (UN, 2020). Closing the AI implementation gap requires sustained efforts and commitment from all stakeholders, including governments, industry leaders, and civil society organisations (WEF, 2022).

The integration of artificial intelligence (AI) in various industries is transforming the global economy, with far-reaching implications for businesses, governments, and society (Accenture, 2022; McKinsey, 2023). As AI technologies continue to evolve, organisations must prioritise strategic investments in digital infrastructure, talent development, and innovation ecosystems to remain competitive (Gartner, 2022). Effective governance frameworks and regulatory policies are also crucial for ensuring the responsible development and deployment of AI solutions (European Commission, 2022). By leveraging AI's potential, organisations can drive growth, enhance productivity, and create new opportunities for economic development (World Bank, 2023).

Implementing artificial intelligence (AI) successfully requires establishing trust and fostering community engagement, which can be achieved through targeted awareness campaigns that highlight both the benefits and risks of AI (Bostrom & Yudkowsky, 2022; Jobin et al., 2023). Community participation in decision-making processes ensures that AI solutions are responsive to local needs and cultural nuances, thereby promoting more effective and sustainable outcomes (Kallio & Hölttä, 2022). Given the global nature of AI challenges, international cooperation is essential, and partnerships between technology companies, research institutions, and international organisations can be particularly beneficial for developing countries (UNCTAD, 2022).

Collaborative efforts can help bridge the AI divide by sharing best practices, conducting joint research projects, and exchanging knowledge. To promote inclusive development, it is crucial to provide targeted support for AI-driven firms and entrepreneurs, including accessible funding sources, mentorship programmes, and incubators that empower local innovators to develop context-specific solutions (GSMA, 2023). By adopting these strategies, stakeholders can work together to create an environment where AI technologies contribute to sustainable development and benefit all segments of society in emerging nations.

The development of infrastructure, capacity building, and other strategies are crucial for closing the AI gap. Public-private collaborations, as seen in Figure 2.

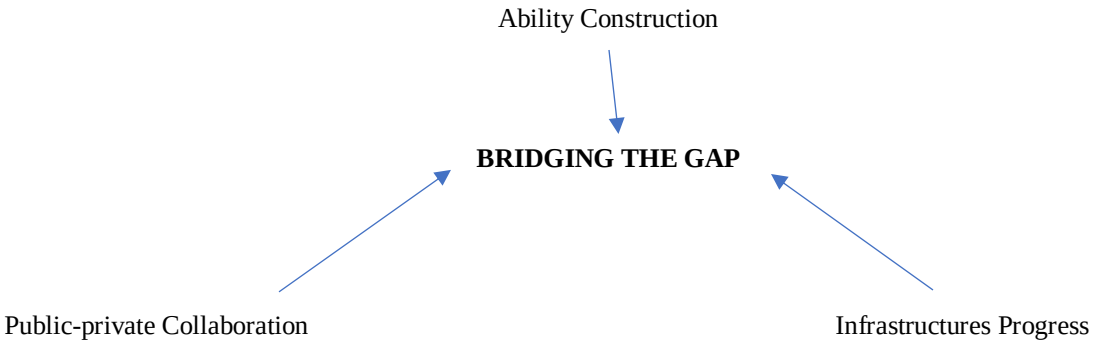

Figure 2: The Secret to Closing the AI Divide

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Ethical Aspects of AI Adoption:

Handling Privacy, Security, Fairness, and Bias The application of artificial intelligence (AI) raises ethical issues that call for careful planning in order to maintain security and privacy, as well as to ensure equity and combat bias. This section examines important ethical issues and offers suggestions for how to handle them.

Fairness and Bias:

Unintentionally sustaining and exacerbating pre-existing societal disparities can be caused by bias in AI algorithms. A proactive strategy for addressing bias is closely examining training data to find and fix biases. To guarantee that the AI system learns from a wide range of experiences, it is imperative to employ a diversified and representative dataset. To find and address biases that might appear during deployment, algorithmic outputs must be continuously audited and monitored. The creation and observance of ethical norms and principles are methods for guaranteeing justice. Accountability is enhanced with transparent AI systems, where decision-making is transparent and easy to understand. Furthermore, promoting diversity in AI development teams and including stakeholders in the decision-making process aid in the detection and rectification of biases, guaranteeing the fair and equitable use of AI systems. (Gultag and Suresh, 2019)

Privacy and Security:

Finding a careful balance between using data to spur innovation and safeguarding personal privacy is essential to the ethical use of data in AI applications. Organizations can gain insights from data without jeopardizing individual privacy, thanks to privacy-preserving technologies like federated learning and differential privacy. To give users control over their data, explicit policies and regulations that clearly define the gathering and use of personal information are necessary (Abadi et al., 2016).

AI in Developing Nations: legal and ethical issues to consider

Strict adherence to ethical and legal standards is necessary when using AI in poor nations. User consent, algorithmic responsibility, and data protection all require the establishment of strong legislation. Local settings and global ethical norms should be taken into consideration while designing these policies. Responsible and advantageous use of AI technology in poor nations is supported by ethical AI practices that defend against potential misuse (Floridi et al., 2021; Murphy and Barr, 2022; Shneiderman, 2020). To foster trust and guarantee the appropriate use of these technologies, it is essential to navigate ethical issues in the application of AI. Stakeholders may aid in the creation of AI systems that adhere to moral principles by aggressively combating bias, advancing justice, and placing a premium on privacy and security, a good impact on society and ethical norms can be achieved by developing AI systems with the involvement of stakeholders.

Opportunities and Suggestions for the Future:

This is an exciting and challenging time to be thinking about artificial intelligence (AI) in developing nations as we find ourselves at the crossroads of technological growth and societal transformation. In order to forecast how AI will contribute to these countries' ongoing development, this section examines current trends in the field. It also offers guidelines for policy to help stakeholders and governments promote safe usage of AI.

New developments in AI:

These technologies have the potential to completely alter a number of industries in the future. Artificial intelligence applications will become more complex and context-aware as machine learning, natural language processing, and robotics advance. AI will establish interconnected ecosystems by integrating with other future technologies like 5G and the Internet of Things (IoT), facilitating smooth data interchange and improved decision-making. According to Saeed and Omlin (2023), the creation of AI models that can be explained by humans will lead to a greater degree of openness and will tackle issues surrounding algorithmic responsibility.

Future Expectations for AI's Contribution to Developing Nations' Continuing Development:

Artificial intelligence is predicted to be a key component in helping developing nations overcome socioeconomic obstacles as they continue to develop. There is a significant expectation for growth in precision agriculture, tailored medical treatment, and inclusive education. Artificial intelligence-powered advancements in manufacturing, finance, and logistics will boost productivity and boost GDP. Global and national cooperation projects will facilitate information sharing and provide doors for technological leapfrogging, allowing emerging nations to take advantage of artificial intelligence.

Policies:

The governments of emerging nations should take into account the following policies in order to fully utilize AI: Expenditure on Research and Education, AI Adoption Incentives, and National AI Strategies. Investing in AI research and education initiatives will help to develop a skilled labor force. Work together with the business and academic communities to close skill gaps and encourage innovation. Offer monetary rewards to companies that implement AI technology. AI adoption can be encouraged by tax credits, grants, and subsidies, especially for small and medium-sized businesses (SMEs). Comprehensive national AI strategies that

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delineate the objectives, roadmaps, and vision for the field of AI research. These tactics ought to take into account local circumstances, target a variety of industries, and be inclusive.

Creating regulatory frameworks is necessary to guarantee responsible usage of artificial intelligence. creating and implementing moral standards for the creation and application of AI. Fairness, accountability, openness, and privacy protection should all be covered by these rules. strong data protection laws to protect people's privacy., establishing precise guidelines for the gathering, storing, and sharing of data in order to avoid abuse, putting in place measures for algorithmic accountability that oblige companies to reveal and justify the ways in which AI systems make decisions. Compliance can be guaranteed by routine audits. AI has enormous potential for developing nations, but responsible governance and strategic planning are needed for it to become a reality. Governments and stakeholders may harness the revolutionary power of AI for inclusive and sustainable development by embracing emerging trends and enacting appropriate policies, AI's transformational potential can be used by stakeholders and governments to promote equitable and sustainable development.

Summary

Since artificial intelligence (AI) has the ability to drastically alter economies, society, and the course of development as a whole, it is clear from our investigation of AI in developing nations that this field has enormous revolutionary potential. Highlighting the potential of AI in promoting inclusive development, this conclusion highlights major findings, highlights key topics covered in the review paper, and provides a strong call to action for stakeholders to resolve obstacles and take advantage of opportunities. In this review, we have explored the complex terrain of artificial intelligence implementation in developing nations.

The journey has been one of discovery and realization of the significant influence AI may have on these countries, from the obstacles presented by insufficient infrastructure, talent gaps, and ethical concerns to the plethora of potential in agriculture, education, medical care, and other sectors. We've seen case studies that highlight practical applications, demonstrating that artificial intelligence (AI) is more than just a luxury technology but rather a workable answer to urgent problems across a range of industries. Artificial intelligence is demonstrating itself to be a force for good, whether it is improving smallholder farmers' precision agriculture, transforming medical care in isolated areas, or keeping an eye on environmental sustainability.

Infrastructure, talent, and ethical issues are barriers for developing nations, but these obstacles also present chances to overcome long-standing limitations. AI's potential can be realized through focused regulations, education, and awareness campaigns. AI is having a huge impact on a variety of industries, from financial services to agriculture and medical care delivery to education and medical care outcomes. AI's many uses highlight how adaptable technology is for solving a wide range of problems. It is clear that AI has the ability to promote inclusive development. When paired with strategic policies, locally-specific precision applications can guarantee that the advantages of AI are shared fairly, promoting inclusive and sustainable development. Governments, corporations, and educational institutions are among the stakeholders who must work together to address issues. measures to bridge skill shortages, infrastructure, and education investments, and programs to bridge skill gaps are crucial. In order to create an environment that is favorable to the application of AI, public-private partnerships can be extremely important.

It is impossible to exaggerate how much AI can promote inclusive development. It is essential that interested parties take advantage of the opportunities that AI applications bring. This entails using AI to promote sustainable agriculture, provide accessibility to medical care, and support creative teaching methods. Beyond national boundaries, AI presents both benefits and challenges for developing nations. To exchange resources, best practices, and information, international cooperation is necessary. Research institutes, IT firms, and international organizations can all be very helpful in assisting underdeveloped nations as they advance their AI initiatives.

In conclusion, the integration of AI in developing nations is a dynamic process that calls for strategic planning, coordinated efforts, and an inclusive mindset. There are enormous potential benefits, and stakeholders can create a more cooperative environment by working together to address obstacles working together, stakeholders can create a future where artificial intelligence (AI) drives sustainable growth and leaves no one behind.

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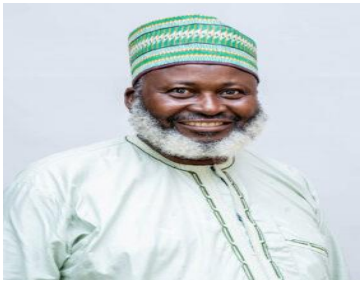

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