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Challenges in Adoption of AI and plan of action for its sustainable development

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Abstract

By the Adoption and Integration of Artificial Intelligence the Global Economy is rapidly transforming, posing both significant opportunities and challenges. AI has the capacity to dramatically boost productivity across various industries. This study illuminates the impact of artificial intelligence (AI) on economic growth and development by looking at its potential to stimulate and drive innovation, enhance productivity, and shed light on Novelty. The article overviews Impact of AI in GDP, job Market, productivity, and economic system of a country. The conversation emphasizes the importance of balanced policies to reap the benefits of AI while mitigating its risks, and it offer insights for policymakers and corporate leaders focusing on minimizing short-term disruptions and enhancing AI-driven economic development.

Keywords: Artificial Intelligence, Economic growth, Challenges, Plan of action

Introduction

In the Changing Scenario, Artificial Intelligence (AI) is emerged as a transformative force in the global environment. Indian economy is no exception, its moving alongside with Revolutionising system. According to the International Data Corporation, by 2030, Artificial intelligence is expected to contribute around \$19.9 trillion to the global economy, resulting 3.5% of global GDP. With the Integration of AI, country can boost Productivity, remove economic imbalance and promote sustainable economic growth. Meanwhile, AI can pose several challenges, but it can be tackled and balance through technologies, Policies and Measures.

Artificial Intelligence has the capability to simplify big data, ease the complex process in different area and facilitate better decision making to reshape industries and redefine economic growth. Economic impact of AI is crucial for maximizing its benefits and ensuring inclusive, long-term growth across various regions. While AI has the potential to boost country's economy, not all sectors or the industries may experience significant/positive increase in its performance from AI. It is the essence of this schedule, to explore how the AI affects economic well-being in different institutional and environmental settings and provide feedback and insight to the stakeholders in policy formulation and economic planning to drive innovation, efficiency and competitiveness.

Objectives

1. To assess the contribution of Artificial Intelligence to country's economy.
2. To analyse the impact of AI on key sectors.
3. To assess the challenges and the Plan of Action needed in adoption and implementation of AI

Literature Review

With AI country can enhance productivity, spur innovation and accelerate economic growth but there is need to address the sustainable development of overall economy for long-term growth and country's prospectus.

AS per the study conducted by Rahman *et al.*, which highlights the potential of AI to enhance economic growth through corporate investment. Study points that 4.87% increase in corporate investment In AI led to 1% Increase in GDP.

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The International Monetary Fund (IMF) and World Bank's (2021) analyses further expansion of the economic frameworks, examining the influence of AI within global economic indicators. They stress that countries adopting AI are likely to witness rapid productivity increases, but this depends heavily on factors such as policy frameworks, infrastructure development, and workforce adaptability.

Brynjolfsson and McAfee (2020) emphasize AI's role as a pivotal technology, comparing its potential to that of the internet or electricity in reshaping economies. They argue that AI can significantly accelerate economic output in industries ranging from manufacturing to services by enhancing efficiency and expanding production capabilities. They further highlight the importance of complementary factors—such as supportive policies and robust technological infrastructure—in maximizing AI's economic impact, especially in developed economies with advanced technology systems.

As of now, much of the existing study focused on AI's impact on Overall GDP, there is a need to examine its effects on Specific and overall sectors of an economy, which is more precise indicator of AI Performance which gives a roadmap. Further, there is a need to focus on challenges it has, and plan of action it needed for successful implementation. This literature review is structured around (1) AI's impact in economic growth, (2) challenges of AI and (3) action plan needed in AI adoption very efficiently Within each sector as well in overall sectors of an economy. The review not only highlights the gap in the existing literature but provides an insight for stakeholders to look into the diverse economic landscapes to optimize the use of AI.

Research Methodology

In order to thoroughly investigate the effects of artificial intelligence (AI) adoption and its difficulties, this study uses a mixed-methods approach that combines quantitative and qualitative analysis. Data are collected from a wide range of reliable sources, including research papers, case studies, Government and Institutional reports, and other publications.

AI & Economic growth; Indian perspective

According to estimates made by the National Council of Applied Economic Research (NCAER), AI is projected to have a significant impact on India's GDP growth in the periods to come. The study conducted by National Association of Software and service Companies (NASSCOM), AI would contribute \$967 billion to the Indian Economy by 2035.

In the Indian context, the impact of AI can already be seen in a wide range of different sectors of the economy. All industries, including the manufacturing, Retail and financial services are using AI to improve its operations. In the Indian banking sector, AI is used, to detect fraud, improve customer service, delivering a more secure and seamless experience. Similar to this, Indian retailers are using AI to improve supply chains, personalise recommendations, and ensure maximum efficiency. By enhancing automation, improving decision-making processes, and enabling new forms of innovation, AI is transforming industries and contributing to overall productivity gains.

As AI technologies evolve, they enable businesses to reduce costs, increase productivity, and improve product quality,

leading to increased output which defines efficiency. There are numerous Indian industries that had a substantial impact with adoption of AI. For instance, in agriculture, AI can increase crop yields, lower crop losses, and raise the quality of agricultural outputs. Further, AI is applied to early detection systems for pests and diseases as well as to optimize irrigation and fertilizer use.

AI has the ability to personalize healthcare delivery, improve disease detection and treatment, and develop new drugs and treatments. In the education field, AI has the potential to personalize learning, elevate educational standards, and improve accessibility. AI can help businesses automate tasks, make smarter decisions, and optimise processes. This might lead to significant increases in productivity, which would boost GDP growth. AI is being utilized to streamline the software development process, improve supply chain management, and help Indian pharmaceutical companies develop new treatments and therapies. A launch of an AI-powered cancer diagnostic tool by Apollo hospitals is a prime example of the potential for new job growth in AI-powered medical imaging and diagnostics. The BFSI sector led early AI adoption for financial operations, fraud detection, and customer service. with AI, country's economy is strengthening and more competitive in the global market.

AI is transforming work landscapes across industries, offering chances for skill development, economic growth, and deliver high quality services. This includes all service sector industries including IT, healthcare, and education.

The GOI is making maximum efforts to encourage the use of AI to its maximum extent. There are variety of programmes and schemes to encourage AI research and development. The era of innovation and growth is led by AI seems to integrate industries across economy. The revolutionary potential of AI in India's economic and technical progress is highlighted by Increase in Startups and MSMEs.

Challenges in AI

The depth and breadth of AI are growing, but there no enough skilled person who can develop and apply AI solution completely and independently. The factors such as Intellectual properties, Corruption, resource availability, lack of infrastructure, and inflation significantly influence economic growth and AI. So, to utilize the full potential of AI, some issues that needs to be fixed.

The biggest issue that arisen with the AI is job displacement. With the adoption of AI, the people, especially engaged in industries like manufacturing, retail, and administrative services will lose their job. If displaced workers are unable to find new jobs or switch jobs, the shift to an AI-driven economy could make economic inequality worse. People with high qualified and technical abilities may benefits from the new opportunities brought forth by AI, But the condition unskilled workers make the situation worse. Targeted reskilling and upskilling initiatives are needed to close this gap and assist employees in adjusting to the evolving labour market.

Another problem that must be resolved is data access. AI systems are trained on data, and a algorithm's performance can be greatly impacted by the quality and amount of that data. Additionally, few Indian businesses and government agencies have limited access to high-quality data.

Furthermore, growth of an economy may be impacted by

ethical and privacy issues raised by AI. AI is used in Collecting data, surveillance, and decision-making processes may result in privacy violations and the misuse of personal data. With biased algorithms there may increase in discrimination and inequality.

Every coin has two side, similarly, the AI's impact on nation growth is not uniformly positive; even though with strong base, AI can disrupt market and create volatility. There's need to close look at how AI management practice and techniques that influence business models, Improves decision-making processes and the widespread task of automation.

Action Plan for Sustainable development of AI

Even though integrating AI poses many challenges, it makes a substantial contribution to the general and sound expansion of an economy. In India, AI is revolutionizing a number of industries from diverse sector, showcasing its full potential to boost productivity, work efficiency, and fulfilling the societal needs. For fostering public trust and defending privacy, ensuring transparency, accountability and fairness is essential in AI application. To maximize AI's Potential its need of the time to proactively formulate policy for its sustainable advancement and development, policymakers and stakeholders must concentrate on the following;

- There is a need to Expand digital infrastructure to boost internet penetration in underserved and rural areas. To ensure that high-speed internet is available to everyone and in each arena.
- Launch a nationwide initiative to teach professionals AI-related capabilities, such as robotics, data analytics, and machine learning. Work together with educational institutions and private businesses to guarantee efficacy and relevance. Formulate programs to reskill and strengthen the workers displaced by automation, enabling them to find suitable role.
- Establish regulatory frameworks to ensure accountability and transparency in AI systems. Mandate the use of explainable AI models to build public trust. Encourage businesses to adopt ethical AI practices, including reducing bias, tracking data provenance, and adhering to global standards. Establish independent oversight bodies to monitor AI deployments across industries, ensuring compliance with ethical guidelines and promoting public trust.
- To curb ethical issues and dilemmas, and to establish and promote public trust, transparency, and fairness, an accountability system should be put in place. Governments, Organisations and institution should frame policies and encourage in enabling a thriving innovation ecosystem, fund start-ups, and support Research and development projects.
- Establish public-Private model and encourage collaborations between the government, private sector, and academia to drive R&D in AI technologies. Take initiative in collaborations to share best practices, foster AI research, and ensure India remains competitive in the global AI landscape.
- To avoid monopolistic practices in AI capabilities with few dominant tech companies, a level playing field and to promote a healthy, competitive market environment, the AI system should be regulated, monitored and promoted by independent body. This should be done in such way that the MSMEs, Start-ups should be given

priority.

- Study suggests that, country should invest in Long-term, Capital-intensive AI Infrastructure facility by ensuring inclusive access to all stakeholders. Establishing Decentralized innovation and tech-park hubs may help mitigate transitional dips, so that country can enhance its global competitiveness.
- To maximize AI's benefits, country must address its adoption issues and develop a Comprehensive AI Strategy. The Government may contribute significantly to this, by funding AI research and development, aiding to train AI specialists, and creating regulatory frameworks that support the use and application of AI. Additionally, promote energy efficient AI systems and invest in green technologies to minimize the environmental impact of AI operations.
- Realizing optimal potential requires strategic investment in infrastructure, education, and governance. The government should establish an ecosystem where AI promotes equitable and sustainable growth by tackling skill gaps, ethical concerns, and regional disparities. Nation can establish itself as global leader in AI innovation with targeted policies, technological capabilities, and demographic advantage to create sustained economic development.

AI may initially disrupt industries and have a limited short-term impact of AI across industries. on GDP; it ultimately leads to increased productivity and long-term economic expansion

Conclusion

In conclusion, the study highlights the significant influence AI has had on the country's economy and its potential to enhance society's economic well-being in the long run. AI has the full potential to make Indian economy a Competitiveness and resilience in the global scenario. Closing the skill gap and guaranteeing ethical AI use are some of the issues that demand attention. Maintaining a healthy & balanced growth that maximises AI's positive effects while reducing its hazards remains essential for long-term sustainable development. So, AI is projected to have a significant impact on India's growth in the days to come. AI may initially disrupt industries and have a limited short-term impact of AI across industries. on GDP; it ultimately leads to increased productivity and long-term economic expansion. Finally, the path to realising AI's full potential is still being travelled, but this incredible technology will continue to Indian economic and corporate environment.

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