



Artificial Intelligence and Economic Growth: Exploring The Pathways of Technological Advancement

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ABSTRACT

Artificial Intelligence (AI) has emerged as one of the most transformative technologies driving digital transformation and economic development. As governments and organizations increasingly integrate AI into their operations, its potential to enhance productivity, foster innovation, transform labour markets, and strengthen business competitiveness has attracted growing attention from researchers and policymakers. Although the literature on AI and economic growth has expanded considerably, the mechanisms through which AI contributes to economic development remain fragmented and require a more comprehensive conceptual understanding. Therefore, this paper explores the relationship between Artificial Intelligence and economic growth through the pathways of technological advancement using a conceptual research approach. By synthesising existing theoretical and empirical literature, the study develops an integrated conceptual framework illustrating how AI contributes to economic growth through four interconnected pathways: productivity enhancement, innovation development, labour market transformation, and business competitiveness. The framework further emphasises the importance of digital infrastructure, human capital, and the policy environment in supporting the successful adoption of AI. While AI offers substantial opportunities for economic transformation, its implementation also presents challenges, including workforce adaptation, ethical considerations, and digital inequality, which should be addressed to ensure sustainable and inclusive economic development. The proposed framework provides a theoretical foundation for future conceptual and empirical studies while offering practical insights for policymakers, researchers, and business leaders seeking to leverage AI for sustainable economic growth in the digital economy.

Keywords: Artificial Intelligence, Economic Growth, Technological Advancement, Innovation, Productivity.

INTRODUCTION

Technology has long been recognised as a fundamental driver of economic growth, contributing significantly to productivity improvement, innovation, industrial transformation, and national competitiveness. Over the past few decades, technological advancement has reshaped production systems, created new industries, and transformed business models across the global economy. In the era of digital transformation, Artificial Intelligence (AI) has emerged as one of the most influential technologies, attracting increasing attention from governments, businesses, researchers, and policymakers due to its ability to transform economic activities, improve organisational performance, and support long-term economic and social development (Qin et al., 2024; Abbas Khan et al., 2024; Shaukat et al., 2025). As AI technologies continue to evolve, they are becoming an important strategic resource for improving productivity, enhancing innovation, and strengthening the competitiveness of both organisations and national economies.

Artificial Intelligence refers to computer systems capable of performing tasks that typically require human intelligence, including learning, reasoning, problem-solving, decision-making, and natural language processing (Wang et al., 2021). Supported by machine learning, big data analytics, and advanced algorithms, AI enables organisations to automate routine processes, improve operational efficiency, optimise resource utilisation, and facilitate data-driven decision-making. Consequently, AI applications have expanded rapidly across manufacturing, finance, healthcare, education, agriculture, logistics, and public administration, fundamentally transforming business operations and economic activities (Challoumis, 2024; Goi et al., 2024). Existing studies consistently demonstrate that AI contributes to higher labour productivity, operational efficiency, technological

innovation, business competitiveness, and the creation of new economic opportunities across various industries (Kalai et al., 2024; Almeida et al., 2024).

Beyond improving organisational performance, AI has become an important catalyst for technological advancement and sustainable economic transformation. AI technologies support intelligent resource management, optimise production processes, accelerate innovation, and facilitate the development of environmentally sustainable practices. The integration of AI with emerging technologies has also contributed to the advancement of the circular economy, resource efficiency, and sustainable development initiatives, highlighting its growing role in balancing economic progress with environmental sustainability (Rasheed & Yuhuan, 2026; Ahmad & Prisca, 2026; Wang et al., 2026). As a result, many countries increasingly regard AI as a strategic technology capable of enhancing economic resilience, industrial competitiveness, and long-term national development.

Despite these significant opportunities, AI adoption also presents several challenges that may influence its contribution to sustainable economic growth. The increasing automation of routine and repetitive tasks has transformed labour markets by altering occupational structures and changing the nature of work, raising concerns regarding workforce displacement and employment transitions (Mpanza, 2025; Almusharraf, 2025). However, rather than simply replacing human labour, AI is also creating new employment opportunities and increasing demand for advanced digital competencies, analytical capabilities, and continuous workforce development. Consequently, organisations and governments are increasingly required to invest in employee reskilling and upskilling to ensure that workers can effectively adapt to technological change and remain competitive in the digital economy (Chuang et al., 2026; Yuan et al., 2026).

In addition to labour market transformation, the widespread adoption of AI has generated growing concerns regarding ethical governance, algorithmic bias, data privacy, cybersecurity, and digital inequality. The increasing use of algorithmic decision-making and AI-enabled management systems has raised important questions regarding fairness, accountability, transparency, and responsible AI implementation within organisations (Pepple & Muthuthantrige, 2026). These concerns suggest that the economic benefits of AI cannot be fully realised through technological advancement alone. Instead, successful AI adoption requires supportive digital infrastructure, skilled human capital, effective governance, and appropriate policy frameworks that encourage innovation while safeguarding social and economic well-being (Ho & Giwa, 2026).

Although the literature examining Artificial Intelligence and economic growth has expanded considerably in recent years, much of the existing research focuses on individual industries, specific technologies, or country-specific contexts (Akhtar & Rawol, 2024; Maswana, 2024). Consequently, there remains limited conceptual understanding of the broader mechanisms through which AI contributes to economic growth across different economic environments. Existing studies often examine productivity, innovation, labour market transformation, or business competitiveness independently, resulting in a fragmented understanding of the interconnected pathways through which AI influences economic development. Furthermore, relatively limited attention has been given to integrating both the opportunities and challenges of AI adoption within a single conceptual framework that explains how technological advancement contributes to sustainable economic growth.

Therefore, this paper aims to explore the relationship between Artificial Intelligence and economic growth through the pathways of technological advancement. Using a conceptual research approach, the study synthesises existing theoretical and empirical literature to develop an integrated conceptual framework explaining how AI contributes to economic growth through productivity enhancement, innovation development, labour market transformation, and business competitiveness. The framework also highlights the importance of digital infrastructure, human capital, and the policy environment in supporting successful AI adoption while recognising the challenges associated with workforce transformation, ethical governance, and digital inequality.

This study contributes to the growing body of literature on AI-driven economic transformation by providing a comprehensive conceptual perspective on the mechanisms linking Artificial Intelligence and economic growth. The proposed framework offers a theoretical foundation for future research and provides useful insights for policymakers, researchers, and business practitioners seeking to maximise the economic benefits of AI while promoting sustainable, inclusive, and resilient economic development in the digital era.

Research Background

Artificial Intelligence in the Digital Economy

Digital technologies are transforming the world economy and Artificial Intelligence (AI) is one of the most important technologies in this field. It is becoming more and more widely accepted that AI can change production systems, business operations, public services, and economic activities. Unlike traditional digital technologies, AI can simulate human intelligence with machine learning, natural language processing, computer vision, predictive analytics, and other skills that allow intelligent decision-making and learning from data (Wang et al., 2021). The increasing adoption of AI is indicative of the transition from production-led to knowledge-based and digital economies where technology is becoming a key factor to economic performance. Increasingly, manufacturing, finance, healthcare, education, logistics, agriculture, and public administration are using AI to improve productivity, resource utilization, and organizational performance.

This increasing adoption of AI also indicates that AI is no longer just an emerging technology but an economic tool that is used to advance digital transformation and long-term economic growth (Qin et al., 2024; Abbas Khan et al., 2024). AI is being increasingly deployed for economic transformation as it has been shown to help in decision-making and efficiency in operations and also the development of new products, services, and business models. AI helps in faster processing with greater accuracy and in business processes to make decisions in a more efficient way; it allows companies and governments to respond to the changing economic conditions and market environment. AI is now an important part of the digital economic ecosystem as it can lead to innovation, competitiveness, and sustainable development (Challoumis, 2024; Goi et al., 2024). AI has also been gaining attention in the field of organizational development as it has been shown to be very useful for the development of the national and international economy.

As digitalization is growing fast in the world, we see that countries continue to invest in AI technologies to improve industrial competitiveness and increase innovation and economic resilience for future generations as well. The integration of AI in economic systems is therefore regarded as a crucial strategy towards higher productivity, sustainable growth, and long-term development in an increasingly tech-oriented economy (Ho & Giwa, 2026; Spagnuolo et al., 2025).

Artificial Intelligence as a Driver of Technological Advancement

In recent years, technological advancement has always been an important driver for economic development and in particular in economies that are rapidly evolving in digital space. As Artificial Intelligence is the future, it goes beyond automation and can help intelligent systems learn, adapt and make better decisions. Moreover, with the rapid development of AI technologies, this is also happening in every field, so that technology is creating new opportunities for innovation, operational excellence, and economic value (He, 2021; Wang et al., 2021). AI technology plays a key role in technological development in that it is able to improve production processes, optimize business operations and help in the development of intelligent digital infrastructure. AI-driven technologies will help companies forecast market trends and provide services like supply chains, customer support and strategic planning based on data. These technologies help businesses to be more agile, efficient and competitive in today's fast-paced world economy (Gyau et al., 2024; Challoumis, 2024).

AI is also one of the key enablers of innovation, as it facilitates research, knowledge generation and technological development. Organizations that invest in AI-driven technologies have more opportunities for innovation in all domains of the economy and thus a higher level of industrial performance and greater technological competitiveness. This relationship shows AI as a technology tool of the future as well as a catalyst of continuous technological development and long-term economic development (Almeida et al., 2024; Qin et al., 2024) as well as the future of society.

What is more important than the organization being successful is the way that innovation leads to the economy as well. AI-driven technological advancement has been associated with productivity, industrial transformation, environmental sustainability, and economic resilience. Recently, technological innovation has been discussed as a factor in balancing economic growth with sustainable development in order to help the economy to grow

better in the face of new environmental and social challenges (Zeb et al., 2025; Ahmed, 2026; Rasheed & Yuhuan, 2026). This is why technological advancement is a critical pathway through which Artificial Intelligence will contribute to economic growth and is the conceptual framework for this paper.

Artificial Intelligence and Productivity Enhancement

Productivity is one of the most important determinants of economic growth and as such, reflects an economy's capacity to create more from its resources. As businesses continue to embrace Artificial Intelligence (AI), productivity improvement has become one of the most visible economic benefits associated with technological advancement. AI enhances organisational efficiency by automating repetitive work, accelerating decision-making processes, reducing operational costs and allowing firms to take advantage of more of the resources available. This means that businesses can optimise production processes and achieve high accuracy, and therefore consistency of production (Kalai et al., 2024; Wang et al., 2021).

The impact of AI in productivity on various sectors is wide-ranging and deep. AI in manufacturing is also a good way to support intelligent production systems, predictive maintenance, and quality control and this will lead to higher production efficiency. AI in the financial sector improves financial decision-making, customer service, fraud detection, and operational management which can be beneficial to the overall organisation and financial sustainability (Gyau et al., 2024). AI in healthcare, education, logistics, and public administration have also led to better service delivery and better operation and resource allocation and is as a result of broad economic value for the use of AI (Abbas Khan et al., 2024; Goi et al., 2024).

AI is not only a labour replacement, but also a productivity driver as it helps employees to analyse the information they have to do and make intelligent decisions as well. This partnership between human innovation and technology makes the whole organisation more productive and employees able to focus on high-value work that promotes innovation and development as we go into the future (Ho & Giwa, 2026). With rapidly becoming digital-oriented economies, productivity enhancement is now a critical step in connecting AI with economic growth. Higher productivity improves industrial performance, makes us more competitive and therefore creates higher economic output and is good for long-term economic growth. Thus, productivity enhancement is one of the key ways Artificial Intelligence will benefit long-term growth.

Artificial Intelligence and Innovation Development

Innovation is one of the key drivers of economic growth as it allows companies to develop new products, services, technologies, and business models that are beneficial for the business. Artificial Intelligence is a catalyst of innovation in the digital economy and is vital for companies to discover new knowledge and new opportunities to develop faster and more technology in the field. AI in the digital economy is able to make companies more innovative by providing them with advanced computational capabilities (Almeida et al., 2024; Qin et al., 2024) and data-driven learning. Artificial Intelligence drives innovation in research and development to improve product design, customer service, and intelligent business solutions.

AI technology helps companies to process complex information efficiently, identify market trends, and create new products and services that add new economic value. So, companies adopting AI become more efficient in terms of their competitive advantage and innovation, and business growth and technological development in all fields (Challoumis, 2024; Goi et al., 2024). AI also has a role to play in innovation beyond the sector of businesses to the broader economic system. AI promotes collaboration among businesses, research institutions, governments, and technology developers, and innovation in collaboration as knowledge is shared and technological innovation is spread across industries.

This collaboration increases innovation ecosystems, entrepreneurship, and the development of knowledge-based industries for national development (He, 2021; Ho & Giwa, 2026). Recently, research scholars have also highlighted the significance of innovation for sustainable and equitable economic development. AI-enabled innovation contributes to the development of efficient production systems, sustainable technologies, and environmentally responsible business practices, harmonizing technological progress with the overall economic and environmental objectives (Spagnuolo et al., 2025; Zeb et al., 2025; Ahmed, 2026). Therefore, innovation

development is another key route through which Artificial Intelligence contributes to economic growth, further highlighting technological advancements as a major factor in future economic growth.

Artificial Intelligence and Labour Market Transformation

Labour market transformation is one of the most significant effects of adopting Artificial Intelligence (AI) in the digital economy. As AI technologies keep advancing, they reshape the nature of work, change job structures, and influence the demand for skills across various industries. Unlike earlier waves of technological change that mainly improved production efficiency, AI can perform cognitive and analytical tasks. This capability allows organizations to automate routine activities and improve decision-making processes. As a result, AI is changing the labour market by altering how work is organized, creating new jobs, and changing the skills needed in modern workplaces (Mpanza, 2025; Shaukat et al., 2025). Thus, labour market transformation has become an important way through which AI helps broader economic development.

The growing use of AI brings both opportunities and challenges for employees and organizations. On one hand, AI-driven automation might decrease demand for repetitive and routine jobs, leading to job loss in certain sectors. On the other hand, AI also creates new jobs and increases the need for skilled workers with knowledge of digital technologies, data analytics, problem-solving, and AI system management. Rather than completely replacing human labour, AI is more often seen as a technology that supports workers in handling more complex, creative, and valuable tasks (Almusharraf, 2025; Mpanza, 2025). This shift highlights the changing relationship between people and intelligent technologies in the digital economy.

The transformation of labour markets has made human capital development and ongoing learning more important. As AI technologies become part of business operations, organizations need to invest in reskilling and upskilling employees to close skill gaps and improve workforce adaptability. Chuang et al. (2026) argue that AI technologies have increased the need for continuous professional development, especially among middle-skilled workers facing technological disruption. Likewise, Yuan et al. (2026) suggest that AI adoption encourages employees to acquire new skills, supports career growth, and enhances self-directed learning within organizations. These trends show that being prepared for the workforce and investing in human capital is key to maximizing the economic benefits of AI while keeping employees competitive in fast-changing labour markets.

Even with its potential advantages, the transformation of labour markets driven by AI brings up important ethical and social issues. The growing use of algorithmic decision-making and AI management systems raises concerns about fairness, worker autonomy, job quality, and digital inequality. Pepple and Muthuthantrige (2026) argue that the spread of algorithmic labour requires more focus on responsible AI governance to ensure that technological progress doesn't harm human well-being or create new forms of inequality in the workplace. Therefore, governments, educational institutions, and organizations have a vital role in creating policies that support workforce transition, lifelong learning, and responsible AI use. Overall, labour market transformation is a key way through which Artificial Intelligence contributes to economic growth by improving workforce capabilities, supporting organizational adaptability, and preparing economies for sustainable development in the digital age.

Artificial Intelligence and Business Competitiveness

Labour market transformation is one of the significant effects of Artificial Intelligence (AI) adoption in the digital economy. As AI technologies continue to develop, they are changing the way people work by automating routine tasks, supporting decision-making, and creating new job opportunities. These changes have influenced workforce demand, job structures, and the skills required by employees across different industries (Mpanza, 2025; Shaukat et al., 2025). Consequently, AI has become an important driver of labour market transformation and economic development.

Although AI may replace some repetitive jobs, it also creates opportunities for employees to perform higher-value tasks that require creativity, critical thinking, and problem-solving skills. The adoption of AI has increased the demand for digital skills, continuous learning, and workforce adaptability. Organisations are therefore encouraged to invest in employee reskilling and upskilling to reduce skill gaps and prepare workers for

technology-driven workplaces (Chuang et al., 2026; Yuan et al., 2026). These efforts contribute to improving workforce productivity and organisational performance.

However, AI adoption also presents challenges related to workforce displacement, ethical concerns, and digital inequality. Therefore, governments, educational institutions, and organisations need to develop appropriate policies and training programmes to ensure that AI implementation supports inclusive and sustainable labour market development (Almusharraf, 2025; Pepple & Muthuthantrige, 2026). Overall, labour market transformation represents an important pathway through which Artificial Intelligence contributes to economic growth by developing a more skilled, productive, and adaptable workforce in the digital economy.

Artificial Intelligence and Economic Growth

Economic growth has traditionally been associated with capital accumulation, labour productivity, technological progress, and innovation. In the digital economy, Artificial Intelligence (AI) has emerged as one of the most significant technological advancements contributing to economic development by transforming production processes, improving organisational efficiency, and supporting innovation across various industries (Wang et al., 2021; Qin et al., 2024). As governments and businesses continue to adopt AI technologies, its contribution to economic growth has become increasingly evident through improved productivity, enhanced competitiveness, labour market transformation, and the creation of new economic opportunities.

The relationship between Artificial Intelligence and economic growth is reflected through several interconnected pathways. First, AI enhances productivity by automating repetitive tasks, optimising resource utilisation, and improving decision-making processes, enabling organisations to increase operational efficiency and reduce costs. Second, AI promotes innovation by supporting research and development, facilitating the creation of new products and services, and encouraging technological advancement. Third, AI contributes to labour market transformation by encouraging workforce reskilling, improving employee capabilities, and creating demand for new digital competencies that are essential in the modern economy. Finally, AI strengthens business competitiveness by enabling organisations to respond more effectively to changing market conditions, improve customer experiences, and develop sustainable competitive advantages. Collectively, these pathways demonstrate how AI supports economic performance and long-term growth.

Beyond organisational benefits, AI also plays an important role in supporting sustainable economic development. The integration of AI with emerging digital technologies has improved resource efficiency, promoted sustainable production systems, and encouraged environmentally responsible business practices. These developments contribute not only to economic resilience but also to broader sustainable development objectives by balancing economic progress with environmental and social considerations (Ahmed, 2026; Spagnuolo et al., 2025; Zeb et al., 2025). Consequently, many countries increasingly recognise AI as a strategic technology for strengthening national competitiveness and supporting long-term economic transformation.

However, the contribution of AI to economic growth depends on several enabling conditions. The availability of digital infrastructure, skilled human capital, and supportive government policies plays an important role in facilitating the successful adoption and implementation of AI technologies. In addition, organisations must address challenges associated with AI adoption, including workforce displacement, ethical concerns, cybersecurity risks, and digital inequality, to ensure that the benefits of AI are distributed more inclusively across society (Ho & Giwa, 2026; Almusharraf, 2025). Addressing these challenges will enable economies to maximise the benefits of AI while promoting sustainable and inclusive growth.

Overall, Artificial Intelligence has become a key technological driver of economic growth by improving productivity, stimulating innovation, transforming labour markets, and strengthening business competitiveness. These interconnected relationships provide the theoretical foundation for the conceptual framework proposed in this study, which explains how AI-driven technological advancement contributes to sustainable economic growth in the digital era.

METHODOLOGY

In this paper we investigate the relationship between Artificial Intelligence and economic growth through the pathways of technological advancement. The conceptual approach is appropriate for understanding emerging phenomena in which existing knowledge is evolving. In this paper we will draw on the existing literature on Artificial Intelligence, technological advancement, productivity, innovation, business competitiveness and economic growth. The basic ideas and theories on technological progress and economic development to understand AI as an emerging driver of economic growth will have been developed in the literature. Based on these concepts, this paper proposes an integrated framework to illustrate how AI is driving economic growth, particularly through productivity enhancement, innovation, and business competitiveness.

CONCEPTUAL FRAMEWORK

Artificial Intelligence has become an increasingly important technological driver influencing economic activities through multiple interconnected mechanisms. In this paper, we have outlined a conceptual framework to describe how Artificial Intelligence is important for economic growth through three main directions: productivity enhancement, innovation development and business competitiveness. The framework I have discussed is as follows:

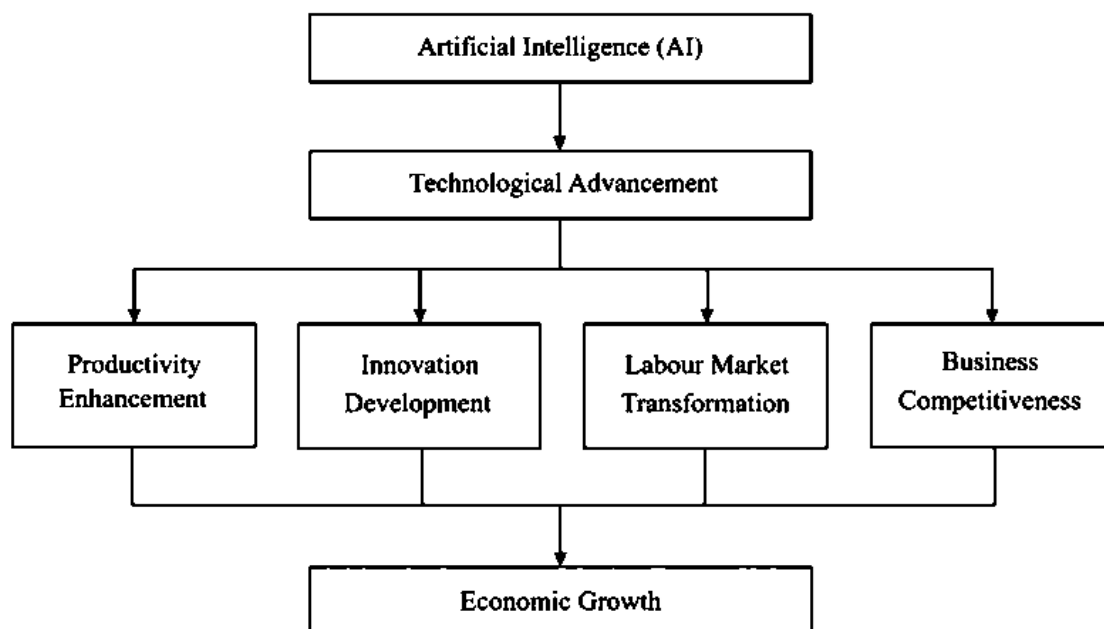


Figure 1: Conceptual Framework of Artificial Intelligence and Economic Growth Through Technological Advancement Pathways.

In this paper, we present a framework that shows the link between Artificial Intelligence (AI) and economic growth through several connected pathways. Figure 1 illustrates how AI boosts economic growth through four main pathways: improving productivity, fostering innovation, transforming the labour market, and enhancing business competitiveness. AI serves as a technology-driven force that enables economic growth by increasing operational efficiency, fostering technological innovation, changing employment structures, and boosting the competitive strength of businesses. These pathways are the primary ways AI affects economic performance. Advances in productivity, innovation, workforce adjustment, and business capabilities all work together to drive broader economic growth. Thus, our framework shows that AI is not just a technological tool; it is also a key driver that supports long-term economic development through these interconnected transformation processes.

DISCUSSION

The proposed framework positions Artificial Intelligence (AI) as the key technology that drives economic growth by connecting four paths: productivity, innovation, labor market transformation, and business competitiveness. AI is not a technology that can be used to primarily enhance production activities but rather to transform many aspects of the economy at once. The framework illustrates that the economic impact of AI is

not made through a simple connection in one simple line. It takes technological skills, organizational transformation, workforce shift, and support from institutions. AI has been shown to play a fundamental role in modern economic development by changing production processes and speeding innovation and the process of decision making (Wang et al., 2021; Qin et al., 2024; Ho & Giwa, 2026).

The first pathway that is identified in this framework is productivity enhancement. AI is an economic engine for growth by improving efficiency, saving money, and using resources in a more efficient manner. AI technologies such as machine learning, predictive analytics, and automation systems enable organisations to handle huge amounts of data, identify patterns, and make better strategic decisions. AI-driven automation in the manufacturing industry can improve productivity with AI tools that optimize supply chains, predict failures, and reduce production waste. AI helps in finance to make risk assessment, fraud detection, and customer service better, and this helps organizations to improve performance (Gyau et al., 2024). In the same way, service companies are increasingly adopting AI systems for improving customer relationships and operational efficiency. So productivity gains due to AI are not only for firms but also for the whole economy in terms of higher output and better competitiveness.

However, productivity benefits of AI adoption are not always realized in a given economic context. At a given time, organisations' ability to harness AI effectively requires technological capability, investment capacity, and infrastructure. Ecosystems with advanced technological capabilities and more digital adoption in developed countries are the best equipped to realize the productivity benefits on a more widespread level in the world and to be able to utilize AI. In developing economies, AI integration can be a slower process due to limited infrastructure and lack of financial resources and skilled human resources, especially in terms of the lack of knowledge (Maswana, 2024; Goi et al., 2024). So, digital readiness is a critical factor that determines whether AI can contribute to the development of the economy. In the second path, AI is integral in the development of innovation. AI is transforming the innovation process by allowing organizations and researchers to analyse large quantities of data, generate insights, and accelerate knowledge discovery. The traditional innovation process, which may be heavily dependent on human experimentation and long research processes, is not that; AI is able to provide advanced analytical tools that enable more rapid and efficient innovation to be conducted, if not faster and more efficiently. Almeida et al. (2024) also pointed out that AI might accelerate the discovery of new ideas, which suggests that AI could be an important driver of future technological progress.

AI also plays a role in the creation of new business models because it allows for personalised services, intelligent platforms, and digital ecosystems. In the health sector, AI is also important in medical research, diagnosis, and personalized treatment development. AI in agriculture allows for precision farming through predictive analysis and resource optimisation. In energy sectors, AI helps in energy management and efficiency (Zheng et al., 2025), and these applications show how AI innovation extends beyond technological progress but also into the more general economic transformation. But the effects of AI innovation are dependent on an inclusive research ecosystem, investment in technology development, and collaboration between governments, industries, and academic institutions.

The third pathway is labour market change, and this is the most controversial aspect of AI advancement. AI has raised concerns about job displacement, particularly in jobs where repetitive and routine work is done. However, the relationship between AI and employment is more complex than job displacement. AI may eliminate some kinds of jobs and create new jobs, but at the same time, it can create new opportunities that are much more complex and require advanced digital skills, analytical skills, and human-AI cooperation. Mpanza (2025) argued that AI affects labour market structure in terms of job demand as it can change the types of jobs and create new kinds of skills. Chuang et al. (2026) point out that AI adoption creates skill gaps but also creates opportunities for continuous workforce development.

Thus, the economic impact of AI on labour markets is highly dependent on human capital development. Education systems, professional training programs, and organisational learning mechanisms are crucial for preparing workers for AI-driven economic environments. Without sufficient investment in reskilling and upskilling in AI adoption, the gap between workers who have digital skills and those who don't is likely to grow. And so human capital should be a moderating factor in the relationship between AI and economic growth. AI is an important factor in the fourth pathway of business competitiveness in digitalisation in the sense that

businesses that harness AI capabilities are more likely to achieve strategic advantage through optimal efficiency, innovation, and consumer response in the new digitalised world. AI helps companies to understand consumer behaviour, make better decisions, optimize the supply chain, and develop more personalised products and services. Akhtar and Rawol (2024) observed that AI is now a key component of economic activity in terms of improving business performance and technological competitiveness in the industry that has a positive impact, and Akhtar and Rawol suggested that AI plays a role in the change of business, and is therefore highly relevant in the competitive environment. At the organizational level, AI adoption of such technology helps firms respond more quickly to market developments and gain competitive advantage in the market and is a step towards making them better in the competitive landscape to move ahead in organisations. Businesses have different benefits associated with AI due to their organization and industry. For large organizations, money, technology, and data are available, and the AI process can be implemented more efficiently. For small and medium-sized companies (SMEs), there are obstacles related to adoption costs, technical limitations, and lack of experience. For this reason, organisational capabilities are a key factor that impacts how AI can be beneficial to business competitiveness and economic growth. AI has opportunities to contribute to economic development, but many challenges must be addressed to make it sustainable. One of the major risks is workforce displacement, where automation could affect certain jobs and create uncertainty in job prospects.

Additionally, ethical issues related to algorithmic bias, data privacy, transparency, and accountability complicate AI adoption. Cybersecurity risks are increasingly important with the growing use of AI-based systems and digital infrastructure in industries and government, and when AI technology is not available as a universal tool in every country, digital inequality between developed and developing countries can become a reality. These challenges show that technology is not enough: good governance, regulatory frameworks and institutional readiness are needed to harness AI and minimize its negative consequences. The enabling factors are therefore a very important aspect to determine the success of AI-driven economic transformation in the economy. Digital infrastructure is the technology that should be in place for AI implementation as well as human capital to enable people and organisations to utilize AI to its fullest potential.

In addition, policy environments shape the development of AI and the development of AI can be governed by rules, investment plans and ethical governance systems. Recent studies have also highlighted the correlation between AI adoption and sustainable development and showed how AI can help to achieve both economic and environmental goals if the context is right (Ahmad & Prisca, 2026; Rasheed & Yuhuan, 2026). The overall framework provides a picture of how AI contributes towards the development of economic growth through complex networks. Productivity increases efficiency, innovation accelerates technological development, labour market transformation facilitates workforce adaptation and business competitiveness enhances organisational performance. And these pathways are not competing but mutually reinforcing: advancements in one dimension may be accompanied by developments in the other and thus have a greater economic impact. AI is not just a technological tool; it is a tool for a strategic transformation of the economy that impacts companies, industries and countries. With technological capabilities integrated with human capital development, organisational readiness and policy support mechanisms and the support of the state, AI can contribute to sustainable and inclusive economic development in different economic environments.

CONCLUSION

In this paper, we explored the role of AI in the growth of the economy, on a conceptual level, using the four interconnected paths (productivity growth, innovation, labour market transformation, and business competitiveness) as a whole. These four pathways point to AI as more than a technological breakthrough, as it is a force that is transforming the way that economic, organisational and industrial processes are conducted and changed. By combining the theoretical and operational literature existing in AI, this paper shows that AI is also economically beneficial in several ways for industry: it is the interaction of technology with human resources and organisational development and institutional support systems that makes it so important. This framework of AI with economic growth is integrated in the current research and is a new dimension to the existing literature (in AI and the economic growth). AI is often seen as a technological advancement, which results in productivity growth or technological breakthrough. However, this study brings together these perspectives by demonstrating how different AI-driven processes contribute to the overall development of the economy.



In this framework, productivity enhancement leads to economic efficiency, innovation development accelerates technological progress, labour market transformation enables workforce change, and business competitiveness enhances the capacity of organisations on the front line to compete in an increasingly digital world. These pathways are interrelated and all contribute to the economic development of the economy. In addition to that, the economic benefits of AI adoption are also influenced by several enabling factors this study indicates. To make AI work in practice, digital infrastructure must be in place, human capital of the organisation must be able to function, and the policy environment must be good for AI implementation. Without these supporting elements, the potential of AI may never be realized and can open up new challenges like technological inequality, workforce disruption and unequal access to economic opportunities. So AI adoption should not be viewed only as a technological investment but also as part of a general economic transformation strategy built on the shoulders of governments, businesses, education institutions and society.

From a policy standpoint, governments need to help shape an AI-ready ecosystem by building digital infrastructure, investing in innovation, establishing appropriate regulatory frameworks and education and training systems. Policies should promote responsible AI development while ensuring that technological advancement is inclusive of inclusive economic growth. In particular, human capital development should be emphasized with respect to reskilling and upskilling because the capacity of the workforce will determine if society can cope with AI-driven changes. Effective governance mechanisms are required to tackle issues in ethical AI use, data privacy, algorithmic bias and cybersecurity. Businesses need to think of AI as an organisation's strategic capability rather than just a tool for operation. AI in the right ways has an impact on efficiency, decision-making, innovation capacity, and faster response to changing market opportunities. But good AI adoption requires not only technological investment but also organisational change, including the training of employees, developing digital skills and how to execute on them well. Small and medium-sized enterprises (SMEs) will need more support to overcome the challenges of cost, technology and implementation. Despite the technological advantages of AI, sustainable economic transformation is a long-term process which must be considered with care. The adoption of AI might cause job disruption for jobs that are routine and repetitive. So, economic strategies must be oriented towards workforce adaptation and innovation rather than resistance to technological change. By promoting lifelong learning, digital education and human-AI cooperation in a way that will bring benefits to the economy and reduce the negative social impact of AI. Similarly, tackling digital inequality will help to ensure that the development of AI-led economic systems does not exacerbate the existing divides of people between countries, sectors and society.

Future research can further develop the proposed framework by investigating different AI capabilities and the impacts on economic growth in different industries, regions and levels of economic development. In the future, we can further explore institutional quality, digital readiness, education capacity, regulatory strength and organisational capacity of each of these factors that affect the impact of AI in relation to economic growth. Other economic studies in developed countries and developing countries could also shed light on how different economic conditions affect the advantages and disadvantages of AI implementation. AI has an important role in industrial transformation and in economic development as it stimulates productivity growth in industries, improves innovation and the labour market and is competitive for companies. The framework outlined in this paper provides a foundation to understand how AI can contribute to the growth of the economy and the ecosystem in which it is implemented and the need to have a supportive ecosystem for successful implementation. It is only as AI continues to evolve that the long-term contribution to economic development of humanity as a whole will depend on how societies will be able to integrate technology with human capabilities, responsible governance and inclusive development strategies.

REFERENCES

1. Abbas Khan, M., Khan, H., Omer, M. F., Ullah, I., & Yasir, M. (2024). Impact of artificial intelligence on the global economy and technology advancements. In *Artificial general intelligence (AGI) security: Smart applications and sustainable technologies* (pp. 147–180). Springer Nature Singapore.
2. Ahmad, M., & Prisca, K. (2026). Unlocking pathways to a sustainable future: The role of AI technologies, resource efficiency, and renewable energy public RD&D budget in sustainable development under geopolitical risk. Gondwana Research.

3. Ahmed, Z. (2026). Navigating the sustainable development pathway: A machine learning assessment of critical minerals, AI technologies, energy transition, and environmental degradation. *International Journal of Sustainable Development & World Ecology*, 33(2), 176–192.
4. Akhtar, Z. B., & Rawol, A. T. (2024). Economy and empirical research perspectives towards artificial intelligence: A deep dive investigative exploration analysis. *Economy*, 11(1), 1–18.
5. Almeida, D., Naudé, W., & Sequeira, T. (2024). Artificial intelligence and the discovery of new ideas: Is an economic growth explosion imminent?
6. Almusharraf, A. I. (2025). Automation and its influence on sustainable development: Economic, social, and environmental dimensions. *Sustainability*, 17(4), 1754.
7. Bawa, S. (2026). Integrating artificial intelligence into resource management for sustainable economic growth in Ghana. *Journal of Industrial Integration and Management*, 11(2), 301–342.
8. Challoumis, C. (2024). Understanding the interplay between AI innovations and economic growth. *BBC*, 3, 326.
9. Challoumis, C. (2024, October). Unraveling the cycle of money: How AI innovations are driving economic change. In *XVI International Scientific Conference* (pp. 152–175).
10. Chuang, S., Shahhosseini, M., Javid, M., & Wang, G. G. (2026). Machine learning and AI technology-induced skill gaps and opportunities for continuous development of middle-skilled employees. *Journal of Work-Applied Management*, 18(1), 95-109.
11. Goi, V., Proskurnina, N., Kovalenko, M., Mamonov, K., & Haidenko, S. (2024). Exploring the influence of artificial intelligence and machine learning on economic and social progress: Prospects and challenges. *Economic Affairs*, 69(3), 1381–1391.
12. Gyau, E. B., Appiah, M., Gyamfi, B. A., Achie, T., & Naeem, M. A. (2024). Transforming banking: Examining the role of AI technology innovation in boosting banks' financial performance. *International Review of Financial Analysis*, 96, 103700.
13. He, X. (2021, October). Exploration of paths for artificial intelligence technology to promote economic development. In *International Conference on Machine Learning and Big Data Analytics for IoT Security and Privacy* (pp. 26–32). Springer International Publishing.
14. Ho, S. Y., & Giwa, F. (2026). Artificial intelligence and economic development: A systematic review of patterns and pathways. *Journal of the Knowledge Economy*, 1–39.
15. Jiang, C. (2024). Revolutionizing economic growth analysis: A novel computational approach to assessing the influence of technological financial efficiency on real economic growth. *Journal of the Knowledge Economy*, 15(3), 11286–11317.
16. Kalai, M., Becha, H., & Helali, K. (2024). Effect of artificial intelligence on economic growth in European countries: A symmetric and asymmetric cointegration based on linear and non-linear ARDL approach. *Journal of Economic Structures*, 13(1), 22.
17. Maswana, J. C. (2024). Exploring the growth effects of artificial intelligence in developing countries in Africa using a semi-endogenous growth model. In *American Economic Association/ASSA Conference*, San Antonio, TX.
18. Mpanza, S. S. (2025). The Economic Influence of Artificial Intelligence on Labour Markets. *EuroEconomica*, 44(2), 25-31.
19. Pepple, D., & Muthuthantrige, N. (2026). Artificial intelligence, innovation and the new architecture of exploitation: Towards reconfiguring humanness in the age of algorithmic labour. *Journal of Innovation & Knowledge*, 11, 100878.
20. Qin, Y., Xu, Z., Wang, X., & Skare, M. (2024). Artificial intelligence and economic development: An evolutionary investigation and systematic review. *Journal of the Knowledge Economy*, 15(1), 1736–1770.
21. Rasheed, M. Q., & Yuhuan, Z. (2026). Exploring the impact of technology related to artificial intelligence, circular economy, and energy intensity on sustainable development goal 13. *Sustainable Development*, 34(1), 533–553.
22. Shaukat, H., Ali, A., & Audi, M. (2025). Artificial Intelligence and Economic Transformation: Implications for Growth, Employment, And Policy in The Digital Age. *Research Consortium Archive*, 3(2), 852-869.

23. Siddik, A. B., Almulhim, A. A., & Masukujjaman, M. (2026). Advancing energy transition through technological financing: Evidence from AI, blockchain, and sustainable development pathways. *Sustainable Development*.
24. Spagnuolo, F., Casciello, R., Martino, I., & Meucci, F. (2025). Exploring the impact of artificial intelligence on the pursuit of SDGs: Evidence from European state-owned enterprises. *Corporate Social Responsibility and Environmental Management*, 32(2), 1987–2001.
25. Wang, L., Sarker, P., Alam, K., & Sumon, S. (2021). Artificial intelligence and economic growth: A theoretical framework. *Scientific Annals of Economics and Business*, 68(4), 421–443.
26. Wang, Q., Liu, T., & Li, R. (2026). Artificial intelligence and environmental sustainability: Investigating the AI-EKC nexus for SDG 7 and SDG 13. *Sustainable Development*, 34(1), 1141–1166.
27. Yuan, Y., Liu, B., Wang, Y., Liu, P., & Yang, L. (2026). Artificial intelligence usage at work: understanding dual self-regulation mechanisms and goal orientation in career growth. *Career Development International*, 1-23.
28. Zeb, A., Shuhai, N., & Ullah, O. (2025). Navigating sustainability and economic growth: The dual influence of green economic growth and technological innovation on environmental outcomes in South Asia. *Environment, Development and Sustainability*, 1–26.
29. Zheng, H., Wu, J., Li, R., & Song, Y. (2025). The role of artificial intelligence in renewable energy development: Insights from less developed economies. *Energy Economics*, 146, 108551.